GME
Gestore
Mercati
Energetici

ANNUAL REPORT 2012

GME
Gestore
Mercati
Energetici

ANNUAL REPORT 2012

EXECUTIVE SUMMARY

The year 2012 marked the second year of a major transition for the Italian and European energy sector in general, and thus also for GME.

On the one hand, the process aimed at establishing the European single energy market through the creation of new infrastructure and rules, promoted by regional initiatives in the first place and, subsequently, by the provisions under the "Third Energy Package", unfolded at an increasingly fast pace; at present, it covers gas markets as well, reinforcing an increasing level of coordination between the various national markets. In the future, this process will most likely determine a more stable price convergence. In this respect, the positive effects stemming from the new rules for the allocation of transmission capacity on gas pipelines and the initial cross-border market coupling experience show that the objective of a single European market cannot be accomplished without a new connection infrastructure across the different national markets and without market rules that allow an efficient use of the existing infrastructure.

On the other hand, the combined effect of structural global phenomena - including the impact of the economic crisis on energy consumption, the remarkable success of renewables in the electricity sector and the wave of production of shale gas in the United States - resulted in a decline in the prices of natural gas and electricity, promoting a price convergence between Italy and the rest of Europe.

GME has strengthened, in this difficult context, its identity as a "multi-commodity" market; thanks to the operation of new projects, it consolidated its presence in the traditional sectors of electricity and environment as well as in the gas sector; at the same time, it began certain preliminary activities to start operating in the fuel sector, too.

In the electricity sector, the consumption crisis (-3.1%) led to a decline in volumes traded on GME's day-ahead market (MGP) down to 178.7 TWh (-1.2%); yet, in 2012 liquidity rose to 59.8%, reaching a historical high of 75.7% in the first quarter of 2013. For the same reasons as well as because of a diversification of supply policies on the part of wholesalers the volume traded in the MTE stopped growing (30.4 TWh, -4.1%) after the increase of volumes traded in 2011 which in turn was offset by an increase in OTC clearing (24.6 TWh).

Conversely, volumes traded in the MI (25.1 TWh, +14.6%) kept increasing; this reflects the need to adjust a clearly long thermal generation market now competing with non-schedulable renewable sources. The most pronounced effects of the ongoing structural changes are well visible on prices. Differently from the past, the average annual growth of prices (€ 75.5/MWh, +4.5%) was significantly lower than the cost increase. Interestingly, prices highlight two entirely new phenomena: a more frequent rollover of zonal prices between day and night - with an all but rare reset of the same - and a drastically smaller average value. This trend began in October and, by virtue of the transactions entered in the forward markets, is going to continue over the 2013-2014 two-year period.

In this scenario, characterized by a significant reduction of the gap with the transalpine countries where a two-way cross-border arbitrage appears to be less unlikely, GME continued to work for a full integration of the domestic and European markets through its participation in various coupling projects: 2012 has been the second year for market coupling with Slovenia, with GME acting as CCP until the end of 2013; the progress of the Price Coupling of Regions (PCR), namely a multilateral project of the main European

exchanges aimed at providing all of Europe with the algorithmic and IT infrastructure required for the coupling of all national markets, whose industrialization has significantly advanced in 2012, supporting the launch of the North-Western European Price Coupling (NWE) by the end of 2013; the European Intra-Day Cross Borders project for the implicit allocation of the cross-border capacity available in near real-time; the Italian Borders Working Table, to outline pre- and post-coupling[1] processes on the Italian borders for the Day-Ahead Market, integrating the PCR as soon as coupling with Italy is going to begin.
Moreover, in the electricity sector mention should be made of the integration of GME's forward trading systems with the Trayport® Global Vision portal; this is designed to allow operators to visualize - in just one single computer screen - GME prices along with those of the major energy exchanges and OTC platforms for the forward trading of electricity, so as to take advantage of any trading opportunities.
Novelties in the gas sector are as significant. As expected, in this sector structural phenomena were even more pronounced than in the electricity sector, with a 4.2% drop in consumption and an increasing convergence between prices at PSV, down during the year, and Northern European prices, fully aligned since last October.
Such price convergence has certainly benefited from the first, full year of operation of the PB-Gas; this latter was shown to be a liquid and transparent balancing market able to convey any excess supply in the market and stimulate the availability of new spot volumes at competitive prices. In particular, the PB-Gas sent out positive signals in terms of traded volumes (€ 34.9 TWh) as well as participation - 95% of volumes traded by participants with SRG to meet the system balancing needs, with the remaining 5% accounted for by volumes traded between market participants[2]; speaking of prices, they were in line with those defined in the M-Gas and PSV trades and, in the latter part of the year, with prices in the major European hubs.
In 2012, moreover, GME, started another segment of the P-GAS, called "as per Legislative Decree 130/10", in order to enable participating investors to fulfill the obligation to offer the volumes of gas made available by their associated virtual storage operators, either alternately or cumulatively, in the M-GAS and P-GAS.
The design of the national natural gas market will be completed during 2013 with the start of the forward gas market; the aim is to promote the formation of a liquid and transparent price and facilitate trading of forward contracts with delivery on increasingly longer time horizons. Also, a new session of the PB-Gas will be implemented. It is aimed at providing the network operator with an additional tool to select and activate flexibility resources *ex ante*, through market-based mechanisms and minimize the expected system imbalance; in this way, participants can count on a market tool to balance their positions on the day ahead.
There have been new developments in the environmental sector, too, in the course of the year. As to the market trend, GCs reached an all-time high in terms of bilaterally traded volumes (28.5 million GCs, +5.8%), whereas volumes traded in the Exchange slightly dropped (3.8 million GCs, -7.8%) with a simultaneously declining price pattern (on average, -7.4% across the various products); conversely, TEEs were traded in large amounts both in the market (2.5 million toe, +98.5%) and on the bilaterals platform (5.1 million toe, +80.2%), with rather stable prices of around 100 €/TEE. In 2012, the Ministry of Economic Development (MiSE) Decree of 5 September 2011 on the new support measures for High Efficiency Cogeneration (HEC) and the MiSE Decree of 28 December 2012 became effective. This latter, amongst others, designated GSE as the entity in charge of managing the certification of energy saving. GME, therefore, amended the rules of operation of the Energy Efficiency Certificates systems. Furthermore, during the year GME started the

1 Pre-coupling processes mainly cover preliminary activities to calculate the available capacity and the sharing of information about submitted bids/offers. On the contrary, post-coupling processes cover the commercial settlement of cross-border flows based on market results, nomination procedures for cross-border physical schedules as well as the calculation of the congestion rent and its distribution, as resulting from the price gap among electricity markets in nearby countries.

2 It should be noted that until 31 March 2012, only the bid/offer submitted by SRG could be accepted on the imbalance side.

systems which enable to trade the Guarantees of Origin. These instruments are designed to promote the transparency of commercial sale operations to the final users of electricity generated from renewables.
To GME, 2013 is going to be a year of major changes; other than the new developments in the gas sector, the Company will begin operating in the field of fuels, pursuant to legislative decree 249/2012. GME will take care of the definition of the trading system of mineral oil logistic services and the wholesale market of liquid oil products for the transport sector in order to promote a true competition in such sector.

Chairman and Chief Executive Officer

Massimo Ricci

TABLE OF CONTENTS

ANNUAL REPORT 2012

EXECUTIVE SUMMARY III

A. RESULTS OF OPERATIONS 2

INSIGHT I

The integration of the Italian market in europe: the PCR project 6

B. THE MARKETS 12

1. REGULATORY FRAMEWORK 12

1.1. REMIT Regulation 12

1.2. The national energy strategy (SEN) 15

1.3. The ownership unbundling of gas transport 16

1.4. The capacity release procedure arranged by ENI 17

1.5. Legislative decree no. 249 of 31 December 2012 on "Oil Stocks" 17

2. ELECTRICITY MARKETS 20

2.1. Spot Electricity Market (MPE) 20

2.2. Forward Electricity Market (MTE) 20

2.3. OTC registration platform (PCE) 21

3. GAS MARKETS 23

3.1. Gas trading platform (P-Gas) 23

3.2. Spot gas market (M-GAS) 23

3.3. Balancing platform (PB-GAS) 25

4. ENVIRONMENTAL MARKETS 27

4.1. Green Certificates Market (GCs) 27

4.2. Energy Efficiency Certificates Market (TEE) 27

4.3. Market of Certificates of origin for renewable energy-power plants (RECOs) ... 29

INSIGHT II

The evolution of generation costs for gas-fired thermal power plants (by REF-E) 32

C. MARKET TRENDS 40

1. FUEL PRICES 40

2. THE ELECTRICITY MARKET 45

2.1. The Italian electricity sector 45

2.2. Market participation 48

2.3. Day-ahead market (MGP) 51

2.3.1. Trends and outlooks in the national market 51

2.3.2. Trend of the Pun and its fundamentals 52

2.3.3. Zonal markets 56

2.4. Intra-day market (MI) 62

2.4.1. Prices 62

2.4.2. Volumes 67

2.5. OTC registration platform (PCE) 71

2.6. The Forward Electricity Market (MTE) 76

2.6.1. MTE volumes 76

2.6.2. MTE prices 83

2.7. International comparisons 88

2.8. Italy-Slovenia market coupling 92

3. GAS MARKETS 94
3.1. The gas system 94
3.2. Market liquidity 97
3.3. PB-GAS 99
3.4. M-GAS 106
3.5. P-GAS 107
3.6. International comparisons 108
4. ENVIRONMENTAL MARKETS 114
4.1. Market participation 114
4.2. Green Certificates 116
4.2.1. Market and Bilaterals Platform 117
4.3. Energy Efficiency Certificates 122
4.3.1. The regulated market and bilateral trading of Energy Efficiency Certificates 123
4.4. RECOs 129
4.4.1. RECO Market (MRECO), Bilateral Platform (PB-RECO), GSE's Auctions 129

APPENDIX I
GME's profile 136
1. GESTORE DEI MERCATI ENERGETICI 136
1.1. Governance 136
1.2. Institutional tasks 139
1.2.1. Market management 139
1.2.2. Electricity market monitoring 141
1.3. International activities 142
1.4. Fees 145

LIST OF ACRONYMS 148
GLOSSARY 150
REFERENCES 160

List of tables

A. RESULTS OF OPERATIONS
Tab A.1.1 GME's performance, income and equity (2011-2012) 2
Tab A.1.2 GME's marginal costs and their share of revenues (2011-2012) 4
Tab A.1.3 GME's key ratios (2011-2012) 4
Tab A.1.4 Breakdown of GME's personnel 5

B. MARKETS
4. Environmental markets
Tab B.4.1 Yearly national quantitative obligations in terms of energy efficiency improvements in end uses of electricity and natural gas 29

C. MARKET TRENDS
2. Electricity market
Tab C.2.1 Maximum generating capacity and peak demand 47
Tab C.2.2 Terna's electricity balance 47
Tab C.2.3 Net thermal generation by type of fuel 47
Tab C.2.4 Participation in the market 48
Tab C.2.5 Volumes traded in GME's markets 50
Tab C.2.6 Volumes in the MGP 53
Tab C.2.7 Zonal volumes in the MGP - 2012 57
Tab C.2.8 Significant variables in the evolution of prices on islands - 2012 60
Tab C.2.9 Forward volumes traded yearly by year of trading 76
Tab C.2.10 Volumes traded in the MTE by year of trading 78
Tab C.2.11 Liquidity of the order book of base-load and peak-load products traded in 2012 79
Tab C.2.12 Liquidity of trades in the MTE by maturity and time ahead of delivery ... 80
Tab C.2.13 Market shares (net of OTC clearing) 83
Tab C.2.14 Correlations and average absolute deviation of check prices for base-load products traded on the MTE, IDEX and TFS (2012 and 2011) .. 84
Tab C.2.15 Correlations between forward prices for front base-load products and spot prices (2012) 84
Tab C.2.16 Price of base-load products traded in 2012 85
Tab C.2.17 Price of peak-load products traded in 2012 86
Tab C.2.18 Ratios of spot prices (MGP) to related forward prices 87
Tab C.2.19 Volatility and ratios of prices by groups of hours 91
3. Gas Markets
Tab C.3.1 Volumes moved on the national transmission network 94
Tab C.3.2 Participation in the gas markets 98
Tab C.3.3 Volumes traded by market platform (GWh) 99
Tab C.3.4 Market shares of the top 10 PB-GAS participants 101
Tab C.3.5 Seasonal averages and spreads of prices posted at the PSV 103
Tab C.3.6 Volumes offered and accepted on the PB-GAS – Feb. 2012 (GWh) 105
Tab C.3.7 Volumes traded in European regulated markets (GWh) 108
Tab C.3.8 Volumes traded on European hubs (GWh) 108
Tab C.3.9 Prices posted on European and non-European marketplaces (€/MWh) 110
4. Environmental markets
Tab C.4.1 Market participation 115
Tab C.4.2 Volumes traded 116

Tab C.4.3 Market: results - 2012 117
Tab C.4.4 Energy Efficiency Certificates Market: results - 2012 123
Tab C.4.5 Energy Efficiency Certificates needed for compliance with the obligation: cumulative values 125
Tab C.4.6 RECO Market: results - 2012 130
Tab C.4.7 RECO Bilaterals: results – 2012 130
Tab C.4.8 GSE's auctions: results – 2012 131

APPENDIX I – GME's profile

Tab 1.1 Fees for participating in GME's markets - 2012 145
Tab 1.2 Key data of GME's markets 146

List of figures

A. RESULTS OF OPERATIONS

Fig A.1.1 GME's marginal revenues 2012-2011 by activity 2

C. MARKET TRENDS

1. Fuel prices

Fig C.1.1 Prices (USD) of the main European energy commodities 40
Fig C.1.2 Prices (€) of the main European energy commodities 41
Fig C.1.3 Spot prices in the main international crude oil markets 41
Fig C.1.4 Monthly trend of international spot and forward crude oil prices 42
Fig C.1.5 Spot prices in the main European markets of crude oil and oil products 42
Fig C.1.6 Monthly trend of European spot and forward prices of crude oil and oil products 42
Fig C.1.7 Spot prices in the main international coal markets 43
Fig C.1.8 Monthly trend of international spot and forward coal prices 43
Fig C.1.9 Spot prices in the main international natural gas markets 44
Fig C.1.10 Monthly trend of European spot and forward natural gas prices 44

2. Electricity Market

Fig C.2.1 Final consumption by sector and GDP 46
Fig C.2.2 Liquidity of the MGP 50
Fig C.2.3 Trend of Pun and of its determinants 52
Fig C.2.4 Yearly average Pun for base-load and groups of hours 54
Fig C.2.5 Peak-load/Off-peak ratio for Pun and fundamentals 54
Fig C.2.6 Monthly trend of Pun 55
Fig C.2.7 Yearly average zonal prices in the MGP 57
Fig C.2.8 Price volatility 58
Fig C.2.9 Peak-load/Off-peak ratio on business days 58
Fig C.2.10 Southern Italy/Northern Italy price delta and different share of wind and photovoltaic supply in the demand in Southern Italy and Northern Italy (average day – 2012-2011) 59
Fig C.2.11 Monthly trend of zonal prices and Southern Italy/Northern Italy price delta – 2011-2012 60
Fig C.2.12 Most frequent market configurations - 2012 61
Fig C.2.13 MI prices: yearly trend 62
Fig C.2.14 MI prices: comparison with PUN number of hours remaining equal 63
Fig C.2.15 Volatility of the selling price: yearly trend 63
Fig C.2.16 Volatility of MI prices: comparison with PUN (number of hours remaining equal) 64
Fig C.2.17 Zonal prices in the sessions of the MI 64
Fig C.2.18 Zonal selling prices 65
Fig C.2.19 Volatility of selling prices 66
Fig C.2.20 Volumes traded 67
Fig C.2.21 Success rate 67
Fig C.2.22 CR3 68
Fig C.2.23 Purchases and sales by type of power plant - 2012 68
Fig C.2.24 Purchases and sales by wholesalers 69
Fig C.2.25 Sales/purchases balance by type of power plant – hourly average 69
Fig C.2.26 Change of injection schedules after the MI 70

Fig C.2.27 Zonal volumes: percentage distribution – 2005, 2010 and 2012 70
Fig C.2.28 Registered transactions, net position and turnover 71
Fig C.2.29 Structure of registered transactions 72
Fig C.2.30 Registered physical schedules 72
Fig C.2.31 Scheduled deviations 73
Fig C.2.32 Registered contracts by maturity (%) 74
Fig C.2.33 Registered contracts by time ahead of delivery (%) 74
Fig C.2.34 Registered contracts by type of electricity accounts used (%) 75
Fig C.2.35 MTE-traded contracts by year of trading and type of product 77
Fig C.2.36 Share of Trayport-traded electricity in total exchange-traded electricity 78
Fig C.2.37 Traded volumes by month of trading, maturity and time ahead of delivery 81
Fig C.2.38 MTE-traded volumes by month of trading and year, including OTC clearing 82
Fig C.2.39 Trend of prices of front products based on check prices 85
Fig C.2.40 Forward curves expressed by the MTE for 2013 as of 31 Mar. 2013 87
Fig C.2.41 Trend of spot and futures volumes in Europe 88
Fig C.2.42 Volumes traded in the futures markets of the main European exchanges 89
Fig C.2.43 Volumes traded in the main European spot markets 90
Fig C.2.44 Historical trend of the spot price on European power exchanges 90
Fig C.2.45 Average level of the spot price and of the price of the calendar product to be delivered in the same year 91
Fig C.2.46 Capacity allocation on the Italian-Slovenian border and share of hours with zero price spread 93

3. Gas markets

Fig C.3.1 Stocks in the 2004-2012 storage years 95
Fig C.3.2 Contributions to the overall system imbalance by sector and imbalance side 96
Fig C.3.3 Volumes covered by commercial trades in total transmitted volumes (m^3) 97
Fig C.3.4 Volumes and prices on the Gas Balancing Platform (PB-GAS) 100
Fig C.3.5 Concentration of Snam's counterparty participants in the PB-GAS during the year 102
Fig C.3.6 Concentration of Snam's counterparty participants in the PB-GAS vs. imbalance 102
Fig C.3.7 Overall system imbalance, contributions by sector and spot prices – Feb. 2012 104
Fig C.3.8 Volumes and prices in the spot market 106
Fig C.3.9 Volumes and prices in the Royalties' segment 107
Fig C.3.10 Volumes traded on European hubs and related churn ratios 109
Fig C.3.11 Spot prices of the different European hubs and wholesale price indices 111
Fig C.3.12 Utilized capacity and prices on the Italian-Austrian border 112
Fig C.3.13 Forward prices (GY+1) on the different European hubs 113

4. Environmental markets

Fig C.4.1 Volumes traded and participation in the markets 114
Fig C.4.2 Market: prices and volumes - 2012 117
Fig C.4.3 Market: prices and volumes 118

Fig C.4.4 Market: price volatility 118
Fig C.4.5 Market: trend of prices vs. GSE's buyback price 119
Fig C.4.6 Market: market shares 120
Fig C.4.7 Bilaterals platform: prices and volumes 120
Fig C.4.8 Comparison between market and bilaterals platform: shares 121
Fig C.4.9 Market and Bilaterals Platform: average prices 121
Fig C.4.10 Energy Efficiency Certificates issued: cumulative values 122
Fig C.4.11 Energy Efficiency Certificates Market: prices and structure of volumes – 2012 123
Fig C.4.12 Energy Efficiency Certificates Market: prices and volumes traded 124
Fig C.4.13 Energy Efficiency Certificates Market: price volatility 124
Fig C.4.14 Energy Efficiency Certificates Market: prices and tariff reimbursements 125
Fig C.4.15 Energy Efficiency Certificates Market: market shares – demand side 126
Fig C.4.16 Energy Efficiency Certificates Market: market shares – supply side 127
Fig C.4.17 Energy Efficiency Certificates Bilaterals: prices and volumes 128
Fig C.4.18 Comparison between market and bilaterals: shares 128
Fig C.4.19 RECO market: prices and structure of volumes - 2012 130
Fig C.4.20 RECO Bilaterals Platform: prices and structure of volumes - 2012 130
Fig C.4.21 GSE's auctions: prices and structure of volumes - 2012 131
Fig C.4.22 Volumes traded – 2012 132

INSIGHT II

Fig II.1 Thermal generating capacity 2005-2012 by technology 32
Fig II.2 Spread between ITECccgt and base-load/off-peak PUN 33
Fig II.3 Load factor of CCGT power plants and operating hours at maximum capacity 35
Fig II.4 Evolution of gas cost for producers with gas-fired thermal plants 36

APPENDIX I – GME's Profile

Fig 1.1 Markets managed by GME 136
Fig 1.2 GME's organizational chart 138
Fig 1.3 Operation of market coupling between Italy and Slovenia 143

SECTION

A

RESULTS OF OPERATIONS

A. RESULTS OF OPERATIONS 2

RESULTS OF OPERATIONS

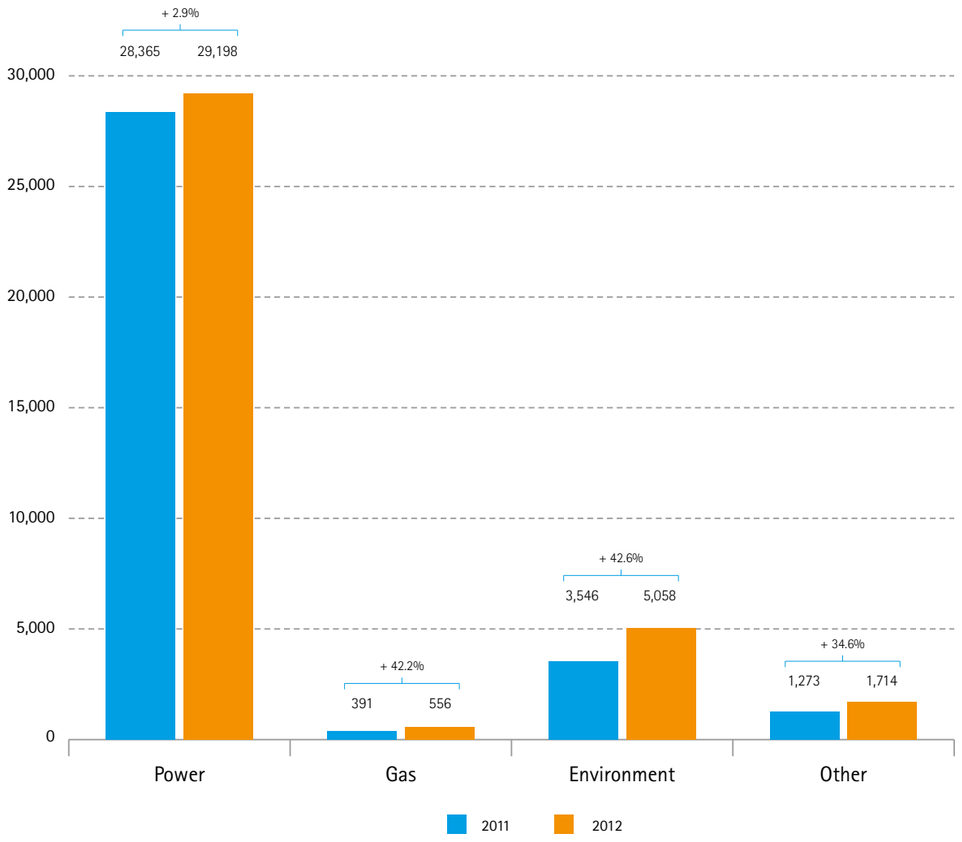
The year 2012 was characterized by an increase in the central-counterparty revenue/cost items (also named "CCP's revenues/costs")[1] by nearly 4.0 billion euro (+20.8%[2] on the previous year). This result is mostly due to the increase of trading prices on the Power Exchange as well as to the rise in volumes traded on both the Spot Electricity Market and on the Forward Electricity Market.

Tab A.1.1 **GME's performance, income and equity (2011 - 2012)**

Data in € million	CCP's revenues/costs	Marginal revenues	EBITDA	EBIT	Net income	Total Assets (a)	Shareholders' equity
2011	19,145.462	33.575	15.969	7.158	2.536	58.424	23.933
2012	23,126.771	36.526	17.937	11.060	8.600	87.195	23.799

Note: (a) Total assets are net of receivables from sales in the Energy Markets towards participants and GSE and from other items associated with OTC trades (CCT); the figure does not include unavailable deposits made by participants.

Fig A.1.1 **GME's marginal revenues 2012-2011 by activity**



1 Central-counterparty revenue/cost items are the revenue items which exactly correspond to the cost items they refer to.
2 In this section, percentage values are reported consistently with the scale adopted; thus, they may be partially different from those cited elsewhere in the report, and were calculated on values which have not been rounded up/down.

In 2012, marginal revenues[3] rose by 3.0 million euro on the previous year (+8.8%). Of this growth, 1.2 million euro (+6.2%) is accounted for by the increase in revenues resulting from the services delivered on the Spot and Forward Electricity Markets, namely by the increase in traded volumes on such platforms. In particular, volumes increased in the:

- MGP, equal to 225.0[4] TWh (+3.4% on 2011), largely due to the greater use of scheduled deviations by participants who entered into bilateral contracts;
- MI, equal to 25.1 TWh (+14.6% on 2011), reflecting a robust tendency to a greater level of activity by participants, thanks to the introduction of new market sessions; such improved flexibility allows a more efficient planning and less costly deviation charges;
- MTE, equal to 55.0[5] TWh (+64.7% on 2011), mostly due to the different procurement method adopted by Acquirente Unico which, starting from May 2011, significantly increased its trades in the MTE.

The growth of marginal revenues, due to the larger volume traded on the Electricity Market, as previously mentioned, was only partially offset by the loss of revenues from services delivered on the OTC registration platform (-0.4 million euro; -4.4% relative to 2011). While this platform was more active (+14.4% relative to 2011) due to the higher volumes traded on the MTE and to an increased turnover, i.e. the ratio of registered transactions to the net position, it was characterized, effective from 1 May 2012, by a decrease in the unit fee, down from 0.02 euro/MWh to 0.012 euro/MWh in accordance with AEEG Decision ARG/elt 44/11.

A further contribution to the growth of marginal revenues was the share of revenues from services delivered in the Environmental Markets and their bilateral platforms, up by 1.5 million euro (+42.6%), thanks to the increased volumes traded on the various platforms. In particular:

- the Energy Efficiency Certificates (TEEs) trading volume on the bilateral market and platform, accounting for the largest increase, rose by 85.4% on the previous year. This growth, greater than the obliged quota falling upon electricity and gas distributors (up from 5.3 Mtoe in 2011 to 6.0 Mtoe in 2012), is due to the procurement strategy on the part of said subjects, who tried to secure a variety of certificates also for future years, in the light of a persistent shortage of supply;
- the GCs trading bilateral platform and market grew less in terms of trading volumes (+3.9%); this was mainly due to the increase in the obliged quota for non renewable electricity producers and importers, up from 6.80% in 2011 to 7.55% in 2012; this was partially offset by the changes introduced by Legislative Decree no. 3 of 28 March 2011 - related to the progressive elimination of the obligation - which had led, in the course of 2011, to an increase of trading;
- P-RECO started recently; with its six market sessions, it reached a number of transactions worth 2.2 million certificates traded on the regulated market and on the RECO bilateral platform.

3 Marginal revenues are the revenue items which enable the Company to cover operating costs and to get a return on the invested capital.
4 The figure reported in this section is referred to volumes traded in the MGP, gross of scheduled deviations, as per article 43 para 43.1 of the Integrated Text of the Electricity Market Rules and default cases as under article 89, para 89.5 letter b) of the same Rules. This figure represents the volumes which generated marginal revenues, and is different from the one reported in the Executive Summary and in chapter C, since it expresses the sum of volumes traded on the Exchange, either as sale or purchase, and the scheduled deviations of sellers or buyers; on the opposite, the figure reported in the Executive Summary and in Chapter C, aimed at representing the share of scheduled electricity traded on the Exchange, solely considers volumes traded directly on the Exchange, including the net balance of scheduled deviations.
5 Electricity volumes traded in the period, regardless of the actual delivery date and inclusive of volumes deriving from the OTC clearing.

Finally, it is worth underlining an increase by 0.4 million euro (+34.6% on 2011) of other marginal revenues, arising from services rendered by GME's personnel as part of the PCR project (+0.1 million euro), higher revenue coming from the fees payable to GME for the renewed (as a result of a specific tender) agreement between GME and the bank in charge of its treasury services (+0.4 million euro), as well as from the development of in-house software to ensure the functionality of the trading platforms for environmental certificates and the proper conduct of monitoring activities (+0.1 million euro).
These effects were partially offset by lower revenues (-0.2 million euro) for the services rendered to Terna for activities related to the allocation of the rights of use of transmission capacity and the collection of bids in the MSD, as a result of the renewal of GME-Terna agreement for the period 2011-2013.

Tab A.1.2 **GME's marginal costs and their share of revenues (2011 - 2012)**

Data in € million	Raw materials and services	Leases and rentals	Personnel	Amortization, depreciation, write-downs and provisions	Sundry operating expenses	Total
2011	7.236	1.485	8.249	8.811	0.636	26.417
2012	7.384	1.486	9.150	6.877	0.568	25.465

Marginal costs include depreciation, amortization and provisions; they amounted to a total of 25.5 million euro and were down by about 1 million euro on the previous year. This decrease is mainly attributable to:

- an increase by slightly less than 0.2 million euro (+2.2%) in the cost of services, mainly related to the extension of business support activities carried out by the holding company, the development of international projects, the review of issues regarding the evolution of the company's business, the smaller fees due to the management and control bodies, as well as to the activities required to ensure the proper functioning of the various market platforms;
- an increase by 0.9 million euro (+10.9%) in personnel costs mainly due to the increase in the variable remuneration policies applied in the course of 2012, the annual salary raise provided for by the national collective bargaining agreement for the electricity sector and a higher, average number of personnel members;
- a decrease by 1.9 million euro (-21.9%) in depreciation and amortization, write-downs and provisions mainly due to higher provisions, allocated during 2011, as a consequence of AEEG Decisions ARG/elt 44/11 and ARG/elt 189/11.

Tab A.1.3 **GME's key ratios (2011 - 2012)**

	EBITDA/ Revenues ratio (%)	EBIT/ Revenues ratio (%)	ROI (a)	ROE (b)
2011	47.6	21.3	12.3	10.6
2012	49.1	30.3	12.7	36.1

Notes: (a) ROI is calculated as the ratio of EBIT to total assets;
(b) ROE is calculated as the ratio of net income to shareholders' equity.

EBITDA were equal to 17.9 million euro, about 2.0 million euro more (+12.3%) than the previous year's.
EBIT were equal to about 11.1 million euro, i.e. up by 3.9 million euro (+54.5%).
The 2012 net income was equal to 8.6 million euro, with an increase of 6.1 million euro.

The following table illustrates the breakdown of the average number of personnel members during the year by labor contract category and of the actual headcount as of 31 December 2012; figures, including those pertaining to seconded personnel, are compared to the previous year.

Tab A.1.4 **Breakdown of GME's personnel**

Category	Personnel members		Personnel members	
	average in 2012	at 31 Dec. 2012	average in 2011	at 31 Dec. 2011
High- and middle-level managers	9.00	9	9.00	9
Low-level managers	29.54	30	29.00	29
Office personnel	54.38	56	51.50	53
Total	**92.92**	**95**	**89.50**	**91**
of whom seconded	*2.58*	*3*	*6.42*	*3*
Total net of seconded personnel	**90.34**	**92**	**83.08**	**88**

INSIGHT I

THE INTEGRATION OF THE ITALIAN MARKET IN EUROPE: THE PCR PROJECT

The process of integration of European markets through the implementation of market coupling requires the development of a market resolution algorithm that incorporates the rules adopted by the different markets on a national scale.

Currently, all European markets adopt a pricing mechanism which is based on the rule of marginal price. However, some of them adopt bidding rules, or constraints on the submission and acceptance of bids/offers, which take into account the inter-temporal constraints between the different hours of the day (block orders, ramp constraints, other inter-temporal constraints such as the minimum income).

On the other hand, the Italian market is characterized by a simple design, with a pricing mechanism applied on an hourly basis only (without inter-temporal constraints), according to the principle of marginal price. In addition, the Italian market has internally subdivided the grid into zones; this method takes into consideration the transmission system limits by employing a differential zone-based pricing (with prices in zones with a supply deficit greater than or equal to the price of zones with a supply surplus). In this way, appropriate price incentives are transferred onto market participants in order to induce, *ceteris paribus*, an efficient use of resources and a proper siting of investments.

Its main, if not the only, complexity, is the well-known presence of a national single price (PUN) applied to every buyer in the MGP. This choice enables, in case of congestion and zone-based pricing, to apply the above said incentive to producers only (who can decide where to site their plants), without affecting consumers across the different Italian zones.

To this end, the PUN is not calculated as a simple "*ex-post*" average of the sales prices that would result from the zonal model, but is determined by the same market algorithm together with the zonal prices. In particular, in order to satisfy both the "budget constraint" (the value of supply offers and of the congestion rent must be equal to the value of demand bids accepted on the market for each hourly interval) and the consistency in the selection of demand bids accepted and rejected at the prices offered by market participants, the PUN defined by the Italian market algorithm shall be:

- equal to the average of zonal prices, weighted for the volumes of electricity specified in the demand bids, referred to the withdrawal offer points belonging to the relevant geographical zones;
- less than or equal to the price specified by the demand bids which have been accepted;
- greater than or equal to the demand bids which have been rejected.

As part of the PCR project, a specific algorithm (*Euphemia*) has been developed; it is able to integrate the pricing mechanism of the Italian market with the specific price formation rules adopted by other European markets (block orders, ramp constraints, other inter-temporal constraints such as the minimum income). However, the integration of all the pricing rules adopted by the European markets into a single algorithm, together with the PUN, has increased the complexity of this latter, requiring a step-based approach to find a market solution. In the first phase, all PCR requirements (namely, the pricing rules of all European markets, including the Italian one, are applied) are solved to the exception of the PUN (Master Problem). Once the Master Problem is solved through a subroutine (PUN Subroutine), the Italian PUN is calculated for the Italian zones. A check is performed to verify that the Subroutine solution is consistent with the PUN constraints mentioned above. In the event the PUN constraints are not satisfied, the calculation process is repeated until a correct solution is reached.

Calculation of the ex-post PUN

With respect to the previous paragraph, one option is the calculation of the ex-post PUN as equal to the weighted average of zonal prices (weight equal to the accepted volume of national consuming units). This implies that the PUN is calculated only after identifying the zonal clearing prices as well as the bids/offers accepted and rejected on the basis of the same prices along the PCR perimeter (including the Italian zones); every PCR requirement to the exclusion of the PUN itself must be taken into account (i.e. by just solving the Master Problem described under the previous paragraph).

One advantage of this approach is a limited number of Euphemia iterations, by minimizing the risk of not finding any solutions within the running parameters set as an input. On the other hand, with the calculation of the ex-post PUN, all bids/offers, including demand bids which are subject to the PUN, would be accepted or rejected on the basis of zonal prices and not on the basis of the PUN as it happens at present. Therefore, we may have:

1. paradoxically rejected demand bids (hereinafter PROs): rejection of a national demand bid with a price lower than the clearing price of the zone it belongs to, although higher than the ex-post PUN;
2. paradoxically accepted demand bids (hereinafter PAOs): acceptance of a national demand bid with a price higher than the clearing price of the zone it belongs to, although lower than the ex-post PUN.

To evaluate the weight of PRO and PAO orders with the ex-post PUN, such method was employed to recalculate results of day-ahead markets throughout the year 2012[1]; the key assumption was that no change in the bidding strategy of participants was due to the ex-post PUN while the loss of welfare associated to PROs and POAs was estimated as follows:

- the loss of welfare associated to PROs was set equal to the product of the difference between the offered and accepted volumes and the delta between the offered price and the ex-post PUN;
- the loss of welfare associated to PAOs was set equal to the product of the accepted volume and the delta between the ex-post PUN and the offered price.

The impact of this approach clearly depends on the elasticity of the curve of demand bids submitted on the market. By analyzing historic data, which reflect a bidding pattern consistent with a PUN-based pricing rule, the following result is obtained.

In 2012, the estimated loss of welfare for PROs and PAOs due to the ex-post PUN calculation amounts to approximately 800,000 €: 472,000 € are accounted for by PROs and 328,000 € by PAOs. Such loss is equal to 0.003% of the overall value of all demand bids, valued at the PUN, accepted in 2012 and amounting to approximately 23,115 billion €.

As to the frequency of PROs and PAOs, the simulation exercise performed for the year 2012 shows that out of 4.15 million demand bids subject to the PUN, about 190,000 are submitted with a specified price (4.6%): of these, 9,600 (0.23% of the total demand bids subject to the PUN and 5.09% of demand bids subject to the PUN and submitted with a price) would have yielded paradoxical results (about 5,000 PAOs and 4,600 PROs).

As to the difference between the offered price with PROs and PAOs and the PUN, the simulation on 2012 data shows that such difference is on average equal to 4.3 €/MWh for PAOs and 12.38 €/MWh for PROs, respectively. The largest difference was equal to 220.96 €/MWh for PAOs (in other words, a demand bid based on the zonal price, with an offered price of 220.96 €/MWh smaller than the ex-post PUN, would have been accepted) and 144.77 €/MWh for PROs (in other words, a demand bid based on the zonal price, with an offered price of 144.77 €/MWh higher than the ex-post PUN, would have been rejected).

1 Excluding the 25th hour of 28 October 2012.

The following tables report data on the simulations performed for the year 2012 with the calculation of the ex-post PUN.

Welfare Loss - PAOs €	TOT	MAX	AVG	MIN
SICILIA	20,791	341.89	51.98	0.13
SOUTHERN ITALY	40,085	1,308.55	108.63	0.28
NORTHERN ITALY	190,231	6,399.01	87.74	0.02
CENTR.-SOUTH. ITALY	31,153	757.98	55.63	0.01
CENTR.-NORTH. ITALY	30,565	710.32	34.89	0.01
SARDEGNA	15,464	503.69	22.38	0.01
TOT PAO	**328,289.41**	**6,399.01**	**64.83**	**0.01**

Welfare Loss - PROs €	TOT	MAX	AVG	MIN
SICILIA	304,933	1,579.68	104.64	0.01
SOUTHERN ITALY	75	73.47	37.58	1.69
NORTHERN ITALY	59,055	1,289.63	93.89	0.02
CENTR.-SOUTH. ITALY	1,089	229.34	34.03	0.31
CENTR.-NORTH. ITALY	7,330	543.95	34.91	0.02
SARDEGNA	99,746	2,107.03	122.69	0.01
TOT PROs	**472,229.05**	**2,107.03**	**102.66**	**0.01**
TOT PAOs + PROs	**800,518.46**	**6,399.01**	**82.84**	**0.01**

Zone	# BID@PUN	# BID@PUN non-PTOs	PAOs	PROs	TOT PRs	TOT PRs/non-PTOs
SICILIA	534,607	17,425	400	2,914	3,314	19%
SOUTHERN ITALY	587,546	9,575	369	2	371	4%
NORTHERN ITALY	1,076,757	65,242	2,168	629	2,797	4%
CENTR.-SOUTH. ITALY	670,427	27,613	560	32	592	2%
CENTR.-NORTH. ITALY	719,889	39,342	876	210	1,086	3%
SARDEGNA	558,363	30,786	691	813	1,504	5%
TOT	**4,147,589.00**	**189,983.00**	**5,064.00**	**4,600.00**	**9,664.00**	**5.09%**

Unit PAO (€/MWh)	MAX	AVG	MIN
SICILIA	37.60	7.16	0.01
SOUTHERN ITALY	37.60	6.92	0.01
NORTHERN ITALY	220.96	3.24	0.00
CENTR.-SOUTH. ITALY	26.90	4.89	0.00
CENTR.-NORTH. ITALY	123.88	3.11	0.00
SARDEGNA	55.97	3.58	0.00
TOT	**220.96**	**4.03**	**0.001**

Unit PRO (€/MWh)	MAX	AVG	MIN
SICILIA	103.04	13.46	0.00
SOUTHERN ITALY	2.45	1.26	0.07
NORTHERN ITALY	20.36	3.05	0.00
CENTR.-SOUTH. ITALY	26.67	3.85	0.07
CENTR.-NORTH. ITALY	13.86	2.70	0.02
SARDEGNA	144.77	18.57	0.00
TOT	**144.77**	**12.38**	**0.001**

Legend:
PAOs: paradoxically accepted orders
PROs: paradoxically rejected orders
PTOs: price taker orders
Tot PRs: total paradoxical orders (sum of PAOs and PROs)

SECTION

B

THE MARKETS

B. MARKETS 12

1. REGULATORY FRAMEWORK 12

1.1. REMIT Regulation 12

1.2. National Energy Strategy (SEN) 15

1.3. The ownership unbundling in gas transport 16

1.4. The capacity release procedure arranged by ENI 17

1.5. Legislative Decree no. 249 of 31 December 2012 on "Oil Stocks" 17

2. ELECTRICITY MARKETS 20

2.1. Spot electricity market (MPE) 20

2.2. Forward electricity market (MTE) 20

2.3. OTC Registration Platform (PCE) 21

3. GAS MARKETS 23

3.1. Gas trading platform (P-GAS) 23

3.2. Gas market (M-GAS) 23

3.3. Balancing platform (PB-GAS) 25

4. ENVIRONMENTAL MARKETS 27

4.1. Green Certificates Market (GCs) 27

4.2. Energy Efficiency Certificates Market (TEEs) 27

4.3. Market of Certificates of Origin for renewable energy power plants (RECOs) 29

THE MARKETS

1. REGULATORY FRAMEWORK

In recent years, the regulatory framework of the energy sector has been mainly characterized by some far-reaching measures. These have led to the introduction of tools for the transparency of electricity and natural gas wholesale markets, as well as intervention measures aimed at promoting the competitiveness of such markets and, more generally, the development of the energy sector as a whole.
With reference to the first regulatory source, mention should be made of Regulation (EU) No 1227/2011 of the European Parliament and Council of 25 October 2011 concerning the integrity and transparency of wholesale energy markets (hereinafter: REMIT).
As to the second aspect, i.e. encouraging the markets' competitiveness and the development of the energy sector, it is worth citing the policy paper on the National Energy Strategy, proposed by the Ministry of Economic Development; such document outlines the development objectives and practical actions to be undertaken by 2020 in each separate intervention area; it entails a general reorganization of the energy system focusing on an improved energy efficiency, the sustainable development of energy from renewable sources, the integration of the gas and electricity markets at a European level, the development of the country's infrastructure as well as the revamping of the national production of hydrocarbons.
With specific reference to the natural gas sector, the adoption of the model of ownership unbundling by Snam SpA, as well as the tender procedures for the allocation of transmission capacity on the TAG pipeline and TENP/Transitgas held by ENI, in accordance with the commitments pursuant to art. 14-ter of Law 287 of 10 October 1990 on the "Standards for the Protection of Competition and the market" qualify as interventions aimed at achieving an improved competitiveness and, above all, a contestability of transmission capacity in a shorter-term perspective, too.
In this regard, it should be noted that these initiatives are part of a European regulatory framework; with the adoption of the third package of directives and Regulations No 714/2009 and No 715/2009, they further enhanced both the principle of impartiality of transmission networks through the adoption of the ownership unbundling model (management model of choice) and the allocation of transport capacity on gas pipelines. According to such principles, any capacity assigned and possibly unused by capacity holders should be offered on the market by network operators on a day-ahead basis, also as interruptible capacity.
Moreover, Directive 2009/119/EC of 14 September 2009 is quite significant since it revised the system of stocks of oil resources. It provides for a strengthening in the level of security of oil and oil products thanks to the introduction of reliable, transparent mechanisms at Community level.

This Directive has been transposed into the national legislation by Legislative Decree 249 of 31 December 2012 - concerning amendments to the national legislation on oil stocks - which has extended the scope of action of GME to include the management and organization of the market platforms of oil logistics of mineral oils, as well as the wholesale market of oil products.

1.1 REMIT Regulation

The financial crisis of 2008, a growing volatility and a rise in the price of commodities, along with the need of a unified supervision of the complex European single market led the European Commission, in the aftermath of G20 resolutions passed in Pittsburgh in 2009, to propose additional legislative measures on the integrity and oversight of markets; harmonization instruments were issued to improve the integrity, efficiency, reliability and transparency of both physical and derivatives markets as a way to further protect investors.
There exist different, albeit mutually related, legislative proposals. They aim at strengthening the supervision of trading of physical and financial products over every type of trading venues (organized or regulated wholesale markets, MTFs, OTFs and more) or simply over OTC markets, to prevent illicit practices which might jeopardize a fair pricing mechanism.
While the tentative versions of such proposals still exhibit some overlapping scope of action, a substantial effort to strengthen the role of national regulators and the two new European agencies, ACER and ESMA[1], is more than evident; both agencies will inevitably collaborate, playing an increasingly crucial role in supervising and monitoring markets. On the other hand, the establishment of these two new agencies and the strengthening of their powers are the natural consequence of the progressive creation of the European single market. On a European level, national regulators' powers may be ineffective when faced with transnational participants and transactions. This is why the EU decided to adopt a centralized approach, making use of Regulations which, by their legal nature, can be enforced directly in the member states.
As far as Community regulations are concerned, it is worth to mention REMIT Regulation on the integrity and transparency of wholesale energy markets, effective since 28 December 2011.
The new transparency and integrity scheme introduced by the Commission is based on four types of measures. First, the definition and prohibition of insider trading and market manipulation practices. These were defined keeping in due account the specific energy market mechanisms and the interactions between raw materials and derivatives markets. The Commission[2] has the power to technically update the scope of such definitions.

Secondly, publicity and transparency obligations falling upon participants. As a result, participants must promptly communicate, starting from the effective date, any inside information available to them about their own firms or plants. The third type of measures establishes ACER monitoring duties, in collaboration with national regulators, over trading of wholesale energy products, including sale and purchase orders, to prevent market manipulation and insider trading. The Agency shall collect any information required for monitoring purposes, on the terms set by the Commission through implementing acts, which should be adopted in the second half of 2013 after a comitology process.
Finally, a fourth type of measures sets out the terms to implement prohibitions. National regulators have been vested with inquiry and sanctioning powers. They shall act in a mutually coordinated and consistent manner and shall collaborate with the Agency. They shall apply definitions set by the Regulation according to any non binding instructions given by the Agency itself under art. 16.
The new European transparency scheme covers various types of data/information:

1. Transparency of "fundamental data", also called pre-trade transparency; the duty to publicize inside information also includes information on generating capacity and usage, storage, consumption or transport of electricity or natural gas, capacity and usage of LNG plants, including any planned or unplanned downtime; moreover, information to be made available under Regulations No 714/2009 (art. 15) and No 715/2009 (art. 18, 19).
2. Transparency of trading, also called post-trade transparency; the Agency shall have access to registers of participants' transactions in wholesale energy markets, including sale and purchase orders, identification of any purchased and sold energy products, any agreed price and volumes, execution date and time, parties involved and transaction beneficiaries, other than any other additional relevant information.

1 See "European Parliament legislative resolution of 29 March 2012 on the proposal for a regulation of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories" (COM (2010) 0484 – C7- 0265/2010 – 2010/0250(COD)).

2 Art. 6.

3. Availability of time series, or mandatory record keeping; in compliance with the Third Energy Package, participants-suppliers (art. 40 Dir. 2009/72 and art. 44 Dir. -2009/73) must keep, for 5 years, any data on electricity or gas supply transactions, or about derivatives; the same obligation falls upon TSOs (art. 15.6 Reg. 714/2009, art. 20 Reg. 715/2009). In addition, the Commission's implementing acts might allow regulated markets, or transaction reporting and control systems, to provide the Agency with a historic summary of transactions performed on wholesale energy products.
4. European register of market participants, to be arranged by ACER according to the information provided by the national regulators; this register shall contain any information required for a univocal identification of participants and can be accessed by every national regulator.

REMIT Regulation pays special attention to the possible role of regulated markets; other than acting as service providers for participants, for the purposes of transparency and reporting obligations, they are bound, from the settlement effective date, to comply with specific obligations outlined under art. 15: establishing and maintaining procedures and measures aimed at the identification of any insider trading and market manipulation practices and reporting any alleged violation to the national authorities.

On a national level, there already exist several information obligations for gas and electricity participants, subject to the relevant authorities' monitoring power (AEEG, Ministry of Economic Development, Gestore dei Servizi Energetici, Gestore dei Mercati Energetici). They cover specific activities which pertain, broadly speaking, to commodity trading (e.g. gas importers reporting information to the Ministry of Economic Development; information on one's own market shares in the gas sector; obligations for electricity producers and importers concerning the injection of renewable energy into the grid, etc.) as well as transactions on commodity markets.
For instance, in the gas sector AEEG monitors the market on the basis of the data it receives on contracts traded at the PSV (Virtual Trading Point); in the electricity sector, AEEG implements the TIMM monitoring system (Integrated Text on Market Monitoring applicable to wholesale electricity markets and to the ancillary services market) by requesting participants to mandatorily report information on forward contracts and the ancillary services market, as well as through the support activities carried out by Terna, GME and GSE.
It looks therefore necessary to liaise Community and national regulations, considering their partial overlapping and the aims of both domestic rules and REMIT Regulation.
The same can be said about the European Register of Market Participants, as hinted above; AEEG is already gathering participants' information, to be registered in the List of Participants. Any information requested on a domestic level shall be consistent and sufficient to fulfill REMIT Regulation requirements, too. According to art. 9 of REMIT Regulation, the national regulators shall send ACER any information on market participants, as detailed in each member State's Register, in order to populate the European Register as established by ACER itself in collaboration with the national authorities.
In this regard, it should be noted that through Decision 01/2012 of 26 June 2012, ACER defined the detailed information content as well as the electronic format to be adopted for sending data. ACER also ordered that market participants proceed to disclose information about themselves within 3 months of the first date of publication of the list of participants included in the European Register.
In addition, ACER followed up provisions under art. 16 of REMIT Regulation on the coordination of surveillance activities by national regulators; in December 2011, ACER published the first version of the Guidelines - a non-binding document of a purely operational nature - whose main purpose is to provide a consistent and exhaustive interpretation of the definitions listed under Art. 2 of the Regulation itself.
Then, in September 2012, ACER released a second version of the guidelines; notwithstanding the first version on inside information, this version discusses in detail various examples of market manipulation and wholesale energy products.

Given the exchanges between the Agency and national Regulators on the enforcement of REMIT, ACER is expected to publish a further updated version of the Guidelines by the end of 2013 so as to incorporate the experience gained across Europe in this field.
In the third quarter of 2012, in order to attain a consistent implementation, ACER presented to the European Commission, in accordance with the provisions of art. 8 of REMIT Regulation, some recommendations on the transaction data; they suggested to include purchase and sale orders so as to monitor the markets. The final document containing ACER recommendations, published in October 2012, was drawn up taking into account the comments made during the consultation process which ended in the summer of 2012.

In 2012, pending the completion of the regulatory framework after the entry into force of REMIT Regulation, GME published a consultation document on "GME's possible contributions with regard to the formalities required by Articles 4 and 8 of Regulation (EU) No. 1227/2011"; stakeholders were presented with certain proposals to simplify the procedures for fulfilling the requirements on the collection, publication and communication of data and information provided by the Regulation itself.

1.2 The National Energy Strategy (SEN)

The National Energy Strategy, a programming tool for the national energy policy, was first introduced through art. 7, Law Decree no. 112 of 2008, ratified by Law no. 133 of 2008; it entrusted the Government with the task of defining its short and long term priorities to achieve, through market-based mechanisms, a number of objectives: diversification of energy sources and supply areas, strengthen the infrastructural facilities, promote renewable energy sources and energy efficiency. This effort was meant to revamp the pivotal role of nuclear energy among energy sources by promoting the construction of nuclear power plants for electricity generation.

Later, following the Fukushima nuclear incident, the role of nuclear power in electricity generation at European level was largely devalued. Hence, a new approach was adopted through law 75/2011 – amending Law Decree 34/2011 to repeal every legislation adopted in 2008-2010 in the field of nuclear energy revival. The construction of nuclear power plants is no longer a priority intervention.
However, even the SEN legislation was subsequently repealed through the June 2011 referendum, including any SEN regulatory provisions under legislative decree 93/11[3], which had transposed into the Italian legislation the Third Package of European Directives on common rules for electricity and gas markets.

Although the national energy strategy lacks an explicit regulatory standardization, as highlighted in AEEG Report 416/2012/I/com where it was suggested to fill such gap by exercising the powers provided for in Article 1, paragraph 5 of 2009 Community law[4], in 2012 the Minister of Economic Development drew up a consultation document entitled "National Energy Strategy: for a more competitive and sustainable energy" which was publicly screened and debated until November 2012. After the public consultation with stakeholders as well as the institutional sharing process, the final document on the National Energy Strategy was approved by means of the inter-ministerial decree of 8 March 2013, jointly drafted by the Minister of Economic Development and by the Minister of the Environment and Protection of Land and Sea.

3 In particular, art. 1 of legislative decree 93/11 provides that the Minister of Economic Development adopts, in line with the objectives of the national energy strategy, ten-year development scenarios for the electricity and natural gas markets as well as the need for infrastructure development related to both sectors . In addition, art. 3 of the same legislative decree provides that the Council of Ministers, upon a proposal from the Minister of Economic Development and the Joint Conference, defines by a special decree the country's infrastructure minimal needs in order to promote the development, expansion and upgrading of the energy infrastructure consistent with the national energy strategy.

4 Article 1, paragraph 5 of Law no. 96 of 4 June 2009 (Community Law 2009) laying down rules on the delegation to the Government for the implementation of EU directives, does indeed allow the government to adopt any regulations supplementing and amending legislative decree 93/11 within 24 months after the entry into force of the legislative decrees implementing the EU Directives.

Given the difficulties that characterize the global and, in particular, European macroeconomic situation, the national energy strategy aims at boosting the country's sustainable growth by giving a pivotal role to the energy sector in order to improve the competitiveness of the national economy, in full compliance with the constraints of environmental sustainability defined at European level.

1.3 The ownership unbundling in gas transport

Directive 2009/73/EC introduced more stringent rules on the separation (unbundling) of gas transport system operators from the other supply chain activities, albeit managed on the free market, than those contained in the previous Directive 2003/55/EC on the legal and functional separation. Although the Community policy on ownership unbundling acknowledges the prominent role of this model in ensuring the independence of the company owning the transmission system with respect to every other asset managed in competition, said Directive enucleates further unbundling models to ensure greater or smaller benefits typical of ownership unbundling; to this end, each Member State has a certain discretion in choosing the model best suited to the national context. In summary, the unbundling schemes provided for by Directive 2009/73/EC are classified as follows:

- Ownership unbundling (OU)
- Independent transport operator (ITO)
- Independent system operator (ISO)

In line with Community guidelines, legislative decree no. 93 of 2011, by means of which the third package of European directives was transposed, defined the operating procedures for each unbundling scheme; also, it established the obligation for the largest transport company to comply with ITO provisions by 3 March 2012.
Notwithstanding the irreversible nature of ownership unbundling, applicable both to a vertically integrated firm, owning the transport system after choosing the ownership unbundling option and in the event this latter, as of 3 September 2009, falls under one of the model requirements, the largest transport company can, at any time, shift from a lower to a higher rank ownership unbundling scheme.

Subsequently, in order to ensure the full impartiality of regulated services such as gas transport, storage, regasification and distribution, Legislative Decree dated 24 March 2012, converted by Law no. 27 of 24 March 2012, declared the mandatory adoption by SNAM SpA of the ownership unbundling model, as provided for by legislative decree 93/11; it remains understood that the unbundling terms and conditions needed to be defined in a special decree to be issued by 31 May 2012, adopted by the President of the Council of Ministers upon a proposal made by the Minister of Economic Development, after hearing the Minister of Economy and Finance and the Electricity and Gas Regulator.

The aforementioned Decree was actually adopted on 25 May 2012; it establishes that ENI, consistent with market conditions and, in any case, not later than 18 months after the entry into force of the decree, reduce its shareholding in SNAM in order to lose its control and proceed to the transfer of a stake of at least 25.1% to Cassa Depositi e Prestiti.

1.4 The capacity release procedure arranged by ENI

In 2012, the preliminary inquiry undertaken by the Competition Regulator (Autorità garante della concorrenza e del mercato; hereinafter, AGCM) against ENI SpA (hereinafter, ENI) came to an end. Allegedly, ENI had a dominant position[5] due the non-call of the auction for international transmission capacity on the TAG and TENP/Transitgas pipelines for summer 2011 and for the thermal year 2011-2012, despite the existence of a spare capacity on both pipelines and of subjects who had expressed their interest in having access to such capacity[6].

Following such proceeding, AGCM decided to accept certain commitments on the part of ENI, pursuant to art. 14-ter of Law 287/90 and concluded the inquiry without levying any sanctions.
AGCM's formal acceptance of such commitments was preceded by a public debate and by a market test; specific info requests were addressed to 43 stakeholders like thermal generation businesses, shippers and industrial customers as well as trade associations in order to fully assess the adequacy of the proposed commitments with respect to the remarks brought up by AGCM.

After the market test, ENI introduced a number of major changes to the first version of its commitments, sent to AGCM on 4 June 2012, so as to incorporate participants' comments. More specifically, the binding commitments taken by ENI and approved by AGCM through its Decision of 6 September 2012, include the sale, by means of specific yearly and seasonal tenders, of 5 billion transport capacity a year starting from the next thermal year (2012-2013), for each of the subsequent 5 thermal years, according to the following criteria:

- 40% of a transport capacity of 4 billion cubic meters/year on the TAG pipeline and 60% on the TENP/Transitgas pipeline will be made available through subletting, i.e. an actual sale of transport capacity to the assignee;
- A transport capacity of 1 billion cubic meters/year will be made available for the virtual transport service of logistics swap, which includes ENI's commitment to withdraw gas volumes from users; these latter are the same users who have been awarded the service in the main European hubs, returning such volumes at the PSV. Any unallocated capacity, despite the logistics swap, will be offered in the form of sub-letting.

1.5 Legislative decree no. 249 of 31 December 2012 on "Oil stocks"

In order to transpose Directive 2009/119/EC of the EU Council of 14 September 2009 laying down the obligation for Member States to maintain minimum stocks of crude oil and/or petroleum products, the Government has been entrusted, through a special law, with the task of adopting a legislative decree to amend the national legislation in force on emergency oil stocks, given the Community legislator's objective to strengthen the national legislation and harmonize it with the provisions issued by the International Energy Agency[7].

5 More specifically, an alleged violation of art. 102 of the Treaty on the Functioning of the European Union (TFEU) on the grounds of possible restrictions to competition.

6 According to the Decision of 6 March 2012, AGCM concerns about competition stemmed from the observation that the non-call of the secondary capacity auctions could have hindered the independent procurement of gas on the part of major final customers; these latter would have been prevented from taking benefit of the smaller price gap between Italian prices and those in the major European hubs.

7 IEA members include the 28 OECD industrialized countries that have ratified the International Energy Program of 1974, which provides for the obligation to hold 90 days of net imports of petroleum products in the form of stock and a program to reduce the global oil demand. The International Energy Agency is in charge of training, information, monitoring and control of mandatory stock requirements.

More specifically, in accordance with the legislative decree implementing Directive 2009/119/EC, the Government must comply with the following guidelines and principles:

a. To adopt a calculation method of the oil stocks which meets both the Community scheme and the scheme in force within the framework of the International Energy Agency;
b. To maintain a high level of security in the supply of oil;
c. To provide for the establishment of a central stockholding entity to be in charge of detention and transport of oil stocks, promoting competition in the provision of storage capacity;
d. To guarantee the full availability of stocks whenever it is difficult to procure crude oil or petroleum products.

These criteria have been implemented under Legislative Decree 31 December 2012, no. 249, published in the Official Journal no. 22 of 26 January 2013, which provides:

- the requirement for subjects which, in each year, have released for consumption petroleum products above the threshold of 50,000 tons to contribute to the achievement of the national target in the following year[8] – as determined by the Ministry of Economic Development - to ensure stocks of petroleum products[9], equivalent to the greater quantity between 90 days of average daily net imports or 61 days of average daily domestic consumption;
- the establishment of Italy's Central Stockholding Entity (OCSIT), whose mission, to be fulfilled by Acquirente Unico S.p.A., includes the acquisition, detention, management, transport and sale of oil stocks held in the Italian territory. Having the task of protecting the oil supply, OCSIT shall facilitate the fulfillment of the obligation to maintain stocks, especially by smaller companies that do not have a sufficient storage capacity; these latter may designate OCSIT, either fully or partly, to fulfill the compulsory detention requirement of their share of stocks[10]. Moreover, OCSIT is expected to proceed with the development and implementation of new oil stock storage sites, as well as with the adoption of measures to upgrade and refurbish the existing ones, entrusted either on a loan or free lease basis. According to the operational guidelines to be identified by special decree of the Minister of Economic Development, OCSIT will operate according to market criteria using the logistics platform designated to exchange any storage capacity of petroleum products.

In order to promote competition in the oil industry, now mainly characterized by vertically integrated operators, and expand the opportunities to offer and supply logistics services and petroleum products, mainly to the benefit of small operators, Legislative Decree 249/12 provides for the development of specific markets - the costs of which are borne by those who benefit from the services offered; GME has the task of managing such markets. Moreover, in organizing and running such markets, GME may act as central counterparty to the relevant transactions:

- the market platform of oil logistics for mineral oils, designed to facilitate trading of short, medium and long term logistics capabilities shall be managed by GME; in this area, GME takes over OCSIT functions, as under Law 4 June 2010, no. 96, Article 17, paragraph 5, letter e), according to principles of neutrality, transparency and competition. The criteria of incorporation as well as the organizational and management platform will be determined by special decree of the Minister of Economic Development to be adopted within 180 days after the entry into force of legislative decree 249/12. By the same deadline, in order to allow the platform to operate, those who by any title have a storage capacity of mineral oil deposits in the country in excess of 3,000 cubic meters, shall duly notify GME. A subsequent decree by the Minister of Economic Development will approve the operation of such platform, as proposed by GME, and will define the operating terms to be met by holders of mineral oil storage sites and refineries, when notifying GME data about the monthly storage and transit capacity for own use, available for use by third parties and engaged on the basis of previously signed agreements. At the end of an initial testing period, as proposed by GME, the Ministry of Economic Development by special decree will establish the kickoff date of the market platform.
- the wholesale market platform of oil products aimed at encouraging the trading of liquid petroleum products for the transport sector, also in coordination with the aforementioned logistics platform, to be managed by GME. The criteria of incorporation as well as the organizational and management platform will be determined by special decree of the Ministry of Economic Development to be adopted within 180 days after the entry into force of Legislative Decree 249/12. Through a subsequent decree, the Minister of Economic Development will approve, after hearing the Ministry of Economy and Finance and the Customs Agency, the market regulation proposed by GME. The launch of the platform will take place at the end of a reasonable testing period determined by GME after hearing the Ministry of Economic Development. Two years after the entry into force of the market, upon GME's proposal, the regulation on the forward market for liquid petroleum products for the transport sector will be approved.

8 The obligation shall be fulfilled by the obliged parties on the basis the quantity of petroleum products released for consumption during the previous year.

9 Mandatory stocks are classified as security and specific stocks: the first are property of the obliged parties, the latter of the State of origin. However, the obliged parties can hold security stocks at the central stockholding entity of another member state, upon authorization released by the Ministry; specific stocks represent an exception, though; being property of the Italian state, they must be managed and held by OCSIT in the national territory.

10 In compliance with the limits and conditions imposed by the Directive and transposed by legislative decree, OCSIT is also allowed to designate, for a specific period of time, the central stockholding entity of another Member State on the territory of which such stocks are located; said entity is established by the second member State. A State can also designate other organizations to manage the oil stocks.

2. ELECTRICITY MARKETS

The Italian electricity market stems from Legislative Decree 16 March 1999, no. 79 - Implementation of Directive 96/92/EC on common rules for the internal market of electricity, as well as any subsequent implementing provisions; amongst these latter, special mention should be made of Ministerial Decree of 19 December 2003, as subsequently amended and supplemented, approving the Integrated Text of Regulations for the Electricity Market as under article 5 of the above said Legislative Decree 79/99 and the Electricity and Gas Regulator (AEEG) Decision of 13 June 2006, no. 111/06 and its subsequent amendments on the Conditions to provide public service dispatching of electricity nationally and to procure the relevant resources on an economic merit basis, in accordance with articles 3 and 5 of Legislative Decree 79/99.
For the purpose of completing rules on the physical execution of electricity purchase and sale contracts entered under the bidding system as under article 5 of Legislative Decree 79/99 or outside such system, the merit-order dispatch rules contained in the above mentioned AEEG Decision no. 111/06 establish that electricity can be purchased and sold in the regulated market run by GME under art. 5 of Legislative Decree 79/99 (such market includes both the spot electricity market - MPE - and the forward electricity market - MTE) or through bilateral contracts (over the counter - OTC), with a subsequent registration in the OTC registration platform - PCE.

2.1 Spot electricity market (MPE)

More specifically, the Spot Electricity Market (MPE) – which started on 1 April 2004 to implement article 5 of legislative decree 79/99, partially redefined after the entry into force of provisions introduced by law 28 January 2009, no. 2 – consists of the Day-ahead market (MGP), Intra-day market (MI) and Ancillary Services Market (MSD).

- Day-ahead market (MGP). The Day-ahead market is the main market run by GME. Hourly contracts with a physical delivery obligation are traded in the MGP with GME as central counterparty.
- Intra-day market (MI). The Intra-day market, where GME is the central counterparty, is organized in four sessions: two are held on day D-1 covering the 24 hours of day D; two are held on day D covering the last 12 and 8 hours, respectively. The MI allows participants to change schedules resulting from the MGP to solve any dispatching issues (gas-fired thermal power plants) or, more generally, changes in the available injection/withdrawal.
- Ancillary Services Market (MSD). In the Ancillary Services Market, run by GME, Terna is the central counterparty getting any resources required for the dispatching service. In this market, Terna solves any residual congestion after the MGP and MI and procures reserve margins on generating units to balance the system in real time.

2.2 Forward Electricity Market (MTE)

In operation since 1 November 2008, following the effective date of provisions under the decree of the Minister of Economic Development of 17 September 2008, as subsequently revised (starting from 1 November 2009) to implement provisions under the Decree of the Minister of Economic Development of 29 April 2009, the Forward Electricity Market (MTE) is a regulated market where GME acts as central counterparty; participants can trade standardized forward electricity contracts, both base-load and peak-load, with delivery and withdrawal obligation.
To ensure the security and stability of the power system, a functional integration between the MTE and PCE was requested to fulfill the obligation for physical delivery of forward traded electricity. This has been achieved by registering on the PCE the physical positions resulting from forward contracts; clearly, they must comply with the latest delivery date provided for by AEEG Decision no. 111/06 to register electricity trades on the PCE (i.e. 60 days).
The OTC clearing functionality is active in the MTE: participants can register – by specifying the counterparty, electricity volume and trading price – bilateral forward transactions. Given GME's role as central counterparty, participants in the MTE can efficiently handle the counterparty risk implied in such contracts.
The MTE rules of operation are outlined in the Integrated Text of the Electricity Market Rules.
In the course of 2012, in the light of the continuing financial crisis that has been affecting our country and of its impact on the banking system, it was necessary to urgently amend the Integrated Text of the Electricity Market Rules, in order to safeguard the proper operation of the market. In particular, after the amendment made in 2011, the minimum rating required of banks was further reduced on 26 January 2012, with reference to sureties given by operators to participate in the electricity market.
Moreover, to reduce the Electricity Market participation costs, article 69 of the Integrated Text of the Electricity Market Rules was also amended. In this way, participants who hold open positions in the physical Forward Electricity Market (MTE), can deliver such positions in the OTC registration platform (PCE) ahead of time. In other words, participants benefit from a shorter financial exposure towards GME.

With reference to the MTE, in order to allow participants to take advantage from trading opportunities, starting from May 2012, GME's trading systems were integrated into Trayport® Global Vision portal; participants can view, on one screen, GME prices, as well as the main electricity Exchanges and OTC platforms for the forward trading of electricity.

2.3 OTC registration platform (PCE)

Vested with GME pursuant to article 16, Annex A to AEEG Decision no. 111/06 and any subsequent amendment, the OTC Registration Platform (PCE) officially started on 1 April 2007. On the OTC registration platform (PCE), participants notify electricity volumes – without reporting the trading prices – underlying bilateral forward contracts entered outside the MPE.
The platform consists of an "electricity account system" to distinguish between the registration of commercial transactions and the relevant injection/withdrawal schedules that participants accept to execute. In the medium-long run, this mechanism allows a more efficient management of energy portfolios. Participants can easily re-negotiate, if necessary, any previously purchased/sold electricity.
The rules of operation of the OTC registration platform are described in the "Rules governing the OTC registration platform, as under article 17 of Annex A to AEEG Decision 111/06 and any subsequent amendment", as verified and agreed by AEEG Market Directorate through its Resolution of 7 February 2007 and any subsequent amendment.
Within the framework of the PCE and the rules that underlie the dispatching service – with special regard to activities linked to the scheme of actual deviations versus injection/withdrawal schedules that dispatching users agree to comply with respect to the grid operator - in 2012, AEEG revised the rules applicable to plants powered by non-schedulable renewable energy sources.
This measure became necessary as a result of policies encouraging generation from renewable sources, with a consequent rapid increase in the total installed capacity. Such increase is mostly attributed to the creation and connection to the grids of plants powered by non-schedulable renewable sources. This increase, though, declined in the course of 2012, following the completion of a consultation process with

participants (DCO AEEG 35/2012/R/EFR). As a consequence, AEEG has changed the reference standards contained in Annex A to Decision 111/06 for the management of actual deviations of producing units powered by non-schedulable renewable sources; where necessary, more changes will be made to the existing rules on the management of such generating units.
In summary, until the end of 2012, the fee applied to actual deviations of plants fed by non-schedulable renewables was equal to the price of supply offers accepted in the day-ahead market (MGP) in the corresponding period and in the localization zone of the reference dispatching point (MGP zonal price). According to this approach, in the event the electricity actually injected into the grid by such units differed from the one scheduled on the PCE, the excess costs related to dispatching management were not attributed to such unit. While this approach had a negligible effect during the start up of the electricity market, it has taken on significance after the latest developments and the estimated increase of generation from non-schedulable renewable sources.
In particular, at the end of the consultation process and in consideration of the responses given by participants, AEEG published on 5 July 2012 its Decision 281/2012/R/EFR, implementing an amendment to Annex A to Decision 111/06, Annex A to Decision 280/07, Annex A to Decision ARG/elt 1/09 as well as Annex A to Decision ARG/elt 187/09.
With this measure, the Regulator ordered - from 1 January 2013 and for a period of 12 months - the entry into force of a transient regulation during which deductibles are applied (20% for the first half of 2013, and 10% in the second half of the same year); in this way, actual deviations, relative to the modified binding schedule registered on the PCE from non-schedulable renewable units, continue to be valued at the MGP hourly zonal price.
Through the same Decision, AEEG acknowledged GSE's full autonomy in submitting electricity supply offers, injected into the grid by the generating units for which it acts as dispatching user, in order to allow a degree of flexibility in the definition and modification of injection schedules in near real time (thus participating also in the Day-ahead market and Intra-day market). Further Regulator's rules will define the terms to apply after 2013, in the light of the regulatory development covering the Ancillary Services Market.
An overall analysis shows that the optimization and increased efficiency of dispatching services allows the country to receive more injections of electricity from non-schedulable renewables, grid security and other economic resources being equal.

3. GAS MARKETS

According to the legislation in force, in Italy the wholesale purchase and sale of natural gas can be made either through bilateral contracts (OTC) or on the markets and platforms run by GME, including the P-GAS, M-GAS and PB-GAS.

3.1 Gas trading platform (P-Gas)

The P-GAS is comprised of three segments:

- Imports' segment, for the management of: i) supply offers and demand bids for gas quotas as under article 11, para 2, Law no.40/07 (import quotas); ii) bids/offers covering quotas other than those as under article 11, para 2, Law no.40/07. The imports' segment is based on the continuous trading mechanism. Contracts covering lots with monthly and yearly delivery periods can be traded;
- Royalties' segment, where supply offers and demand bids for royalties owed to the State as under article 11, para 1, Law no. 40/07 are traded (royalties). In the royalties' segment, trading is organized in the form of auctions; contracts for monthly deliverable lots are traded in this segment;
- Segment as per Legislative Decree 130/10 (also known as "virtual storage" segment"), where supply offers and demand bids are handled for gas volumes for which investors have accepted to fund the implementation of new storage facilities or expand the existing ones for an overall amount of 4 billion (storage capacity) and have availed themselves of the transient measures as under article 9 of Legislative Decree 130/2010. Said investors must comply with the bidding requirement for gas volumes s made available by virtual storage operators with whom/ which they are associated. The segment as per Legislative Decree 130/10 is based on the continuous trading of contracts for volumes with a monthly and six-monthly delivery period.

The P-GAS is managed by GME acting as a broker (rather than as a central counterparty). The delivery of traded gas, guarantees, invoicing and payments are handled by participants. This means that the terms of supply are set by the seller who notifies GME which in turn simply publishes them in its website. It follows that contracts traded by each participant can be quite different from one another.
The rules of operation of the P-GAS platform are illustrated in the Regulations of the gas trading platform, approved by the Ministry of Economic Development on 23 April 2010, and any subsequent amendment.

3.2 Spot gas market (M-GAS)

Pursuant to article 30 of Law 23 July 2009, no. 99, GME started the spot gas market operations (M-GAS) in December 2010.
Only participants enabled to perform transactions at the Virtual Trading Point (PSV) are allowed to trade in the M-GAS.
In the M-GAS, unlike the P-GAS, GME acts as central counterparty to transactions entered by participants. It guarantees the delivery of traded gas and the positive outcome of payments.
To guarantee the delivery of gas traded in the M-GAS, GME entered into a specific agreement with Snam Rete Gas governing the exchange of certain information flows, essential for an appropriate management of market activities and those required to register gas quantities traded at the PSV. This latter is managed by Snam Rete Gas.

The positive outcome of payments for gas volumes is backed by a system of financial guarantees.
The M-GAS consists of:

- Day-ahead gas market (MGP-GAS), where gas supply offers and demand bids for the gas-day following the day on which the auction session ends are selected;
- Intra-day gas market (MI-GAS), where gas supply offers and demand bids for the gas-day corresponding to the day on which the session ends are combined.

The rules of operation of the M-GAS are illustrated in the Gas Market Rules approved by the Ministry of Economic Development, after hearing AEEG, on 26 November 2010 and any subsequent amendment.
In the course of 2012, in the light of the continuing financial crisis that has been affecting our country and of its impact on the banking system, it was necessary, alike the electricity market, to make urgent changes to the Gas Market Rules, in order to safeguard the proper operation of the market. In particular, after the amendment made in 2011, the minimum rating required of banks was further reduced in January 2012, with reference to sureties given by operators to participate in the gas market.

With regard to the expected developments in the gas market, in compliance with Article 32, paragraph 2, Legislative Decree 1 June 2011 no. 93 - which entrusts with GME the management of physical forward gas markets - GME, in coordination with the institutions, has continued to develop the proposed design of the forward market (MT-GAS).

In October 2012, GME pursued this objective; in agreement with the institutions, and in order to start a debate with the parties concerned, GME published the "Consultation Document 04/2012: physical forward gas market" to illustrate the proposed design of the MT-GAS to participants.
The solution identified by GME, notwithstanding some differences, essentially follows up the approach previously tested in the electricity markets, where the forward market has been placed along with the existing spot markets.

GME has continued, therefore, the activities required to start the MT-GAS; it prepared a draft regulation outlining the operating rules of the market, drawing up a single body of rules blending both the new rules and those already applicable to the M-GAS, for its subsequent approval by a Ministerial Decree, after hearing the competent Parliamentary Committees and AEEG.

The MT-GAS provides for the trading of yearly, half-yearly, quarterly, monthly and BoM (Balance of Month - contracts including the day of the current month, still to be delivered) contracts.
These contracts will be subject to the continuous trading and settlement mechanisms of the forward electricity markets. In particular, contracts will be settled through cascading, a procedure under which contracts are replaced upon maturity with an equivalent number of contracts with a shorter maturity. The new positions are opened at a price equal to the final settlement price of the original contracts. They are also settled through shifting (at the end of a contract trading period, a similar contract referred to the subsequent delivery period is traded, so as to constantly trade the same number of contracts).

The delivery of contracts will be registered daily in the PSV system as the MGP-GAS closes. On every single day, the individual positions registered in the PSV will be the sum of all trades entered by each participant both in the MT-GAS (yearly, half-yearly, quarterly, monthly and BoM products referred to the day of delivery) and in the MGP-GAS (daily products referred to the day of delivery).

As part of the regulatory framework applicable to the MT-GAS, in giving effect to the provisions of art. 32, paragraph 2, legislative decree 1 June 2011, no. 93, AEEG established through its Decision 525/2012/R/gas the regulatory conditions which enable the performance of GME management activities for forward physical gas markets.

The rules of operation of the MT-GAS have been approved by Decree of the Minister of Economic Development of 6 March 2013 on the "Approval of the Natural Gas Market Rules"." In particular, pursuant to art. 1, paragraph 3 of the Decree, the start date of the MT-GAS will be determined, upon GME's proposal, through a subsequent decree of the Ministry of Economic Development, and, in particular, after a suitable test period the length of which will be determined by GME and notified to MiSE.

3.3 Balancing Platform (PB-GAS)

Since 1 December 2011, the gas merit-order balancing market has been active in Italy. It is managed by GME and was introduced to quantify imbalances between scheduled volumes and actually delivered volumes, according to the market value of gas as required to balance the system. The new regulations for a simplified balancing system are based on market criteria (SBSM) and were defined by AEEG to comply with provisions under art. 11 of Legislative Decree 13 August 2010 no. 130, through AEEG Decision of 14 April 2011, ARG/gas 45/11 (reflecting Community regulations contained in the so called Third Energy Package, most notably Regulation No 715/2009), and Implementing Law no. 96/10.

The new regulations paved the way to the establishment of a gas balancing platform (PB-GAS) used by SNAM to procure any resources necessary to make up for the overall network imbalance. Within this system, SNAM acts as central counterparty to the platform transactions whereas GME is in charge of organizing and managing the PB-GAS on behalf of SNAM itself.

To guarantee a secure system, with SBSM the physical dispatching of the system by SNAM keeps revolving around storage. To this end, it is mandatorily established that all users who purchased rights over storage services (defined as authorized users) take part in this market, with the exception of strategic storage service users.

The rules of operation of the PB-GAS platform are outlined in the Regulations of the gas balancing platform, under art. 5 of AEEG Decision ARG/gas 45/11, approved by AEEG through Decision ARG/gas 145/11 of 28 October 2011, as subsequently amended and supplemented.

With regard to the future developments of the balancing market, in line with AEEG Decision 538/2012/R/GAS of December 2012, GME held its talks with the stakeholders to define the rules of operation of a balancing session on the day before the gas delivery day (G-1), subject to AEEG subsequent approval. G-1 balancing session aims at providing the gas transport network operator with a tool to select and activate ex ante, through market-based mechanisms, further flexibility mechanisms, different from storage, in order to reduce the level of the expected system imbalance; this is particularly important during a contingency, to guarantee appropriate leeway while providing participants with one additional market instrument to trade gas and balance out their respective positions. Hence, in compliance with criteria defined by Decision 538/2012/R/GAS, the G-1 balancing session shall include:

- the right for balancing users who hold flexible gas resources other than storage, to submit supply

offers and demand bids with respect to specific points of import, storage and LNG;
- the acceptance of bids/offers submitted by users, compatible with the sale limits established by the system of guarantees defined in accordance with Decision 45/11;
- the participation of Snam Rete Gas, as balance responsible party, in a manner to be defined by AEEG through a separate measure.

If necessary, AEEG may allow a phased implementation of the platform capabilities; in the first stage only the combination of bids/offers submitted by balancing users with the overall demand bid or supply offer expressed by the balance responsible party will be allowed; on the other hand, a market model where transactions between balancing users are allowed may be postponed to a later time.

4. ENVIRONMENTAL MARKETS

4.1 Green Certificates Market

The market mechanism of Green Certificates was introduced in Italy by Legislative Decree 16 March 1999, no. 79, on the liberalization of the electricity sector and the promotion of electricity generation from renewable sources; the legislation provides for a gradual replacement of the previous feed-in tariff support scheme known as CIP 6, effective since 1992.
Under the above decree, producers and importers of electricity from non renewables, starting from 2002, shall inject every year into the grid electricity from renewables in an amount equal to 2% of electricity produced or imported in the previous year in excess of 100 GWh. This mandatory quota was later increased by 0.35% a year, relative to the 2004-2006 period, and by another 0.75% a year, for the 2008-2012 period. Thus, whenever a subject must fulfill this obligation, it may decide whether to invest in the erection of new plants fed by renewable sources and get GCs by generating electricity, or buy GCs from other producers.
To promote the GCs trading, Ministerial Decree of 11 November 1999 later repealed and replaced by Ministerial Decree of 18 December 2008 on "Support to electricity from renewable sources, pursuant to article 2, para 150, Law 24 December 2007, no. 244" established that GME organizes and manages a platform to trade such Certificates.
GME manages both the regulated market of green certificates, which started in March 2003, where it acts as central counterparty to ensure the successful outcome of transactions, and the GCs Bilaterals Platform (PBCV); on this latter, participants who choose the bilateral trading of such certificates can register a bilateral contract and notify its details to enable the transfer of traded GCs from the seller's to the buyer's account. The registration of bilateral contracts on the PBCV has become mandatory since 2009.
The rules of operation of the regulated market of green certificates are outlined in the Integrated Text of the Electricity Market Rules. As to the GCs Bilateral Platform, the rules of operation are described in the Rules governing the green certificates bilaterals registration platform, as under article 12, para 3, D.M. 18 December 2008.
The recent regulatory developments in terms of policies for the promotion of renewable energy sources will lead to the gradual replacement of the system of Green Certificates for a new feed-in tariff system, starting from 2013.
Legislative decree 3 March 2011, no. 28, on the "Implementation of Directive 2009/28/EC on the promotion of electricity generated from renewables", under art. 25 establishes that producers and importers from conventional sources shall inject into the power grid a share of energy generated from renewable sources (art. 11, paras. 1 and 2, legislative decree 16 March 1999, no. 79) in an amount of 7.55% in 2012; this percentage will be linearly decreased from 2013 until becoming equal to zero in 2015.

4.2 Energy Efficiency Certificates Market (TEEs)

Since 2006, the Energy Efficiency Certificates – which prove the energy saving attained by implementing specific energy saving projects, in accordance with provisions under decrees 20 July 2004, as subsequently amended – have been traded on the market arranged and run by GME (hereinafter Energy Efficiency Certificates Market), under art. 10, para 3, decree of 20 July 2004, as established by the Rules of Operation of the Energy Efficiency Certificates Market, adopted by GME in agreement with AEEG Decision no. 67/05; they can also be traded bilaterally and registered in the register managed by GME as under art. 4, para 4.1, D.M. 21 December 2007, in the manner established by the Rules for registering bilateral transactions of Energy Efficiency Certificates, approved by AEEG through Decision EEN 5/08 of April 2008.

In 2012, in order to transpose the provisions of AEEG Decision 203/2012/R/EFR of May 2012, GME began adjusting the Rules of Operation of the Energy Efficiency Certificates Market and the Rules for registering bilateral transactions of Energy Efficiency Certificates to comply with the new regulatory framework applicable to the TEE mechanism. Such activities include the establishment of two new types of certificates for projects in the transport sector, introduced by AEEG Decision EEN 9/11 of 27 October 2011 (Update of Guidelines on energy efficiency), namely:

- type IV: certificates giving evidence of savings of primary energy other than electricity and gas, implemented in the transport sector, to be assessed as described under article 30 of Legislative Decree 3 March 2011, no. 28;
- type V: certificates giving evidence of savings of primary energy other than electricity and gas, implemented in the transport sector, to be assessed through methods different from those envisaged for type IV certificates,

as well as the types of tradable TEE of type HEC II, as under MiSE Decree 5 September 2011.
Such decree introduces new support measures to High Efficiency Cogeneration (HEC), i.e. the combined generation of electricity and heat; cogeneration plants are entitled, for each calendar year during which they meet HEC requirements, to receive White Certificates from GSE; the number of certificates is proportional to the primary energy saving attained in any given year.
The decree establishes that HEC units are entitled to receive white certificates by virtue of their high efficiency cogeneration, considered as a Type II equivalent; also, certificates can be used to fulfill the mandatory quota requirement on the part of obliged parties (those who must fulfill the national energy saving objectives).
Alternatively, HEC operators can ask GSE to take TEEs back. In this event, TEEs taken back by GSE cannot be traded with the obliged parties.
Finally, the TEE mechanism falls under the provisions introduced by Ministerial Decree 28 December 2012; the decree sets out the national energy saving goals to be attained by obliged distributors in 2013-2016 (Tab. B.1).
Furthermore, in enforcing D.M. 28 December 2012, GME amended, in the first quarter of 2013, the regulatory framework applicable to the white certificate trading and registration systems; amongst others, it introduced two additional types of Energy Efficiency Certificates ("IN" and "E"). These latter are issued, pursuant to art. 8, para 3, D.M. 28 December 2012, as a reward for technology innovation and for reducing atmospheric emissions.
The same ministerial decree introduced a number of novelties. Amongst others, GSE's responsibility in managing the certification mechanism, the approval of new technical data sheets drawn up by ENEA, criteria to determine the tariff contribution for the costs incurred by the obliged parties.

Yearly national quantitative obligations in terms of energy efficiency improvements in end uses of electricity and natural gas

Tab B.4.1

Obligation year	Obligations of electricity distributors (million WCs)	Obligations of gas distributors (million WCs)	Cumulative obligations (million WCs)
2013	3.03	2.48	5.51
2014	3.71	3.04	6.75
2015	4.26	3.49	7.75
2016	5.23	4.28	9.51

4.3 Market of Certificates of origin for renewable energy power plants (RECOs)

Legislative decree 3 March 2011, no. 28, Article 34 provides that "in order to allow electricity providers to prove to final customers the share or quantity of energy from renewable sources in their energy mix" they shall solely use the Guarantees of Origin to be issued, acknowledged and used in the manner prescribed by a specific inter-ministerial decree.
Pending the adoption of the above mentioned inter-ministerial decree, AEEG Decision ARG/elt 104/11 of 28 July 2011:

1. specified that with respect to the fulfillment of obligations of electricity providers in the field of fuel mix disclosure, RECOs could be used, as under ministerial decree of 31 July 2009;
2. identified the trade/transfer and subsequent cancellation of such certificates as the instrument to monitor the above said sales; in this way, the same electricity generated from renewables would not be included in several sale contracts.

With reference to the latter, the regulator has identified GME as the entity in charge of managing the market platform for the exchange of such certificates of origin (M-RECO), as well as the registration platform of bilateral transactions (PB-RECO).
RECOs can be transferred through bilateral contracts or through GME's regulated market. In the event participants decide to trade certificates bilaterally, they still need to register the corresponding transaction on the bilaterals platform prepared by GME, indicating the volume, price and counterparty.
RECOs trading system – the operation of which was established by GME and positively received by AEEG Market Directorate on 22 December 2011, as subsequently amended – consists of the M-RECO and PB-RECO. RECOs can be traded on these platforms by those holding an ownership account with a specific registry held by GSE, where the RECOs issued after the generation of electricity from renewables, those traded in the M-RECO, those awarded after the auctions organized and run by GSE, or those traded bilaterally are registered.
With reference to the operation of M-RECO, the following should be noted:

- participation in the M-RECO is decided by participants on a voluntary basis;
- the trading venue consists of as many order books as the various types of traded RECOs pertaining to the different renewable generation sources;
- trading takes place in the form of continuous trading, with an automatic matching of buy and sell orders in the different order books;
- GME checks the validity and adequacy of the various submitted orders; in particular, it verifies the following: i. orders have been entered in accordance with the applicable Rules; ii. the volume of RECOs offered for sale cannot exceed the volume of RECOs in the ownership account held with the

GSE Registry, net of those which have already been traded; iii. the value of buy orders shall not be higher than the cash amount previously paid in by the participant to GME; iv. in this market, GME acts as central counterparty to transactions; as such, it settles the financial positions resulting from the transactions entered by participants.

As far as the operation of the PB-RECO is concerned:

- participation in the PB-RECO is mandatory for participants, whether they trade bilaterally or receive RECOs as a result of auctioning procedures;
- registrations are made in real time and are deemed to be final once, after being entered by the seller, they are accepted by the purchaser, after any validity and/or adequacy verifications (the latter, only if expressly requested). Adequacy verification is a check on the cash deposit made by the purchaser; validity verification is a check on both the seller's and the purchaser's right to register transactions in the PB-RECO, as well as a check on the available number of RECOs in the seller's ownership account with the GSE Registry. In particular, bilateral transactions can be registered in one of two ways:
  i. Without adequacy verification (in this case the registration request is only subject to validity checks, and to the availability of RECOs in the seller's ownership account);
  ii. With adequacy verification (in this case the registration request is subject to the above validity check as well as to a check on the financial adequacy of the cash deposit previously paid in by each participant);
- on this platform, GME does not act as central counterparty. It simply arranges and runs the registration system. Hence, the payables/receivables arising from the registered transactions are directly settled by participants on a bilateral basis.

Also, RECOs can be purchased through auctions organized by GSE. During the auctions, GSE's own RECOs are awarded; such RECOs pertain to the electricity generated by CIP 6 plants (for electricity from renewable sources only), electricity taking benefit from the net metering scheme, electricity from plants supported through green certificates or other schemes ("ritiro dedicato" - simplified purchase and resale arrangements, "tariffa fissa omnicomprensiva" - all-inclusive feed-in tariff) for which the plant owner did not request RECOs by the month of September of the year of generation. RECOs awarded through GSE auctions shall be registered in GME's bilaterals platform, too.

The current regulatory framework will be modified in accordance with the implementing provisions of the above mentioned art. 34, legislative decree 28/11, under the inter-ministerial decree of 6 July 2012.

The Minister of Economic Development, in agreement with the Minister of the Environment and Protection of the Land and Sea, has indeed paved the way to the enforcement of the above said provisions under art. 34 of legislative decree 28/11; the share of electricity produced from renewable sources can only be certified by means of the guarantee of origin. Such obligation is effective from 1 January 2013, in compliance with art. 34, para 4, legislative decree 28/11.

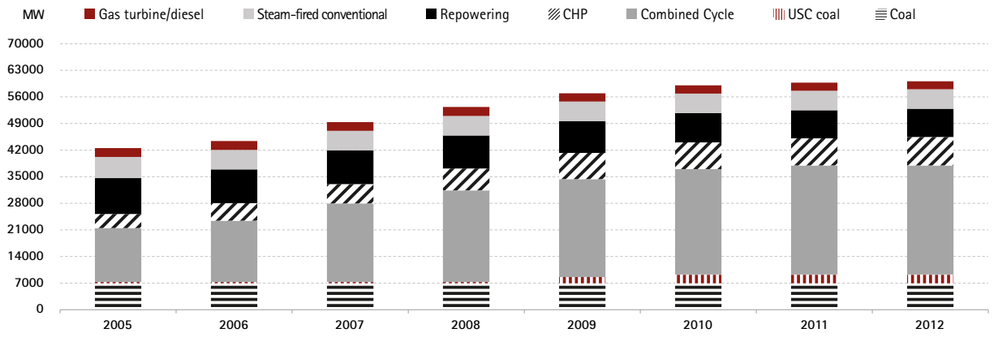
By the end of 2013, in line with the "procedure for the identification of renewable-fed plants, issuing and management of the Guarantees of Origin" - prepared by GSE and approved by the Ministry of Economic Development after hearing AEEG (Decision 534/2012/I/EFR), pursuant to article 31, para 1, inter-ministerial decree 6 July 2012 - GME will introduce any changes originating from the transition from the RECO certification system to the Guarantees of Origin (GO).

INSIGHT II *- written by REF-E*

THE EVOLUTION OF GENERATION COSTS FOR GAS-FIRED THERMAL POWER PLANTS

Over the last decade, the national and international business cycle and technology advances have deeply changed the world market of energy commodities, in terms of relations with both the prices and the risk (volatility) of the different products. These changes, together with the evolution of the Italian electricity generation led to a profound change in the structure of electricity generation costs for gas-fired plants, having a major impact on prices and margins in the wholesale market.
The evolution of generation costs is primarily a function of change in the generation fleet: in Italy, after the power outage in the summer of 2003, the energy policy has encouraged the growth and upgrade of generation focusing in particular on combined cycle plants.
Between 2005 and 2012, 14 GW of combined cycle plants were put into operation, bringing the share of this technology in total supply of thermal generation to 48% (Fig II.1). In the last decade, technological developments have increased the efficiency of these plants: the average efficiency of gas-fired plants in Italy rose from 51.9% in 2005 to 52.5% with an effect on the generation costs related to this technology.

Fig II.1 **Thermal generating capacity* 2005-2012** by technology



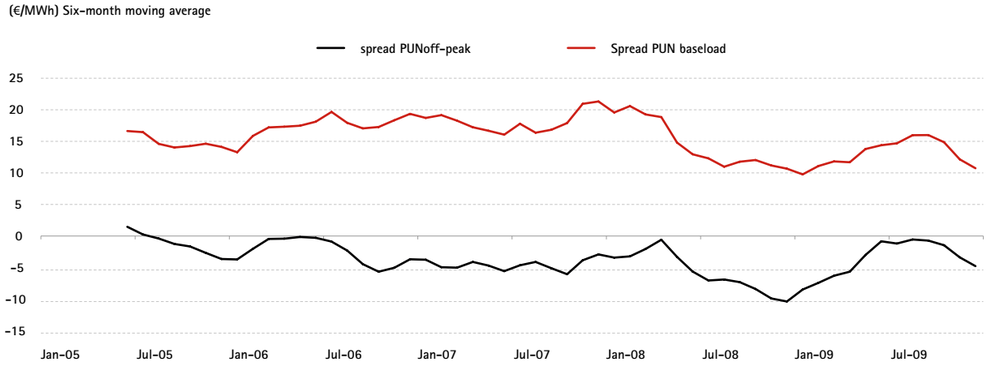
* Net maximum capacity of power plants >15 MW (no CIP-6 or self-generation)
** As of 31 Dec. of each year
Source: REF-E estimations

The greatest change in the generation costs of CCGT plants, however, was the development of the gas market in Europe. Historically, owing to the high degree of dependence on foreign supplies of natural gas, the long-term supply contracts entered into by importers and shippers were based on take-or-pay formulas by means of which it was possible to develop the gas transport infrastructure from Russia, Northern Europe and the Maghreb region.
Until 2009, with a prevailing shortage of supply across the globe, the take or pay contracts were the most common instruments used to define prices and volumes to be supplied in the medium-long run. The cost of gas supply to power plants between 2005 and 2009 reflected the supply costs borne by the importers on the Upstream market and were based on gas price formulas calculated on the basis of the 6/9-month moving averages of the price of oil and derivative fuels.

This trend is confirmed when analyzing the differences between the ITECccgt index published by REF-E since 2004 and the average monthly value of the base-load and off-peak PUN (Figure II.2).

The 6-month moving average has remained almost stable between 2005 and June 2008, with values of -2.9 €/MWh in the low load hours and 17.3 €/MWh at base-load. In the second half of 2008 and during 2009, the rapid growth of oil prices, followed by the collapse ensuing the Lehman Brothers bankruptcy and the global recession have promoted a smaller spread between the electricity price and ITECccgt index and, later, a new growth; yet, the cost structure was still based on the oil and petroleum products price indexing. (Fig. II.2)

Spread between ITECccgt and base-load/off-peak PUN Fig II.2



Source: REF-E processing of GME and Platt's data

In 2010, the performance of the electricity price did change: the demand was weak, as a result of the insufficient recovery after the Fall of 2009 and an increasing level of competition in the wholesale market, due to the completion of the investment in new gas-fired thermal capacity and to an increased generation from renewable sources. This caused a sharply shrinking spark spread for combined cycle plants.
Starting from the 2010-2011 thermal year, in an effort to circumscribe the declining margins and the continuing drop of spot gas prices, many thermal power plant operators have renegotiated their supply contracts, in order to get a better gas price in line with the supply and demand conditions in the electricity and gas markets alike. Although there is no official figure about the exact level of discount applied by suppliers, a 10% rebate most likely has been granted in the vast majority of cases.
In particular, starting from October 2010 supply contracts were characterized by a decrease of the fixed component (the so-called P0) whereas the variable component kept to be indexed to the price of oil and oil products. During the thermal year 2010-2011, the cost of generation for CCGT plants was assumed to be equal to the ITECccgt index where the initial P0 value was 10% smaller than the official index.
In 2011, the price level in oil, gas and electricity markets showed quite an opposite trend in Italy: despite a substantial growth in the Brent price, spot prices of electricity and gas in key European markets have remained stable.
Again, this trend has resulted in a mismatch between the indexed gas supply formulas and the actual performance of electricity and gas spot markets.

The substantial increase in oil prices was offset by an excess supply of gas across all European countries, with a large overcapacity in the Italian gas-fired thermal power plants, also due to the massive advent of renewable-fed plants, especially PV plants.

Such factors have determined the non-competitiveness of oil-indexed gas supply contracts, especially with regard to the gas spot price posted in the main European hubs. In every major European gas market (including the PSV), the increased liquidity pushed forward the use of spot prices in supply contracts starting from October 2011; it is estimated that the supply cost for gas-fired thermal power plants is represented by the gas component of ITEC12/REF-E index. It includes, in an amount equal to 25%, the TTF price as a cost item. The shift to ITEC12/REF-E index also depends on the improved efficiency of the Italian generating mix, as hinted above: the ITEC12/REF-E index does assume a mean efficiency of CCGT plants equal to 53% vs. a 50% value employed in the ITEC/REF-E index.

Despite the increasing weight of the spot components and the subsequent renegotiation of gas contracts, the continued existence of structural differences in terms of demand and supply ratio on the oil and gas markets, and the weakness of the Italian energy sector have led to new changes in the contract covenants starting from the thermal year 2012-2013.

In the second half of 2012, the deteriorating economic outlook for 2013 and the possibility of a greater exploitation of the gas transport infrastructure due to the elimination of some contractual congestions, led thermal generation businesses to enter into more competitive supply contracts. Given the high level of uncertainty, it is possible to define just a cost range for gas for the last quarter of 2012 and 2013.

Within such range, the highest value is the gas component of the ITEC12/REF-E index; the minimum value is the gas cost derived from the MAGI index converted into lower calorific value, assuming logistics costs equal to 2.3 €/MWh and a 53% mean efficiency. The MAGI index is calculated as a weighted average of the month ahead transactions at the PSV (70% weight) with a survey component which represents operators' expectations of the gas price in the following month (30%). The estimated cost range is also in line with the results of an investigation conducted by the Electricity and Gas Regulator (AEEG) on the cost structure of the gas retail market, where the weighted average cost of a sample of volumes supplied to thermal power plants for the thermal year 2012/2013 amounts to € 36.10/MWh for contracts signed by July 2012 and adjusted to the spot price of gas for contracts entered after this period.

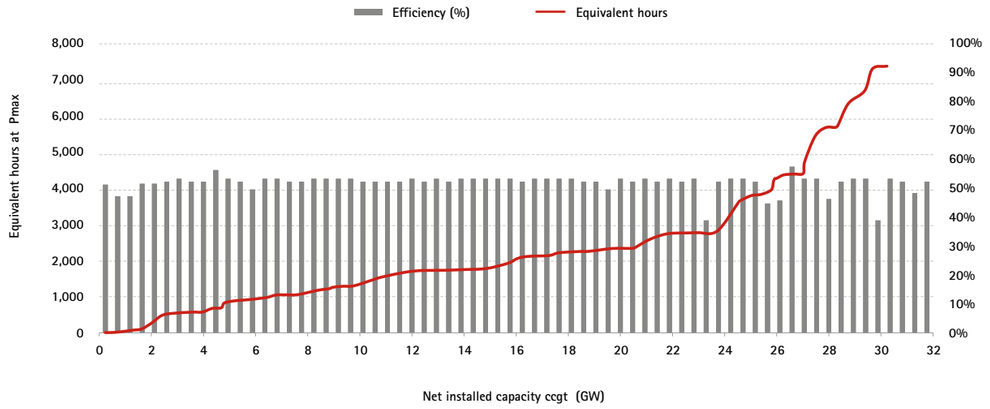
The size of this range is due to the retail market trend. The 2012 sales campaign began, as usual, in the summer, namely when the most radical paradigm shift has hit the market. Contracts signed for one thermal year only, during the initial phase of the campaign, may have prices closer to the ITEC12/REF-E index, while contracts signed at the end of the campaign, possibly based on a calendar rather than a thermal year, may have prices aligned with the gas spot market.

The analysis of the electricity price of bids/offers (of public domain) accepted in the MGP during the last quarter of 2012 shows an extremely high heterogeneity: on the one hand, in all time bands the PUN dropped, starting from the Fall; on the other, there exist substantial differences in the number of operating hours of the various combined cycle plants. Combined cycle plants have gone from a relatively homogenous and intensive operation (over 3,500 hours at maximum capacity in 2009) to less than 2,500 hours at maximum capacity in 2012 with generation differentials between the various plants, not necessarily related with their efficiency.

In addition, by combining data on the operation of each plant with its specific efficiency at maximum capacity, it becomes evident that a higher load factor is not necessarily associated with a higher efficiency with respect to the remaining CCGT plants: plants which were in operation for over 4,000 equivalent hours at maximum capacity have an average efficiency of 50.2%, whereas the remaining plants (with fewer hours of operation) show an average efficiency at maximum capacity of over 52% (Fig. II.3).

Load factor of CCGT power plants and operating hours at maximum capacity*

Fig II.3



* Excluding small plants below 50 MW
Source: REF-E processing of GME data

Such heterogeneity can be interpreted in many ways: the specific costs of procurement of raw material, the location of the plant and the specific bidding strategies of operators.

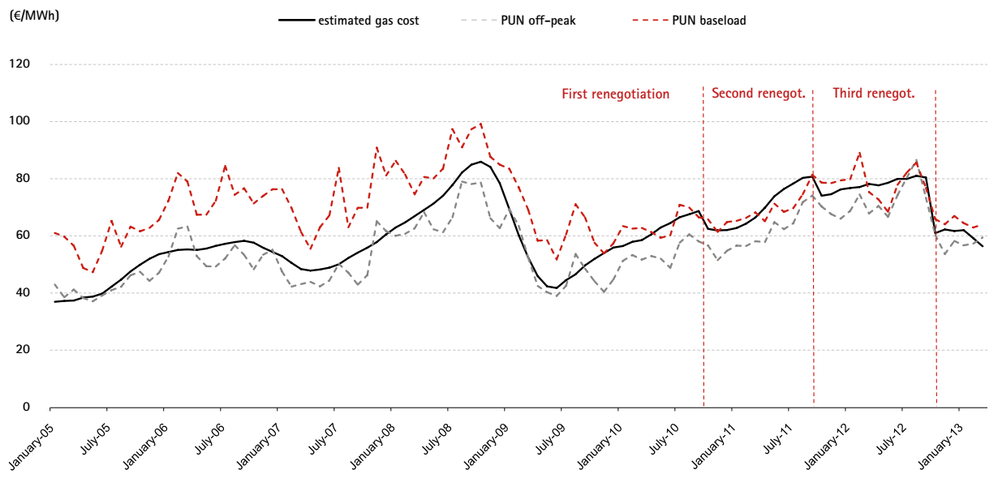
As to the first factor, the variability of prices at which operators have entered into gas supply contracts may cause a plant, even if highly efficient, to be unable to compete with less efficient combined cycle plants which, however, can count on a greater competitive advantage in terms of generation costs. The difference in gas costs may depend on the time of renegotiation of supply contracts as well as on the parties' bargaining power.

Another significant element is the zonal market: despite a homogenous price in most of the hours across the entire continent, short-term deviations can bring benefit only to certain plants which meet the demand in a specific market zone.

The third element that may contribute to the extreme variability in plant operation is related to operators' strategies: different portfolio of plants, different levels of plant amortization, as well as differences in the company's financial structure may affect the pricing strategies implemented in the market and consequently increase the variability in terms of plant utilization (Fig. II.4).

Fig II.4

Evolution of gas cost for producers with gas-fired thermal plants



Source: REF-E processing of GME and Platt's data

SECTION

C

MARKET TRENDS

C. MARKET TRENDS 40

1. FUEL PRICES 40

2. ELECTRICITY MARKET 45

2.1. The Italian electricity sector 45

2.2. Market participation 48

2.3. Day-ahead market (MGP) 51

2.3.1. Trends and outlooks in the national market 51

2.3.2. The trend of the Pun and its fundamentals 52

2.3.3. Zonal markets 56

2.4. Intra-day market (MI) 62

2.4.1. Prices 62

2.4.2. Volumes 67

2.5. OTC Registration Platform (PCE) 71

2.6. Forward electricity market (MTE) 76

2.6.1. MTE Volumes 76

2.6.2. MTE Prices 83

2.7. International comparisons 88

2.8. Italy-Slovenia market coupling 92

3. GAS MARKETS 94

3.1. The gas-system 94

3.2. Market liquidity 97

3.3. PB-GAS 99

3.4. M-GAS 106

3.5. P-GAS 107

3.6. International comparisons 108

4. ENVIRONMENTAL MARKETS 114

4.1. Market participation 114

4.2. Green Certificates 116

4.2.1. Market and Bilaterals Platform 117

4.3. Energy Efficiency Certificates 122

4.3.1. The regulated market and the Energy Efficiency Certificates bilateral trading 123

4.4. RECOs 129

4.4.1. RECO Market (MRECO), Bilateral Platform (PB-RECO), GSE's auctions 129

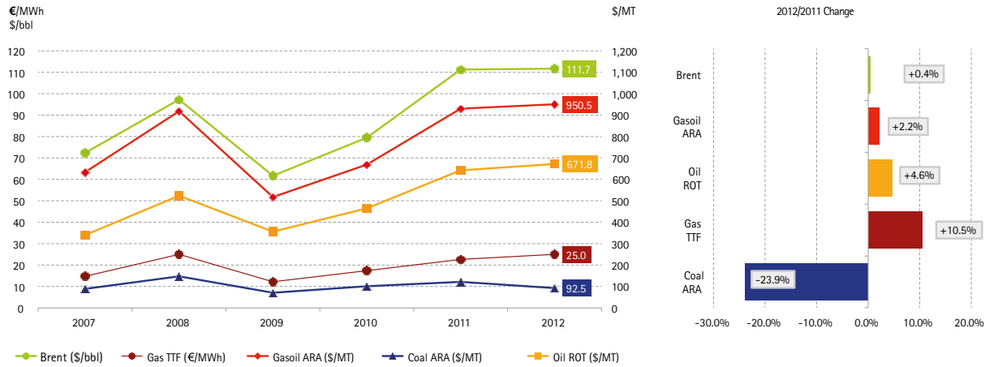
MARKET TRENDS

1. FUEL PRICES

In 2012, in a context of relentless economic crisis, the European prices of energy commodities for the Italian thermal power plants, for the first time after six years, turned out to be quite heterogeneous and only partially in line with the predominantly upward trend observed during the previous two years (2010-2011).

Indeed, on an annual basis, the substantial stability of continental crude oil around its historically highest values contrasts, on the one hand, with the significant decline in coal prices, which fell close to the minimum level of 2009, and, on the other, with the sustained increase in the price of natural gas, never so high since 2008 (Fig. C.1.1).

Fig C.1.1 **Prices (USD) of the main European energy commodities**



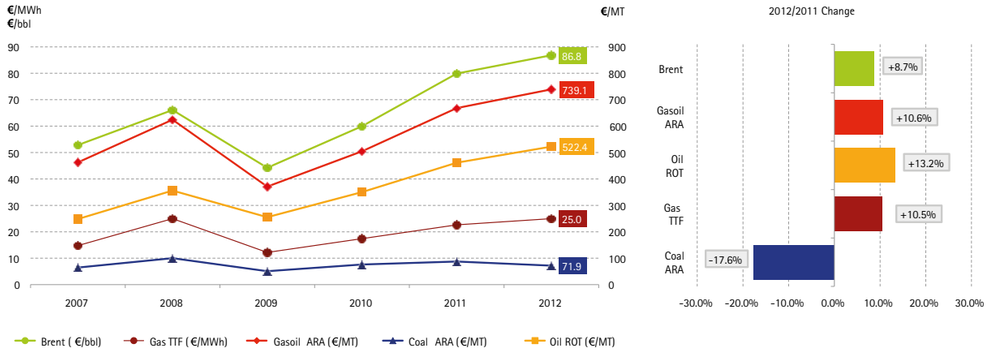
Source: Thomson Reuters

On the other hand, to appropriately assess the impact of variable costs relative to the prices of fuels on the thermal power generation in the European Union, it is worth noting that, due to the loss of power suffered in the past year by the continental currency compared to the U.S. dollar[1], against the slight setback suffered by the annual growth rates of coal prices converted into euro, the Brent and petroleum products prices showed a substantial tightening, rising to levels similar to those recorded for gas[2] (Fig. C.1.2).

1 In 2012, the dollar/euro exchange rate went down to 1.29 $/€, the lowest value in the last six years, with a 7.6% decreasing trend.

2 Compared to 2011, the Brent and oil product prices, converted into euro, increased by 8.7%; +10.6% (diesel oil) and +13.2% (fuel oil), respectively.

Fig C.1.2 **Prices (€) of the main European energy commodities**



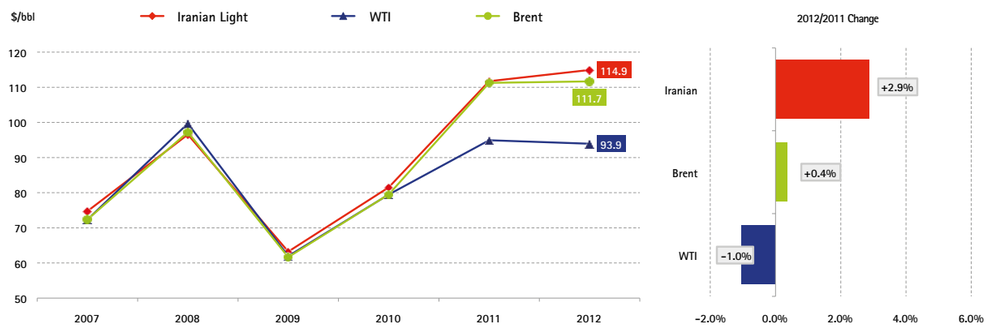
Source: Thomson Reuters

An analysis focused on the units of measurement adopted to trade each commodity on the Exchange shows that in 2012, after two years of fast growth, prices have not changed either in Europe or in key international markets. This pattern dispelled the previous downward hypothesis and confirms, to the same effect, the decoupling between the U.S and the Continent, totally unprecedented until 2010, for the second year in a row.

More specifically, in Europe the Brent stood at around $ 112/barrel; in the twelve month period, the price fluctuations reached the yearly maximum level of $ 125/bbl in March, before a steep decrease down to $ 95/bbl in June and a subsequent recovery which reached its apex in August, when crude oil rose to $ 113/bbl, a value which remained virtually stable in the last quarter.

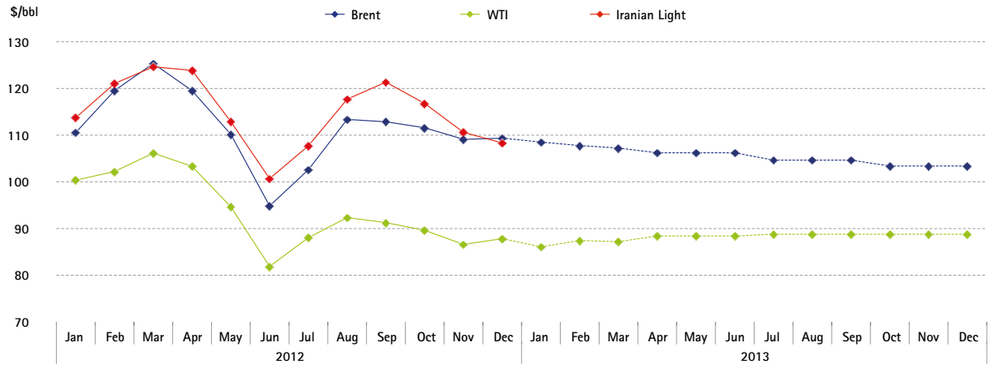
However, these ups and downs during the year have been very gradual, with no evidence of any significant structural breaks; this is well expressed by the volatility calculated on a daily basis, down to 1.4%, the lowest level since 2003. As to the future, in 2012 the market had moderately downward expectations for the following year, with a gradual decrease from $ 106/bbl; this price was taken as a basis to deliver the 2013 annual base-load product, with a long term outlook pointing to a renewed gradual convergence towards WTI levels which are expected to slightly recover (Fig. C.1.3, Fig. C.1.4).

Fig C.1.3 **Spot prices in the main international crude oil markets**



Source: Thomson Reuters

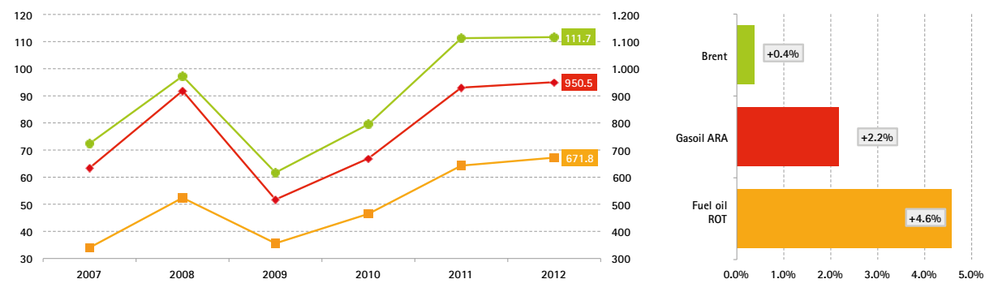
Fig C.1.4 **Monthly trend of international spot and forward crude oil prices**



Source: Thomson Reuters

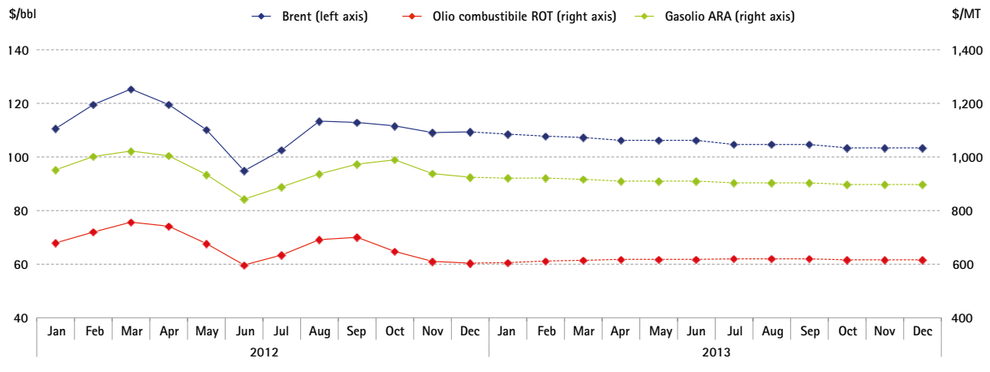
A pattern similar to the Brent's was recorded, as usual, for petroleum products whose price has reached $ 950/MT (diesel) and $ 671/MT (fuel oil), with yearly changes slightly higher than their reference commodity (+2.2% and +4.6 %, respectively). The intra-year dynamics of the two fuels showed a more pronounced tendency to rise (fuel oil) between August and October, in contrast to the exceptionally weak signal shown by continental crude oil during the same period (Fig. C.1.5, Fig. C.1.6).

Fig C.1.5 **Spot prices in the main European markets of crude oil and oil products**



Source: Thomson Reuters

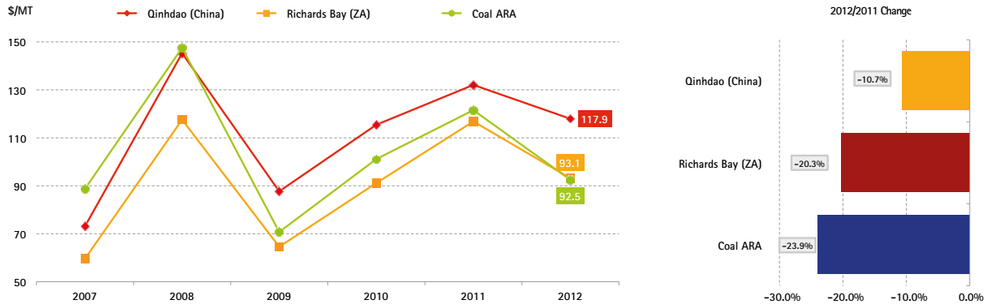
Fig C.1.6 **Monthly trend of European spot and forward prices of crude oil and oil products**



Source: Thomson Reuters

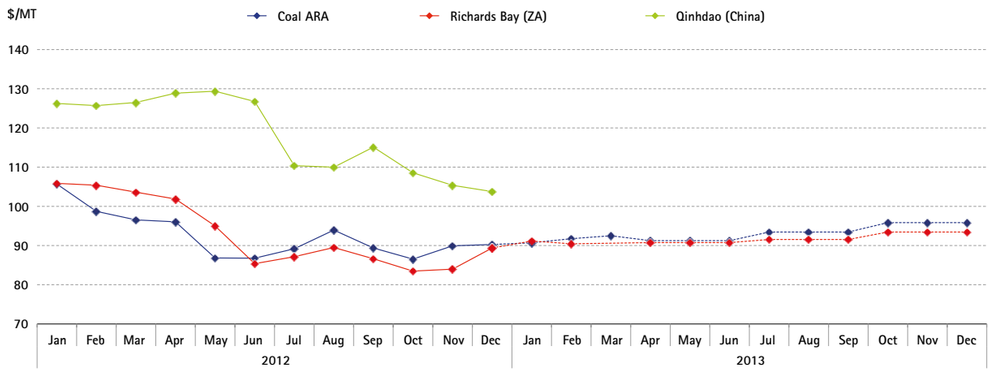
On the other hand, in contrast to what had been observed in previous years, the price pattern of coal was opposite to other fuels' in 2012, with a sharp upturn of its two-year growth trend on every international market. In Europe, the API2 price fell to $ 92.5/MT, well below market expectations and just higher than 2009 over the past five year period; on average, it declined by 23.9 %, within a 15%-30% range over the various months. Prospectively, participants expect a moderately upward trend in 2013, mostly in the second half of the year, with prices never exceeding $ 100/MT (Fig. C.1.7, Fig. C.1.8).

Fig C.1.7 **Spot prices in the main international coal markets**



Source: Thomson Reuters

Fig C.1.8 **Monthly trend of international spot and forward coal prices**



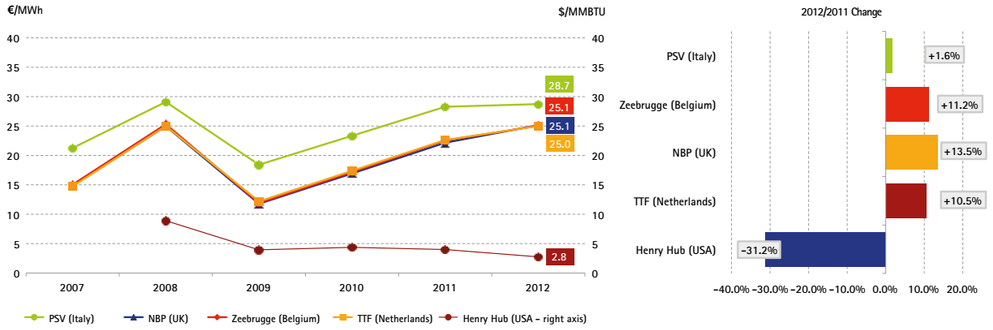
Source: Thomson Reuters

As far as natural gas is concerned, the two-year growth in prices was significantly stronger in the main northern-central European gas hubs, where prices stood at about 25 €/MWh, the highest level in the 2008-2012 five year period (+10/+13%), while keeping very different patterns in the corresponding U.S. markets[3] (-31%); this somehow confirmed the alleged possible changes in the ratio and oil indexation system, as anticipated by looking at the trends observed in the closing months of 2011.

3 The figure represents the 2012-2011 change calculated at the Henry Hub, the reference hub for the U.S. market (Source: Nebraska Government Website - Nebraska Energy Office - www.neo.ne.gov).

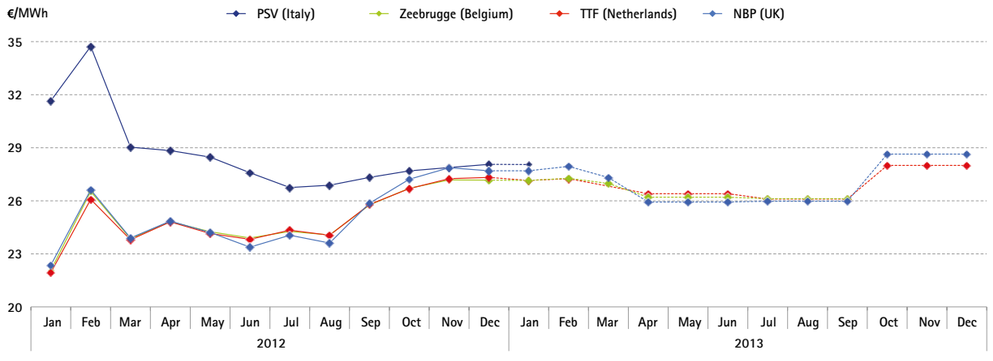
The price increase mostly occurred during the last four months of the year, when the central-continental prices were again aligned with the Italian PSV, generally higher. In 2012, this latter equaled approximately 29 €/MWh, after reaching very high levels in January-February; later, it gradually declined and closed the year with just a +1.6%. The main effect of the Italian and central-European prices is well depicted by their spread which, calculated on the basis of the Dutch TTF, hit a historical minimum of 3.7 €/MWh. This phenomenon continued and became more pronounced throughout the first quarter of 2013. In that period, and for several weeks, the Italian reference (this had rarely happened in the past) was lower than every major central-northern continental hubs'. Looking forward, the futures gas market seems to believe in a long lasting rise of prices, which are expected to go up in the next thermal year, following the typical seasonality of gas demand (Fig. C.1.9, Fig. C.1.10).

Fig C.1.9 **Spot prices in the main international natural gas markets**



Source: Thomson Reuters

Fig C.1.10 **Monthly trend of European spot and forward natural gas prices**



Source: Thomson Reuters

2. ELECTRICITY MARKET

2.1 The Italian electricity sector

In 2012, in a context in which the Italian economy moved from a state of stagnation to recession, the electricity demand significantly declined, falling down to the lowest levels in the past three years. In the face of a real GDP decline of 2.3%, the electricity demand fell down to about 305 TWh, with a 3% decline on an annual basis. The effects of a weak macroeconomic situation on the electricity demand is clearly visible in the breakdown by sector; the industrial consumption sector, physiologically more elastic with respect to the aggregate demand, fell by 6%, returning to levels close to those of 2009 (131.8 TWh).
Less striking, albeit significant if compared to the growing trend of recent years, the drop of consumption in the services and agricultural sectors, respectively down to 5.8 TWh (-2%) and 97 TWh (-1%). On the other hand, household consumption levels, intrinsically less elastic, are less affected by the economic cycle fluctuations and remain quite similar to last year's (70.4 TWh; +0.1%).
Although no significant time changes have been observed, even the peak demand tended to decline, with a maximum demand level of 54.1 GW (2.4 GW) (Fig. C.2.1 – Tab. C.2.1).

In 2012, in spite of the electricity demand drop, several features which originated in the last couple of years became more evident, on the supply side, including a new increase of the installed capacity, with a consequent and lasting system overcapacity. According to Terna estimates, on 1 March 2013 the installed capacity further rose up to 129.8 GW (+7.5 GW vs. the end of 2012), driven by the popularity of non-schedulable renewable generation (+6 GW), with special regard to photovoltaic generation (17.2 GW; +4.5 GW). In the face of this development, the installed thermal capacity increased to 81 GW in March 2013, with a modest rise on 2012 (+1.3 GW). The stagnating generating capacity, especially from combined cycle plants, seems therefore to be the logical response to the above said excess supply and to an oversized generation, given the current demand level. A structurally long market like the present one, along with a new yearly increase of the cost of raw material (gas), has favored a further fall in the investment profitability, as highlighted by the spark spread[4] compression.

Moreover, an analysis of the generation fleet structure, prior to assessing the impact of the new support measures on the development of renewable power in 2013, shows that a capacity increase characterized by virtually zero variable costs has contributed to crowding out a share of the more costly thermal supply. While this latter keeps accounting for the largest demand share (63% of demand; -2% on 2011), it hit the lowest value in five years, down to 204.8 TWh (-6.5% on 2011) to the benefit of an exceptional increase of wind and photovoltaic generation, equal to 13.1 TWh and 18.3 TWh (+34%, +71%), respectively; together, they cover about 10% of domestic consumption.
To this end, it should be noted that the collapse of thermal power generation, partly due to a shrinking demand and to the growth of renewables, has mostly affected natural gas-fired thermal power plants (-15.5 TWh on 2011); this translated into a marked fall in the consumption of gas as an electricity generation source; the decrease of this latter, on the other hand, was the major driver of the overall gas demand drop (for further information, see Section C.3.1). On the opposite, solid fuel production is back on track (+9.5%), driven by the greater use of coal. Being less costly than gas, as it clearly emerges from post-MGP injection schedules, coal supported the production in plants fired by this fuel.

4 This pattern was decisive in slowing down the rate of investment in combined cycle plants; in certain circumstances, it contributed to halting a number of pre-existing projects.

Mention should be made also of the net import variation, which hit the lowest value in the last 5 years (43.1 TWh; -6%), mostly in the month of February; in that period, the price peaks observed in the central European exchanges made electricity import less affordable; the same occurred in the months in which the renewable supply was more abundant. The growth of this latter, in fact, seems to contribute to the decrease of import flows both directly (causing part of the supply from foreign zones to be out of merit), and indirectly, given the yearly reduction of the expected NTC levels to be imported on low demand days[5] (-500 MW versus values expected in 2011 on the days defined by Terna as 'bank holidays' or 'low consumption weekends').

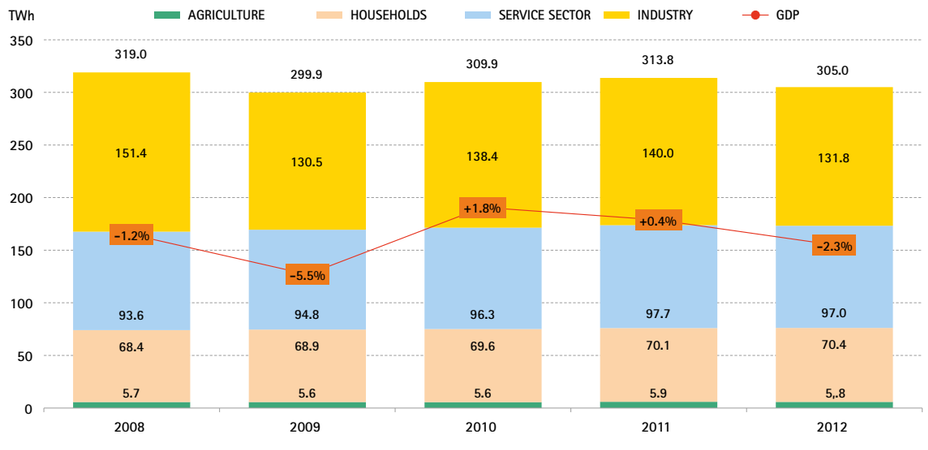
Speaking of the grid development, the widespread availability of renewables seems to play a particularly significant role, bringing out new criticalities while acting as an incentive for new investment.

In particular, as highlighted by Terna in the 2013 Grid Development Plan, a larger growth of renewable generation in southern Italy has determined, consistently with the price gap observed in 2012 between the southern Italy and northern Italy zones in the MGP[6], more congestions over the grid section connecting the southern Italy zone with the central-southern one, as well as an increase in the grid overload and congestions inside the southern Italy zone.

With respect to this point, several actions to upgrade and strengthen the grid have been implemented by Terna in the recent past. Amongst others, those on the "Montecorvino - Benevento II," "Benevento II - Volturara - Celle S. Vito "and" Foggia - Deliceto - Andria "- directions; also, many new projects are envisaged by the 2013 Development Plan so as to solve the grid criticalities due to the presence of non-schedulable renewable sources. In this regard, it is worth noting that the strategic investments identified by Decision 40/2013/R/EEL include certain grid enhancement measures in Foggia - Benevento.

As to the expansion of foreign interconnections, special mention should be made of the interconnection project between Italy and the Balkans; in the years to come, submarine cable connections will be implemented between Italy and Montenegro for a transmission capacity of about 1,000 MW.

Fig C.2.1 **Final consumption by sector and GDP**



Source: Terna; 2012 provisional data.
Source: I.M.F.; World Economic Outlook Database, October 2012.

5 The reason of this measure lies in the need to ensure the acceptance of a supply share from national thermal power plants in the MGP, sufficient to guarantee an appropriate spinning reserve. On low demand days, with a significant amount of volumes offered by non-schedulable renewable sources, keeping the usual interconnection capacity with foreign countries may bring about a situation where, after the MGP schedules, the requirements are nearly entirely covered by the foreign supply and by renewables, to the detriment of the system security.

6 See Section C.2.3.3.

Maximum generating capacity and peak demand Tab C.2.1

GW	As of 31 Dec.2008	As of 31 Dec.2009	As of 31 Dec.2010	As of 31 Dec.2011	As of 29 Feb.2013
GROSS MAXIMUM CAPACITY	102.3	105.2	110.3	122.3	129.8
HYDRO	21.6	21.7	21.9	22.1	22.3
THERMAL	76.0	76.7	78.3	79.7	81.1
GEOTHERMAL	0.7	0.7	0.8	0.8	0.8
WIND & PHOTOVOLTAIC	4.0	6.0	9.3	19.7	25.7
Wind	-	-	-	*6.9*	*8.4*
Photovoltaic	-	-	-	*12.8*	*17.2*
PEAK DEMAND	55.3	51.9	56.4	56.5	54.1
DAY	*26 June*	*17 July*	*16 July*	*13 July*	*10 July*
HOUR	*12*	*12*	*12*	*12*	*12*

Source: Terna; 2012 provisional data.

Terna's electricity balance Tab C.2.2

TWh	2008	2009	2010	2011	2012	2012/2011 % Change
TOTAL DEMAND	339.5	320.3	330.5	334.6	325.3	*-3.1%*
DOMESTIC CONSUMPTION	319.0	299.9	309.9	313.8	305.0	*-3.1%*
GRID LOSSES	20.4	20.4	20.6	20.8	20.3	*-3.1%*
PURCHASES BY PUMPED-STORAGE PLANTS	7.6	5.8	4.5	2.5	2.6	*3.2%*
NET GENERATION	307.1	281.1	290.7	291.4	284.8	*-2.5%*
HYDRO	46.7	52.8	53.8	47.2	43.3	*-8.5%*
THERMAL	250.1	216.1	221.0	218.5	204.8	*-6.5%*
GEOTHERMAL	5.2	5.0	5.0	5.3	5.2	*-1.7%*
WIND	4.9	6.5	9.0	9.8	13.1	*33.9%*
PHOTOVOLTAIC	0.2	0.7	1.9	10.7	18.3	*71.3%*
NET IMPORTS/EXPORTS	40.0	45.0	44.2	45.7	43.1	*-6.0%*
IMPORTS	43.4	47.1	46.0	47.5	45.4	*-4.8%*
EXPORTS	3.4	2.1	1.8	1.8	2.3	*27.3%*

Source: GME's processing of Terna's 2012 provisional data.

Net thermal generation by type of fuel Tab C.2.3

TWh	2011	2012	2012/2011 Change (%)	2012/2011 Change (TWh)
SOLID FUELS	40.7	44.7	*9.5%*	*4.0*
NATURAL GAS	140.6	125.2	*-11.2%*	*-15.5*
OIL PRODUCTS	7.6	8.1	*5.3%*	*0.4*
OTHER SOLID FUELS	20.2	21.1	*4.4%*	*0.9*
OTHER GASEOUS FUELS	8.6	3.1	*-64.0%*	*-5.5*
OTHER	0.8	2.7	*250.8%*	*1.9*
TOTAL NET GENERATION	218.5	204.8	*-6.5%*	*-13.7*

Source: GME's processing of Terna's 2012 provisional data.

2.2 Market participation

In 2012, more participants registered with GME's markets and platforms, hitting again an all-time high on the PCE (259; +51) and a level of 200 participants on Ipex (+8). Other than the nominal increase in the number of registered participants, the most interesting aspect is a constantly rising trend in the number of active participants. This phenomenon was observed in every electricity market; in the MI and MGP, the number of bidding participants reached 114/149 units (+23/+12), respectively, whereas the MTE rose by 25%, despite its still modest size (25 units). As to the number of active participants, the growth of these latter was quite balanced, since both bidding and selling participants rose in number (Tab. C.2.4).

Tab C.2.4 **Market participation**

	2007	2008	2009	2010	2011	2012
PCE						
Participants	116	146	167	205	208	**259**
Participants with schedules	108	100	88	95	103	**120**
injection	94	76	68	75	79	**97**
withdrawal	73	70	65	71	73	**75**
IPEX						
Participants	127	150	172	207	192	**200**
MTE						
Participants with bids/offers	-	8	16	15	20	**25**
supply offers	-	8	13	12	18	**23**
demand bids	-	5	12	13	13	**19**
MGP (excluding PCE)						
Participants with bids/offers	89	105	115	131	137	**149**
supply offers	71	84	92	104	111	**124**
demand bids	74	90	90	102	107	**118**
MI						
Participants with bids/offers	32	37	53	69	91	**114**
supply offers	29	34	48	65	81	**105**
demand bids	32	36	49	59	79	**101**

While the recession did induce a remarkable drop in the electricity requirements as recorded by Terna (325 TWh; -3.1%), the amount of electricity traded on GME's markets and platforms reached 566 TWh (+7.6%), thus confirming an upward trend which began prior to 2007.
Similarly to last year, the growth was driven by forward traded volumes (363 TWh; +11.8%); for the first time since the start of this market, it exceeded spot transactions, which went down to 324 TWh (-3.1%). Broadly speaking, the surpass of forward over spot volumes seems to reflect the participants' need to get an appropriate hedging against the spot price volatility risk; in this respect, spot markets are likely to become venues where to modulate and adjust positions after forward trades. More specifically, this pattern reflects an increase in trading activities by participants on GME's platforms[7]. The decline of spot trades in Italy, the evolution of which expectedly follows the electricity demand recorded by Terna along with the increase of forward volumes, translate into a higher churn ratio, i.e. the ratio between registered volumes and volumes nominated for delivery.

7 The increase in trading was mostly observed on the PCE and, to a smaller extent, in the MTE.

The figures on the spot traded electricity shows that the overall drop of this latter is partly affected by a fall in the MGP exchange volumes, equal to approximately 179 TWh (-1%); to a large extent, bilateral execution schedules are declining down to 120 TWh (-9%). One exception is the Intra-day Market (MI); although the overall volumes still account for less than 10% of MGP volumes including bilaterals, MIs hit a historical record thanks to a simultaneous growth across the four MI sessions (in total, 25 TWh).
In this sense, in the coming years, a contribution to the growth of MI volumes could also come from a revision envisaged by AEEG of the electricity dispatching service for non-schedulable renewable-fed units (Decision 281/2012/R/EFR); this is aimed at transferring part of the deviation costs to NSRES[8] producers. Charging fees for NSRES deviations would be, in fact, a natural incentive for producers to make more use of the MI, adjusting their schedules in near real time according to updated forecasts so as to contain deviation charges[9].
The obvious consequence of the drop in bilateral volumes nominated for delivery, proportionally larger than the Exchange decline, is a growth of MGP liquidity[10], up to 60% (+2 %). Such increase, driven by the exceptional growth of GSE sales on the Exchange (51 TWh; +30%)[11], is somehow mitigated by Acquirente Unico's opposite behavior. This latter reduced its purchases on the regulated market to an extent greater than bilateral volumes[12]. On the other hand, the liquidity of non-institutional participants was stable at 29% (-1 p.p.) (Tab. C.2.5; Fig. C.2.2).

In the face of a modest recovery of liquidity on an annual basis, it is worth reporting the figure for the first quarter of 2013, when the MGP liquidity increased significantly up to levels never seen before on the market at this time of the year (75.7% , about +18.4 p.p. compared to the first quarter of 2012).
Such increase is primarily affected by a change in the operating modes of non-institutional participants, and in particular of those who operate as net sellers. Some of them did change their selling strategy; they raised the prices offered on the volumes from bilaterals and, at the same time, lowered the price of offers on the Exchange.
The result was an increased liquidity due to the rise in both sales and purchases, by virtue of a larger scheduled deviation of a negative sign[13]. Such behavior could signal the search for a reduction in the amount of financial guarantees to be submitted to GME, where participants' receivables from GME, by virtue of the increased Exchange sales, exceed the payables to GME as a result of the higher scheduled deviation of negative sign.

8 Non-schedulable Renewable Energy Sources.

9 To this end, in the first quarter of 2013, GSE volumes in the MI grew by 18%, on the demand side, whereas they more than doubled on the supply side.

10 Defined as the ratio of volumes traded on the Exchange (MGP) to the total volumes (including, therefore, bilateral contracts) traded in Sistema Italia.

11 GSE increase of sales on the Exchange seems to be due to the further expansion of the renewable units it dispatches.

12 In this case, given the small amount relative to its purchases, no account was taken of the impact on liquidity caused by the ratio of Exchange sales to bilateral sales made by AU in foreign zones.

13 Given the sign convention adopted on the PCE for injection accounts, if the algebraic sum (electricity balance of the account) of the net position and of the schedules registered on the account itself is different from zero (zero scheduled deviation), it will be less than zero (negative scheduled deviation).

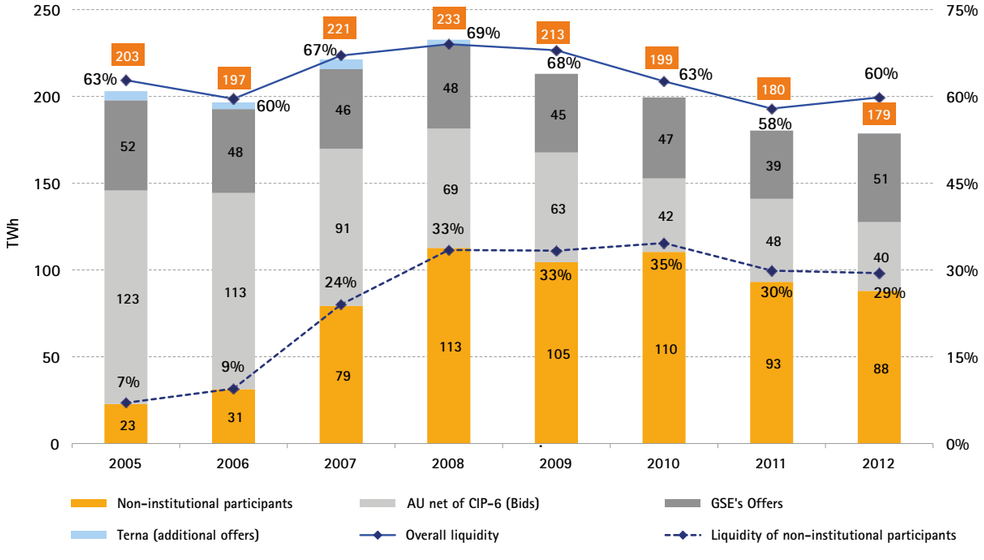
Tab C.2.5 **Volumes traded in GME's markets[14]**

		2007**	2008	2009	2010	2011	2012	
		TWh	TWh	TWh	TWh	TWh	TWh	Delta %
	TOTAL VOLUMES (a+b+c+d+e+g)	360.64	398.51	401.44	456.93	526.47	566.36	*7.6%*
	SISTEMA ITALIA (e+f)	329.95	336.96	313.43	318.56	311.49	298.67	*-4.4%*
	Forward trades (a+b+c+d)	97.28	154.22	176.47	242.87	324.26	362.57	*11.8%*
(a)	MTE/exchange	-	0.06	0.12	6.29	31.67	30.36	*-4.1%*
(b)	MTE/OTC clearing	-	-	-	-	1.77	24.60	*1287.7%*
(c)	CDE	-	-	-	0.10	-	-	-
(d)	PCE (*)	97.28	154.16	176.35	236.48	290.82	307.61	*5.8%*
	Spot trades (e+f+g)	342.69	348.61	325.36	333.18	333.36	323.80	*-3.1%*
(e)	MGP/exchange	221.29	232.64	213.03	199.45	180.35	178.66	*-1.2%*
(f)	PCE/OTC	108.66	104.32	100.39	119.11	131.15	120.00	*-8.7%*
(g)	MA/MI (h+i+l+m+n)	12.74	11.65	11.93	14.61	21.87	25.13	*14.6%*
(h)	MA	12.74	11.65	9.30	-	-	-	-
(i)	MI1	-	-	1.68	9.47	14.47	15.99	*10.3%*
(l)	MI2	-	-	0.95	5.15	5.38	6.21	*15.0%*
(m)	MI3	-	-	-	-	1.22	1.72	*40.9%*
(n)	MI4	-	-	-	-	0.80	1.21	*50.7%*

(*) Contracts registered on the PCE by year of trading, net of contracts pertaining to the MTE (including OTC clearing) and the CDE. The 2007 data refer to the April-December period.

(**) Total volumes include the PCE/OTC data pertaining to the January-March 2007 period.

Fig C.2.2 **Liquidity of the MGP**



14 Percentage changes of total volumes and forward trades are calculated on absolute values, whereas those referred to spot trades are calculated on average hourly values.

2.3 Day-ahead market (MGP)

2.3.1 Trends and outlooks in the national market

In 2012, the spot electricity market somehow confirmed the trends observed in the previous two years; however, this stable picture was questioned by new signals which emerged forcefully in the latter part of the year and were confirmed by the partial indications resulting from the first quarter of 2013.

Alike the period between 2010 and 2011, the analysis of the Pun trends and its determinants showed, also in 2012, a slight nominal increase of prices – when gas generation costs rose[15] - and a simultaneous marked drop in real terms[16], driven by a structural system overcapacity made even stronger by the extreme weakness of the demand, down to 2006 levels, and by the exponential increase of renewable capacity.

In a macroeconomic environment characterized by a deep recession, these phenomena have indeed favored a lose-lose scenario in the market: consumers found themselves forced to pay higher prices while producers incurred higher costs and more difficulties in the dispatching of thermal power plants.

The strengthening of the two-year trend was also confirmed in the movements observed in the microstructure of prices which, even in 2012, showed an increasing convergence of the Pun in the different groups of hours; this led Italy to align with European standards. In the course of the year, within the framework of this underlying trend, the MGP was characterized by increasingly frequent episodes where the day/night prices were inverted and where hourly prices became equal to zero, due to the impact of the increasing photovoltaic supply, more than sufficient to meet the overall demand during peak irradiance hours.

Despite such substantial inertia, a first, significant sign of change became clear in the last four months of 2012, when the slowing growth of natural gas[17] triggered a trend reversal in the electricity price, leading to a nominal decrease.

Indeed, a downward trend in the national markets of gas and electricity, as confirmed by participants' expectations for 2014[18], seems to pave the way to two new possibilities: on a domestic level, the lose-lose scenario could eventually break up, to the benefit of both consumers and producers, paying smaller procurement costs[19]; on a European level, the gap between the Pun and the other continental prices could become smaller, thanks to the coupling projects where Italy is involved at a Community level, like the project already in operation with Slovenia.

15 At present, given the continuous renegotiation of procurement contracts, it is impossible to identify one single, univocal reference for the cost of gas nationwide. As a matter of fact, with a deeply weak electricity demand, renegotiating the costly take or pay contracts along with the growing significance of prices in the spot Exchanges, and a clearcut increase in liquidity, have gradually eroded the efficacy of the traditional oil-indexed formulas, without providing any truly convincing alternative. However, despite the uncertain nature of the exact figures, the main public gas cost indicators seem to deliver similar results; throughout 2012, such cost kept increasing, despite some slow down in the last part of the year.

16 Real Pun is the difference between the Pun and variable generation costs.

17 A considerable decline was observed especially at the PSV. For further details, please refer to Chapter C.3 of the present Report.

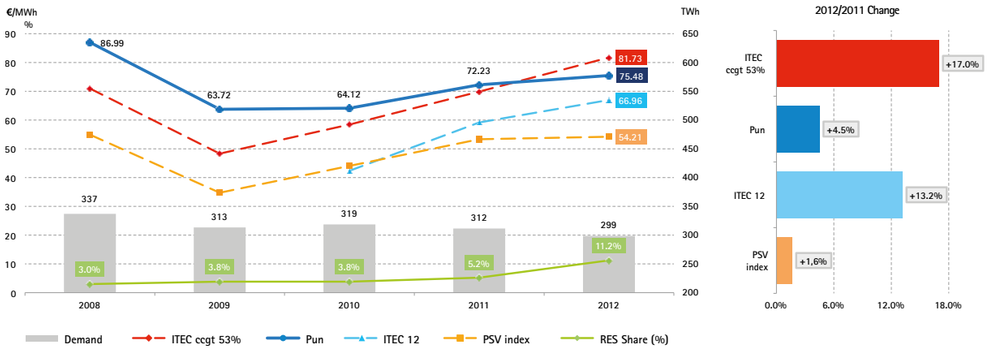
18 In GME's forward electricity market (MTE), the base-load prices of monthly and quarterly products referred to 2013, being traded in March, were approximately 14% lower than the actual Pun of 2012; the yearly product referred to 2014 at the end of the first quarter was priced at around 63 €/MWh; in other words, next year the wholesale price of electricity may get close to its all-time low.

19 This notion is even more valid for producers, to the extent that the weight of spot prices in the gas cost formulas becomes greater, to the detriment of the oil-indexed long term component.

2.3.2 The trend of the Pun and its fundamentals

In 2012, the wholesale price of electricity had a slight nominal increase at 75.48 €/MWh (+4.5%); while in Europe prices are lower and generally declining, the Italian case seems to take an opposite direction: this may be due to a less affordable generating mix and to a higher cost of the raw material (gas) compared to the rest of the Continent[20].
A moderately upward two-year trend was confirmed; its inflationary impact was mitigated in 2012 by the limiting effect of a series of factors which, altogether, did promote a further, drastic reduction of the Pun in real terms (Fig. C.2.3).

Fig C.2.3 **Trend of Pun and of its determinants**



First and foremost, the MGP purchases returned to a historical low (298.7 TWh, -4.4%), mostly because of the economic recession and of the increase of out-of-market self-consumption induced by the development of renewable power[21]. The impact of the crisis in the electricity market is also corroborated by the growth of scheduled deviations of withdrawal units to their highest values (Section C.2.5, Figure C.2.30) and by the elasticity of the demand curve; this latter is a symptom of the greater willingness on the part of consumers to adopt, given the unfavorable situation, more stringent and conscious pricing strategies[22] (Tab. C.2.6).

20 This figure refers to the trend observed in the major gas hubs in 2012, when the overall gap between the price at the Italian PSV and the other European references was around 4 €/MWh.

21 The increase of self-consumption generated by the widespread presence of wind and photovoltaic plants impacts on the market by causing an "artificial" reduction of volumes requested in the MGP. In the last two years, this trend promoted a drop of purchases in the spot market greater than the changes in Terna's actual -- electricity requirements (325.3 TWh, -3.1%). Hence, in 2012 the ratio between commercial and physical volumes went down to the historical minimum of 91.8% (Tab. C.2.6).

22 This propensity is demonstrated by the increase of demand bids with a specified price (34.8 TWh, +23.4%) and by their high rejection rate (Tab. C.2.6).

Volumes in the MGP Tab C.2.6

TWh	2005	2006	2007	2008	2009	2010	2011	2012	2012/2011 Change
Terna's requirements	330.4	337.5	339.9	339.5	320.3	330.5	334.6	325.3	-3.1%
Demand	324.0	337.1	335.4	354.3	339.2	345.1	338.2	330.5	-2.5%
with specified price	3.5	8.5	7.3	20.9	27.9	28.3	28.2	34.8	23.4%
rejected	0.8	7.1	5.4	17.2	25.7	26.4	26.6	31.8	19.1%
Purchases	323.2	329.8	329.9	337.0	313.4	318.6	311.5	298.7	-4.4%
% of Terna's requirements	97.8%	97.7%	97.1%	99.3%	97.9%	96.4%	93.1%	91.8%	-1.6%
Supply	445.2	455.8	480.2	495.4	499.2	509.5	538.1	555.4	2.9%
% from wind and PV sources	3.4	4.0	3.4	10.0	12.1	12.2	16.3	33.6	105.6%
Sales	323.2	329.8	329.9	337.0	313.4	318.6	311.5	298.7	-4.4%
from wind and PV sources	3.1	4.0	3.4	10.0	12.1	12.2	16.3	33.6	105.5%
zero price	233.6	247.4	221.0	226.5	225.8	218.4	210.0	201.8	-4.2%
IPEX	*100.6*	*100.6*	*103.8*	*116.5*	*126.0*	*123.0*	*111.5*	*119.8*	*7.1%*
PCE	*133.0*	*146.8*	*117.2*	*110.0*	*99.8*	*95.4*	*98.5*	*82.1*	*-16.9%*

Secondly, the phenomenal growth of non-schedulable renewable plants: by virtue of a sales level of 33.6 TWh (+105.5%) and an 11.2% market share (+6 p.p.), it contributed to the price fall.

Finally, a declining market concentration went down to physiological levels; it was fueled by an oversupply and forced a decrease in sales in the absence of competition (IOR: 9.3%, -3.3 p.p.)[23] and, after five straight years of increase, of the marginal presence of combined cycle plants (ITM ccgt: 59.7%, -6.2 p.p.). These latter were overwhelmed by the market decline, by the competitive renewable supply and by continuously rising gas prices, as confirmed by figures. Indeed, their market share did collapse, (45%, -8 p.p.), with a decrease in the hours with bids/offers accepted in the MGP (-7%) and a smaller success rate[24] (-13.6 p.p.), as well as the further fall of the demand of gas for thermal generation (-12.2%).

In 2012, some structural changes were observed at system level, in a context in which the complex set of relations between the price and its fundamentals appears to remain sound[25] (Fig. C.2.5 -Fig. C.2.6). This specifically promoted two phenomena: a reduction of the day/night spread, on the one hand; on the other, the decrease of its nominal value in the last part of the year.

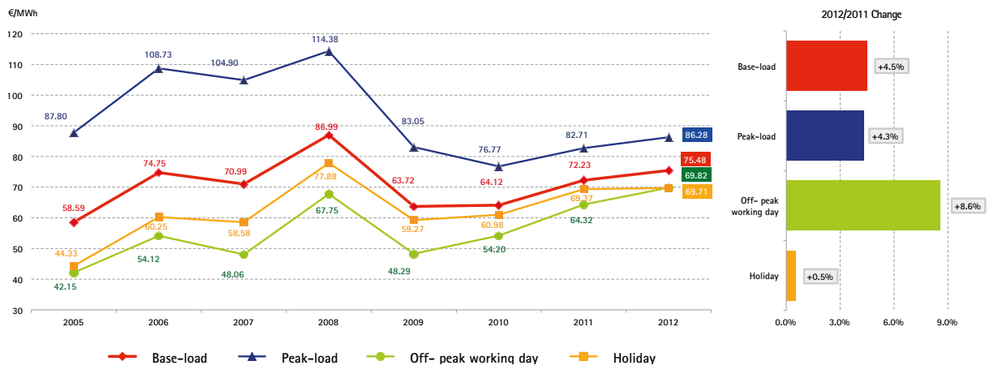
With regard to the first aspect, in an already long market, characterized by a demand level which is unlikely to return to the higher levels of the previous five years, the increasing availability of wind and photovoltaic power has emphasized the price convergence among groups of hours, in line with the European standards; also, it increasingly favored a day/night reversal (21% of days, +15 p.p.) and a zeroing, for the time being on a zonal basis only (southern Italy: 8 hours, Sicilia 34 hours, Sardegna 69 hours).

23 The IOR, halved in comparison to five years ago, is even equal to zero in the northern Italy zone of the MGP.

24 The success rate is the ratio between accepted and submitted bids/offers.

25 The sound relationship between the Pun and its determinants appears to be confirmed by the validity of GME econometric model; for further details, please refer to Box 2 of 2009 Annual Report. To improve the model simulation capabilities, other than the historically employed variables, in 2012 use was made of the impact of the price dynamics in the Islands, measured by the weighted average of prices in Sardegna and Sicilia. The absolute mean error rate of the model is equal to 2.67 €/MWh in the 2008-2011 period and 1.95 €/MWh in 2012. See diagram in Figure C.2.6.

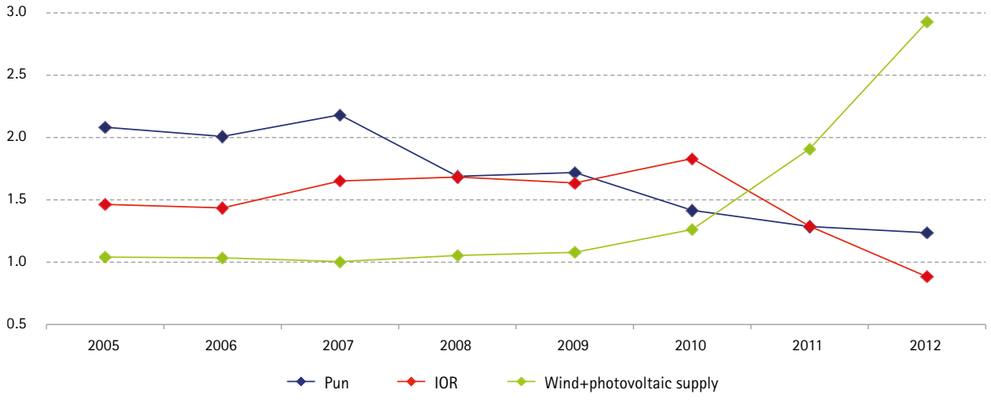
Fig C.2.4 **Yearly average Pun for base-load and groups of hours**



In detail, the general flattening of the Pun daily profile is evidenced by yet another reduction in the ratio of peak-load to off-peak prices to 1.24 (€ 86.28/MWh vs. € 69.82/MWh), by virtue of the largest increase of the latter (+8.6% vs. +4.3%); most probably, participants have tried to recover their margins taking advantage of the lower contribution of new renewable capacity (Fig. C.2.4- Fig. C.2.5).

Quite predictably, the maximum convergence was noticed in April-September[26]; with more hours of sunlight, the daily phenomenon of the day/night price reversal became pretty significant (37% of days, 65% in August)[27].

Fig C.2.5 **Peak-load/Off-peak ratio for Pun and fundamentals**

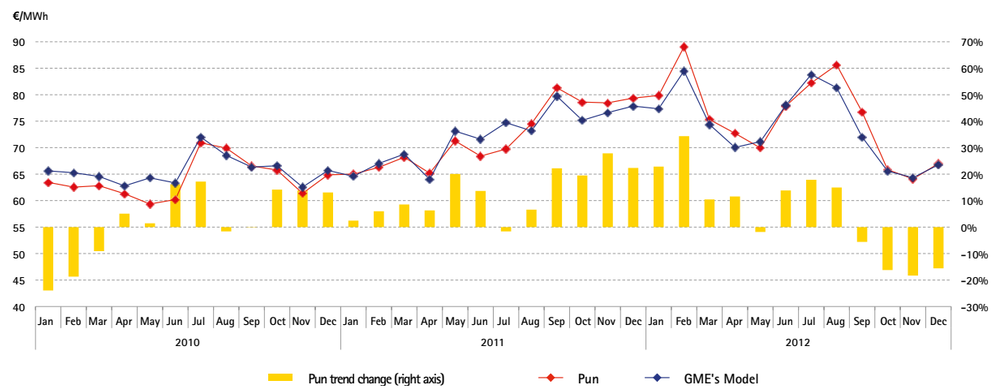


A pronounced tendency toward the lowest European values was observed in the holiday/off-peak price ratio, showing an unprecedented alignment in the MGP. Parity was achieved with a substantial stability of holiday prices which, again, reflected the strong competition resulting from a more abundant supply (IOR: 11.2%, -2.9 p.p.); this neutralized the upward effect endogenously generated by the market, by the increase in gas price and, exogenously, by the periodical reduction of the NTC implemented by Terna to ensure the management of the power system under security conditions in periods of low demand[28].

As to the future, the tendency toward a progressive reduction of the hourly modulation of the Pun seems to be long lasting, as confirmed by the early figures on 2013[29] and, indirectly, by the signs generated by the forward electricity markets. At the end of the first quarter of 2013, these latter showed a narrower peak-load/base-load spread for the remaining months of the year as well as for 2014[30].

The downward expectations expressed by participants with respect to the MTE[31] prices embed - this is the second major phenomenon of 2012 - a pronounced downward trend of the Pun starting from the end of summer.

Fig C.2.6 **Monthly trend of Pun**



In particular, in the last quarter of 2012 prices reached an average value of 65.66 €/MWh (versus 78.78 €/MWh in the previous nine months), with a series of major reductions (16-19%) throughout the first half of 2013[32], stemming from the sharp changes of market parameters over the same period (which have an impact on prices).

More specifically, in October-December, the reduction of purchases in the MGP amounted to 7% versus 4% during the first nine months of the year; the supply increased by +6% versus +2% in January–September, whereas the IOR decreased by 6% versus 2% in the previous months of 2012. As to gas, at present it is difficult to identify a national reference to properly estimate the average procurement cost of combined cycle plants. However, during the last months of the year all indicators employed in the past have shown a slower growth (Itec ccgt, 53%) or even a drastic drop (PSV).

26 Overall, in April-September, the peak-load/off-peak ratio was down to 1.11, and equal to around 1.38 in the remaining months.

27 In this case, the figure was calculated without separating holidays and business days. More precisely, 5% of the first and 57% of the latter, with rates up to 10% and 96% were obtained, respectively, in April-September.

28 In periods of low demand and high availability of non-schedulable renewable supply, Terna restricts interconnections with foreign countries (and/or transits inside the Italian peninsula) to ensure a sufficient reserve margin from schedulable plants and get a secure management of the system.

29 In the first quarter of 2013, peak-load/off-peak and holiday/off-peak price ratios amounted to 1.28 and 1.02, respectively, down by 9% and 2% on the previous year.

30 The figure is calculated as the peak-load/base-load price ratio for the yearly product 2014. Such value, equal to 1.11, is decreasing relative to the final result of 2012 for the yearly product 2013, 1.14, which probably implies a further peak-load and off-peak price convergence.

31 See Chapter C.2.6.

32 In the first quarter 2013, the price was around 63.84 €/MWh, 21% less than the same period of 2012. The decline was especially marked in February (-29%); in the same month of 2012 the Pun had hit its yearly maximum, after very unfavorable weather conditions. Still, it reached remarkable values also in January (-19%) and March (-16%).

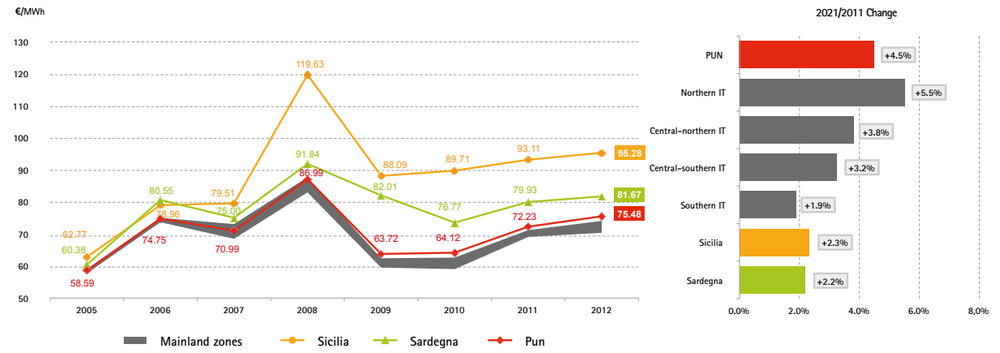
In conclusion, a stronger overcapacity, an even higher competitiveness of the MGP, and especially the early signs of slower growth of the gas cost (the only upward determinant having an impact on the Pun in the last three year period), have determined a reversal of the multi-year price trend; this paved the way to a nominal decrease of electricity prices and to a possible overcoming of a lose-lose market scenario.

2.3.3 Zonal markets

In 2012, similarly to the Pun, zonal prices have increased in nominal terms; this mainly reflects the rising cost of gas-fired generation whose upward effects, however, appear once again to be mitigated by a further strengthening of the overcapacity across all zones. Also, this fostered a widespread reduction in the share of sales in the absence of competition (IOR). Similarly to what has been observed at system level, new elements have emerged in the final part of the year, when the excess supply became even bigger, and the inflationary dynamics of the raw material (gas) slowed down; this turned into a reverse growth of zonal prices, as confirmed by sharp price falls in the first quarter of 2013.
By reason of such dynamics, zonal prices rose to 70-74 €/MWh in the mainland, and as much as up to 82 €/MWh and 95 €/MWh in Sardegna and Sicilia. Given the similar nature of such changes (similar to what happened with the Pun), interesting and new aspects emerge if one looks at the size of the price increase, quite different from the last five years. The different intensity of change, more pronounced in northern Italy, less significant in southern Italy, has indeed modified the price convergence in place since 2008 in mainland zones; for the first time from the establishment of the market, northern Italy is the most costly zone in the continent (74.05 €/MWh, +5.5%), with a difference of about 4 €/MWh with the cheaper southern Italy (70.34 €/MWh, +1.9%), the only net exporting zone of the system (net export, 22 TWh). While the overcapacity of the electricity market appears to affect northern Italy relatively more (rejected, +17% vs. +12% in the South), due to both a higher increase of offered volumes (+4% vs. +2%) and to a declining demand[33] (northern Italy demand -4% vs. -2% in southern Italy), the diverging zonal prices seem to be accounted for by a faster growth of the renewable supply in southern Italy (Fig. C.2.7; Tab. C.2.6). The early figures on 2013 seem to endorse such trend, with a progressive widening of the northern-southern Italy gap. This reflects participants' expectations, gearing toward a further divergence between the two prices. As to the latter point, it is worth noting how, looking at the results of the CCC auction for the yearly peak-load profile, the price of this option, in the northern Italy zone, turned out to be negative for the first time (-0.10 €/MWh).

33 In this respect, the sharp fall of consumption in northern Italy zones looks consistent with 2012 provisional data published by Terna, highlighting a close relationship between the economic recession and the fall in electricity demand; industrial consumption declined by 6%.

Yearly average zonal prices in the MGP Fig C.2.7



Zonal volumes in the MGP - 2012 Tab C.2.7

Zone	Purchases	*2012/2011 change*	Sales	*2012/2011 change*	Supply	*2012/2011 change*	Demand	*2012/2011 change*	Rejected bids/offers	*2012/2011 change*
Northern IT	158.4	*-4.6%*	120.5	*-7.5%*	254.0	*4.0%*	159.6	*-3.9%*	133.5	*17.1%*
Central-northern IT	31.6	*-7.2%*	20.8	*3.1%*	39.7	*-2.2%*	31.9	*-6.5%*	18.8	*-7.6%*
Central-southern IT	47.7	*-4.1%*	31.5	*0.8%*	77.7	*8.5%*	47.8	*-3.8%*	46.1	*14.5%*
Southern IT	25.0	*-2.3%*	47.4	*-4.7%*	83.6	*1.7%*	25.1	*-1.9%*	36.3	*11.5%*
Sicilia	20.0	*0.5%*	19.0	*-1.0%*	32.0	*6.2%*	20.0	*0.7%*	13.0	*19.0%*
Sardegna	12.7	*-6.3%*	12.8	*10.2%*	18.6	*1.0%*	12.7	*-6.0%*	5.8	*-14.6%*
Foreign countries	3.3	*-7.6%*	46.5	*-6.9%*	49.8	*-4.9%*	33.3	*10.3%*	3.3	*36.9%*
Italy	298.7	*-4.4%*	298.7	*-4.4%*	555.4	*2.9%*	330.5	*-2.5%*	256.8	*13.0%*

The impact of renewable generation and its penetration becomes evident when analyzing the price volatility and the dynamics of the peak-load/off-peak price ratio. As regards the first, the system-wide growth of renewable energy, and in particular of that coming from non-schedulable sources, seems to encourage a reversal of the downward trend of the last two years, with the volatility of the Pun rising to 8.8%, i.e. a yearly recovery of 1.5 percentage points.
Again, the Pun volatility was observed in nearly every zone[34], albeit it was sharper in those zones with a higher density of wind and photovoltaic capacity (12% volatility in southern Italy, +2.8 p.p., vs. 8.8% volatility in northern Italy, +1.6 p.p.). Even the peak-load/off peak ratio, sharply declining in all zones to confirm a tendency noticed in recent years, appears to decline more abruptly in southern Italy zones. In these latter, the growth of wind and photovoltaic supply, largely concentrated in the central hours of the day, mitigated the upward price trend in peak-load hours, although the number of hours during which the minimum prices were equal to zero did increase[35]. This aspect appears to have indirectly contributed to the off-peak prices; in line with IOR figures by groups of hours, participants most likely concentrated the recovery of their margins in off-peak hours, also thanks to a stronger market power due to the reduced availability of renewable supply. This pattern was exceptionally significant in Sardegna, where peak-load and off-peak prices were largely equivalent (1.10; -14%); at any rate, it was quite relevant in southern Italy, too (1.15; -5%), (Fig. C.2.8 - Fig. C.2.9).

34 The only exception is Sicilia, stable at 15%.

35 The number of day hours (9-20) during which prices were equal to 0 €/MWh was 8 in southern Italy, as high as 15 and 28 hours in Sicilia and Sardegna, whereas it was null in every zone in 2011.

Fig C.2.8 **Price volatility**

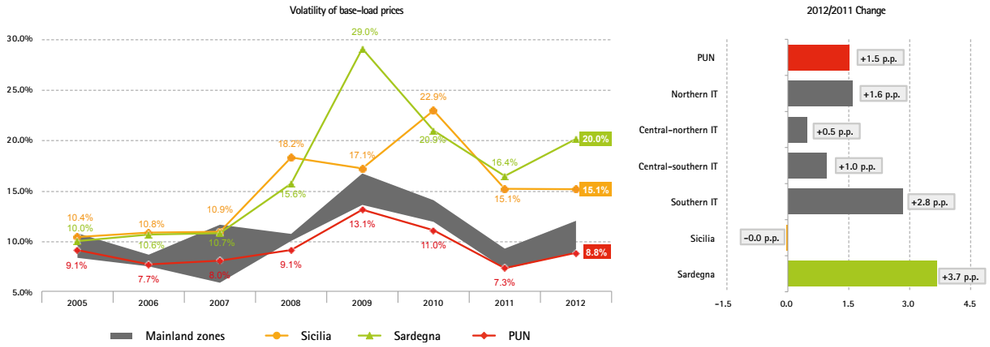
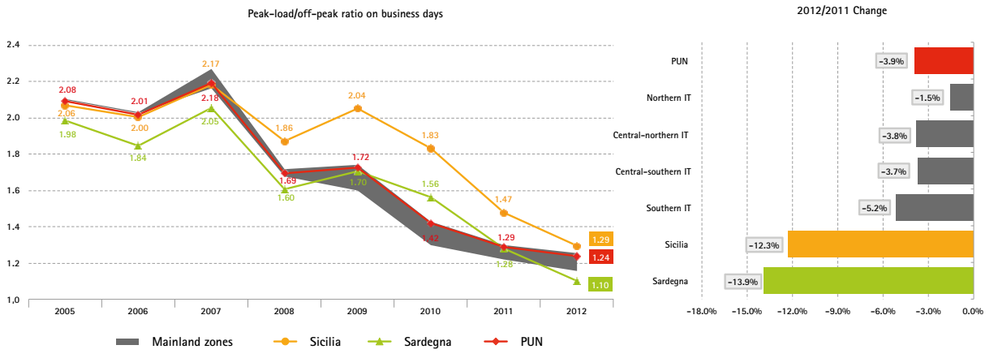


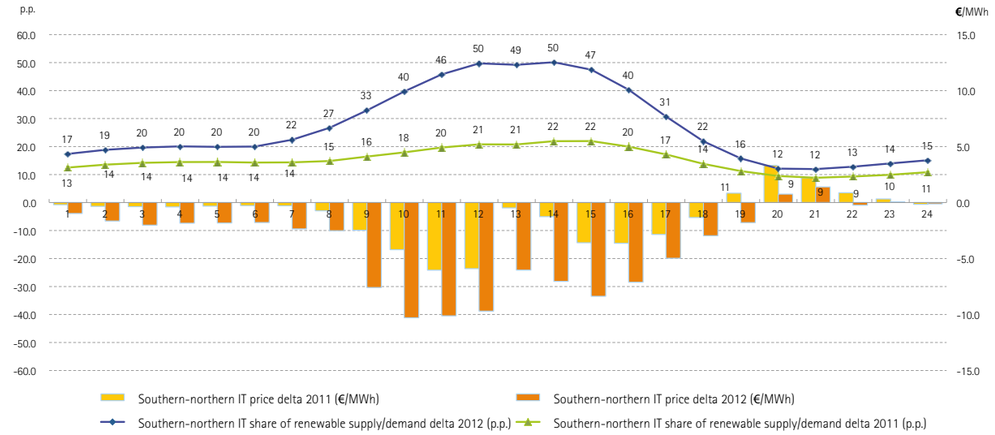
Fig C.2.9 **Peak-load/Off-peak ratio on business days**



The effects of a gradually expanding renewable capacity on the structure of zonal prices are even more striking when an hourly analysis of selected market parameters in northern and southern Italy is conducted. In each hour and for each of the two zones, a comparison of the average annual share of the wind and solar supply relative to the demand, clearly shows that the gap between the northern Italy and southern Italy zones is especially significant in the hours with the highest solar radiation, clearly increasing on 2011. During the night, the renewable supply in southern Italy is 12/20 percentage points higher than in northern Italy; this difference reaches about 50 percentage points between noon and 2 p.m., whereas in 2011 the delta was roughly equal to 20-22 points.

Hence, the price difference between the two is mostly concentrated in the central hours of the day, when the southern Italy zone becomes more and more frequently separated, with export flows made possible by the huge availability of renewable energy; the average price delta between southern and northern Italy is about -5 €/MWh, and, in some hours, as much as -10 €/MWh (Fig. C.2.10).

Fig C.2.10 **Southern Italy/Northern Italy price delta and different share of wind and photovoltaic supply in the demand of Southern Italy and Northern Italy (average day – 2012-2011)**

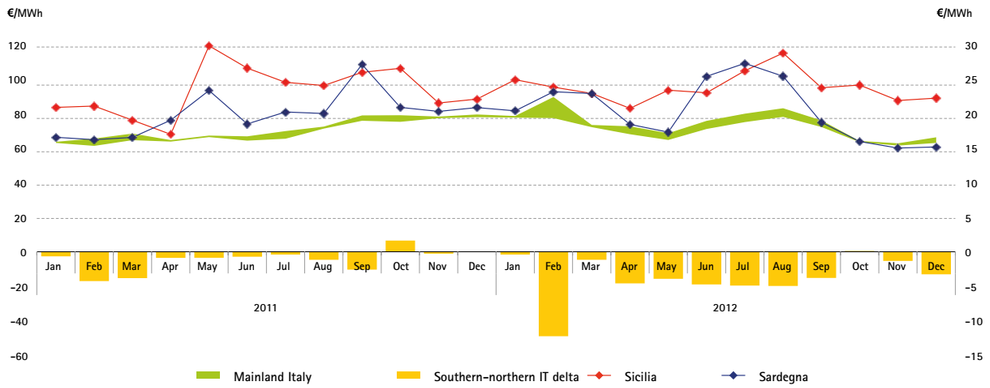


In continental zones, alike with the Pun, an analysis of the monthly evolution of prices shows a structural break in the second half of the year; after the upward trend of the last two years and into the first eight months of 2012, the mainland prices significantly decreased on an annual basis (-13/-16% in the continental belt). As to the price gap between southern and northern Italy , this latter seems to largely reflect the seasonality of renewable energy, with a stable price of -4/-5 €/MWh between April and September. In this period, on the other hand, the larger availability of renewable supply causes indirect effects by reducing the import NTCs envisaged by Terna in low demand periods. As a matter of fact, this pattern generates an inflationary effect especially in northern Italy zone. The price of this latter, while the supply from northern foreign zones falls, appears to depend upon the low cost supply in southern Italy. During the winter, the northern-southern Italy differences are less evident, with the only exception of February when the spread of the two prices does not seem to reflect structural phenomena but, rather, the exceptional price spikes in the central European exchanges. These caused a sudden increase of prices in the foreign northern zones, with a subsequent upward impact on the price of northern Italy.

In the Islands, while the price increase on 2011 was less pronounced than in the mainland (approximately +2%)[36], the monthly price pattern looks similar as in the continent. In Sicilia and Sardegna, prices hit the highest value in summer months; during the same period, in Sardegna the import capacity of Sapei was diminished, contributing to major price spikes (Fig. C.2.11).

36 Although to a small extent, this helped reduce the spread between the Island prices and the Pun; Sicilia showed a difference of 20 €/MWh (-1 €/MWh on 2011); Sardegna had a spread of 6 €/MWh (-2 €/MWh on 2011).

Fig C.2.11 **Monthly trend of zonal prices and Southern Italy/Northern Italy price delta – 2011-2012**



As far as Sardegna is concerned, the pattern observed since the entry into operation of the new connection cable with the mainland at the end of 2009, became more robust. This has helped ensure a greater integration between the Island and the mainland. In terms of export, Sardegna is united or even separated in 92% of the hours; on the opposite, it showed a saturated import in a limited number of hours (8% of the hours) when the spread with the Pun looked particularly significant. It follows that the price-Pun differential of Sardegna on an annual basis (6 €/MWh) is generated in a limited number of hours, characterized by unique criticalities in the island. To be more specific, the price misalignment looks especially significant in 3.4% of the hours; in the same period, there exists a decreased transmission capacity along the central-southern Italy-Sardegna transit line and a reduced availability of the zonal supply.

In the light of some small signs of improvement, the price-Pun delta of Sicilia, as compared to Sardegna, appears to be more related to structural phenomena and more scattered over time. Indeed, very often the Island separates from the continent in terms of import (76%); in those hours, the average spread equals 28 €/MWh, which becomes as high as 38 €/MWh in the hours in which the interconnection capacity with the mainland is reduced and the supply is scanty (36% of the hours).

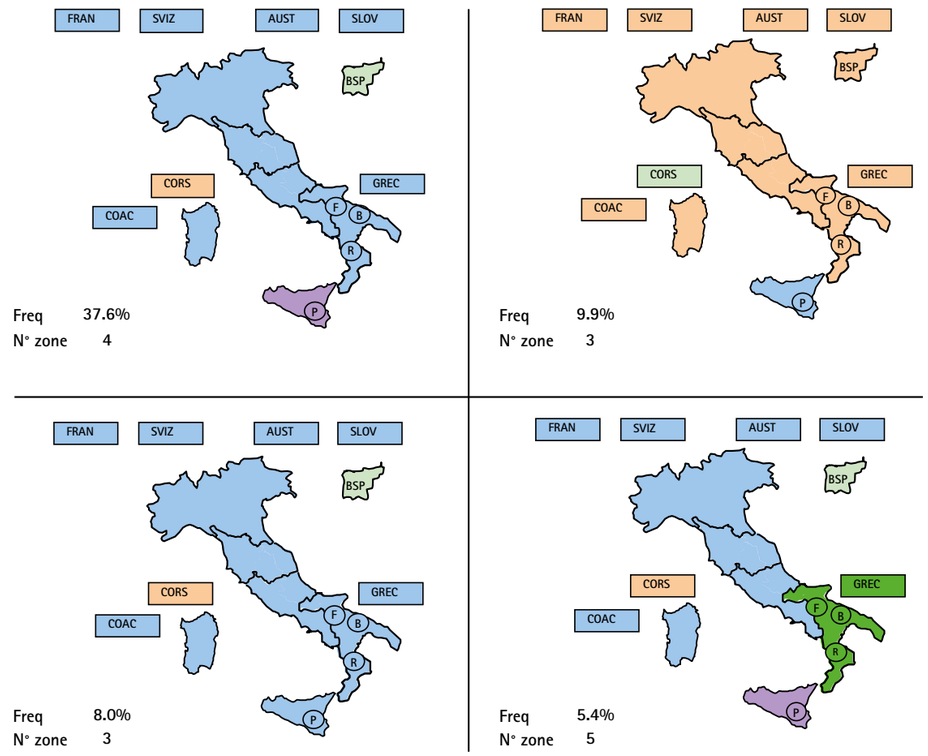
Tab C.2.8 **Significant variables in the evolution of prices on islands – 2012**

	Capacity of the CSUD-SARD transit		Rejected supply		
			Low	High	Total
Hours in which Sardegna is separated in the import direction	Lower than/equal to 530 MW	Frequency (%)	3.4%	1.7%	5.1%
		Pun Delta (€/MWh)	131.7	88.1	117.2
	Higher than 530 MW	Frequency (%)	2.4%	0.4%	2.9%
		Pun Delta (€/MWh)	100.0	23.1	88.2
	Any	Frequency (%)	5.8%	2.1%	7.9%
		Pun Delta (€/MWh)	118.4	74.5	106.6
Hours in which Sardegna is not separated or separated in the export direction	Any	Frequency (%)	44.8%	47.3%	92.1%
		Pun Delta (€/MWh)	-1.7	-3.2	-2.5
Total	Total	Frequency (%)	51%	49%	100%
		Pun Delta (€/MWh)	12.1	0.1	6.2

	Capacity of the ROSN-SICI transit		Rejected supply		
			Low	High	Total
Hours in which Sicilia is separated in the import direction	Lower than/equal to 100 MW	Frequency (%)	36%	21%	57%
		Pun Delta (€/MWh)	37.6	23.6	32.3
	Higher than 100 MW	Frequency (%)	6%	13%	19%
		Pun Delta (€/MWh)	22.0	14.3	16.5
	Any	Frequency (%)	41%	35%	76%
		Pun Delta (€/MWh)	35.5	20.0	28.4
Hours in which Sicilia is not separated or separated in the export direction	Any	Frequency (%)	8%	16%	24%
		Pun Delta (€/MWh)	-7.7	-6.9	-7.1
Total	Total	Frequency (%)	49%	51%	100%
		Pun Delta (€/MWh)	28.6	11.4	19.8

The greater fragmentation of continental zones and the increasingly frequent misalignment of prices in the mainland did encourage both an increase in the number of zones in the continent (1.44; +0.10 on 2011) and a growth of the congestion rent, up to 206 million euro (+ 27% on 2011)[37]. The number of hours in which southern Italy and Sicilia were simultaneously separated from the central-northern Italy zones was also significant and equal to 5.4% (Fig. C.2.12).

Fig C.2.12 **Most frequent market configurations - 2012**



37 In particular, the increase looks especially significant along the southern-central-southern Italy and central southern-central northern Italy directions.

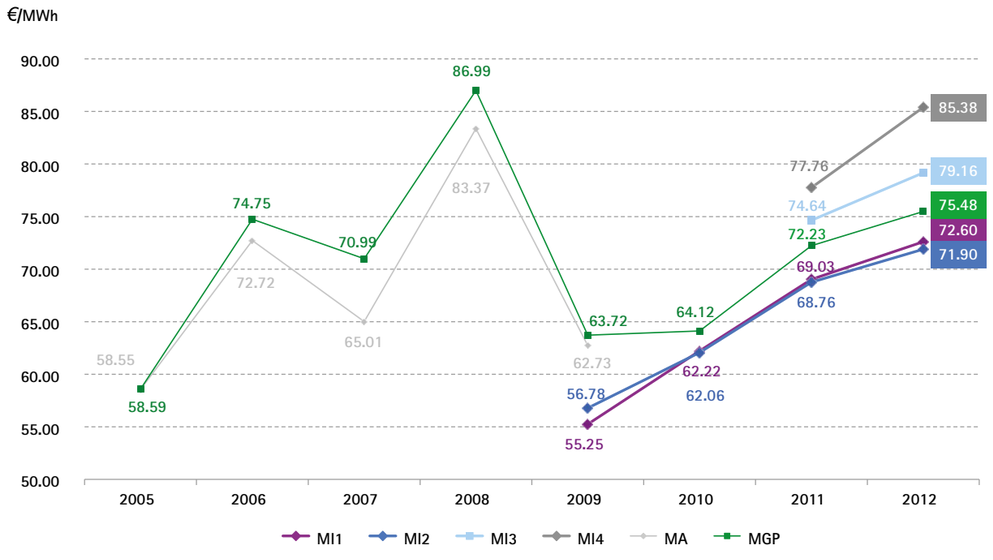
2.4 Intra-day market (MI)

The Intra-day market (MI), introduced by Law 2/09, has been replacing the Adjustment Market (MA) since 1 November 2009. Initially, it consisted of two sessions held the day before delivery with reference to the 24 hours of the subsequent day (MI1 and MI2). Since 1 January 2011, two more sessions have been added to the MI (MI3 and MI4) which close during the delivery day, with reference to the last 12 and 8 hours of the same day, respectively. During these four sessions, based on implicit auctions, participants can update their consuming unit withdrawal schedules, in the light of the latest information on the status of their plants, energy requirement and market conditions.

2.4.1 Prices

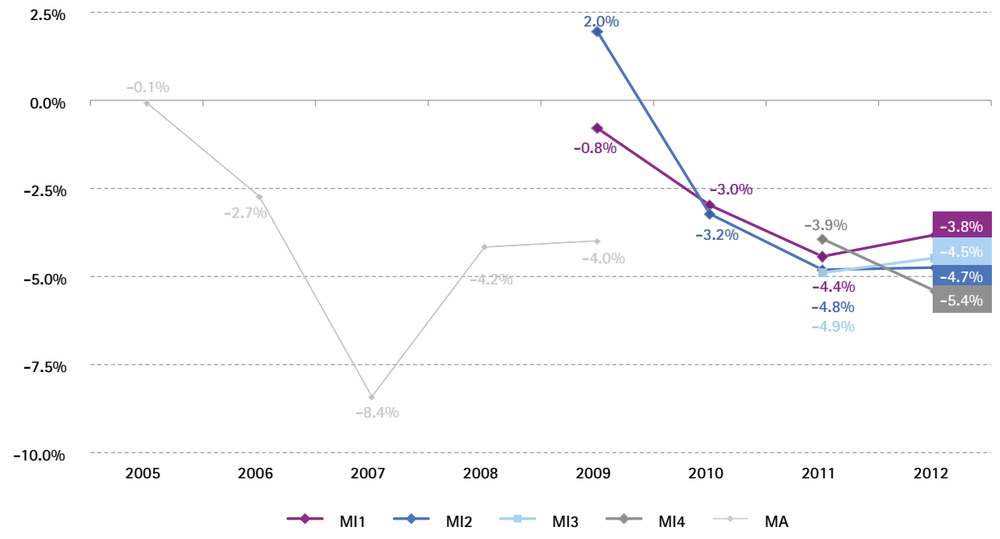
In 2012, in every market session, prices rose between 5 and 10%, less than the increase observed in 2011 on the previous year (MI1 and MI2). They all hit an all-time high level since their inception. The average price of the four sessions varied between 71.90 €/MWh (MI2) and 85.38 €/MWh (MI4). In 2010-2012, the price pattern of the Intra-day market seemed to be closely related to prices in the MGP (PUN), as it happened with the Adjustment Market evolution in the 2005-2009 period (Fig. C.2.13).
In the last three-year period, the MI price across the four sessions was always 3-5% lower than the PUN, in line with the differential observed for the MA in the last two years. Of course, MI3 and MI4 were compared with the PUN only in the hours of the day in which such markets generate a price (h13-24 on MI3 and h17-24 on MI4) (Fig. C.2.14).

Fig C.2.13 **MI prices: yearly trend**[38]



38 The yearly average value of MI prices is calculated as the average of zonal prices weighted for the corresponding purchases.

Fig C.2.14 **MI prices: comparison with PUN number of hours remaining equal**



Prices of MI1 and MI2 sessions were less volatile than MI3 and MI4, nearer in time to the first and closer to the physical delivery of traded electricity. The price volatility of MI1 and MI2 kept decreasing in the last two years, getting close to the PUN's, traditionally less volatile. In particular, in 2012 the price volatility of MI1 (the largest session in terms of volumes) was for the first time lower than the MGP's (-1.1 percentage points) (Fig. C.2.15; Fig. C.2.16).

Fig C.2.15 **Volatility of the selling price: yearly trend**

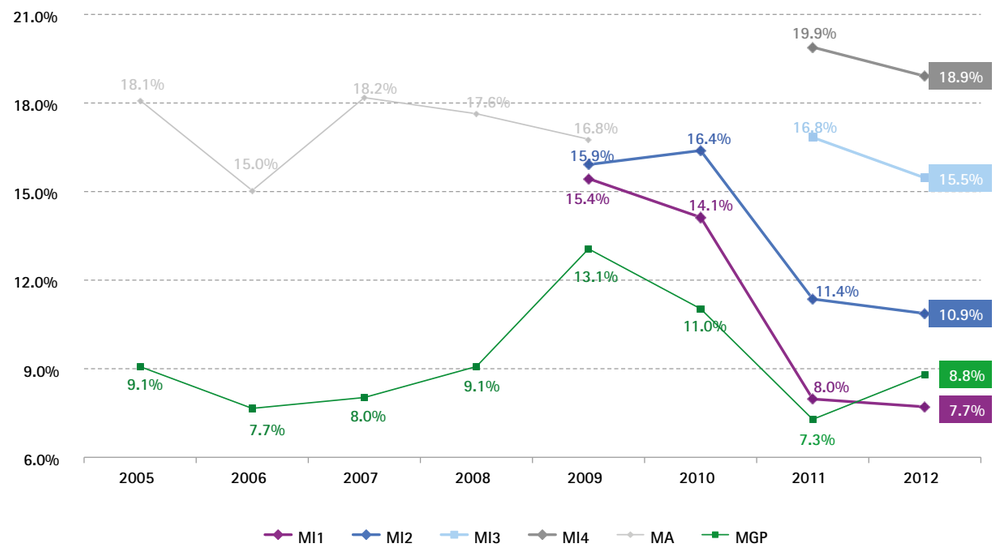
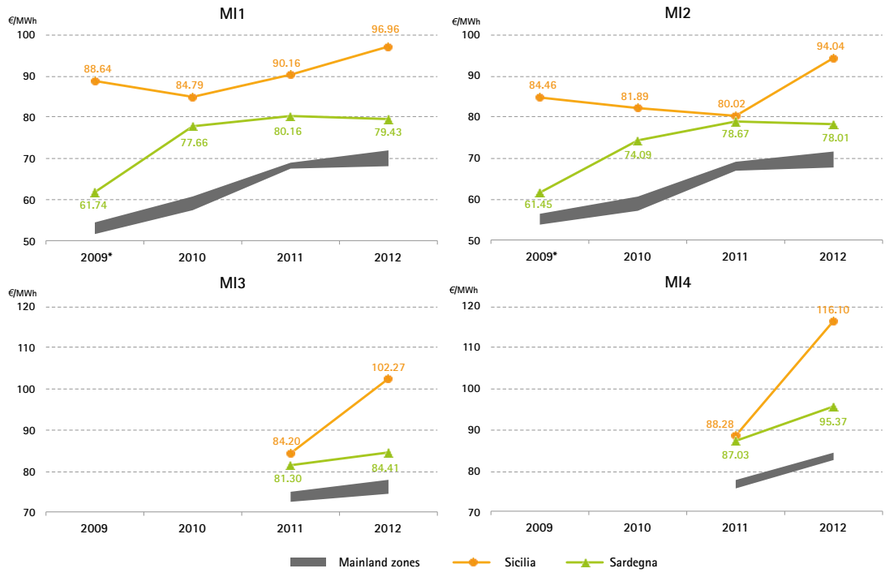


Fig C.2.16 **Volatility of MI prices: comparison with PUN (number of hours remaining equal)**[39]

The zonal prices of the four MI sessions also seem to correlate, in terms of both trend and level, with the zonal selling prices in the MGP. Hence, in the 2010-2012 three-year period, prices in both Islands were considerably higher than those in the four continental zones; these latter were quite convergent, with fluctuations within a rather narrow range (Fig. C.2.17).

Fig C.2.17 **Zonal prices in the sessions of the MI**



*The figure refers to the last months of the year

39 This figure expresses the difference (in percentage points) between the yearly average values of the MI and PUN price volatility. Again, for MI3 and MI4 the difference was calculated on the basis of the average PUN price volatility only in the hours in which said intra-day markets generate a price (h13-24 for MI3; h17-24 for MI4).

In the 2010-2012 three-year period, the zonal prices in the four MI sessions were lower than the MGP zonal selling prices, with a couple of exceptions in the two Islands (Fig C.2.19).
Over the same period, the volatility of zonal prices showed a generalized reduction across the four MI sessions. In the Islands, especially in Sicilia, the price volatility was way higher than in the continental zones. Among these latter, no significant difference was observed. Moreover, in the continental zones MI1 had a lower volatility also relative to the MGP; volatility was quite higher in MI3 and MI4 (Fig C.2.19)

Fig C.2.18 **Zonal selling prices**

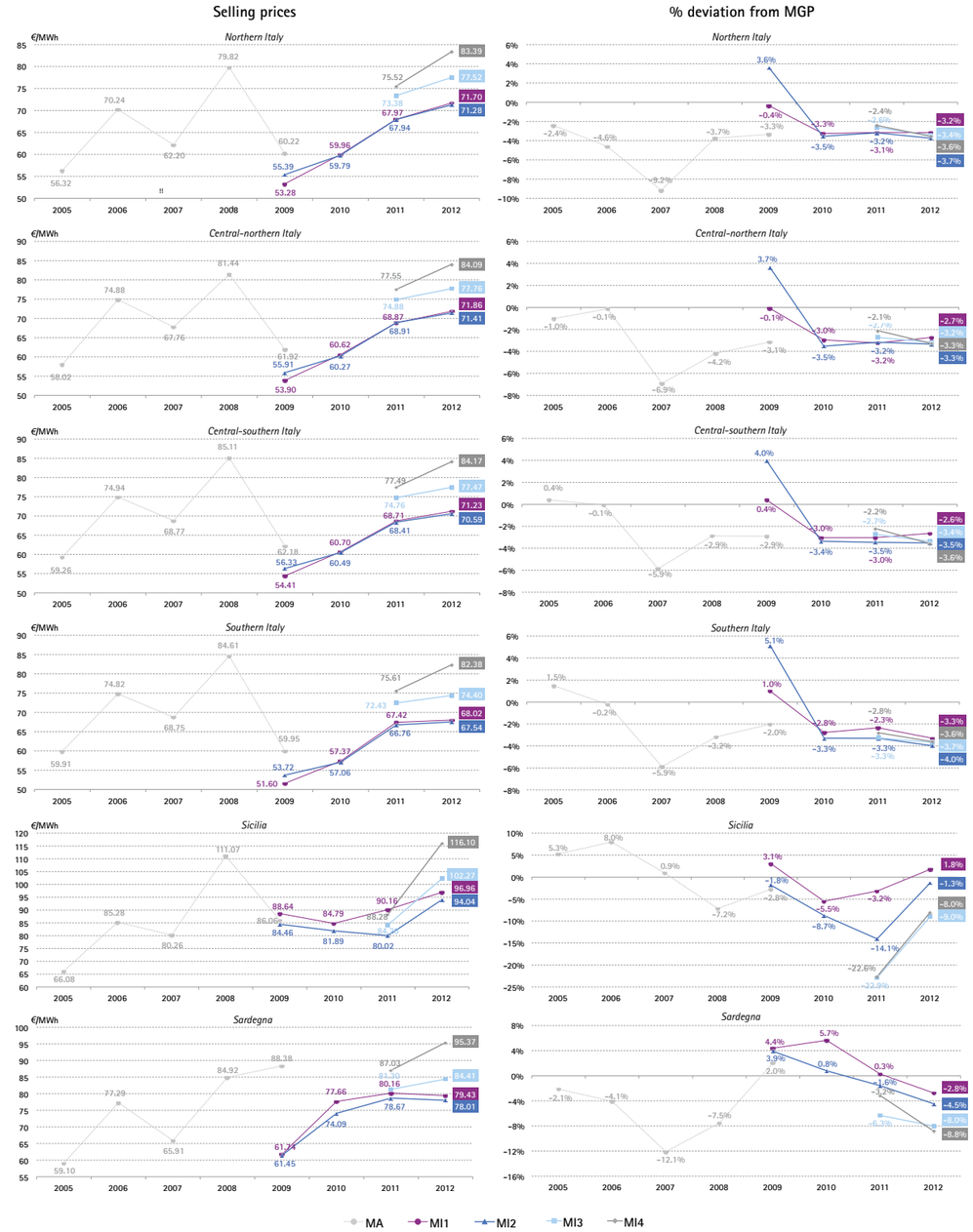
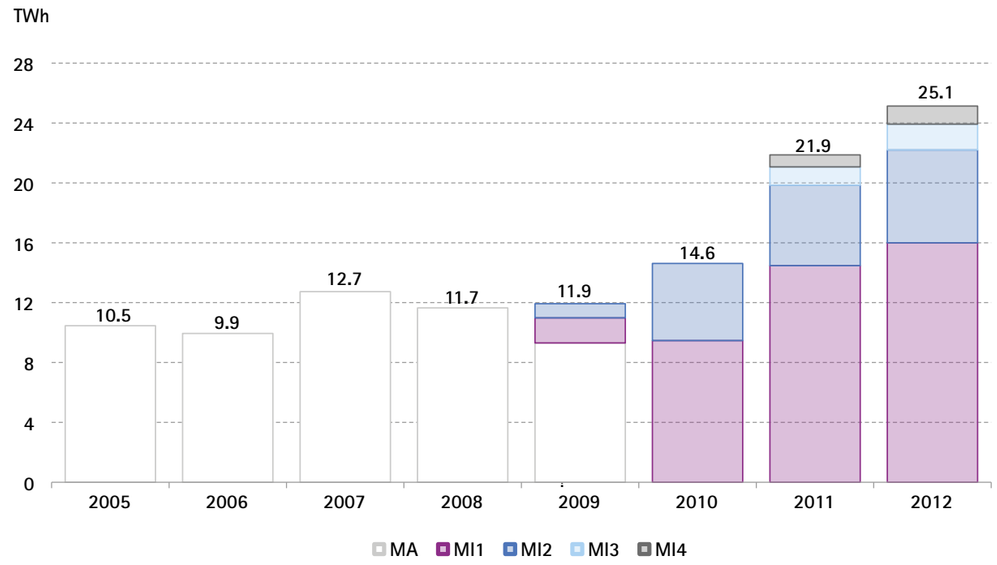


Fig C.2.19 **Volatility of selling prices**

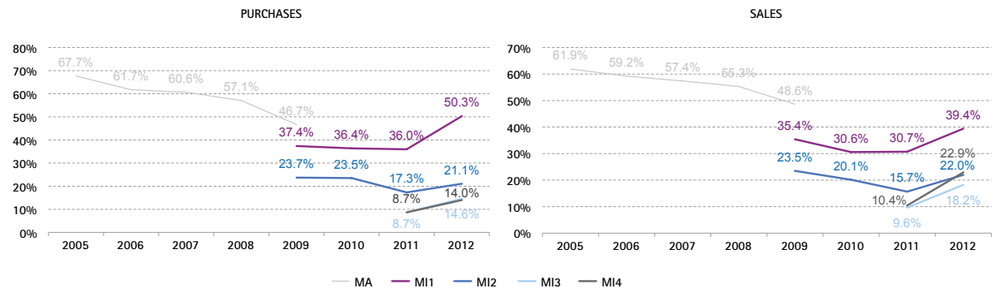
2.4.2 Volumes

Slightly more than three years after the introduction of the Intra-day market, traded volumes progressively increased until they doubled those traded in the previous five years in the Adjustment Market. In 2012, the volumes traded in the Intra-day market hit an absolute record, equal to 25.1 million MWh, with a 14.6% growth on the previous year and +71.5% on 2010 (Fig. C.2.20).
In 2012, too, MI1 was the most important session with its 16.0 million MWh (54.6% of the total traded as an hourly average). MI1 was the session with a more limited growth rate (+10.3%) and with the highest submitted/accepted bid/offer ratio, both on the demand side (above the 50% threshold in 2012) and on the supply side. Generally speaking, this ratio, also called "success rate", was lower than the one observed in the MA in the past, during the MI three years of operation (Fig C.2.21).
In 2012, 6.2 million MWh (+15.0%) were traded on MI2 whereas 1.7 and 1.2 million MWh were traded on MI3 and MI4, respectively. These two sessions, while accounting for slightly more than 10% each, grew considerably (+40.9% MI3, +50.7% MI4).

Volumes traded Fig C.2.20

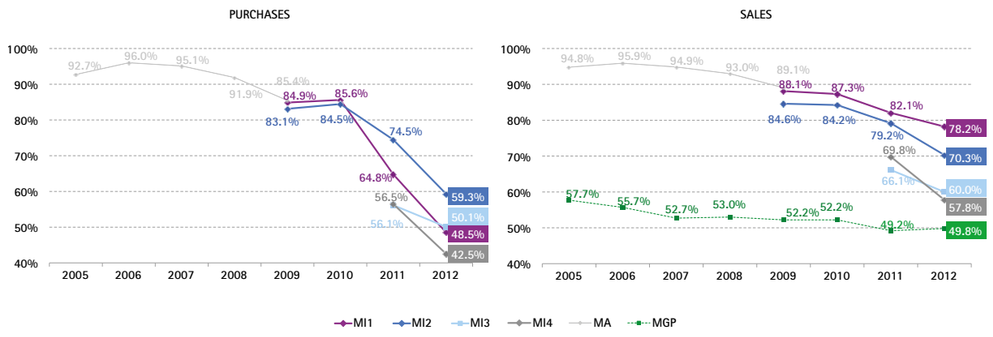


Success rate Fig C.2.21



The growing activity of participants in the Intra-day market promoted a higher level of competitiveness: the three leading participants' share (CR3) remarkably decreased in the 2010-2012 three year period; however, it is still significantly higher than the MGP's, especially on the supply side (Fig C.2.22).

Fig C.2.22 **CR3**



In 2012, in the four Intra-day market sessions, participants holding injection points were the most active, for the purpose of modifying generation schedules defined after the MGP. However, purchases by participants holding withdrawal points (wholesalers), equal to 6.9 million MWh and over twice as much as in 2011, account for 28.3% of total purchases (4.4% in 2009).

On the supply side, participants holding of injection points (producers and importers) largely prevail, with a share of 97.0% (98.1% in 2011). Here, wholesalers' sales, while keeping a residual weight, have nearly doubled from 0.4 million MWh in 2011 to 0.7 million MWh in 2012 (Fig C.2.23, Fig C.2.24).

Fig C.2.23 **Purchases and sales by type of power plant - 2012**

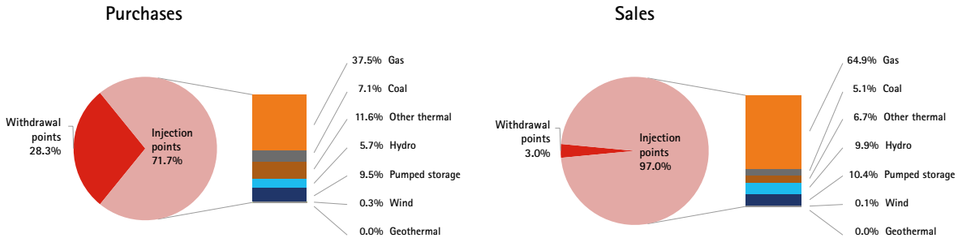
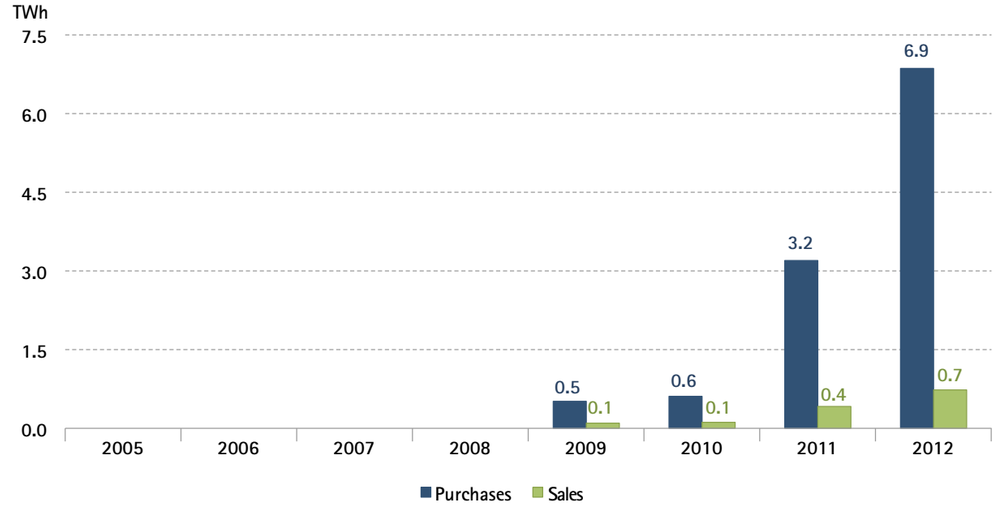
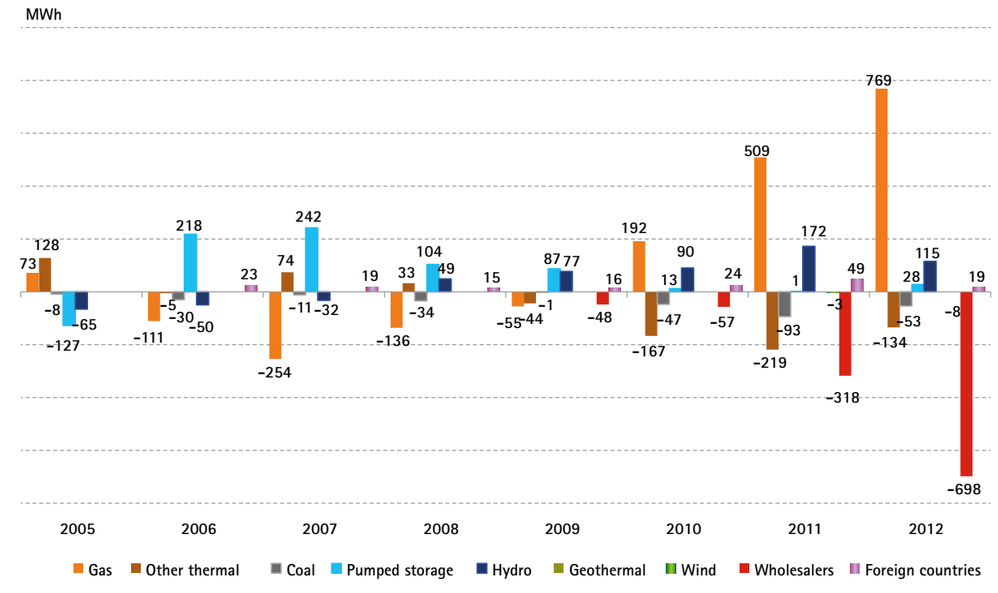


Fig C.2.24 **Purchases and sales by wholesalers**



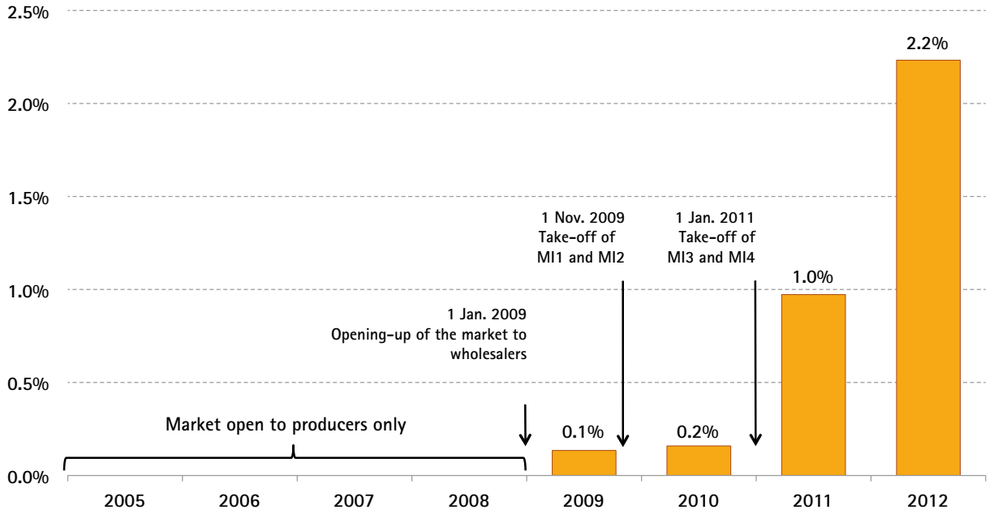
In 2010-2012, electricity trading in the MI was characterized by a steady increase of sales by gas-fired plants (+769 MWh, hourly average in 2012). Hydro plants also increased their sales (+143 MWh in 2012) whereas coal-fired plants (-53 MWh in 2012) and other thermal power plants (-134 MWh in 2012) kept decreasing their share of sales (Fig. C.2.25).

Fig C.2.25 **Sales/purchases balance by type of power plant – hourly average**



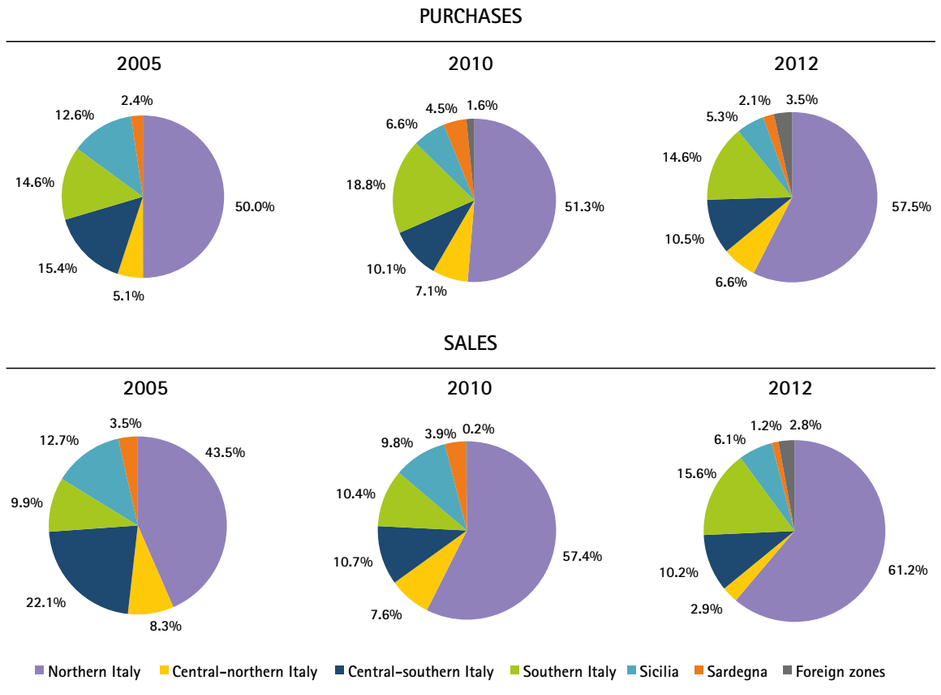
Since 2011, the Intra-day market has been characterized by an increase of injection schedules after the MGP (+1.0% in 2011 and +2.2% in 2012) (Fig. C.2.26).

Fig C.2.26 **Change of injection schedules after the MI**



At zonal level, between 2005 (when the MA was in operation) and 2012 (four MI sessions), the weight of the northern Italy zone has considerably increased both on the demand side (57.5%; +7.5 percentage points) and on the supply side (61.2%; +17.7 p.p.), to the detriment of every other zone, with the only exception of sales in southern Italy (15.6%; +5.7 p.p.). In the last three years, there have been trades in the foreign zones, too (approx. 3% in 2012 on both sides) (Fig. C.2.27).

Fig C.2.27 **Zonal volumes: percentage distribution – 2005, 2010 and 2012**



2.5 OTC registration platform (PCE)

The establishment of the OTC Registration Platform (PCE) has been a milestone in the history of the electricity market; most importantly, this market has opened up a new flexible option for participants. Buy and sell transactions concluded outside the bidding system (the so called bilateral contracts), volumes from the Forward Electricity Market (MTE) and from the Electricity Derivatives Platform (CDE) with any related physical injection and withdrawal schedules are registered on this platform.

On the PCE, the registration obligation applies to the two month period prior to delivery only; hence, any data registered on the PCE and trading activities represent only a proportion of the Italian over the counter market.

Transactions registered on the PCE, with delivery/withdrawal in 2012, were worth 345.9 million MWh, 16.5% more than the previous year. Their growth rate has never stopped since 2007, reaching a new record level. The economic recession seems to have affected only the growth rate; although declining (+36.5% in 2010, +25.3% in 2011 and, as mentioned, +16.5% in 2012), the growth rate remains quite high (Fig. C.2.28).

In 2012, registered transactions originated (89.7%) from contracts entered by participants outside the regulated market (bilateral contracts), and were worth 310.3 million MWh (+7.4% on 2011). Non standard contracts account for 57.5% of the total and amounted to 198.9 million MWh (+11.1%); this confirms that they are the most popular among participants, followed by base-load contracts (91.2 million MWh. +3.9%). Also, transactions resulting from contracts entered in the MTE performed quite well in 2012, over four fold the previous year's level; they reached 35.7 million MWh, equal to 10.3% of the overall registered contracts (2.7% in 2011) (Fig. C.2.29).

Conversely, no transaction derived from the CDE platform.

The net position of electricity accounts, resulting from the registered transactions, continued a long positive series and hit the previous year's record at 193.7 million MWh, although its growth rate declined from +21.6% in 2011 to +3.3% in 2012.

Therefore, the turnover, namely the ratio of registered transactions to the net position rose (+ 0.21 points) up to 1.79, its all-time high (Fig. C.2.28).

Fig C.2.28 **Registered transactions, net position and turnover**

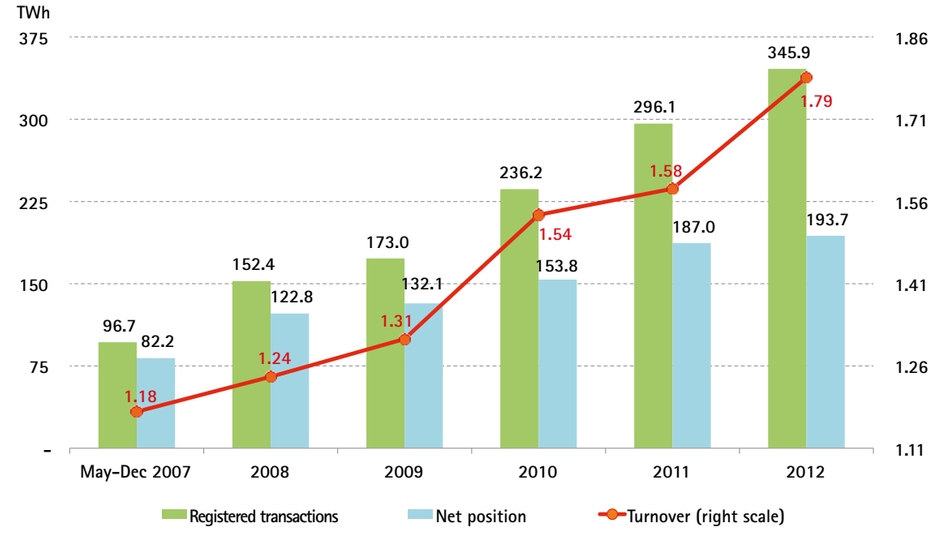
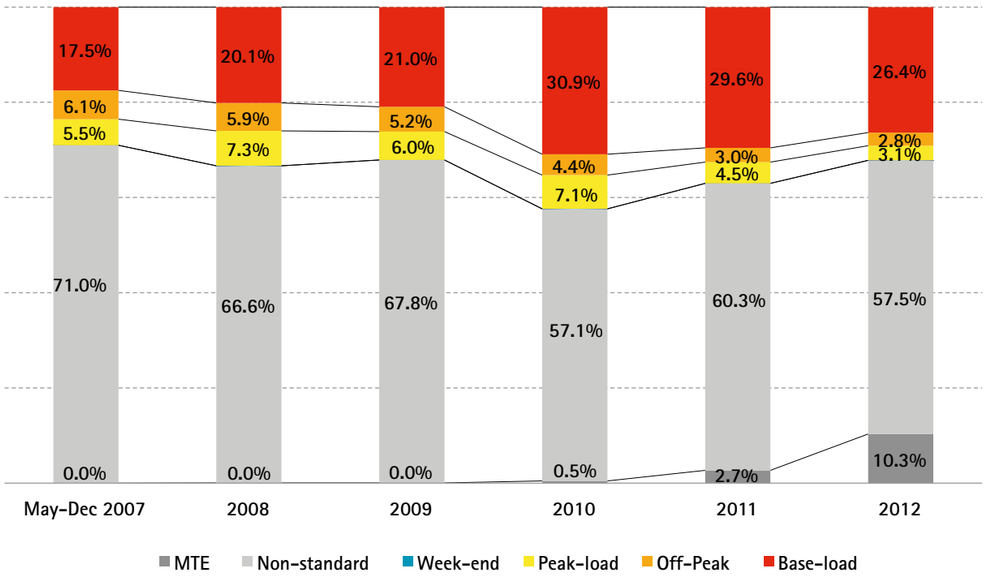
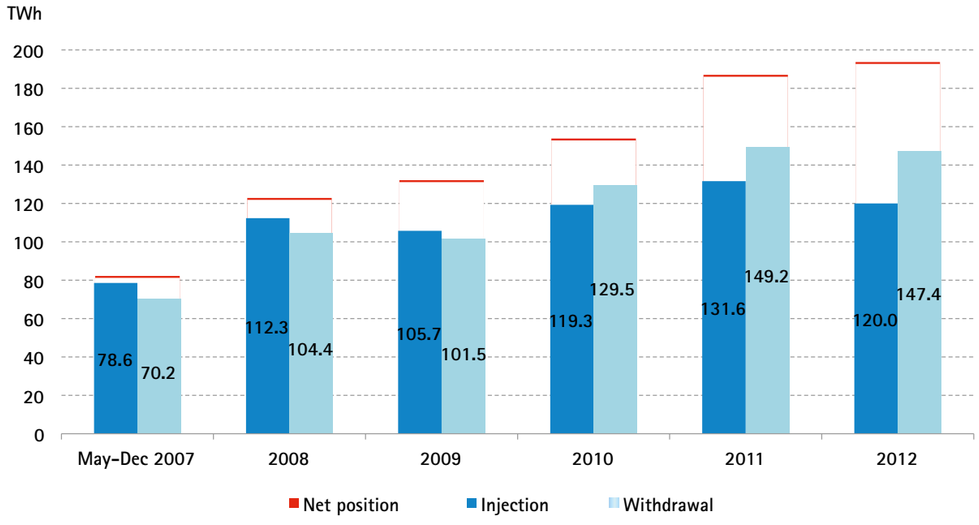


Fig C.2.29 **Structure of registered transactions**



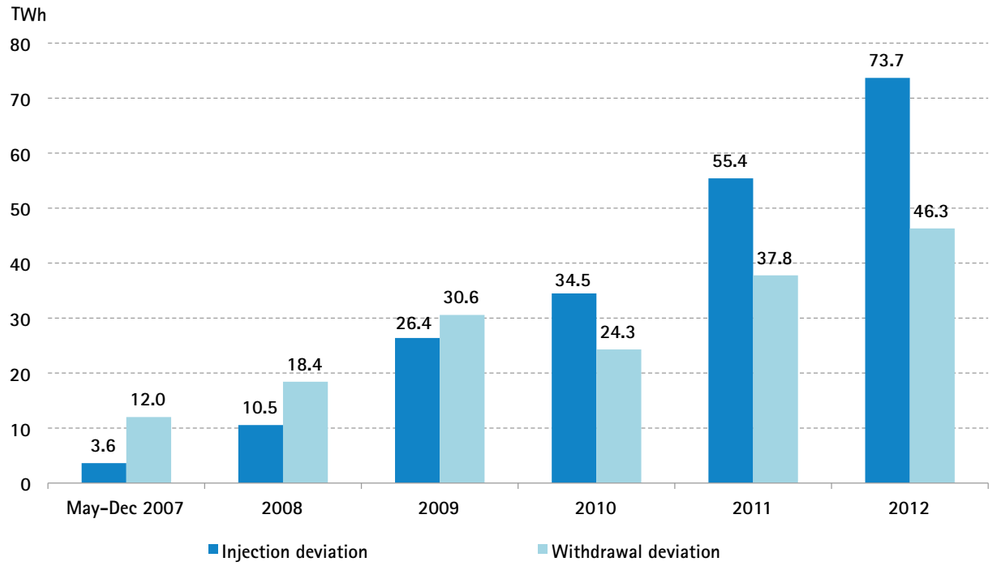
In 2012, the physical schedules registered on the PCE electricity accounts, after two years of double digit growth, declined from the record levels of 2011. More specifically, schedules registered in injection accounts decreased by 9.1% at 120.0 million MWh, whereas physical schedules registered in withdrawal accounts only dropped by 1.5% at 147.4 million MWh (Fig. C.2.30).

Fig C.2.30 **Registered physical schedules**



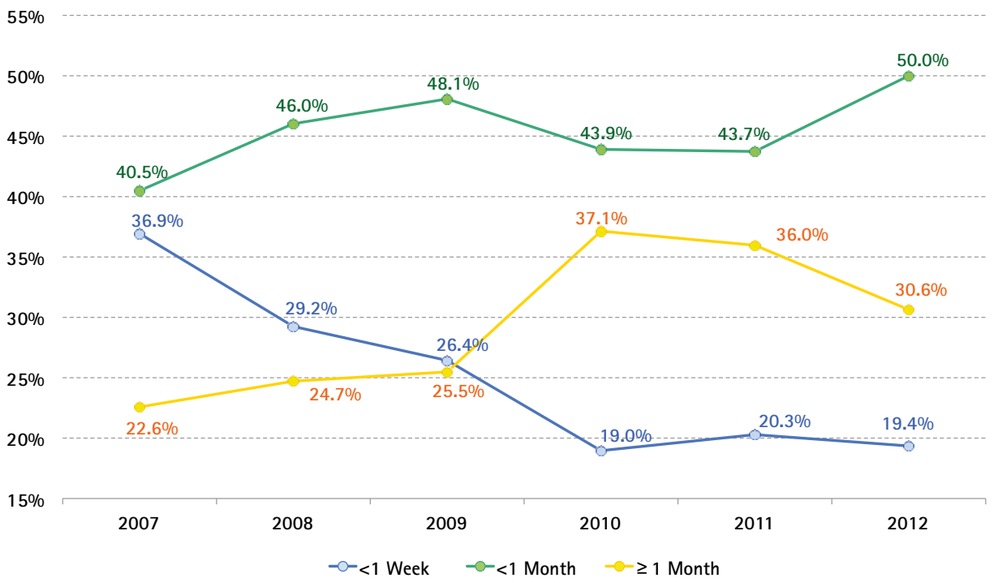
The evolution of registered physical schedules is the logical consequence of the growing use of scheduled deviation by participants, as a major flexibility tool in managing their portfolio. Most notably, in 2012 scheduled deviations on the injection side (electricity sold over the counter or in the forward market, not shown in schedules after the MGP) reached a historical high at 73.7 million MWh, with a 32.6% growth on the previous year. Deviations on the withdrawal side (electricity purchased over the counter or in the forward market, not shown in schedules after the MGP), although lower than the injection side, rose up to 46.3 million MWh (+22.3%), hitting a historical record, too (Fig C.2.31). In the last three years, also because of the excess supply, the gap between injection and withdrawal side deviations has been increasing, with a trend opposite to the previous years'.

Scheduled deviations Fig C.2.31



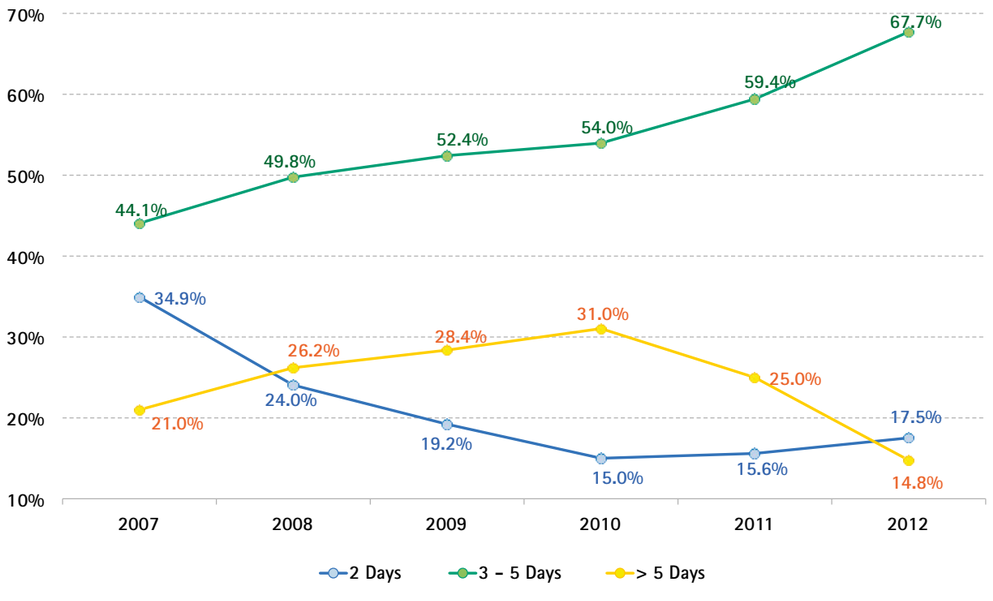
We present below an analysis of the evolution of PCE registered contracts and their characteristics, net of volumes deriving from the MTE, such as: maturity, time ahead of delivery and type of electricity accounts. As to the first aspect, contracts with a maturity shorter than one week after a progressive decline in the early years, have been stable at around 20% since 2010. Contracts with a maturity shorter than a month and longer or equal to one week (mostly weekly) have been historically most popular (50% of the total in 2012). Finally, contracts longer or equal to one month accounted for 37.1% in 2010 and fell down to 30.6% in 2012 (Fig. C.2.32).

Fig C.2.32 **Registered contracts by maturity (%)**



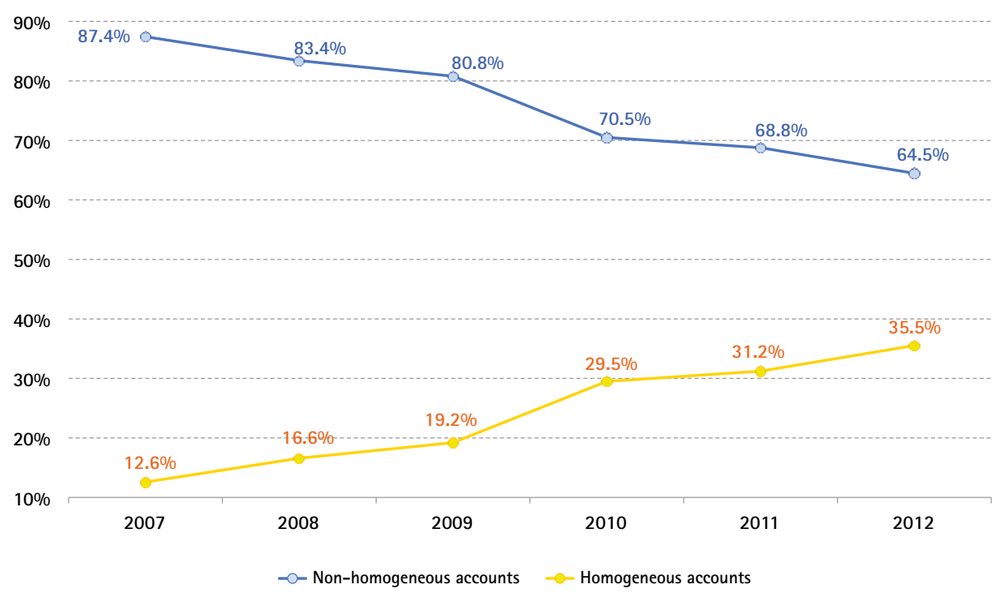
As to the time ahead of delivery, most contracts have been registered, since the inception of the PCE, 3-5 days ahead of the delivery date; this rate has been steadily increasing from 44.1% in 2007, up to 67.7% in 2012. Contracts registered on the last day (2 days before) and those registered earlier (>5 days), in the last two years upturned the pattern observed in the previous four years: the first went up to 17.5% in 2012 and the latter dropped down to 14.8% (Fig. C.2.33).

Fig C.2.33 **Registered contracts by time ahead of delivery (%)**



Finally, with regard to the type of electricity accounts moved, "classical" transactions aimed at a physical trade of energy, where the sale is registered in an injection account and the purchase in a withdrawal account (homogeneous accounts), accounted for the highest volumes.
Yet, their proportional weight has considerably fallen over the years, from 87.4% in 2007 to 64.5% in 2012. Conversely, transactions where both the sale and the purchase are registered in the same type of account have grown in importance. The proportion of these latter has nearly tripled (35.5%) relative to 2007 (Fig. C.2.34).

Fig C.2.34 **Registered contracts by type of electricity accounts used (%)**



2.6 The Forward Electricity Market (MTE)

In 2012, the trend of the last three years was confirmed, with the Italian Forward Electricity Market progressively growing in size; in three years, traded volumes grew by over 300 TWh and were stable at 564 TWh in 2012, with a ratio with the physical underlying rising from 0.80 in 2009 up to 1.73 in 2012 (Tab. C.2.9).

While the volume traded directly in the regulated markets has been quite stable – in the MTE and IDEX the Exchange trading overall equaled 44 TWh – the growth, as in recent years, was driven by volumes traded over the counter which still account for the largest share of forward traded electricity (approximately 92%). Two aspects should be noted: first, the sharp increase of OTC contracts registered for clearing purposes on GME's regulated forward market (MTE); in this respect, the MTE gets closer to the more mature regulated markets of northern Europe. The second aspect, partly related to the first, is a change in the type of bilateral contracts. During the last three years, OTC volumes referred to non standard and/or indexed contracts have been falling, whereas contracts similar to those traded on regulated markets have been growing in popularity. This may be interpreted as a sign of the forward market maturity, in as much as the widespread use of standard contracts; these latter make forward electricity products homogeneous and promote an increased liquidity, i.e. an ease in trading and/or selling a given product.

Tab C.2.9 **Forward volumes traded yearly by year of trading**

TWh	2009	2010	2011	2012
Physical market (Terna)	320.3	330.5	334.6	325.3
Spot market (IPEX)*	225.0	214.1	202.2	203.8
Forward market	255.9	381.7	523.4	564.2
IDEX	15.8	15.4	11.7	13.8
MTE/exchange	0.1	6.3	31.7	30.4
MTE/OTC clearing	-	-	1.8	24.6
OTC (**)	240.0	360.0	480.0	490.0

Source: processing of data from GME, Borsa Italiana and European brokers
(*) includes volumes traded in the MGP net of bilaterals, and those traded in the MI
(**) estimate based on data from the main European brokers

2.6.1 MTE volumes

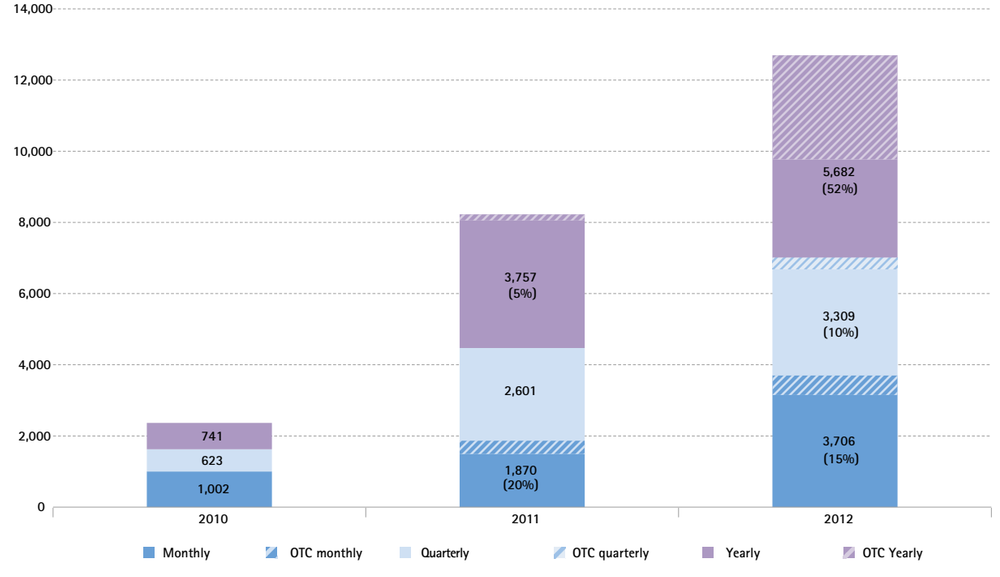
In a context where, as hinted above, the Italian wholesale forward market is gradually expanding, GME's Forward Market (MTE) seems to contribute to such phenomenon, as shown by several market metrics. First, it is worth noting the major growth of traded electricity, up to 55 TWh (+64% on 2011) thanks to the exponential rise of OTC clearing volumes (25 TWh: +23 TWh on 2011), accounting for 45% of total electricity. The number of bilateral contracts is also increasing to a large extent (12,697 MW; +54%), due to both the increase of bilaterals (3,815 MW; +3,260 MW) and of contracts traded on the platform (8.882 MW; +1.209 MW).

The share of sessions which ended with at least one matching has also improved (75%; +34 p.p.) and the same applies to the number of participants with trades, from 7 in 2010 up to 20 in 2012 (Fig. C.2.35; Tab. C.2.10).

In this context, one major novelty of 2012 is the integration of GME's forward trading systems with Trayport® Global Vision portal; participants can see in just one display GME's prices as well as those of the main European power exchanges and brokering platforms, so as to capitalize on any trading and arbitrage opportunities. Since July 2012, when the portal entered into operation, the share of trades from Trayport out of the total Exchange trading, has been increasing all the time, from 4% in July (however, during that month it operated for just half of the days) up to 99% in December. This confirms that participants highly value the portal's operational advantages. Those participants who have requested to be enabled to use Trayport have virtually abandoned the direct access to the order book in order to place their orders through Trayport. Conversely, the integration of MTE's book with Trayport does not seem to cause a rise in the number of active participants; out of MTE registered participants prior to 2012, inactive in the market until that date, just a few, after being enabled to use Trayport, have begun their Exchange trading through the portal (Fig C.2.36).

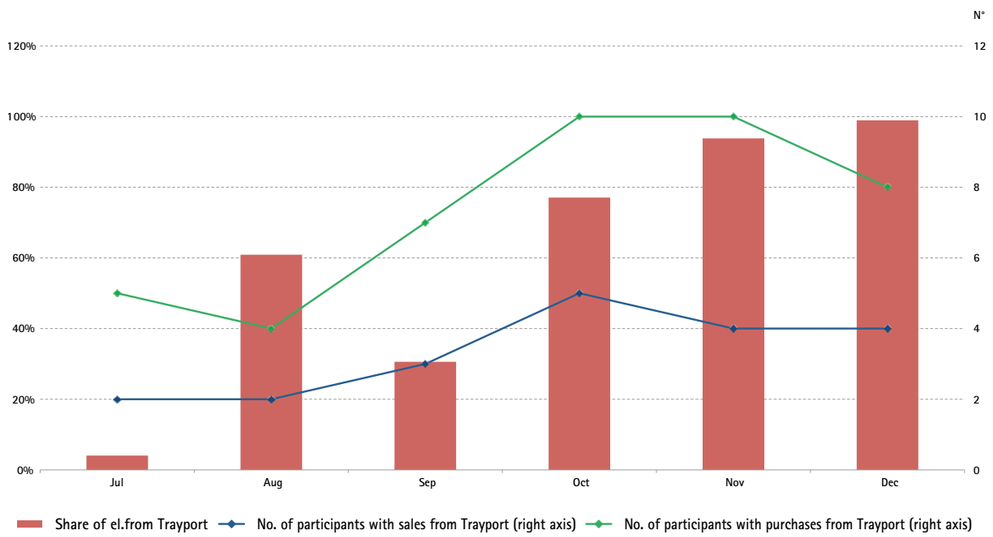
It should be noted, however, that the trading activity in the market, although more common with respect to 2011, remains at still fairly low levels. For most products, the ratio of trading volumes to the related open positions (churn ratio) is equal or close to one, with a few exceptions such as the base-load of the second quarter 2013 and the monthly base-load of February. It should be clear, however, that in these cases, the indications provided by the churn ratio partially lose their significance since the volumes traded and the related open positions registered on these products have reached rather limited levels (Tab. C.2.11).

MTE-traded contracts by year of trading and type of product* Fig C.2.35



* The share of OTC contracts registered for clearing purposes has been reported as a percentage.

Fig C.2.36 **Share of Trayport-traded electricity in total exchange-traded electricity**



Tab C.2.10 **Volumes traded in the MTE by year of trading**

	2010	2011	2012	Δ %2011/2012
Contracts (MW)				
Total	**2,366**	**8,228**	**12,697**	**54%**
Base-load	1,146	6,018	11,633	93%
Peak-load	1,220	2,210	1,064	-52%
Volumes (MW)				
Total	**6.3**	**33.4**	**55.0**	**64%**
Base-load	5.0	29.8	52.3	76%
Peak-load	1.3	3.7	2.7	-27%
Number of matchings				
Total	**360**	**665**	**953**	**43%**
Base-load	177	478	884	85%
Peak-load	183	187	69	-63%
Share of OTC volumes				
Total	**0%**	**5%**	**45%**	**+ 39 p.p.**
Base-load	0%	6%	45%	+ 39 p.p.
Peak-load	0%	1%	46%	+ 45 p.p.
% sittings with exchange trades				
Total	**31%**	**41%**	**75%**	**+ 34 p.p.**
Base-load	18%	39%	73%	+ 34 p.p.
Peak-load	27%	23%	16%	- 7 p.p.

Liquidity of the order book of base-load and peak-load products traded in 2012

Tab C.2.11

BASE-LOAD PRODUCTS

Delivery		Full book	Usef.sessions	Matching time	Avg Bid-Ask*	Churn ratio**	Average offered volumes*		Participants with matchings	
Year	Period	% hrs	% sessions	(mm:ss)	(€/MWh)	%	Bid (MW)	Ask (MW)	Bid	Ask
2012	Feb	10%	5%	245:10	0.79	100%	5	5	1	1
2012	Mar	9%	7%	14:45	1.95	100%	9	5	1	3
2012	Apr	23%	13%	34:43	1.50	100%	10	5	1	2
2012	May	43%	19%	26:52	1.45	101%	14	6	3	2
2012	Jun	61%	32%	48:17	1.16	100%	16	7	2	2
2012	Jul	71%	31%	45:13	1.60	110%	18	7	4	4
2012	Aug	65%	28%	35:0	1.34	101%	26	6	4	3
2012	Sep	33%	5%	77:51	2.17	100%	14	6	2	2
2012	Oct	21%	5%	60:15	3.07	100%	6	6	3	4
2012	Nov	30%	18%	32:49	1.34	101%	11	6	5	4
2012	Dec	57%	34%	33:59	1.16	100%	14	6	3	6
2013	Jan	34%	11%	78:9	1.47	100%	10	5	3	2
2013	Feb	26%			2.13	131%	9	5		
2013	Mar	19%	11%	40:36	1.83	115%	5	5	1	2
2012	Q2	34%	24%	34:34	1.28	103%	11	5	1	2
2012	Q3	56%	31%	33:54	1.21	102%	14	7	5	3
2012	Q4	50%	37%	61:0	1.19	106%	14	6	7	5
2012	Q1	44%	18%	57:50	1.45	101%	9	6	4	5
2013	Q2	43%	5%	53:31	1.89	188%	6	6	5	5
2013	Q3	33%	21%	69:50	1.12	100%	9	6	3	2
2013	Q4	44%	25%	41:11	0.88	100%	10	5	2	3
2013	Y	55%	47%	41:34	1.15	104%	15	7	13	5

* the indicators pertain to the first matchable bids/offers on the two sides of the order book and to the time intervals in which they are present at the same time
** the indicator is calculated as volumes/open positions net of cascading

PEAK-LOAD PRODUCTS

Delivery		Full book	Usef.sessions	Tempo abbinamento	Avg Bid-Ask*	Churn ratio**	Average offered volumes*		Participants with matchings	
Year	Period	% hrs	% sessions	(mm:ss)	(€/MWh)	%	Bid (MW)	Ask (MW)	Bid	Ask
2012	Feb					100%				
2012	Mar	1%			0.75		5	5		
2012	Apr	3%	2%	137:28	2.38	100%	9	11	1	1
2012	May	11%	2%	17:58	2.85	100%	6	7	1	1
2012	Jun	25%	6%	47:20	1.83	100%	6	6	2	2
2012	Jul	16%			4.58		6	6		
2012	Aug	1%	2%	37:54	0.50	100%	5	5	1	1
2012	Sep	1%			3.00		5	5		
2012	Oct	2%	2%	0:15	4.07	100%	7	8	1	1
2012	Nov	1%	2%	39:9	0.64	100%	5	5	1	2
2012	Dec	2%			0.78		9	5		
2013	Jan	0%	2%	104:43	7.00	100%	5	5	1	1
2013	Feb					100%				
2013	Mar					100%				
2012	Q2	4%			2.87	100%	5	6		
2012	Q3	12%	1%	10:56	2.11	100%	7	5	1	1
2012	Q4	7%	1%	59:55	2.37	100%	7	5	2	2
2012	Q1	3%			3.97		7	5		
2013	Q2	0%			6.85		5	5		
2013	Q3	0%			8.74		5	5		
2013	Q4	1%			1.92		5	5		
2013	Y	22%	12%	62:40	1.50	105%	13	6	8	6

* the indicators pertain to the first matchable bids/offers on the two sides of the order book and to the time intervals in which they are present at the same time
** the indicator is calculated as volumes/open positions net of cascading

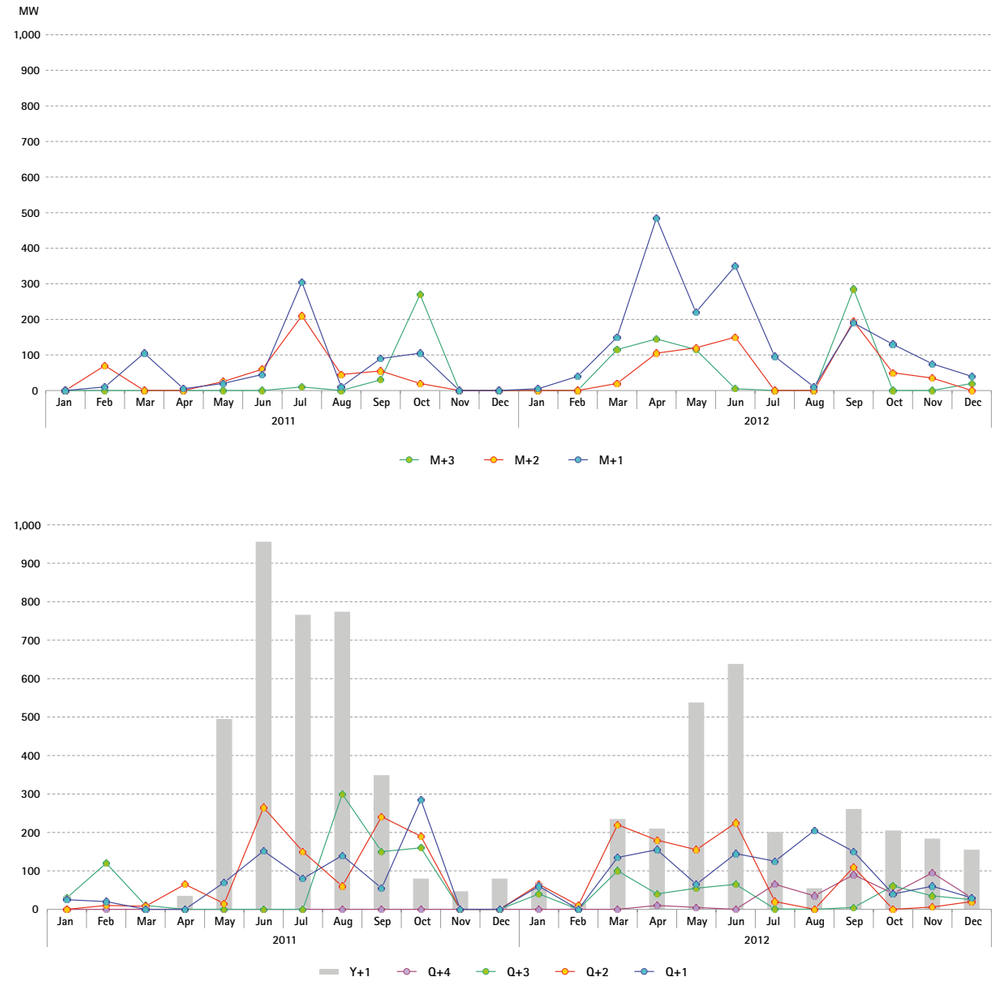
Looking at the distribution of trading by product in 2012, participants appear to prefer the base-load products, whose volumes nearly double year on year, to the detriment of peak-load products for which the traded electricity shows a further decline from the already low value of 2011 (2.7 TWh; -27%).
The most interesting part, however, relates to a change in the overall purchasing strategy of the market, quite evident in three mutually-related dimensions: a transfer of liquidity from yearly products to products with a shorter delivery period, especially monthly; within each product with a similar maturity, a concentration of trading prior to the initiation of the delivery period and a greater distribution of trading throughout the year instead of the summer months peak as observed in the past.
As to the monthly figures, in 2012 the total number of traded MW amounted to 3,706 (29% of the total; +6 p.p. on 2011), whereas contracts with delivery in the month after the trading period (M+1) reached 2,336 MW (64% out of the monthly total amount), accounting for as much as 18% of MTE's total MW (+5 p.p. on 2011) (Tab. C.2.12; Fig. C.2.37). These patterns do not simply reflect a change in the procurement strategy of Acquirente Unico – whose mode of operation has a huge influence on the forward market, given the still dominant role played by this participant as a consumer – but of a plurality of participants. Hence, it can be assumed that, at least to some extent, this trend reflects a greater difficulty in forecasting the medium-long term fundamentals - due to the growth of non-schedulable renewable sources on the supply side, and to the instability of the economic cycle on the demand side.

Tab C.2.12 **Liquidity of trades in the MTE by maturity and time ahead of delivery**

Year 2012	Monthly				Quarterly					Yearly	
Time ahead	M+3	M+2	M+1	Total	Q+4	Q+3	Q+2	Q+1	Total	Y+1	Total
Contracts (MW)	5.4%	5.4%	18.4%	29.2%	2.9%	3.5%	8.4%	11.2%	26.1%	44.8%	100.0%
Volumes (MWh)	0.9%	0.9%	3.0%	4.8%	1.5%	1.7%	4.3%	5.7%	13.2%	82.0%	100.0%
No. of matchings	6.5%	5.9%	18.9%	31.3%	5.0%	6.7%	11.6%	14.1%	37.5%	31.3%	100.0%
Share of OTC volumes	0.7%	0.7%	23.3%	14.7%	-	2.0%	5.6%	18.0%	9.9%	52.1%	44.8%

Year 2011	Monthly				Quarterly					Yearly	
Time ahead	M+3	M+2	M+1	Total	Q+4	Q+3	Q+2	Q+1	Total	Y+1	Total
Contracts (MW)	3.8%	5.9%	13.1%	22.7%	-	9.4%	12.2%	10.1%	31.6%	45.7%	100.0%
Volumes (MWh)	0.7%	0.8%	1.8%	3.3%	-	3.8%	5.5%	4.9%	14.2%	82.5%	100.0%
No. of matchings	3.0%	6.0%	10.7%	19.7%	-	10.1%	11.9%	10.4%	32.3%	48.0%	100.0%
Share of OTC volumes	0.0%	0.0%	38.1%	21.2%	-	0.0%	0.0%	0.0%	0.0%	5.6%	5.3%

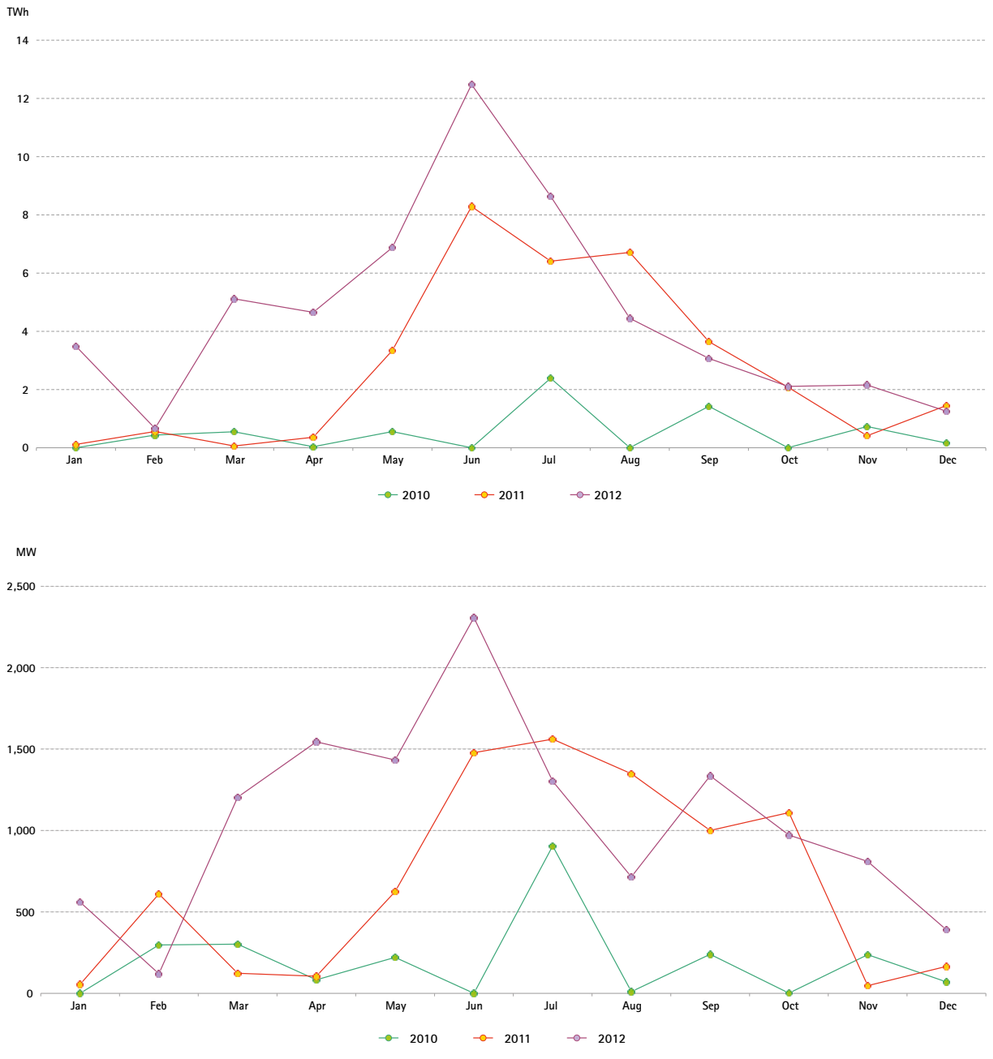
Traded volumes by month of trading, maturity and time ahead of delivery Fig C.2.37



The liquidity shift toward shorter maturity products and, among these latter, toward those with the nearest start of delivery, is accompanied by a more consistent distribution of trades over time; indeed, the trading and delivery dates have come pretty closer to each other. More specifically, while in terms of traded electricity the months of May and August are the busiest ones (the yearly base-load product is especially liquid in that period by virtue of a typical business practice[40]), in terms of MW the distribution looks markedly more homogeneous all over the year (Fig. C.2.38).

40 During this time period, supply contracts for the following year are renewed.

Fig C.2.38 **MTE-traded volumes by month of trading and year, including OTC clearing**



Conflicting patterns can be singled out in the market concentration parameters. The number of participants with bids/offers the platform, while rising on 2011 (+5), remains quite limited (25). As to market shares, the competitiveness level is way behind the MGP; market shares of AU purchases, while decreasing on an annual basis, still account for 86% (-9.9 p.p.), and the cumulative market share of sales of the top two participants (Enel and Edison) accounts for 97% of volumes (Tab C.2.13). As to the latter, although they clearly act as net sellers, alike last year, most of the reduced trading activity observed on this platform is due to the above two participants, who were active on both sides of the order book.

Market shares (net of OTC clearing) Tab C.2.13

	Purchases					Sales				
Participant	M	Q	Y	Totale	2012/2011	M	Q	Y	Total	2012/2011
ACQUIRENTE UNICO S.P.A.	85.3%	91.6%	84.9%	86.3%	*- 9.9 p.p.*	-	-	-	-	-
ASSOUTILITY S.R.L.	4.5%	2.1%	4.0%	3.6%	*+ 3.6 p.p.*	-	-	1.4%	1.0%	*+ 1 p.p.*
ACEA ENERGIA HOLDING SPA	-	0.3%	3.5%	2.6%	*+ 2.6 p.p.*	-	0.2%	0.1%	0.1%	*+ 0.1 p.p.*
EZPADA	-	1.4%	1.7%	1.5%	*+ 1.5 p.p.*	-	1.0%	-	0.2%	*+ 0.2 p.p.*
ENEL TRADE S.P.A.	1.6%	1.9%	1.1%	1.3%	*+ 1 p.p.*	51.2%	52.7%	77.4%	70.1%	*+ 11 p.p.*
EDISON TRADING S.P.A.	0.2%	0.7%	0.6%	0.6%	*+ 0.4 p.p.*	41.5%	43.7%	20.0%	26.7%	*+ 11 p.p.*
EDF	6.7%	1.0%	0.4%	1.0%	*- 1.3 p.p.*	0.7%	0.2%	-	0.1%	*- 10.4 p.p.*
Other	1.7%	0.9%	3.8%	3.0%	*+ 1.8 p.p.*	6.6%	2.3%	1.2%	1.8%	*- 12.9 p.p.*
Total	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	100.0%	

2.6.2 MTE prices

In 2012, MTE prices conveyed multiple signals confirming the general growth of the Italian forward market liquidity; on the other hand, in line with the instability of the economic cycle, they seemed to indicate a lower predictive ability of the MTE.

As to the first aspect, it is worth noting that compared to 2011, the price level[41] expressed by the MTE provides consistent indications, even more consistent than those coming from other markets or brokering platforms. In this respect, the larger liquidity of the MTE[42] has helped bringing the correlation between MTE and Idex and TFS prices close to one; the largest progress has been observed with monthly products (correlation with Idex equal to 0.98 vs. 0.55 in 2011), where the growth of trades has been especially remarkable[43]. As to the absolute, average price difference there seems to exist quite a significant integration across the various platforms, with a value never exceeding 0.6 €/MWh (Tab. C.2.14).

An analysis of the correlation between spot prices and MTE base-load prices for the various front products is also quite telling; it brings up a series of phenomena quite in line with both the economic theory and the practice adopted by more mature forward electricity markets. First of all, compared to MTE products, a higher correlation for products sharing the same or near delivery periods can be observed. Hence, monthly products M+1, M+2 and M+3 exhibit the highest correlations with product Q+1, and a progressive decrease of correlations with the quarters Q+2, Q+3 and Q+4. As to the correlation between forward and spot prices, quite different results are obtained if one utilizes the value of the average daily Pun observed in the MGP in each session[44] or, alternatively, its simple moving average referred to a given number of sessions prior to the MTE trading date. In the first case, as expected, the correlation dynamics shows how any change in the spot price has a greater influence on the trend of products near to delivery and a shorter trading period; the spot-forward price correlation changes from 0.63 (Pun and monthly M+1) to 0.28 (yearly, Y+1), with a price which is physiologically less responsive to the very short term fluctuations of the spot price. On the other hand, correlations become more significant also with longer term forward products with a deferred

41 In this paragraph, unless otherwise specified, the price analysis is not based on the average prices of matchings concluded in each session, which by definition are calculated only on days with trades, but on the check prices that are conventionally calculated at the close of each session to allow the calculation of the available amount of financial guarantees even in the absence of trades. This choice is due to the fact that, although in 2012 the number of sessions with trades has increased, there are still numerous sessions without trades and therefore it is technically impossible to construct a continuous series of matching prices. The use of check prices inevitably influences the outcome of the analysis, both in reference to the values of the prices quoted, their volatility and the calculation of the correlations between such prices and other variables. Nevertheless, due to the calculation method of check prices, which in sessions with trade are close to or in some cases equivalent to the average matching prices, the results obtained from such analysis do not appear uninteresting.

42 In this respect, it is both the pure increase of signed contracts and the growth in the number of sessions with trades and active participants.

43 The increased correlations among the various markets/platforms reflects, other than the MTE increasing liquidity, also an increase in the number of Idex trades.

44 In particular, the Pun is referred to the delivery day, whereas check prices at the close of the session are referred to the MTE trading date.

delivery, when the Pun moving average is employed. By way of exemplification, if you consider the moving averages of the Pun of order 10 (SMA Pun 10) and order 30 (SMA Pun 30), the correlation with the yearly product rises to 0.40 in the first case and equals 0.54 in the latter, proving the relationship between the spot and forward price trend (Tab. C.2.15).

Tab C.2.14 **Correlations and average absolute deviation of check prices for base-load products traded on the MTE, IDEX and TFS (2012 and 2011)**

	Correlation			Average absolute deviation (€/MWh)		
MTE vs INDEX	M	Q	Y	M	Q	Y
Year 2012	0.98	0.97	0.98	0.5	0.6	0.4
Year 2011	0.55	0.89	0.85	0.9	1.1	0.7

	Correlation			Average absolute deviation (€/MWh)		
MTE vs TFS	M	Q	Y	M	Q	Y
Year 2012	0.95	0.98	0.99	0.6	0.5	0.2
Year 2011	0.50	0.88	0.89	0.4	0.3	0.4

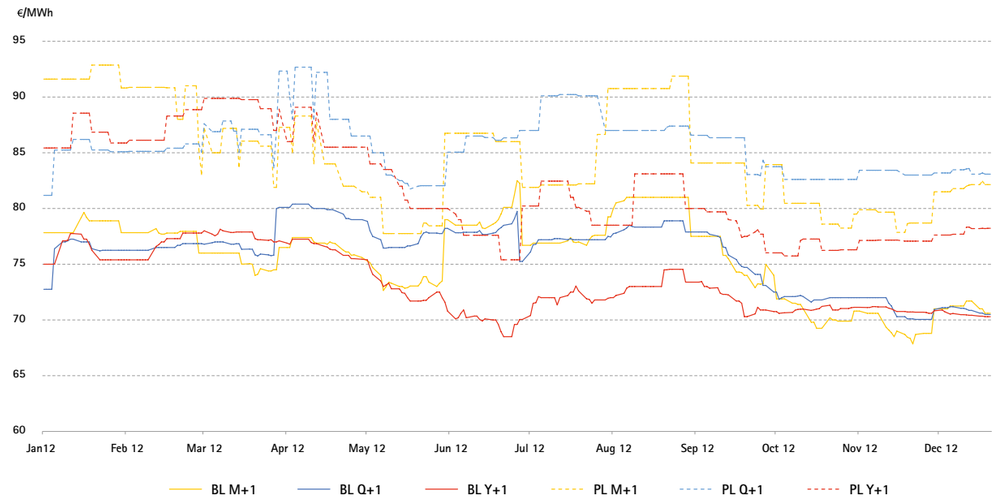
Tab C.2.15 **Correlations between forward prices for front base-load products and spot prices (2012)**

	Base-load											
Correlations	M+1	M+2	M+3	Q+1	Q+2	Q+3	Q+4	Y+1	PUN	SMA PUN 10	SMA PUN 30	Correlations
M+1	1.00	0.77	0.76	0.81	0.68	0.09	0.20	0.39	0.63	0.75	0.73	M+1
M+2		1.00	0.65	0.84	0.75	0.12	0.16	0.45	0.50	0.62	0.65	M+2
M+3			1.00	0.91	0.76	0.28	0.10	0.47	0.41	0.46	0.53	M+3
Q+1				1.00	0.83	0.25	0.08	0.50	0.45	0.54	0.58	Q+1
Q+2					1.00	0.65	0.48	0.80	0.41	0.49	0.57	Q+2
Q+3						1.00	0.66	0.77	0.05	0.01	0.07	Q+3
Q+4							1.00	0.83	0.28	0.37	0.50	Q+4
Y+1								1.00	0.28	0.40	0.54	Y+1
PUN									1.00	-	-	PUN
SMA PUN 10										1.00	-	SMA PUN 10
SMA PUN 30											1.00	SMA PUN 30

The relationship between spot and forward electricity markets results also from the monthly trend of front products prices which – in most cases and especially in the final months of the year – tended to decrease, when MGP prices dropped, too. The distance between the first and the last matching price of each product can be considerable; while prices of most products fell, the largest differences were seen with products traded in the second half of 2012; the gap between the last and first matching price equals -4/-10 €/MWh for base-load monthly products in February and March 2013, and as much as -11 €/MWh in Q2 2013.
The impact of spot markets on the forward electricity markets is clear also by looking at the base-load/peak-load price ratio, with special reference to yearly products; these latter exhibit a progressive convergence during the year, consistently with the smaller spread between day and night prices observed in the MGP; the spread between yearly peak-load and base-load prices fell from 10.43 €/MWh at the beginning of the year down to 7.9 €/MWh at the end of December (Fig C. 2.39; Tab. C.2.16; Tab. C.2.17).

On the other hand, major differences with the MGP persist in terms of price volatility, ranging between 0-2% in the MTE and way below the MGP (9% approximately), most likely because of the different nature of the spot and forward electricity markets (Tab. C.2.16; Tab. C.2.17).

Trend of prices of front products based on check prices Fig C.2.39



Price of base-load products traded in 2012[45] Tab C.2.16

BASE-LOAD PRODUCTS

Delivery		Liquidity	Check Price (€/MWh)						Matching Price (€/MWh)				
Year	Period	%sittings with match.	First	Last	Min	Max	Avg	Vol.	First	Last	Min	Max	Avg
2012	Feb	2%	77.83	78.90	77.83	79.65	78.03	0.2%	79.30	79.30	79.30	79.30	79.30
2012	Mar	5%	77.83	77.95	77.70	78.20	77.84	0.2%	78.20	77.64	77.60	78.20	77.81
2012	Apr	12%	72.75	74.50	72.75	76.00	75.38	1.0%	76.00	74.55	74.00	76.00	74.62
2012	May	19%	76.37	75.85	75.80	77.40	76.61	0.4%	76.50	75.80	75.80	77.00	76.35
2012	Jun	32%	78.20	73.50	72.65	78.20	75.77	0.6%	77.40	73.04	72.65	77.50	74.92
2012	Jul	31%	80.00	82.25	77.20	82.50	79.00	1.1%	80.31	82.25	77.20	82.50	79.44
2012	Aug	28%	79.00	77.60	74.40	79.00	76.29	0.7%	75.77	77.20	74.40	77.40	76.17
2012	Sep	5%	79.50	81.00	78.90	81.00	79.62	0.3%	79.00	81.00	79.00	81.00	80.33
2012	Oct	5%	75.25	73.25	72.90	77.50	76.03	1.0%	74.30	73.11	72.90	74.30	73.16
2012	Nov	18%	78.00	69.90	69.25	78.50	75.26	1.0%	77.87	69.85	69.25	78.00	74.96
2012	Dec	34%	77.72	68.80	67.85	77.72	72.18	1.4%	77.10	68.77	67.85	77.10	73.57
2013	Jan	11%	73.10	71.00	70.60	73.20	72.18	0.8%	72.10	71.00	70.60	72.10	71.33
2013	Feb	11%	72.10	64.50	64.50	72.10	70.54	0.6%	70.40	66.80	66.75	71.10	68.03
2013	Mar	19%	69.90	59.95	59.50	70.40	65.01	1.2%	70.40	59.95	59.50	70.40	64.60
2012	Q2	10%	69.00	75.81	68.83	77.25	71.90	1.4%	71.18	75.45	68.70	77.25	72.81
2012	Q3	18%	72.21	79.74	72.21	82.00	76.81	0.5%	73.23	78.35	73.20	81.60	78.75
2012	Q4	27%	73.81	74.08	73.81	83.10	78.35	0.7%	81.90	74.03	73.90	83.00	78.40
2013	Q1	18%	78.00	70.49	70.05	80.60	76.00	0.5%	80.61	70.60	70.00	80.65	74.08
2013	Q2	6%	73.25	60.99	60.99	73.25	67.29	0.5%	73.05	62.30	62.30	73.05	67.17
2013	Q3	18%	68.50	-	67.05	73.30	71.01	0.9%	71.73	-	67.05	72.75	71.82
2013	Q4	16%	71.91	-	65.20	73.00	69.85	0.7%	72.10	-	65.20	73.00	71.39
2013	Y	46%	75.00	70.30	68.50	78.15	73.29	1.0%	74.73	76.66	68.50	78.20	72.56

45 The check price reported in the "first" column is the check price at the opening of the product trading session. The value reported in the "last" column is the closing value reported in the last session of the trading period. Figures are referred to 31/03/2013.

Tab C.2.17

Price of peak-load products traded in 2012[46]

PEAK-LOAD PRODUCTS

Delivery		Liquidity	Check Price (€/MWh)						Matching Price (€/MWh)				
Year	Period	% sedute con abb	First	Last	Min	Max	Avg	Vol.	First	Last	Min	Max	Avg
2012	Feb	0%	89.33	92.87	89.33	92.87	90.89	0.2%					
2012	Mar	0%	89.47	91.01	88.00	91.01	90.44	0.7%					
2012	Apr	2%	81.62	81.90	81.62	87.19	84.76	1.9%	83.05	83.05	83.05	83.05	83.05
2012	May	2%	84.94	82.00	82.00	88.30	85.56	1.5%	82.00	82.00	82.00	82.00	82.00
2012	Jun	6%	87.19	78.45	77.75	88.81	83.78	1.6%	85.10	78.45	77.75	85.10	80.15
2012	Jul	0%	94.73	86.00	86.00	95.62	88.72	2.5%					
2012	Aug	2%	86.58	86.65	77.50	86.65	81.14	1.3%	86.65	86.65	86.65	86.65	86.65
2012	Sep	0%	82.11	91.88	82.11	91.90	90.84	1.6%					
2012	Oct	2%	85.67	79.95	79.95	87.40	85.38	1.1%	79.98	79.98	79.95	80.00	79.98
2012	Nov	2%	92.03	78.24	78.24	92.03	86.56	2.0%	78.68	78.68	78.60	78.75	78.68
2012	Dec	0%	87.32	78.70	77.86	87.32	81.77	1.5%					
2013	Jan	2%	81.72	82.15	80.27	82.76	81.72	0.6%	82.15	82.15	82.15	82.15	82.15
2013	Feb	2%	85.88	77.00	77.00	89.83	86.62	1.5%	78.77	78.77	78.77	78.77	78.77
2013	Mar	3%	79.54	67.85	67.85	80.11	74.73	1.0%	69.90	67.85	67.85	69.90	68.88
2012	Q2	4%	80.04	83.64	74.97	87.85	80.92	1.4%	80.00	79.00	77.75	80.40	79.39
2012	Q3	1%	83.76	86.34	80.21	94.23	86.23	1.2%	82.20	81.65	81.65	82.40	82.32
2012	Q4	1%	78.47	82.94	78.47	99.25	90.32	1.0%	87.65	84.40	84.40	87.65	86.03
2013	Q1	0%	89.91	83.08	82.61	100.16	90.12	1.3%					
2013	Q2	0%	83.58	66.06	66.00	83.85	72.45	0.6%					
2013	Q3	1%	77.65	-	72.26	81.42	75.66	1.5%	75.00	-	72.60	75.00	73.80
2013	Q4	2%	83.78	-	75.70	83.78	79.37	1.4%	76.45	-	75.70	76.50	76.22
2013	Y	11%	85.27	78.23	75.40	89.88	81.78	1.2%	83.84	83.10	77.40	80.10	78.15

Given the above said relationship between MGP and MTE, the year 2012 was characterized, as expected, by a poorer predictive capability of the forward market, calculated as the difference between the last price of monthly products near to delivery in the MTE and the Pun expressed for the same month by the MGP (Tab. C.2.18). In spite of a significant growth of liquidity in the forward market, as proven with monthly products by the sharp increase in the number of sessions with matchings, the absolute mean spread between the last check price and MGP price rose from 3.1 €/MWh in 2011 to 4.4 €/MWh in 2012. Although such increase mostly occurred in the month of February, when the European spot markets exhibited exceptionally high price spikes due to hardly predictable criticalities, this phenomenon showed up in other months, too[47]. In particular, such pattern was prevalent in the last four months of the year, when the MGP prices dropped considerably on an annual basis, an event which was underestimated by participants in the forward electricity markets.

The lower predictability of the MTE appears to reflect, broadly speaking, an uncertainty of the Italian Electricity Market due to a hard time in forecasting the fundamentals. Such difficulty was caused by both the growth of renewables (supply side) and by the pronounced macro-economic instability (demand side). In conclusion, in 2013 the forward curve expressed by the MTE shows downward expectations relative to the 2012 spot curve, with the 2013 calendar product priced at 70.3 €/MWh against a yearly average Pun (2012) of 75.5 €/MWh. Consistently with the MGP, the expected fall of prices in peak-load hours is even bigger; in the MTE, the last available price for the 2013 peak-load yearly product is equal to 78.2 €/MWh, against a 2012 peak-load value of the Pun of 86.3 €/MWh (Fig. C.2.40).

46 See footnote 44.

47 To the exclusion of the month of February, the absolute mean difference between the last check price and MGP price would have gone from 3.3 €/MWh in 2011 to 3.8 €/MWh in 2012.

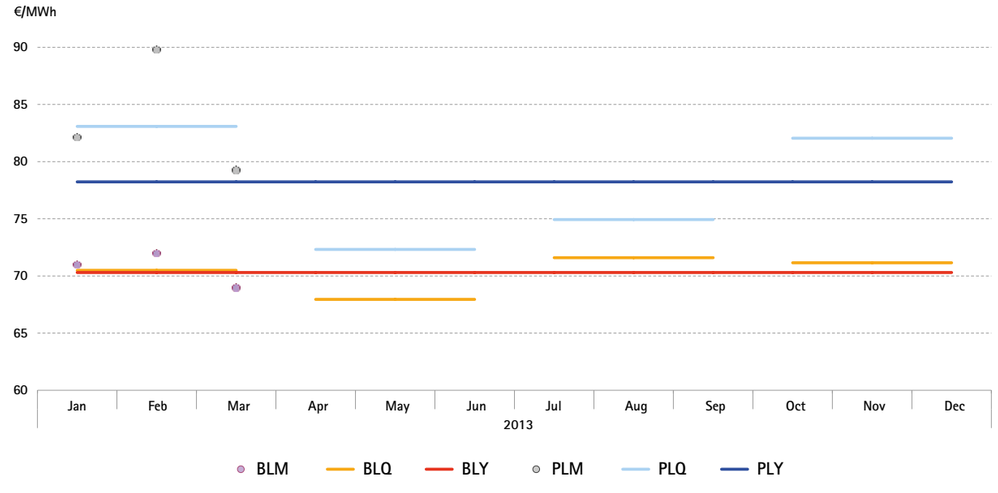
Tab C.2.18

Ratios of spot prices (MGP) to related forward prices

Delivery month	PUN	Avg PC – PUN	Last PC – PUN	Avg PA – PUN	Last PA – PUN	%sittings with match.
January-11	65	4.75	4.75	-	-	0%
February-11	66.29	-0.03	-1.19	-	-	0%
March-11	68.18	-3.36	-2.68	-3.18	-3.18	2%
April-11	65.18	-0.28	2.81	-1.14	-0.58	5%
May-11	71.28	-6.04	-3.53	-3.53	-3.53	2%
June-11	68.41	0.58	1.39	-	-	0%
July-11	69.74	7.26	6.16	7.34	5.76	8%
August-11	74.51	0.35	-3.31	-1.61	-3.16	11%
September-11	81.31	-7	-7.81	-6.78	-8.11	6%
October-11	78.61	-2.52	-1.11	-1.78	-1.16	14%
November-11	78.47	0.42	1.53	1.68	1.53	9%
December-11	79.37	-0.13	0.83	0.1	0.83	5%
January-12	79.85	-0.06	0.25	0.1	-0.05	14%
February-12	89.04	-11.01	-10.14	-9.74	-9.74	2%
March-12	75.31	2.53	2.64	2.5	2.33	5%
April-12	72.72	2.66	1.78	1.9	1.83	12%
May-12	69.96	6.65	5.89	6.39	5.84	19%
June-12	77.88	-2.11	-4.38	-2.96	-4.84	32%
July-12	82.2	-3.2	0.05	-2.76	0.05	31%
August-12	85.64	-9.35	-8.04	-9.47	-8.44	28%
September-12	76.77	2.85	4.23	3.56	4.23	5%
October-12	65.86	10.17	7.39	7.3	7.25	5%
November-12	64.09	11.17	5.81	10.87	5.76	18%
December-12	66.99	5.19	1.81	6.58	1.78	34%

Fig C.2.40

Forward curves expressed by the MTE in 2013 as of 31 Mar. 2013

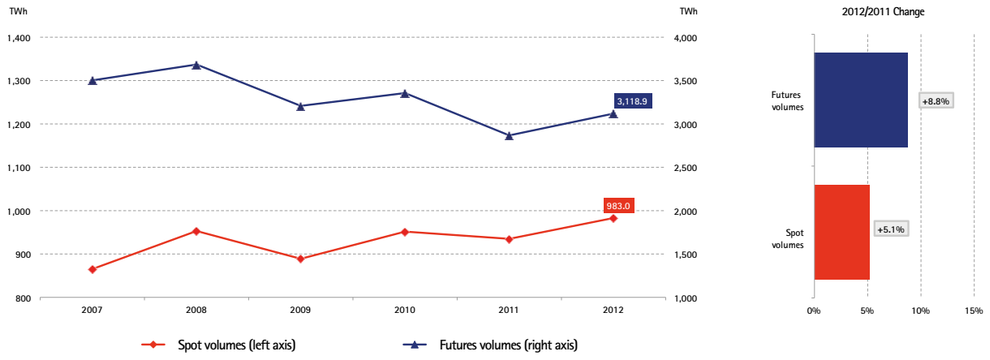


2.7 International comparisons

Despite the economic recession that has been hitting Europe since 2009, the regulated electricity markets[48] in 2012 showed an overall recovery of traded electricity, mostly driven by the propelling force of Germany. In fact, the overall figures are guided by the trend observed in the German-Scandinavian region which accounts for 86% of traded volumes; this hides diverging and counter-intuitive local trends which reflect, on the one hand, the different severity of the recession in Western European countries and, on the other, the variable maturity of the national exchanges.

Moreover, the recovery seems to take on, at least apparently, differing connotations in the two market segments, without significantly altering the downward trend of futures trading over the last five years and giving, on the contrary, further impetus to the moderately upward trend observed in the same period of time for spot traded quantities (Fig. C.2.41).

Fig C.2.41 **Trend of spot and futures volumes in Europe**

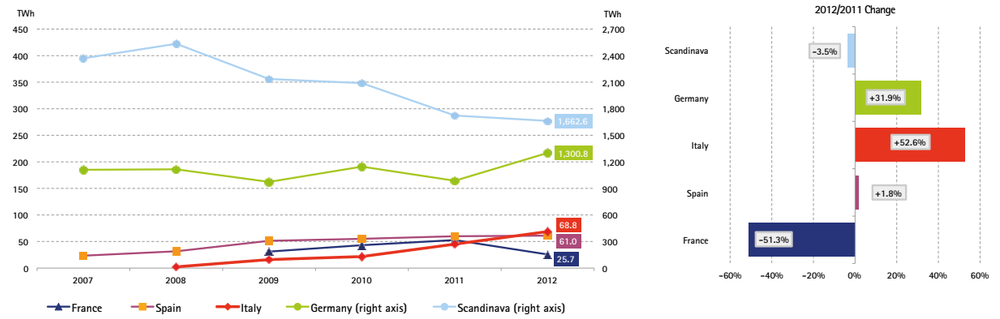


In the case of forward electricity markets, in fact, the level of traded electricity remains among the lowest ones over the five-year period; it was solely supported by the driving force of Germany, which has cushioned the impact of the economic crisis better. This finding is still difficult to interpret: if analyzed prospectively, the increase in volume could be considered as a first tentative signal of confidence in the possibility of stimulating the demand, triggered by Germany and then gradually extended to other European countries.
In detail, in Germany the volume of trades grew to an all-time high of 1,300 TWh (+31.9%), thereby rapidly approaching the overall volume of electricity traded in Scandinavia, traditionally higher; yet, it fell from 2,535 TWh in 2008 to 1,663 TWh in the last year, with a five-year drastic decline of 34%.
Encouraging signs come from the young Mediterranean exchanges: while their size is smaller compared to more mature central-northern exchanges, they keep gradually increasing their liquidity.
In particular, while the electricity traded in Spain rose to 61 TWh (+1.8%), partly slowing down the race that had quickly reached a level of 60 TWh in the previous five years, in Italy trading went up to nearly

48 This finding refers to volumes traded in the main spot and forward markets, considering the reference geography of interest: Nord Pool (spot) and Nasdaq OMX (futures) for Scandinavia, Epex (spot) and EEX (futures) for Germany and France, GME for Italy, Omie (spot) and Omip (futures) for Spain.

69 TWh[49], driven by the physical forward market (MTE) which gathered about 80% of such volume. It is worth mentioning that, in both countries, the growth appears to be promoted by the greater utilization of platforms for clearing[50] purposes, proving the participants' resolve to neutralize the counterparty risk at a time of profound economic uncertainty (Fig C.2.42)

Fig C.2.42 **Volumes traded in the futures markets of the main European exchanges**



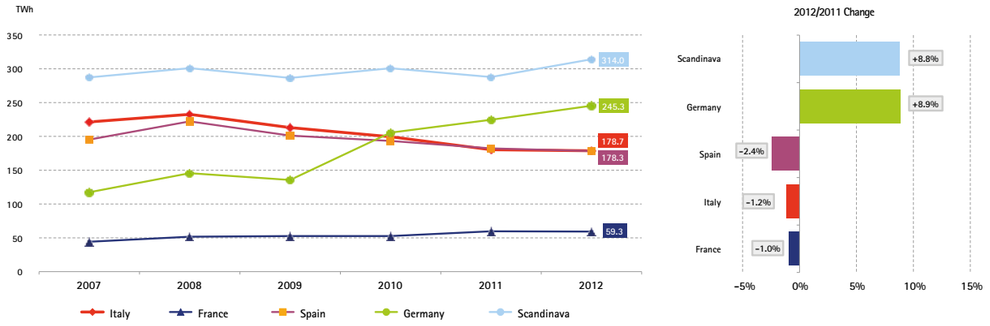
The strengthening of the slightly upward trend exhibited by the spot traded volumes originates from the driving effect generated from central-northern exchanges; in this case, the reference exchange of the Scandinavian region is no exception: with its 314 TWh, it remains the largest one, by virtue of a trend increase which has never been so strong in the last five years (+8.8%). The moderately upward propensity noticed at the continental level has, however, been fed, especially from 2010 onwards, by the clear progression of the wholesale volumes traded in the German market, which again reached their highest level of 245.3 TWh (+8.9%). The most significant depressing impact exerted by the economic recession on the energy demand in the Mediterranean countries has instead led to a further drop in spot trading on the Italian and Spanish exchanges; both reached a level of around 179 TWh, the lowest value since 2007 (-1.2 % and -2.4%, respectively). A partial reversal of this trend is emerging in Italy, where in the first quarter of 2013, the liquidity of the spot market has increased by 18.4 p.p., mostly thanks to a change in the sale business strategies implemented by operators who have moved a share of the electricity traditionally sold through bilateral contracts[51] to the Exchange (Fig. C.2.43).

49 This figure was calculated considering volumes traded in the physical electricity market (MTE), run by GME, and in the financial market (IDEX), run by Borsa Italiana.

50 As to Spain, with a substantial stability of trades on the platform, registrations for clearing purposes grew by 4%. In Italy's MTE, the increase of this latter was bigger +23TWh. For a thorough analysis, see Section C.2.6.

51 For further details on the Italian situation, see Section C.2.2

Fig C.2.43 **Volumes traded in the main European spot markets**

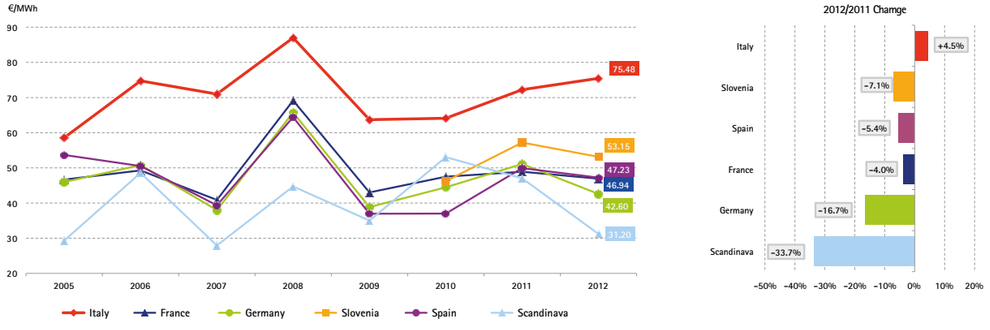


In contrast to the findings resulting from the analysis of volumes, which highlights local specificities often typical of the domestic demand and the degree of penetration and maturity of the regulated markets as an instrument for the supply of energy, electricity prices in Europe were relatively homogeneous in 2012, both in spot and futures trading, reflecting the existing structural differences in the generation fleet.

However, in spite of a good level of interaction between the spot exchanges, supported also by the many coupling experiences across the Continent, there seem to exist more difficulties on the part of the derivatives market in launching correct price signals for the future, given the uncertainty about the end of the economic crisis and the transformation of the technological mix caused by the gradual spread of new renewable capacity.

In particular, in 2012, despite the rising price of fuels in Euro[52] and the upward expectations expressed by the forward electricity markets at the end of 2011, the European spot prices declined to around 42/47 €/MWh in Central Europe (-16.7% in Germany, -4.0% in France)[53] and in Spain (-5.4%) and equaled 31.20 €/MWh in Scandinavia (-33.7%), hitting the lowest level over the 2008-2012 period. An exception to this trend is the Italian price; in line with the variable cost of generation and with the signals sent out from the futures at the end of last year, such price was equal to 75.48 €/MWh (+4.5%), with a spread with the neighboring French market close to its historically highest level of 30 €/MWh. On the one hand, this points to a volatility much lower than in the rest of Europe (8.8%); on the other, the only example in the Continent, it showed a declining peak-load/off-peak modulation (1.24) (Fig C.2.44 - Tab. C.2.19).

Fig C.2.44 **Historical trend of the spot price on European power exchanges**



52 See, to this end, Section C.1.

53 The markets of France and Germany have been coupled since November 2010 with the CWE market coupling. In 2012, the two exchanges expressed similar prices in 13% of the hours vs. 16% in 2011.

Tab C.2.19 **Volatility and ratios of prices by groups of hours**

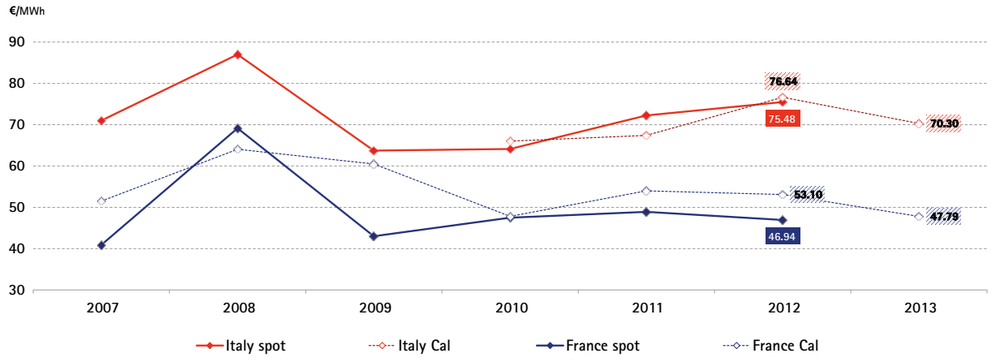
	Italy	France	Germany	Slovenia	Spain	Scandinavian area
Peak-load/off-peak working day	1.24 *(-3.9%)*	1.41 *(1.2%)*	1.36 *(4.4%)*	1.45 *(9.3%)*	1.18 *(2.7%)*	1.24 *(11.8%)*
Holiday/off-peak working day	1.00 *(-7.4%)*	0.85 *(-8.2%)*	0.82 *(-11.5%)*	0.87 *(-4.8%)*	0.95 *(-6.3%)*	0.97 *(-1.7%)*
Volatility	8.8% *(+1.5 p.p.)*	13.5% *(+2.4 p.p.)*	15.2% *(+6.8 p.p.)*	17.9% *(+8.7 p.p.)*	15.2% *(+6.1 p.p.)*	9.4% *(+2.9 p.p.)*

Trend changes between parentheses

It should be noted that despite an improving spread with foreign countries – this reflects, as mentioned, profoundly different fleet and generation costs - seasonal patterns of convergence between the Italian and French prices have occurred in the last quarter of 2012 and in the first half of 2013, following a drop in the price of Italian[54] gas and a seasonal increase in the transalpine demand along with a major unavailability of generation from nuclear sources.

In detail, the gap between the prices of the two adjacent markets[55] on average dropped down to 18 €/MWh between October and December; it fell again down to 9 €/MWh in the first half of 2013, when such differential more often than not was overturned. This caused inefficiencies in the management of volumes allocated on the border through explicit auctions. Indeed, in the first three months of 2013 the French price exceeded the one of the northern Italy zone in 18% of the hours; however, the flow of electricity after the MGP is Italy-bound from France, which highlights an inconsistent allocation relative to the prices[56]; also, it stresses the benefits resulting from the coupling mechanism already operational in Italy along the Slovenian border[57].

Fig C.2.45 **Average level of the spot price and of the price of the calendar product to be delivered in the same year[58]**



54 For further details, please refer to Section C.3.

55 In this case the differential is calculated between the French price and the one expressed by the adjacent northern zone of Italy's power system.

56 It should be noticed, however, that in the only hour in which electricity was properly sent from Italy to France, only a partial share of the available transmission capacity was used.

57 See Section C.2.3.4

58 Reference is made to the settlement price for the Calendar product on the last trading day. By way of simplicity, the diagram only depicts the series of Italian and French spot and futures prices.

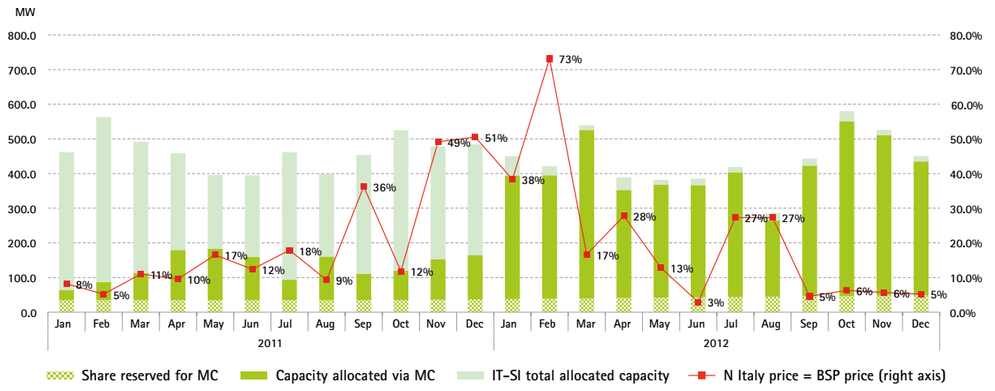
2.8 Italy-Slovenia market coupling

The second year of full operation of market coupling on the day-ahead electricity markets in Italy and Slovenia did endorse the positive signals which emerged as early as in 2011; these are encouraging signs, especially in view of the future adoption of the same mechanism along the other Italian borders[59].
Although there was no major impact on the price and volumes circulating in the Italian market (a more than predictable condition in the light of the small volume of electricity available for allocation), the project[60] proved to be quite successful also in 2012, as confirmed by multiple factors.

First of all, the use of market coupling grew considerably; on average, the allocated volumes amounted to 415 MW, i.e. 95% of the total figure (more than tripled on 2011); at the same time, only 5%, a negligible share, was allocated through explicit auctions (71% in 2011). The switching from periodical explicit auctions to the daily implicit auction to buy and sell the import capacity available across the two borders appears to be due to the massive utilization of the Use It Or Sell It (UIOSI) covenant: market participants can sell back to the TSO the forward purchased import capacity (purchased through monthly and yearly auctions) and buy it back in the spot market through supply offers in the Slovenian day-ahead market (Fig. C.2.46). This instrument is key to understand the second success factor of coupling, as identified by the booming volumes traded on the Slovenian exchange (BSP), which rose from about 0.2 TWh in 2010 to 4.4 TWh in 2012. This success further proves that successful coupling projects can be finalized with smaller-sized exchanges; also, it proves a liquidity benefit, stemming from the commercial opportunities related to the efficient capacity allocation mechanism. To this end, it is worth observing that the rise in volumes traded on the Slovenian exchanges, after the start off of the coupling project, has triggered a virtuous process by attracting the local demand on the same market (amounting to 0.8 TWh[61]).

On the other hand, while coupling could not eliminate the structural spread between the two exchanges[62], it did encourage their convergence in 20.5% of the hours (19.9% in 2011). Precisely in the hours in which the price spread gets near to zero, with the subsequent difficult forecast of consistent cross-border flows, the added value of market coupling becomes evident. It can ensure the appropriate allocation of the available interconnection capacity and determine a flow level in line with market prices. This option is not guaranteed under the explicit auction. Such mechanism may be inefficient, as demonstrated in 2012: in spite of a growing price spread between the Slovenian exchange and the northern Italy zone (see footnote 60), the resulting flows were not cost-effective in 8 hours of the year (Fig. C.2.46).

Capacity allocation on the Italian-Slovenian border and share of hours with zero price spread Fig C.2.46



59 The decentralized coupling model adopted on the Slovenian border is exactly the same as the Price Coupling of Regions (PCR), a project which GME is developing in collaboration with the major European exchanges.

60 For further details, refer to Box 2 of GME's 2011 Annual Report.

61 This figure is the difference between the total volume traded on the Slovenian exchange (BSP, 4.4 TWh) and the volume allocated through market coupling (3.6 TWh).

62 The price spread of the two exchanges reflects a very different cost structure of the two generation fleets. In 2012, the price spread between the northern Italy zone and the BSP price (Slovenian exchange) was equal to 21.03 €/MWh (+8.05 €/MWh on 2011).

3. Gas markets

3.1 The gas system

Natural gas is a key fuel in the national energy context, accounting for 35% of total energy utilized in a year, as well as the primary source for electricity generation[63].

During the year, the system operator Snam Rete Gas (SRG) has moved a total of 75.9 billion cubic meters on the national high-pressure transmission network, 3.4% less than last year, in the face of a declining demand (83.7 billion cubic meters, down 3.3%), mainly driven by lower consumption for thermal generation (24.4 billion cubic meters, down 12.2%) (Tab C.3.1).

Tab C.3.1 **Volumes moved on the national transmission network[64]**

mm³	2006	2007	2008	2009	2010	2011	2012	delta %
Production	11,506	9,776	9,120	8,229	8,144	8,028	**8,277**	2.8%
Imports	76,482	73,512	76,526	68,676	75,168	70,276	**67,596**	-4.1%
Storage (delivery)	6,930	5,665	5,668	9,273	8,040	8,046	**7,827**	-3.0%
Total injected	94,919	88,953	91,315	86,177	91,353	86,349	**83,699**	-3.3%
Distribution	34,469	32,449	33,376	33,968	36,524	33,619	**33,889**	0.5%
Industrial	15,685	15,514	14,560	12,133	13,320	13,544	**13,379**	-1.5%
Thermal	31,007	33,718	33,477	28,672	29,818	27,732	**24,418**	-12.2%
Storage (injection)	10,608	4,417	6,791	8,496	8,681	8,942	**9,328**	4.0%
Other(exp.,grids/networks,system)	3,149	2,854	3,114	3,028	3,012	2,512	**2,686**	6.6%
Exports	-	-	-	-	-	124	**196**	57.2%
Third-party grids/networks	-	-	-	-	-	1,325	**1,713**	28.9%
System	-	-	-	-	-	444	**778**	74.6%
Total withdrawn	94,919	88,953	91,315	86,177	91,353	86,349	**83,699**	-3.3%
Storage delta	3,678	-1,248	1,123	-776	641	896	**1,501**	67.0%
Total transmitted	87,989	84,536	85,646	77,681	83,313	78,304	**75,872**	-3.4%

The drop of withdrawals for thermal generation is characterized by a declining demand for the fourth consecutive year, due to the economic situation. At the same time, combined cycle plants were crowded out by a larger availability of the more competitive renewables (see Section C.2). A look at the monthly figures shows that consumption is especially declining in the first and third four-month period of the year. The withdrawals for distribution are stable at the levels of the past years (33.9 billion cubic meters, up 0.5% from 2011). However, a more accurate analysis reveals a declining trend in consumption with an average increase in temperature (+1°C compared to typical standards[65]). The average level is counterbalanced by higher withdrawals in April and December (+12% and +5% over 6 years), with the coldest, below the average temperatures. The month of February was exceptional: a wave of frost hit most of the country for two weeks, leading to the highest withdrawals level (+29% over 6 years), even higher than in January. The industrial consumption (13.4 bcm) slightly decreased on 2011 (-1.5%) but remains well below the average levels observed prior to the economic downturn (-12.5% compared to the average level of 2006-2008). The decline is distributed evenly across the months of the year, with the exception of the month of August, when the value grew by 6 p.p. compared to pre-recession levels.

Export is rising (0.2 bcm; +57%) as well as redelivery to minor transmission networks (1.7 bcm; +29%), although it still accounts for just a tiny percentage of the total demand (2%).

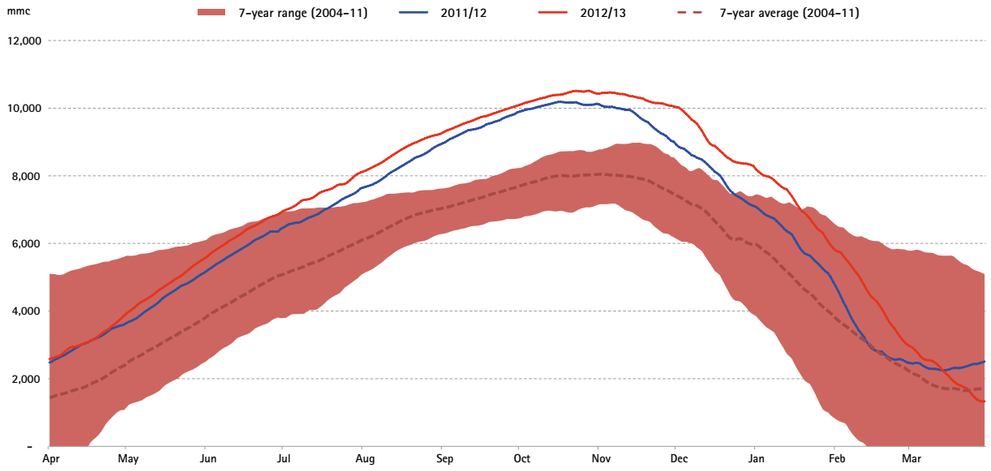
On the injection side, the decline in domestic demand is absorbed by the lower border supply (67.6 billion cubic meters, down 4.1%) and by a smaller delivery from storage (7.8 billion cubic meters, down 3%) while the domestic production is increasing (8.3 billion cubic meters, up 2.8%).

The decrease in imports was mainly due to volumes from Russia (23.8 billion cubic meters, -10%), Northern Europe (9 billion cubic meters, -17%) and Libya (6.5 billion cubic meters; -31%[66]); the decline in the regasification of LNG volumes from Arab countries (7.3 billion cubic meters, -19%) is quite striking. A minor decline affected imports from Algeria (-4%), which remains the second largest supply country (31% of total imports) after Russia (35%). Looking at the monthly data, the decline pattern seems to be concentrated in the winter months (with the exception of the peak in February), in line with the physiological fluctuation of seasonal flows.

The role played by delivery from storage keeps being crucial, covering 9% of the total demand this year. In the 2012/2013 storage year[67], the leading provider of modulation services, Stogit, made higher volumes available to the operators (10.7 billion cubic meters; +7%) while the strategic storage was reduced (4.5 billion cubic meters, -10%).

Operators have only partially exploited this increased availability; injections rose (+3%) but only 94% of the capacity of storage sites was filled up, compared to 98% last year. Conversely, a sharp increase in winter deliveries (8.7 billion cubic meters, +18%) did occur, bringing the stock remaining at year-end (1.2 bcm) down to nearly half as much as the initial level, as opposed to a near-equality in the previous year. However, this increase is totally concentrated in the month of March 2013, on the occasion of a spike in household consumption and above average spot prices (Fig. C.3.1).

Fig C.3.1 **Stocks in the 2004-2012 storage years**



Source: Stogit

63 Source: MSE "Bilancio Energetico Nazionale 2011", 63,814 Mtoe of gas utilized out of 184.204,00 Mtoe of consumed electricity.

64 Daily balance data (source: Snam as at 31/12/2012) and GME elaboration: to calculate the rate of change from 2011, 2012 data were adjusted for the leap year; the total demand (or total withdrawn volume) is calculated as the sum of volumes delivered back and storage injections; conversely, the total transported volume is calculated as the sum of volumes injected from the points of production and import and the absolute differential (only when this is negative) of storage inventories at the beginning and end of the year (storage delta).

65 The average temperature anomalies observed in 2012 (+1.02°C) were calculated compared to the 1971-2000 period. Source: "Meteogiornale.it" on ISAC-CNR data.

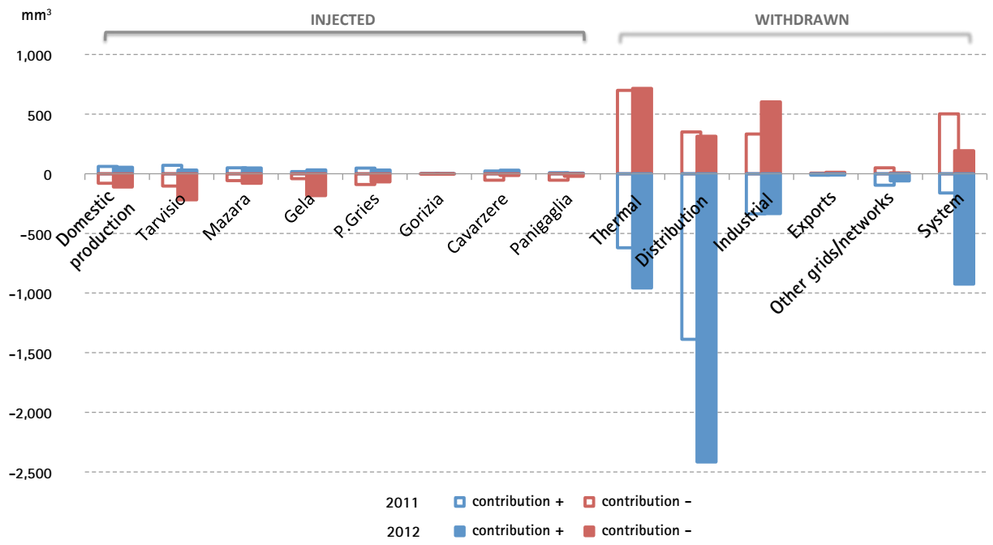
66 This comparison was made with volumes imported in 2010, since 2011 volumes had collapsed because of the civil war in Libya.

67 See Glossary.

As to the balancing of flows in each individual gas day[68], despite a declining demand the system was mostly long in two thirds of sessions (244/366 days); on the opposite, it was mostly short in March-December 2011[69]. Over two thirds of the overall imbalance was on the demand side: the various sectors withdrew 2.0 billion cubic meters more and 4.4 billion cubic meters less than scheduled, proportionally to the volumes actually withdrawn by each sector (Fig C.3.2). On the supply side, production, import and export flows accounted for just 18% of the overall imbalance, with the majority of imbalance volumes in the negative. Conversely, 13% was due to withdrawals and injections made by Snam, which reduced the overall imbalance in 67% of sessions[70].

Net of individual imbalances of an opposite sign, SRG had to find (either for purchase or sale on the PB-GAS) 3.1 billion cubic meters (equal to 4% of carried volume) to balance out the system; this is almost exactly the same quantity procured for imbalance purposes last year[71] (please refer to Section 3.3 for a further discussion on the imbalance sign).

Fig C.3.2 **Contributions to the overall system imbalance by sector and imbalance side[72]**



Source: Snam

SRG[73] published an SCS forecast at 7:00 p.m. on the day before the close of the gas day; this certainly helped expand the amount of information available to participants in order to estimate the cost-opportunity of their individual physical imbalance (and present offers on the PB-GAS). This value was shown to have a

68 See Glossary.

69 The data published by Snam allow to calculate the Overall System Imbalance (SCS) only from March 2011; in March-December 2011, there were 193 positive imbalances out of 306 days.

70 Actions taken by Snam (system withdrawals in the daily balance) are deemed to help an SCS reduction when its sign is opposite to the actual imbalance's.

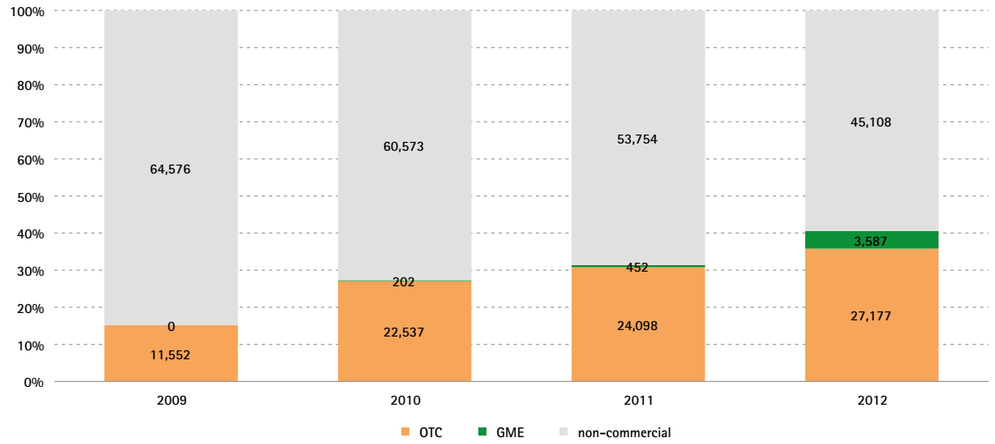
71 A comparison is made by calculating the ratio of the sum of daily SCS absolute values over the March-December period, in the lack of data prior to March 2011.

72 The so called "imbalance volumes" are calculated as the difference between volumes actually reported on the balance on G+1 and re-nominated volumes on day G they are referred to. In both years, the March-December period was considered.

73 Introduced from October 2011.

26% mean error rate relative to the actual balance value[74].
Finally, the share of transmitted volumes subject to commercial trading increased (41%; +9 p.p. since 2011); at the same time, trades registered on SRG platform[75] also grew (27 bcm; +13%) as well as the transactions concluded on GME's regulated platforms (3.6 bcm) (Fig. C.3.3).

Fig C.3.3 **Volumes covered by commercial trades in total transmitted volumes (m³)**



Source: Snam and GME

3.2 Market liquidity

To GME, 2012 has been very important in the gas sector: the overall volumes traded on GME's platforms grew from 5 to 38 TWh, namely 13% of volumes registered at the PSV and 5% of volumes delivered by SRG. A similar increase occurred in the number of participants registered in the various markets, for a total number of 92 (+19%) (Tab. C.3.2).

The vast majority of such volumes and increases clearly results from the full operation of the balancing platform (PB-GAS); it started in December 2011 and became heavily used by participants, with trades worth about 35 TWh: suffice it to think that most registered participants operated on the balancing platform, whereas only 9 were active on all three platforms (M-GAS, P-GAS, PB-GAS). In this market, liquidity is clearly facilitated by SRG participation for its own balancing needs and by the mandatory participation of participants. This said, its operation is extremely important: other than providing an economic value of the system imbalance through a transparent pricing process, it also provides, for the first time, an official reference price to participants in the spot market. This is an alternative to the only previously existing reference, i.e. the price estimate of bilateral contracts registered at the PSV (Tab. C.3.3).

On the other hand, the liquidity of the other platforms remains pretty limited; it is basically influenced by the regulatory constraints applicable to the various segments. They were established to allow participants

74 The error is calculated as the average ratio of the forecasting difference and the actual imbalance values, both squared.

75 We report traded volumes with an impact on physical nominations (net traded volumes).

to fulfill their obligation to sell to third parties a share of their national production and imports, which translate into explicit obligations to bid and price constraints.
In particular, only the P-GAS Royalties segment is quite active (approximately 3 TWh), but just in 6 out of 126 sessions. Volumes, on the other hand, are negligible in the M-GAS day-ahead and intra-day sessions, with trades in 42 and 15 sessions, respectively, worth 0.136 TWh and 0.036 TWh. They were non-existent in the P-Gas import and virtual storage segments (Tab. C.3.3).

Tab C.3.2 **Participation in the gas markets**[76]

	2010	2011	2012
GME			
Participants	53	77	**92**
P-GAS			
Participants	53	61	**72**
Royalties			
Participants with accepted bids/offers	17	17	**72**
Imports			
Participants with accepted bids/offers	2	0	**0**
As per Legislative Decree 130/10			
Participants with accepted bids/offers	n.a.	n.a.	**0**
M-Gas			
Participants	20	33	**42**
MGP-continuous trading			
Participants with accepted bids/offers	0	16	**11**
MGP-auction			
Participants with accepted bids/offers	1	3	**0**
MI			
Participants with accepted bids/offers	0	7	**5**
PB-Gas			
Participants	n.a.	60	**65**
Participants with accepted bids/offers	n.a.	38	**68**

76 The number of registered participants is reported as of 31 December of each year.

Tab C.3.3 **Volumes traded by market platform (GWh)**[77]

	2010	2011	2012
PSV			
Total volumes traded	238,515	255,035	**287,626**
GME			
Total volumes traded	2,142	4,785	**37,965**
MGP-continuous trading			
Volumes accepted	-	148	**136**
Sessions. No.	0/19	78/365	**42/366**
MGP-auction			
Volumes accepted. GWh	1	1	**-**
Sessioni. N.	1/19	2/365	**0/366**
MI			
Volumes accepted. GWh	-	13	**36**
Sessions. No.	0/19	18/365	**15/366**
PB-Gas			
Volumes accepted. GWh		1,712	**34,925**
Sessions. No.		31/31	**366/366**
Royalties			
Volumes accepted. GWh	2,141	2,911	**2,868**
Sessions. No.	7/92	8/126	**6/126**
Import			
Volumes accepted. GWh	0	-	**-**
Sessions. No.	1/169	0/252	**0/253**
As per Legislative Decree 130/10			
Volumes accepted. GWh			**-**
Sessions. No.			**0/167**

* Volumes traded having an impact on physical nominations (net traded volume)

3.3 PB-GAS

In the course of 2012, a total of 35 TWh was traded, i.e. 12% of volumes traded at the PSV and 4% of volumes withdrawn from the system over the same period. Although active participants[78] have just an obligation to bid on the PB-GAS, the stimulus to be actively involved with the balancing pricing process was well taken by most participants subject to said obligation: out of 68 active participants in at least one of the 366 sessions, each participant average-wise traded 10 GWh per session, i.e. 6% of volumes offered by participants themselves.
The unique nature of the PB-Gas, a market instrument established to allow SRG to procure balancing resources, entails one specific aspect: in 92% of traded volumes[79] SRG acts as counterparty. In over two

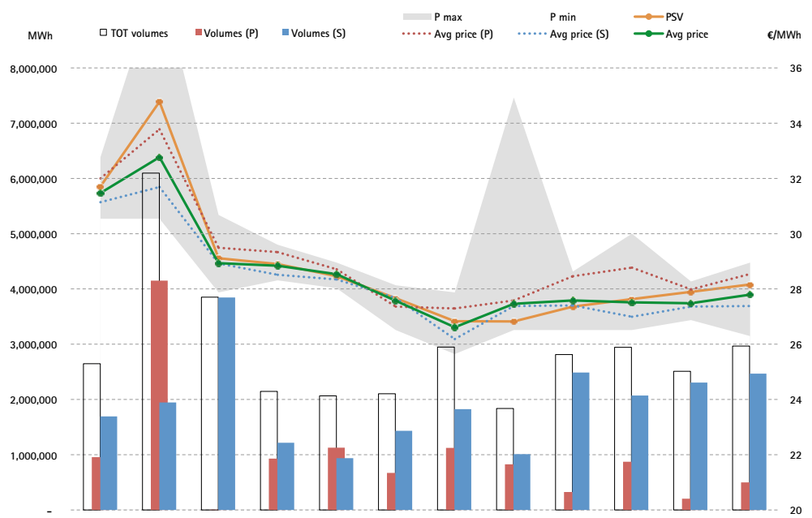
77 As to volumes traded at the PSV, we report only volumes which had an impact on physical nominations (net traded volume); the "number of sessions" is the number of days with at least one trade out of the number of sessions in a calendar year.

78 On the balancing platform, "active" means a participant who has traded volumes in the reference sessions; submitting a bid/offer in itself is unimportant, since participants are obliged to participate in this market.

79 The figure refers to the Apr-Dec 2012 period; prior to that date, the applicable legislation provided that only the bid/offer of the system operator on the imbalance side could be accepted. In 2012, this figure was equal to 95%, since it incorporated three months of 100% quotas resulting from the regulatory constraints.

thirds of cases, volumes were sold by reason of a system which was long in most days of the year (244/366 days). This trend is the opposite as in 2011, when the system turned out to be long in less than one third of the time (refer to §3.1 for further details on system balancing).
At the same time, the remaining 8% of the overall traded volumes (1.8 TWh) resulted from the trading of volumes among participants. This was possible with the final setup of the market (from 1 April 2012), whereby volumes offered on the same system imbalance side are accepted, too. Interestingly, after changing the system, the market participation has remained steady (51 active / 65 registered participants) with a small trade of volumes among participants. This confirms that the platform is mostly used for balancing, rather than trading purposes (at any rate, with the current system in the lack of imbalance sanctions, trading can be performed also by resorting to imbalance); such method is absolutely consistent with the goal of attaching a financial value to the volumes utilized by Snam for the physical system balancing (Tab. C.3.4).

Fig C.3.4 **Volumes and prices on the Gas Balancing Platform (PB-GAS)**



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012
PB price (€/MWh)	31.46	32.76	28.92	28.83	28.52	27.56	26.6	27.45	27.57	27.5	27.47	27.78	**28.52**
PSV price (€/MWh)	31.70	34.77	29.10	28.89	28.45	27.65	26.82	26.81	27.35	27.62	27.88	28.15	**28.76**
Average PB volumes/sess. (GWh)	85	210	124	72	67	70	95	59	94	95	84	96	**95**
no. of active participants	37	46	35	40	43	42	46	43	40	43	39	41	**13**
changes on Snam side	10	2	2	8	7	9	9	4	7	7	6	8	**79**
price volatility	1.5%	5.5%	0.9%	1.2%	0.9%	1.2%	2.0%	7.0%	1.2%	2.4%	1.6%	1.2%	**2.9%**

The physiological presence of SRG's bid/offer on one of the two sides of the market has a number of implications. In terms of volumes and concentration, from time to time the market heads for the opposite side as SRG. In this respect, as far as the other active participants on the PB-GAS are concerned, 8 out of the 10 leading participants by volumes traded have relatively similar market shares on both sides of the system imbalance. As to the total traded volume, one third was traded among just 3 participants who approximately have a 10% market share each, whereas the remaining two thirds are scattered across the other 62 participants whose market share varies between 1% and 5%. The top two participants (E.ON and

SHELL) look homogeneous in terms of the ratio between the accepted volumes and their obligation to bid (~3% Acc/Off); the third participant (GDF) is the most active one in the market with a four-fold higher ratio (~12% Acc/Off) (Tab C.3.4).

Market shares of the top 10 PB-GAS participants[80] Tab C.3.4

	Short system		Long system		Both signs			% Sessions active
	P	S	P	S	P	S	TOT	
SNAM RETE GAS	91%	-	-	97%	30%	64%	**95%**	100%
E.ON ENERGY Trading SE	1%	9%	12%	0%	8%	3%	**12%**	62%
SHELL ITALIA S.P.A.	0%	13%	10%	0%	7%	4%	**11%**	48%
GDF SUEZ ENERGIA ITALIA S.p.A.	0%	7%	12%	0%	8%	2%	**10%**	56%
EDISON S.P.A.	0%	9%	3%	0%	2%	3%	**5%**	26%
SPIGAS SRL	0%	3%	5%	0%	3%	1%	**4%**	27%
ENEL TRADE S.P.A.	0%	10%	0%	0%	0%	3%	**4%**	4%
A2A TRADING S.r.l	0%	3%	4%	0%	2%	1%	**4%**	17%
BP ITALIA SPA	0%	1%	4%	0%	3%	0%	**3%**	26%
HB TRADING S.P.A.	1%	2%	3%	0%	2%	1%	**3%**	20%
ENI S.P.A.	0%	5%	2%	0%	1%	2%	**3%**	2%
other	6%	38%	45%	2%	32%	14%	**46%**	n.d.
Volumes (GWh)	11,691		23,234			34,925		-
TOTAL	33%		67%		100%	100%	**200%**	-

Broadly speaking, the concentration level of SRG counterparties is constantly high: the yearly average HHI is equal to 2,957 versus a theoretical threshold of 1,000 for a competitive market and a maximum of 10,000 for a perfect monopoly, highlighting a concentration value which is constant over time (Fig.C.3.5). Furthermore, as the imbalance volumes increase, the concentration of Snam's counterparty operators decreases (Fig C.3.6); this suggests that balancing participants on average can offer, at a competitive price, the same share of volumes even when the imbalance rises; during the year, the operators exhibited a good ability to respond to the system balancing needs through their storage capacity. As a further proof, an increase in the number of active participants was observed when the imbalance volumes rose. However, this condition applies to limited volumes (in absolute terms), such as those currently traded on the PB-GAS: the analysis of the limited peaks of the overall system imbalance (for instance, the peak which occurred in February) does highlight a fast increasing supply concentration on the PB-GAS, even though no participant played a pivotal role.

80 Figures reported as "total of both signs" reach 200%, to highlight the share held by Snam on the imbalance side (whatever it was) and by the individual participants on the opposite side.

Fig C.3.5 **Concentration of Snam's counterparty participants in the PB-GAS during the year**

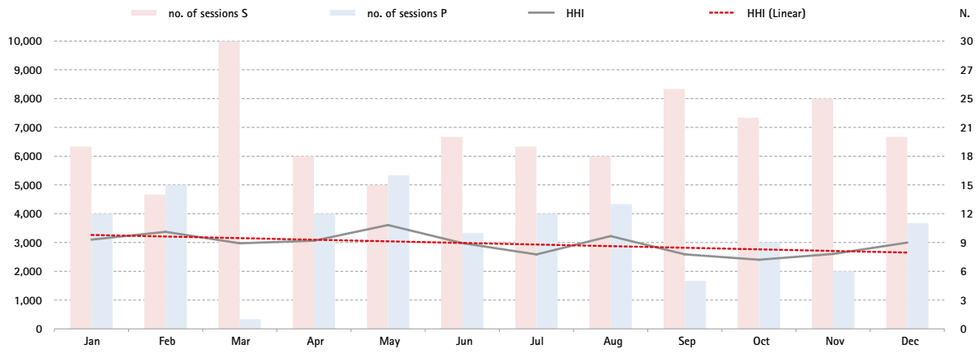
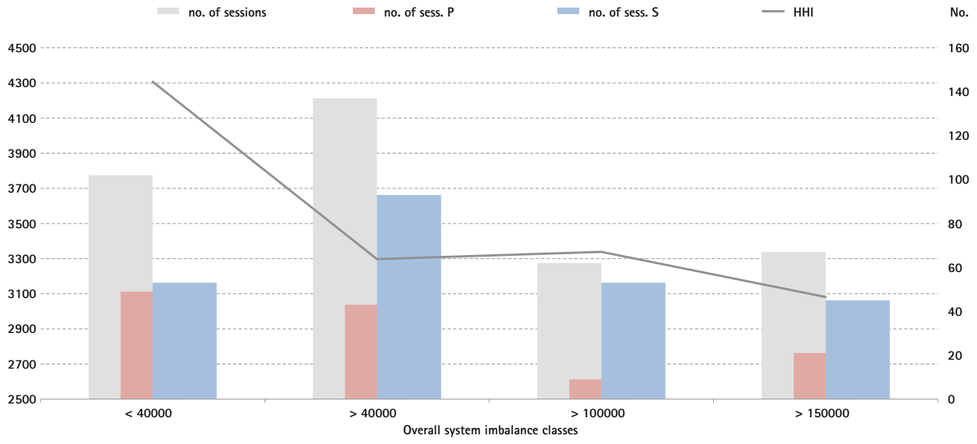


Fig C.3.6 **Concentration of Snam's counterparty participants in the PB-GAS vs. imbalance**



The most interesting indications from the PB-Gas, however, include those on the price level and structure. As to the first aspect, a major alignment is observed between the balancing price on the PB-Gas and prices posted at the PSV. Such alignment is both yearly (the first one is worth 28.52 €/MWh, the latter 28.76 €/MWh[81]) and also in the course of the year, with daily differences within a range of ±0.67 €/MWh and a declining trend. At year end, this translated into a reduction of nearly 5 €/MWh on the beginning of the same year, upturning the growth by over 7 €/MWh which was observed last year[82] (see §3.6).

On the PB-GAS the price volatility is very low (2.86%), with an average level reflecting Snam's position: if one considers just the number of consecutive days on which Snam balances on the same side, the price volatility is remarkably less (1.6%) relative to the days on which Snam changes the bidding side (4.62%). Generally speaking, the PB-GAS volatility is lower than the PSV (5.37%), both considering the total number of balancing sessions and limiting these latter to the days on which the PSV[83] price is observed. However, the volatility of the two prices is aligned, net of the peaks which occurred on both platforms during the year. To the exclusion of the price spikes in January on both platforms and the spike in one August session on the PB-GAS, the PSV volatility goes down to 1.29% whereas the PB-GAS one drops to 1.62.

The PB-Gas started in December 2011; hence, an analysis of the price trend can be performed only considering the value posted at the PSV as a reference price for all periods prior to that date. In this sense, what emerges is a modest increase in price on an annual basis (+2%), which however implies a reversal of the upward trend of 2011 from 24 to 33 €/MWh, with a decreasing trend in the first half of 2012, down to 27 €/MWh. It became virtually stable in the second half of the year, remaining below 28 €/MWh at all times (see § 3.6).

The main factor contributing to the price decline is a low demand; such phenomenon, however, is also attributable to the renegotiation of several long-term contracts in 2011/2012[84]. Indeed, withdrawals from the national network markedly dropped (-4.2%),[85] mostly because of the consumption decline in the thermal generation sector (-12.2%), which in its turn suffered from the electricity demand crisis and competition from renewables.

Also, it should be noted that a greater availability of the storage volume may have contributed to mitigating not so much the daily price spikes, which by nature are uncommon and limited, as the average level of prices in the winter versus summer: in fact, despite the increase in the modulation space allocated to operators in the thermal year 2012/2013[86], the seasonal spread of spot prices was the second lowest in the last six years (Tab. C.3.5).

Tab C.3.5 **Seasonal averages and spreads of prices posted at the PSV**

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
S1 (summer)	18.21	29.27	13.51	23.57	27.52	27.64
S2 (winter)	25.34	29.49	20.62	25.04	32.21	27.87
spread	**7.13**	**0.21**	**7.11**	**1.47**	**4.69**	**0.23**

Source: Thomson Reuters

The above remarks apply to the average yearly sessions, i.e. to a standard system and market. In the presence of physical and commercial tensions, the different nature of the two markets can turn into significant price differences. For example, during the session held on 9 February 2012, when a 20%-50% upward trend was exhibited by domestic and foreign spot markets, the PSV price showed a 32 €/MWh premium over the PB-GAS price.

In particular, during the period between 31 January and 12 February, a simultaneous series of events led to spikes in the daily imbalance[87]: first of all, on the demand side, the sharp drop of temperature caused exceptional withdrawals from the distribution networks[88]; secondly, on the supply side, the decline of

81 Source: Thomson-Reuters, delayed by one day.

82 This is a comparison with prices at the PSV in 2011, since the PB-GAS entered into operation in December 2011.

83 By restricting this calculation to the sessions in which the PSV price is observed, the PB-GAS volatility is equal to 3.38%.

84 According to REF estimates, in 2011/2012 wholesale supply contracts at the Italian border were renegotiated and were worth over 100 Gcm/year (Natural Gas Outlook #6, December 2012). It is worth noting that the same downward trend was impacted by the slower price increase of crude oil, which remains the main component of the indexation formulas of such contracts. In fact, the Gas Release 07 index rose from a growth of more than 10 €/MWh in 2011 to a stationary change of less than 5 €/MWh in 2012. The price decrease in long-term contracts has been granted, in most cases, keeping the net back pricing method, without adding any spot component; they rather changed the formula coefficients, including the level of the base price. In addition, the link between the prices of long term contracts and prices in the Continental European hubs generally seems to be no more than 15% (REF, Natural Gas Outlook #6, December 2012).

85 It excludes storage injections.

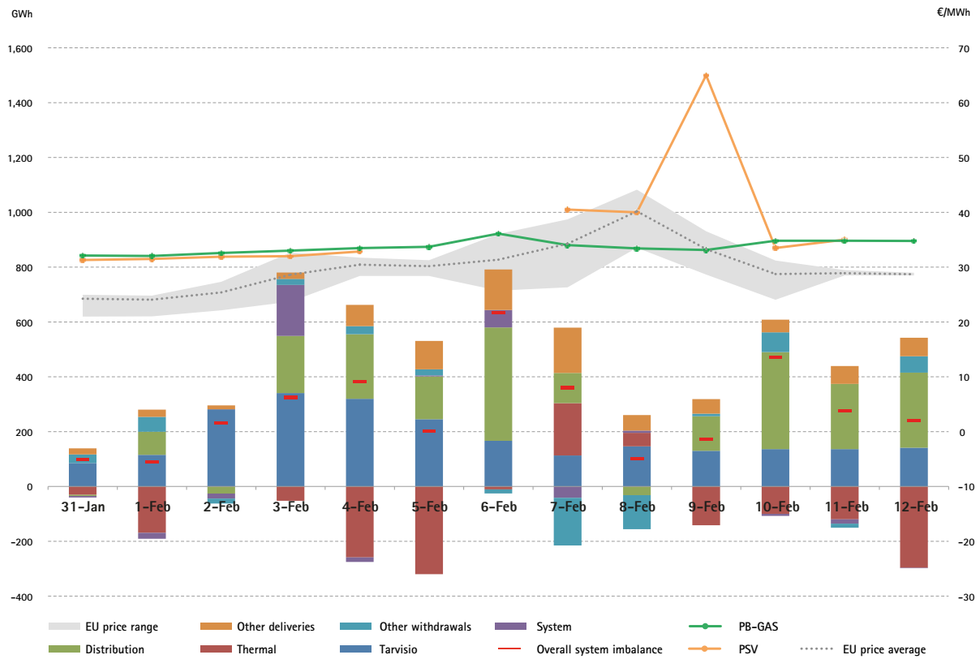
86 The space allocated to users for the seasonal modulation of flows during the thermal year 2012/2013 was about 11 billion cubic meters (+7% on 2011/2012 and +27% on 2008/2009) (source: Stogit); in addition, more space is virtually made available as under Legislative Decree 130/10.

87 On average, the overall system imbalance was equal to 276 GWh (3.2 fold greater than the yearly average of sessions with a positive SCS); there was a spike of 634 GWh on 6 February.

88 +29% on the average of the previous 6 years.

imports was induced by the decrease of deliveries on the north-eastern border[89] and by the partially unavailable transmission capacity on the GreenStream, as well as by the impossibility to deliver LNG because of bad weather. Although the other import points had not saturated their nominal transmission capacity yet[90], storage sites injected flows exceeding their nominal delivery capacity[91] into the system, with a wide availability of stocks[92]. The registered imbalance was not critical, though; this is confirmed by the fact that the available supply from every participant on the balancing platform was more than sufficient to meet SRG requirements, although it was smaller than average[93] (see Tab. C.3.6 and Fig. C.3.7).
A day-ahead balancing market will represent a spot assessment instrument to indicate the scarcity of the storage injection or withdrawal ahead of time relative to the B-GAS, with a significant improvement in terms of system transparency.

Fig C.3.7 **Overall system imbalance, contributions by sector and spot prices – Feb. 2012**



Source: SRG, GME, Thomson-Reuters, CEGH, APX, EEX, PowerNext

Tab C.3.6 **Volumes offered and accepted on the PB-GAS – Feb. 2012 (GWh)**

	31-Jan	01-Feb	02-Feb	03-Feb	04-Feb	05-Feb	06-Feb	07-Feb	08-Feb	09-Feb	10-Feb	11-Feb	12-Feb	*average*
Volumes offered	1,218	1,015	1,547	1,753	1,652	1,702	1,616	1,740	2,615	1,986	1,840	1,280	1,365	**1,641**
Volumes traded	98	89	231	325	383	202	635	360	101	173	471	275	241	**276**
% acc / off	8%	9%	15%	19%	23%	12%	39%	21%	4%	9%	26%	22%	18%	**17%**
% CR10	51%	27%	55%	76%	77%	62%	81%	82%	83%	79%	49%	76%	63%	**69%**
no. of selling part.	14	11	18	17	23	21	26	12	11	8	25	20	19	**17**

89 The net drop of deliveries from Russia (-16% of scheduled volumes) was apparently due, according to official sources, to Gazprom inability to meet the whole European demand on the days in which the domestic withdrawals of gas in Russia had hit an all-time high (2 billion cubic meters a day), with a temperature below -35°C for several days in a row (source: Oxford Energy Comment, April 2012, Interfax News data).

90 At the interconnection points of Mazara and Passo Gries, the mean rate of utilization of nominal capacity was 92% and 81%, respectively; it reached 100% only on the sessions of 9-12 February.

91 On average, the rate of utilization of nominal capacity from storage sites (Stogit) was 91%, with a peak of 109% on 7 February.

92 At the beginning of the period, stocks in storage sites were equal to 4.9 billion cubic meters (nearly half the overall assigned space); this value rises to 9.9 billion cubic meters if the strategic reserve is added.

93 In 2012, on average the SCS accounted for 6% of volumes offered for sale by operators when SRG purchased; it accounted for 17% during the period being analyzed.

3.4 M-GAS

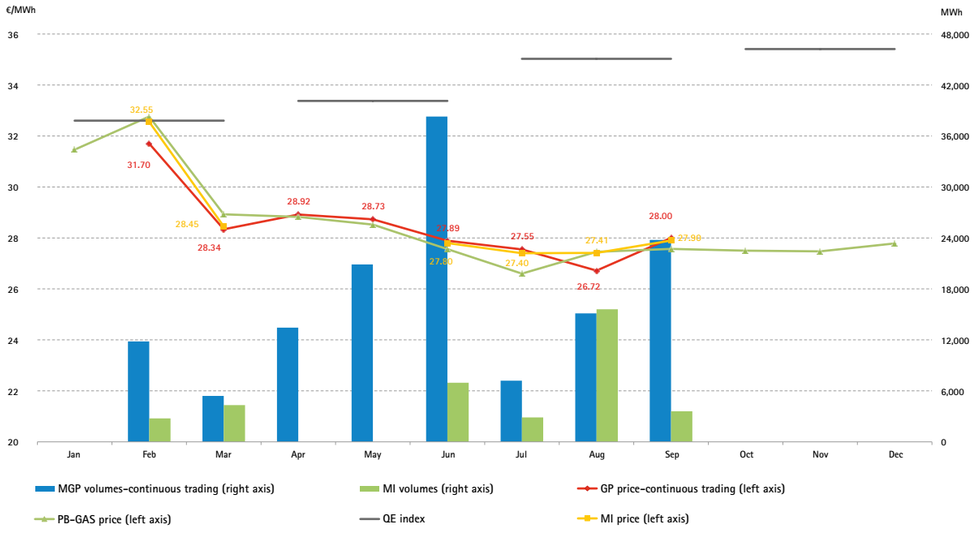
The spot market trading platform (M-Gas) keeps being illiquid, with regard to the traded volume (overall, 172 GWh) and to the number of sessions with recorded trades (42/366 on MGP and 15/366 on MI) as well as to the number of matched participants (11 participants, two of whom traded 83% of total volumes), (Fig. C.3.8).

In particular, in the continuous trading MGP, transactions seem to be concentrated in the first half of the year; as it happened in 2011, no matching was made in the auction market segment throughout 2012. Furthermore, although virtual storage operators can now fulfill their obligation to bid on this platform, too, causing a rise in the volumes offered for sale[94], no matching was finalized since prices were not competitive enough.

In the intra-day market (MI), the number of matchings was stable; the average traded volumes rose, with a slightly increasing utilization of this segment to balance one's own position prior to the deadline for the re-nomination of system flows.

Being the two platforms illiquid, yearly average prices are not significant. In this respect, the average monthly figures reported in Fig C.3.8 may be misleading, since they compare the average PB-GAS prices referred to every day of the month with average M-GAS prices referred to the few sessions with trades. However, in M-GAS sessions with transactions, the difference with the PB-GAS on average amounted to 17 c€ less, and never exceeded a difference of 2 €/MWh[95]. Trade prices were aligned with PSV and PB-GAS spot prices.

Fig C.3.8 **Volumes and prices in the spot market**[96]



94 As an alternative to the Segment as per legislative decree 130/10 of the P-GAS.

95 To the exclusion of a differential of over 8 €/MWh on 8 August 2012 with a price spike on the PB-GAS whereas the MGP-GAS price fell within the average value during the week.

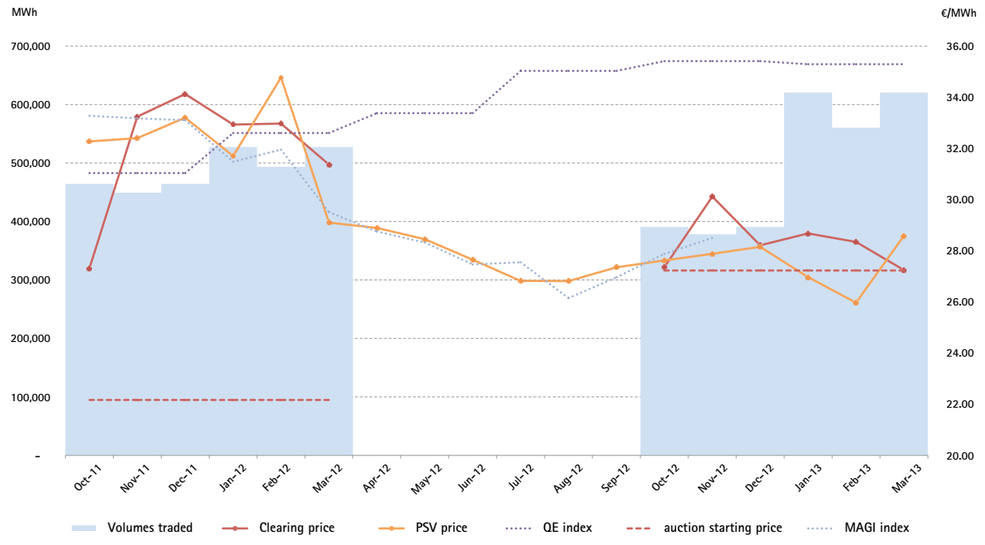
96 Prices reported for the PB-GAS represent the average of every day of the month being analyzed; in the M-GAS, prices represent the average of sessions with transactions during the month only (frequency ranging between 1 and 10 sessions a month).

3.5 P-GAS

In the forward markets, as already observed in 2011, participants subject to regulatory obligations submitted supply offers in each of the three segments: in the Imports' segment, participants offered pre-established quotas for the thermal year 2012/13 referred to gas imported from non European countries during the thermal year 2011/12[97]; in the segment as per legislative decree 130/10, investors participating in virtual storage offered, for the thermal year 2012/2013, the volumes corresponding to the quantities made available to them by virtual storage operators during the previous thermal year; in the Royalties' segment, participants offered for the 2012/2013 winter, the pre-established royalties owed to the State from their production from national gas fields during the previous thermal year.

However, even in 2012 there have been trades only for royalties from production in the Royalties' segment; the volumes offered under the auction mechanism by the obliged parties nearly always were traded during the first session of the relevant trading month, with an auction base price[98] which was competitive compared to the prices expected in the spot markets for the reference month (Fig C.3.9). Yet, this effect was smaller compared to the previous year: the differential between the auction base price and the clearing price diminished by nearly 90% (from 10 €/MWh to nearly 1 €/MWh), in line with the drop in the total demand (8.85 TWh, -59%). This pattern was particularly pronounced for the October 2012 and March 2013 products, when the difference with the auction base price was near to zero[99]; for the March product, it took 4 sessions to find a counterparty for the whole volume offered. This can be explained with the declining price in the spot markets and with the 2-month price expectations of participants, showing a positive correlation with spot prices and, on average, 122 c€/MWh higher (versus 25 c€/MWh in 2011/12); at the same time, the auction base price was unchanged, since it derived from an index unrelated with spot prices. Hence, a regulated auction base price, in the presence of large variations of spot prices, could require more sessions for supply allocation or even non-allocation.

Fig C.3.9 **Volumes and prices in the Royalties' segment**



97 As requested by article 11.2 of Law 40/2007 and established in Ministerial Decree of 19/03/2008.

98 As per ministerial communication 24/01/2012, no demand bids are accepted if lower than the arithmetical mean of QE index in the 4 quarters of the year (calendar year) for which royalties are due (i.e. the calendar year prior to the first month of trading in a given thermal year).

99 13 and 2 c€/MWh, respectively.

3.6 International comparisons

In 2012, major changes affected especially the European gas market, with two major developments: on the one hand, the growing liquidity of trades both in the regulated markets and in the hubs; on the other, the unprecedented convergence of prices on the continental platform and Italian prices; eventually, this ended with a reversal of the historical differential in the first quarter of 2013. These two factors are mutually interacting and are bound to have a major impact on the sector on both a commercial and organizational level; in the future, a growing integration of national markets into a single European market is quite likely. This may happen through a proper "market-coupling of gas" as well as the introduction of flow reversal systems at the borders.
As far as liquidity is concerned, it grew considerably both in the hubs and in the spot markets, with the first clearly prevailing over the latter (Tab. C.3.7).

Tab C.3.7 **Volumes traded in European regulated markets (GWh)[100]**

country	*platform*	2008	2009	2010	2011	2012	delta Y-1
Italy	*PB-GAS*	-	-	-	-	**34,925**	-
Austria	*CEGH*	-	-	778	1,526	**2,005**	31%
Germany	*EEX*	-	-	-	4,261	**6,187**	45%
France	*PowerNext*	-	1,765	6,529	12,791	**12,772**	0%
Netherlands	*EEX*	-	-	-	452	**674**	49%

Tab C.3.8 **Volumes traded on European hubs (GWh)[101]**

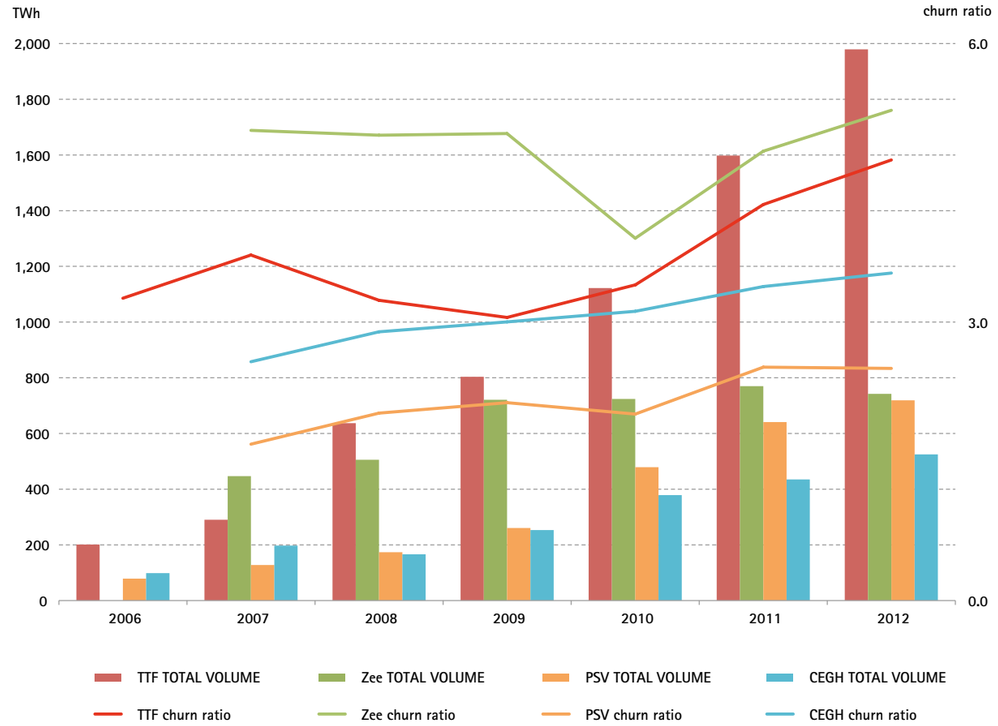
paese	*piattaforma*	2008	2009	2010	2011	2012	delta Y-1
Italy	*PSV*	173,741	260,588	479,146	641,135	**719,206**	12%
Austria	*CEGH*	166,020	253,340	378,660	435,010	**525,100**	21%
Netherlands	*TTF*	636,885	803,530	1,122,114	1,597,906	**1,979,126**	24%
Belgium	*Zeebrugge*	505,579	721,205	724,010	769,797	**742,462**	-4%
UK	*NBP*	1,344,935	11,507,039	13,672,222	14,185,474	**14,170,099**	0%

With respect to the hubs, the undisputed leaders are the Dutch TTF and the British NBP; with a strategic position at the crossroads among the three European producers (Norway, Netherlands and UK) and the great continental platform of consuming countries, they reached 1,979 TWh (+24%) and 14,170 TWh (a stable level), respectively. However, peripheral hubs are also growing at a fast pace: the Italian PSV (719 TWh; +12%) and the Austrian CEGH (525 TWh, +21%), now as big as Belgium's Zeebrugge (742 TWh, -4%). Within this framework, the relative immaturity of the Italian spot market and its growth potential are confirmed. In fact, the PSV is the European hub with the lowest ratio of total volumes traded to participants' actual nominations (the so called "churn ratio"). In addition, it was the only one which did not grow in 2012.

100 Sources: GME, CEGH, EEX, PowerNext.

101 Sources: Thomson-Reuters, Gasunie TS, Zeebrugge Hub Operator, National Grid Gas.

Fig C.3.10 **Volumes traded on European hubs and related churn ratios**



Conversely, the volumes recorded in the spot exchanges were quite low, despite a rising trend. In particular, the PB-Gas (35 TWh) is one of the most liquid, regulated markets in Europe, thanks to SRG's balancing purchases; it is 3-fold greater than the French platform PowerNext, established three years earlier, boasting a liquidity of 12 TWh; it is way bigger than the Austrian (CEGH), German (EEX) and Dutch (EEX) platforms, although all have been growing since their establishment (Tab C.3.8).

However, the most significant finding is the unprecedented price convergence across the whole European platform. On an annual basis, the spot prices of gas in the main hubs as well as in the European exchanges do confirm the upward trend of the previous two years, although at a different pace; this determined a difference between Italy and Europe, declining but still positive (from 5 to 3 €/MWh). This finding originates from a modest growth of the Italian reference, which stands at 28.74 €/MWh (+2%), against every other reference being around 25.4 €/MW and markedly growing (+11%) (Tab. C.3.9).

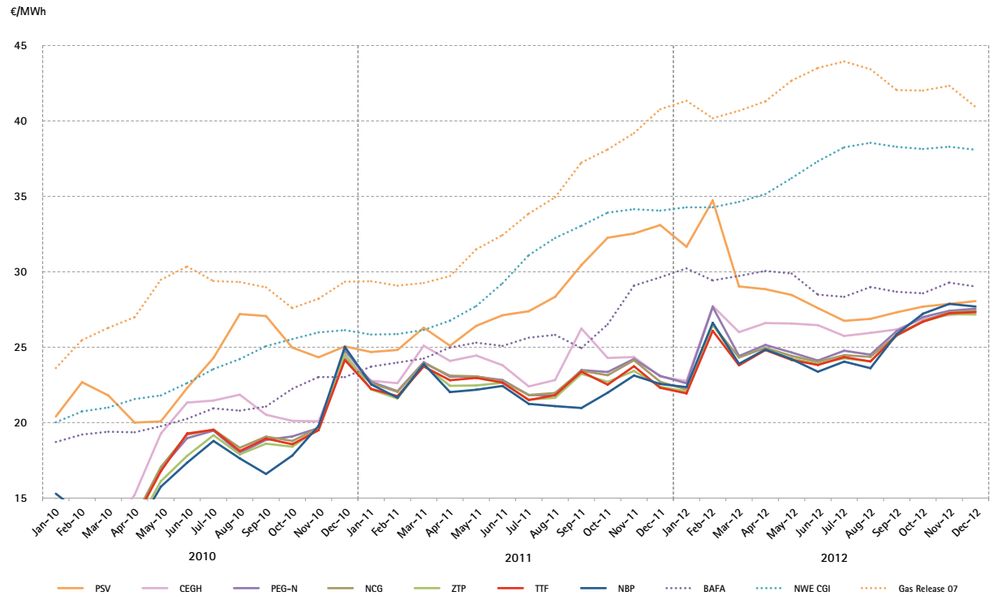
Tab C.3.9 **Prices posted on European and non-European marketplaces (€/MWh)**

country	trading point	platform	2008	2009	2010	2011	2012	delta %
US	Henry Hub	OTC		9,71	11,29	9,79	**7,31**	-25%
Italy	PSV	OTC	29.04	18.46	23.35	28.21	**28.74**	2%
		PB-GAS	-	-	-	-	**28.54**	-
Austria	CEGH	OTC	-	-	18.82	23.83	**26.28**	10%
		regulated market	n.d.	n.d.	18.76	23.83	**26.22**	10%
Germany	NCG	OTC	25.54	12.72	17.55	22.90	**25.21**	10%
		regulated market	-	-	-	22.82	**25.19**	10%
France	PEG Nord	OTC	25.83	12.59	17.53	22.96	**25.49**	11%
		regulated market	-	-	17.54	22.92	**25.47**	11%
Netherlands	TTF	OTC	24.94	12.24	17.38	22.62	**25.00**	11%
		regulated market	n.d.	12.21	17.43	22.65	**25.04**	11%
UK	NBP	OTC	24.91	11.82	16.91	22.14	**25.14**	14%
		regulated market	n.d.	11.83	16.91	22.14	**25.15**	14%
Belgium	ZTP	OTC	25.26	11.95	17.13	22.51	**25.05**	11%
		EU average	25.92	13.30	18.38	23.59	**25.84**	10%
		EU average (excluding PSV)	25.29	12.27	17.55	22.83	**25.36**	11%
		PSV-EU delta	3.75	6.19	5.79	5.38	**3.38**	-37%

In the monthly series, the differential exhibits an extremely pronounced convergence; values collapsed from the all-time high of 10 €/MWh in February to the all-time low of 1 €/MWh in December, reaching even negative values in the first quarter 2013 (Fig. C.3.11). This true "revolution" in the price system reflects an intra-yearly trend, although of a different intensity, on the two sides of the Alps: a pronounced drop in the first two four-month periods in Italy (starting from an absolute maximum level) and just a hint of such drop in Europe, followed by a timid recovery in Italy and by a sudden recovery in Europe (where it reaches its all-time high). More specifically, in all such countries the initial decline represents an increasing trend whereas the subsequent upward rise reflects a trend increase in Transalpine countries only, at a time when such values continued to decrease in Italy.

The above described general price trend appears to reflect the effect of import costs which are still, and heavily, oil-indexed; however, the different intensity of this pattern across the different four-month periods and geographies mostly originates from a long market.

Fig C.3.11 **Spot prices of the different European hubs and wholesale price indices**



The Austrian reference shows quite an interesting pattern. On the one hand, a clearcut price convergence across the various European hubs is still present (on average, there is a difference of less than 1 €/MWh[102]); France and Germany are generally driven by the fluctuations of the more liquid Netherlands and UK; nonetheless, the Austrian trading point, starting from February 2012, "took off" from this group and is aligned half-way between the PSV and the average level existing in the rest of Europe; it seems to act almost as an arbitrage absorber between the two countries (Fig C.3.12). This occurred when an interruptible, day-ahead capacity was introduced over the TAG (gas pipeline connecting Austria), facilitating an arbitrage of spot prices in the two markets (PSV and CEGH); in particular, during the first two months of operation (March and April 2012), the CEGH spot price went upward (with a smaller differential with the PSV) when a larger daily capacity volume was purchased. On a more general level, the presumably structural reduction of the PSV/EU differential may also be due to a long term higher capacity made available by ENI in the OTC market both on Transitgas (connection with PEG, TTF and GPL) and TAG (connection with CEGH)[103].

102 Monthly prices of 2012 for TTF, NBP, PEG Nord, NCG; February spikes were not considered.

103 Following AEEG Decision no. 23871, reported in Bulletin no.36 of 24/09/2012.

Fig C.3.12 **Utilized capacity and prices on the Italian-Austrian border**

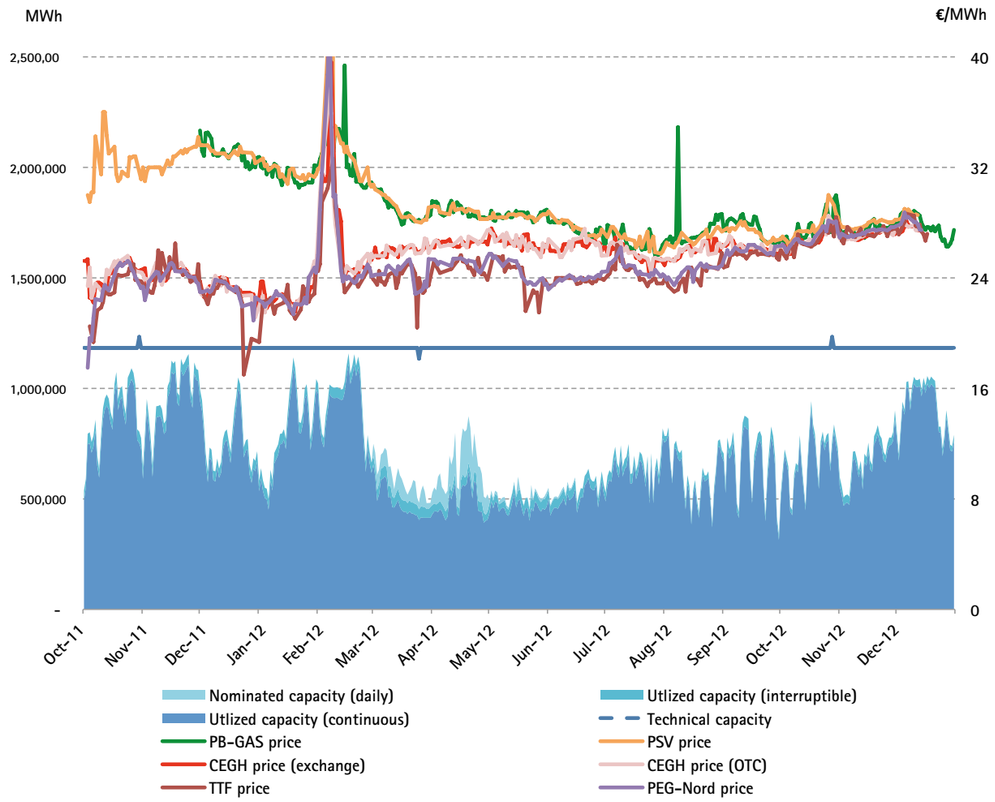
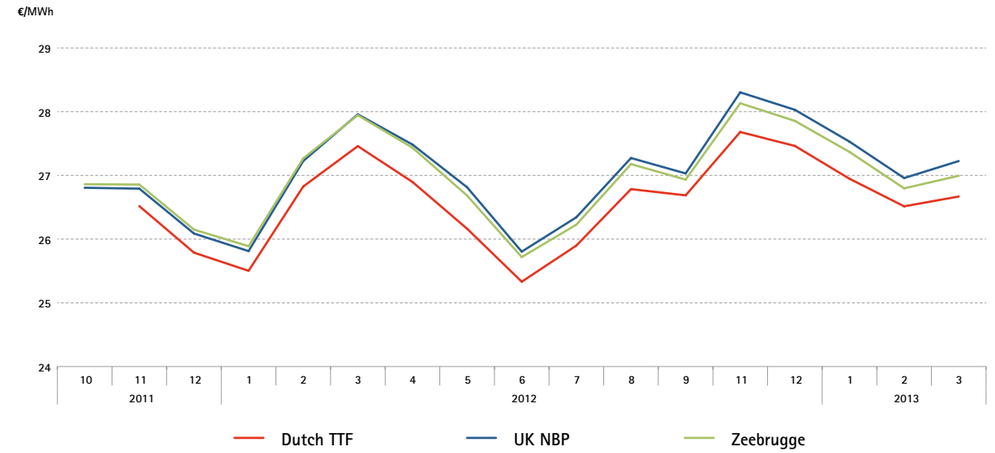


Fig C.3.13 **Forward prices (GY+1) on the different European hubs**



Source: Thomson-Reuters

In this sense, the absence of reliable forward prices in the Italian market, to be compared with similar ones in other markets, makes a projection on the future performance of this spread impossible. The only reference data is the trend of the forward prices for foreign gas markets, which - with reference to the thermal year 2012/2013 product, delivered last October - indicate an expected price of nearly 26.65 €/ MWh, in line with the current spot market values.

As noted in previous years, in the early months of trading, the spot price premium equaled approximately 4 €/MWh, with a physiological reduction near maturity, following a fluctuation trend closely related to that of spot prices. The thermal year 2013/2014 products, however, do not exhibit any premium or just a tiny one, in the first two months of trading with respect to spot prices. This phenomenon is not surprising if one considers that spot prices were up against a fall in consumption.

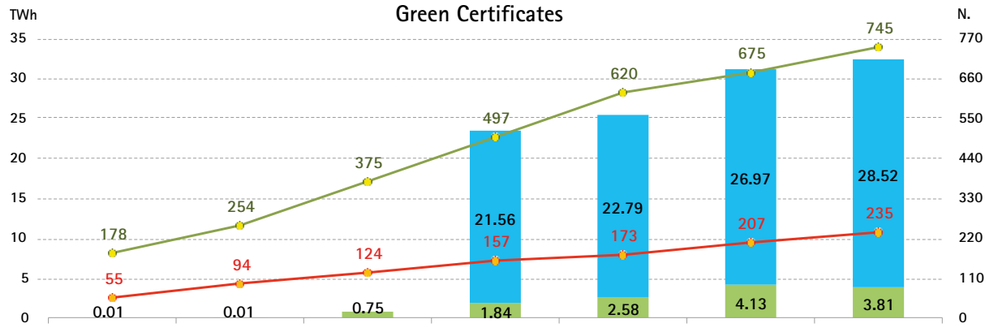
By contrast, participants' expectations for the one year price seems to be more closely linked to the expected downward market fundamentals.

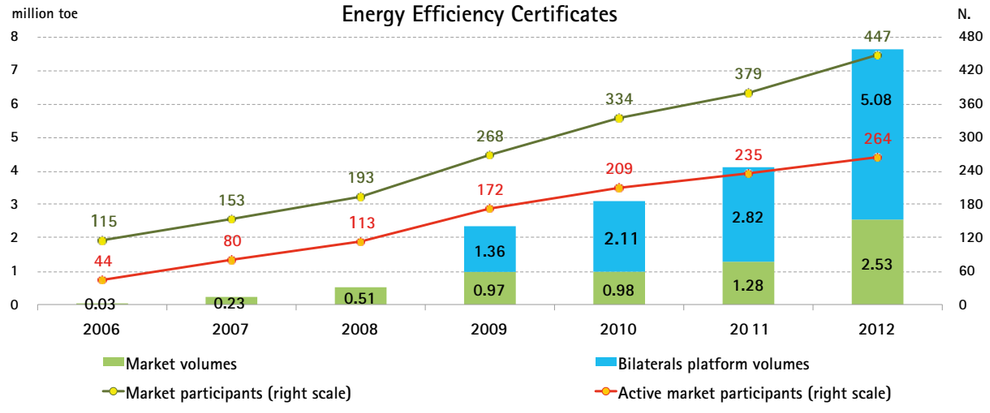
4. ENVIRONMENTAL MARKETS

4.1 Market participation

In 2012, environmental markets continued to grow, both in terms of volumes and participation, as it has happened ever since their inception. This pattern was also eased by the higher targets set for the obliged parties. The total volume traded on GCs and TEEs regulated markets and on the relevant bilateral platforms were higher than in previous years (Fig. C.4.1).

Fig C.4.1 **Volumes traded and participation in the markets**





As of 31 December, 745 participants were registered with the GCs market, 70 more than the previous year. During the year, those who operated in the market rose up to 235 (207 in 2011) (Tab. C.4.1).
At year end, participants registered with the TEE market were 447 (+68); in 2012, those who operated in the market increased by 29 units, up to 264.
On both markets, "sellers" are more numerous than "buyers", who are mostly accounted for by a limited number of obliged parties.
Finally, in the six sessions of the new RECO market, which started in July 2012, 28 participants had at least one matching, 18 of which on the supply side. At year end, registered participants were 180.

Tab C.4.1 **Market participation**

Market participants (No.)	2006	2007	2008	2009	2010	2011	2012
GCs							
Participants	178	254	375	497	620	675	745
with matchings	55	94	124	157	173	207	235
demand side	12	17	23	35	43	42	49
supply side	45	82	112	148	160	193	216
TEEs							
Participants	115	153	193	268	334	379	447
with matchings	44	80	113	172	209	235	264
demand side	12	23	35	42	44	57	65
supply side	32	65	95	140	177	195	225
RECOs							
Participants							180
with matchings							28
demand side							12
supply side							18

In the GCs regulated market, 2012 was a record year by number of registered transactions (4,246), although the volume of traded certificates, equal to 3.81 TWh, slightly declined from the previous year (Tab C.4.2). On the GCs Bilateral Platform, however, the number of traded certificates continued to grow up to 28.52 TWh with a number of transactions (2,125) still rising, although to a smaller extent than the market; this was due to the need of Obliged Parties to get large quantities of certificates with the lowest number of transactions possible. In 2012, therefore, the liquidity of the GCs market showed a slight decrease down to 11. 8% (-1.5 percentage points).
For TEEs, too, 2012 was a record year: out of nearly 6,000 transactions in the regulated markets, certificates were traded for a volume equal to 2.53 million toe; on the bilateral platform, transactions were 1,271 with 5.08 million toe of traded volumes. The market liquidity gained 2.1 percentage points, up to 33.3% (Tab. C.4.2).
In the new RECO market, there have been 53 transactions with a trading of guarantees worth 0.47 TWh, against 1.75 TWh traded on the bilateral platform (Tab. C.4.2).

Tab C.4.2 **Volumes traded**

	2006	2007	2008	2009	2010	2011	2012
GCs							
Market							
Volumes (TWh)	0.01	0.01	0.75	1.84	2.58	4.13	3.81
Transactions (No.)	152	315	1,039	2,255	2,731	3,118	4,246
Bilaterals platform							
Volumes (TWh)	-	-	-	21.56	22.79	26.97	28.52
Transactions (No.)	-	-	-	1,410	1,461	1,721	2,125
Liquidity	-	-	-	7.9%	10.2%	13.3%	11.8%
TEEs							
Market							
Volumes (million toe)	0.03	0.23	0.51	0.97	0.98	1.28	2.53
Transactions (No.)	180	622	1,206	2,113	2,803	3,527	5,987
Bilaterals platform							
Volumes (million toe)	-	-	0.59*	1.36	2.11	2.82	5.08
Transactions (No.)	-	-	251*	601	659	837	1,271
Liquidity	-	-	46.4%	41.7%	31.7%	31.2%	33.3%
RECOs							
Market							
Volumes (TWh)							0.47
Transactions (No.)							53
Bilaterals platform							
Volumes (TWh)							1.75
Transactions (No.)							53

* values for the April-December period

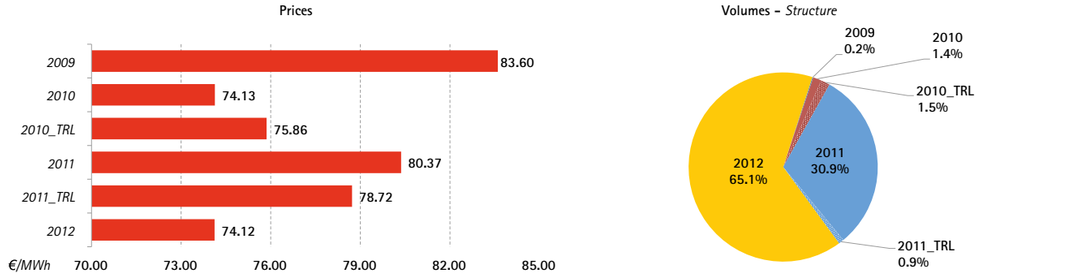
4.2 Green Certificates

Green Certificates (GCs) represent a type of support measure, based on market mechanisms, to encourage electricity generation from renewables. As a matter of fact, GCs can be traded and are issued by GSE proportionally to the electricity produced by a IAFR plant (renewable-fed plant), entered into operation by 31 December 2012, in accordance with Legislative Decree 28/2011; their number varies with the type of renewable and of plant (new construction, reactivation, expansion and remaking).
The GCs support mechanism, introduced by the electricity liberalization decree no. 79/99, is based on the obligation for producers and importers of electricity from conventional sources to inject into the grid, every year, a minimum amount (which increases from year to year) of electricity generated by renewable-fed plants.
Such obligation can be fulfilled either by injecting electricity from renewables into the grid or by purchasing GCs from "green" electricity producers, either in the market or through bilateral contracts.
GME organizes and runs the GCs market where it acts a central counterparty. Either as buyers or sellers, GSE, domestic and foreign producers, electricity importers, wholesale customers and associations (user and consumers' associations, environmentalist associations, labor unions) are entitled to participate in the GCs market, after applying to GME and qualifying as market participants.
The Green Certificate Bilaterals Registration Platform (PBCV) is an electronic platform to register and settle bilateral transactions covering the sale of green certificates, according to the provisions of the relevant Regulation.

4.2.1 Market and Bilateral Platform

In the 48 market sessions arranged by GME in 2012, 3.8 million MWh were traded, 7.8% down from the all-time high of the previous year (Fig C.4.3). The most traded certificates were those referred to 2012 and 2011, with 2.5 million MWh (65.1% of the total) and 1.2 million MWh (30.9%), respectively. The average price of GCs traded in 2012 varied between 74.12 €/MWh for GCs 2012 and 83.60 €/MWh for GCs 2009, whose trading period ended in March 2012 (Fig. C.4.2 and Tab. C.4.3).

Market: prices and volumes - 2012 Fig C.4.2



Market: results - 2012 Tab C.4.3

	2009	2010	2010_TRL	2011	2011_TRL	2012
Volumes traded (MWh)	6,139	54,832	58,672	1,175,891	34,309	2,476,496
Total value (€)	513,249	4,064,747	4,450,985	94,501,881	2,700,854	183,555,839
Minimum price (€/MWh)	81.00	69.00	70.40	70.49	74.00	69.00
Maximum price (€/MWh)	86.50	89.00	81.25	82.00	82.10	77.80
Average price (€/MWh)	83.60	74.13	75.86	80.37	78.72	74.12

The Green Certificates Market, after a time of uncertainty in its early years of operation, has been consolidating ever since 2009: this promoted an increase in traded volume, a steady decline of prices and a downward stabilization of the price volatility (Fig. C.4.3, Fig. C.4.4)
In 2012, the mean weighted price of GCs, of any type, down for the third consecutive time, hit an all-time low at 76.13 €/MWh, with a volatility slightly higher than 1%.

Fig C.4.3 **Market: prices and volumes**

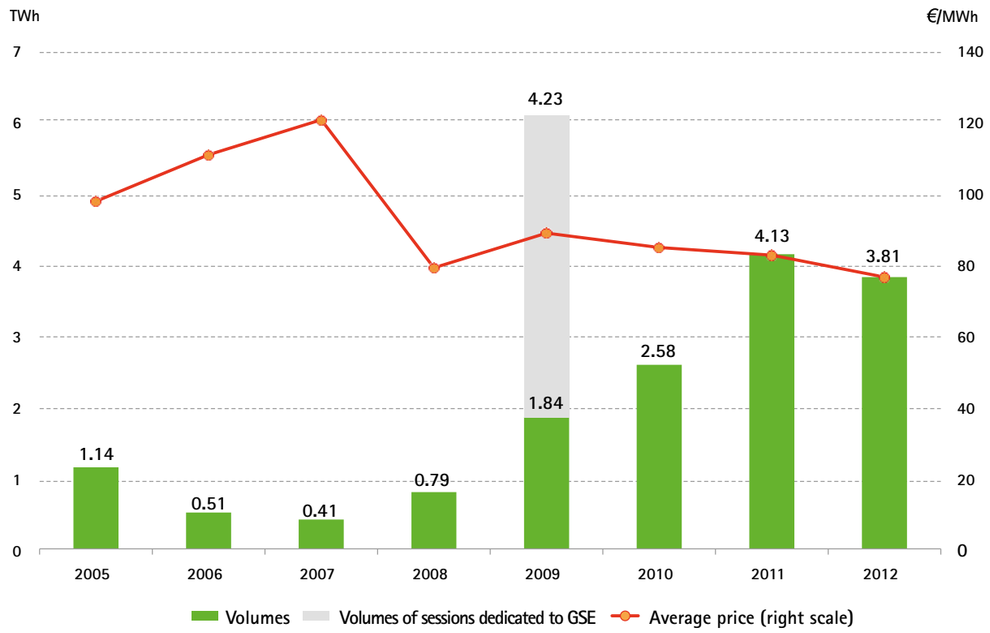
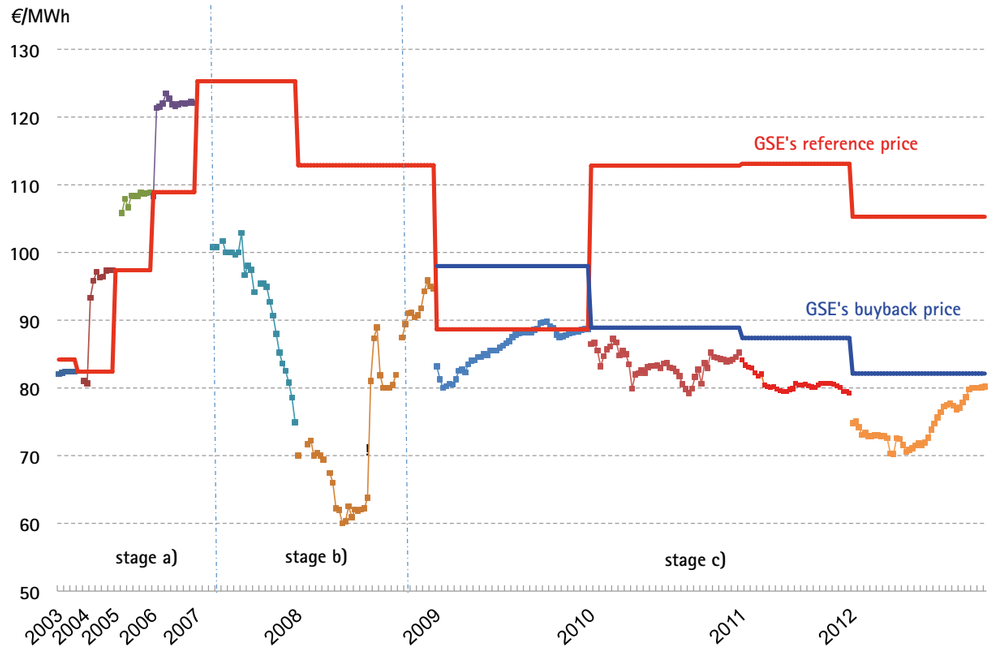


Fig C.4.4 **Market: price volatility**

As early as in the same year (2009), after the introduction of Decree 18 December 2008, GSE, as buyer of last resort, could totally absorb any excess supply, so as to ensure a perfect balancing of the market. Legislative decree 3 March 2011, no. 28, provides that the buyback price of GCs in excess for the years 2011-2015 is no longer equal to the average market price of GCs in the previous three years: it amounts to 78% of GSE's GCs reference price. This latter is the difference between 180 € and the average sale price of electricity in the year prior to buyback, as calculated by AEEG.
The reference price of GSE GCs for the year 2012 was equal to € 105.28 / MWh, while the buyback price of GCs issued in respect of generation of electricity from renewable sources in the same year was equal to € 82.12/MWh. The prices posted in 2012 market sessions were below such buyback /reference levels, due to the fact that the price is normally discounted by the interest rate for the period elapsing between the time of purchase and the time GSE actually makes such payment. In particular, in 2012 the timing of reimbursement was quite uncertain, which led to a market discount based on a higher buyback price.

Fig C.4.5 **Market: trend of prices vs. GSE's buyback price**

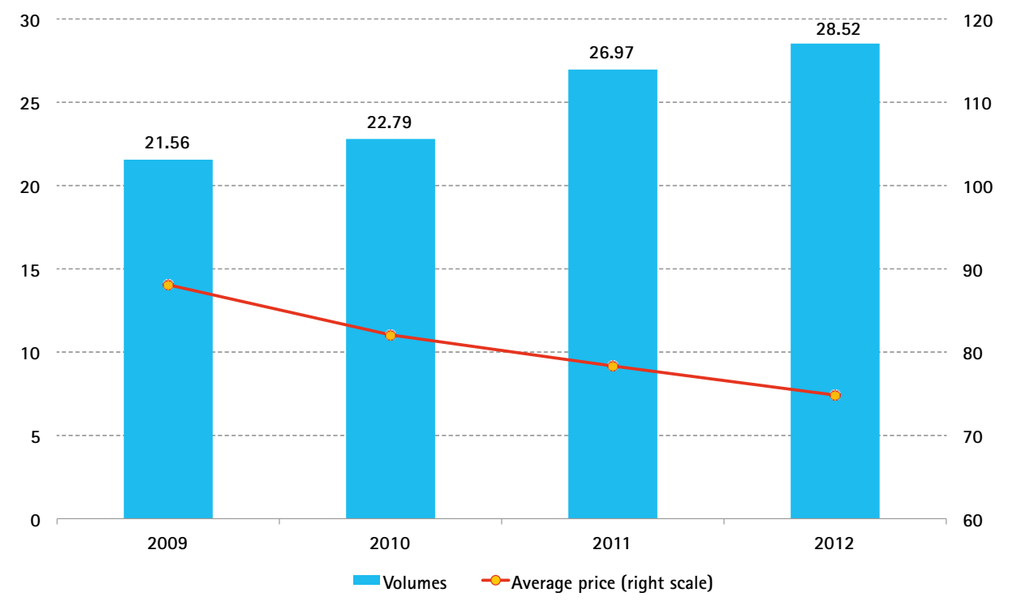


The GCs market is characterized by a supply from a variety of producers from renewable sources and by a demand mainly accounted for by the major producers of electricity from conventional sources subject to the obligation. Therefore, the market is more focused on the demand side where the percentage share of the top three participants (CR3), despite a decline of 16.0 percentage points, was still equal to 38.4% in 2012, against a 24.2% percentage on the supply side. The same trend was observed for the percentage share of the top ten participants (CR10), equal to 73.0% (demand side) and 47.1% (supply side) (Fig C.4.6).

Fig C.4.6 **Market: market shares**

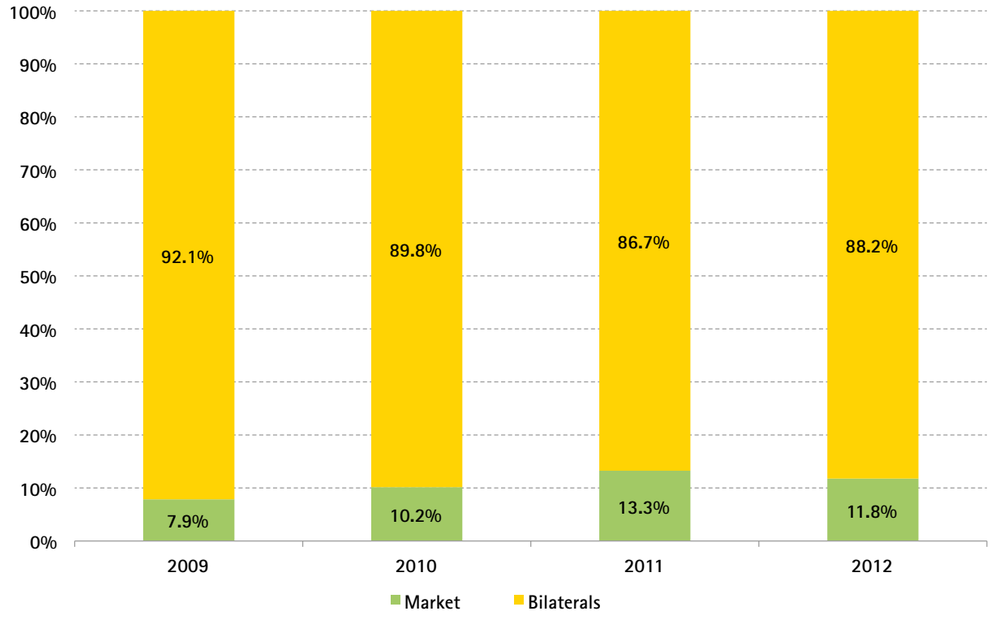
In the 2009-2012 period, even the GCs Bilaterals Platform was characterized, on the one hand, by an increase in registered transactions and, on the other, by a steady price decline.
In 2012, registrations reached a record level of 28.5 million MWh (+5.8% on the previous year), with an average price at a historical low of € 74.84 / MWh (Fig. C.4.7).

Fig C.4.7 **Bilaterals platform: prices and volumes**



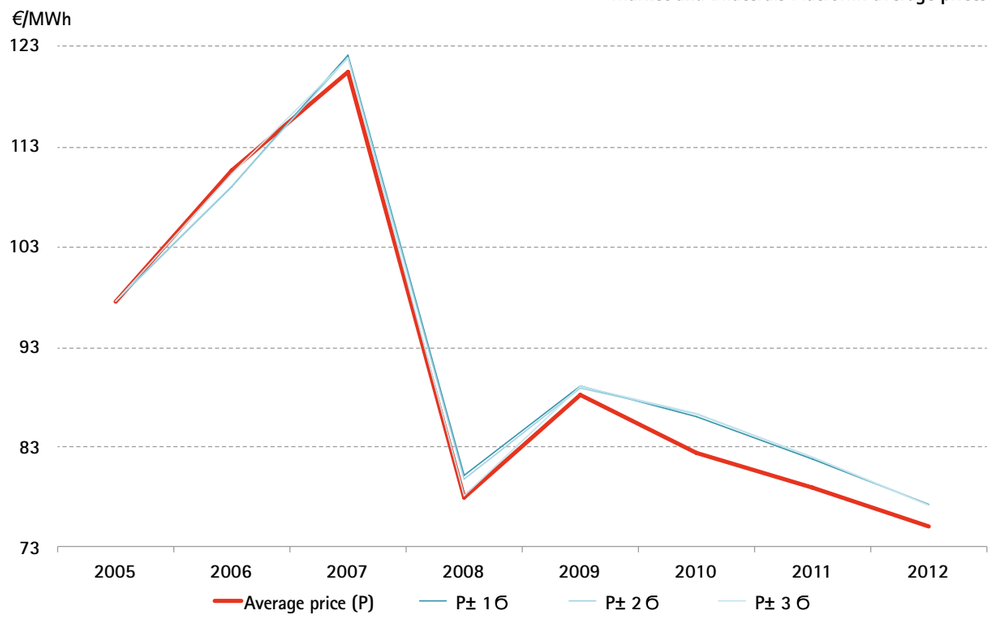
Although the regulated market insures participants against the risk of insolvency, thanks to GME's role as central counterparty, transactions registered on the bilaterals platform accounted for 90% of total certificates traded in the four-year period (Fig. C.4.8).

Fig C.4.8 **Comparison between market and bilaterals platform: shares**



Finally, Figure C.4.9 shows the time series of the average yearly price of GCs both in the regulated market and on the bilaterals platform, and the average values of the same prices calculated in the range of the average plus or minus one, two and three times the standard deviation (σ). These three series are virtually superimposed and show that the exclusion of the tails from the average results in a price increase attributable to the presence of a considerable number of bilateral transactions at zero cost.

Fig C.4.9 **Market and Bilaterals Platform: average prices**



4.3 Energy Efficiency Certificates

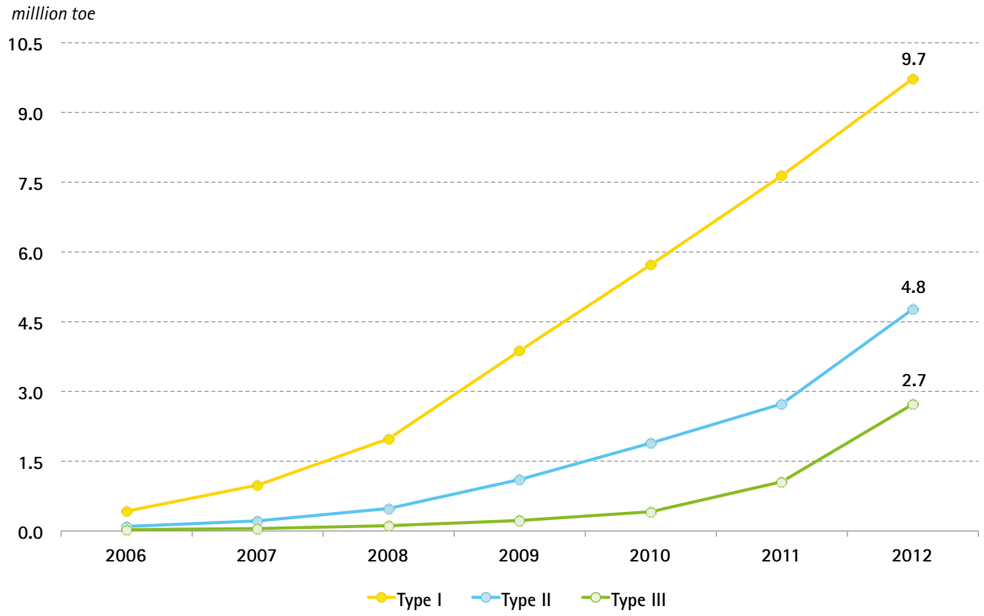
Energy Efficiency Certificates (TEEs), also known as White Certificates, were established by Decree of the Ministry of Productive Activities in agreement with the Minister of the Environment and Land Protection of 20 July 2004 (Ministerial Decree 20/7/04 electricity, Ministerial Decree 20/7/04 gas), as subsequently amended and supplemented by Ministerial Decree 21/12/07 and Ministerial Decree 28 December 2012. This latter decree defined the national quantitative targets in terms of energy efficiency for the 2013-2016 four-year period in order to fulfill the specific goals provided for by the National Plan on Energy Efficiency. TEEs are issued by GME under article 7, Ministerial Decree 28 December 2012, on the basis of the savings achieved and notified to GME by GSE[104], in compliance with provisions under Ministerial Decree 28 December 2012.

Electricity and gas distributors, i.e. the parties obliged to take part in the TEE mechanism, can accomplish their energy efficiency targets both by implementing an energy efficiency project which entitles to the subsequent granting of TEEs, as well as by purchasing TEEs elsewhere. GME arranges and runs the Energy Efficiency Certificates trading venue in the regulated market and on the bilaterals platform.

In 2012, GME issued, upon the prior authorization from the Electricity and Gas Regulator, 5.8 million Energy Efficiency Certificates. This is the highest number ever issued, with a 70.1% increase on 2011.

Hence, since the inception of the support measure, the number of certificates issued has been rising to 17.2 million: 9.7 million of type I, 4.8 million of type II and 2.7 million of type III (Tab. C.4.4).

Fig C.4.10 **Energy Efficiency Certificates issued: cumulative values**



104 Pursuant to Article 5 of Ministerial Decree 28 December 2012, AEEG designated GSE as the entity in charge of managing, assessing and certifying any savings resulting from energy efficiency projects under the white certificates mechanism, within 30 days from the publication of the decree itself. This measure became effective on 3 February 2013. As to projects for which the saving certification application has been submitted to AEEG prior to the above said date, AEEG shall notify GME about any savings accomplished by the individual participants.

4.3.1 The regulated market and the Energy Efficiency Certificates bilateral trading

In 2012, 2.5 million TEEs were traded in the regulated market, nearly twice as much as the previous year (+98.5%), hitting an all-time high.

Similarly to the past, the most traded certificates were type I, with 1.2 million toe (46.1% of the total); however, in 2012 the other two types grew considerably, too. In particular, with nearly 600,000 trades, TEEs of type III more than quadrupled relative to 2011.

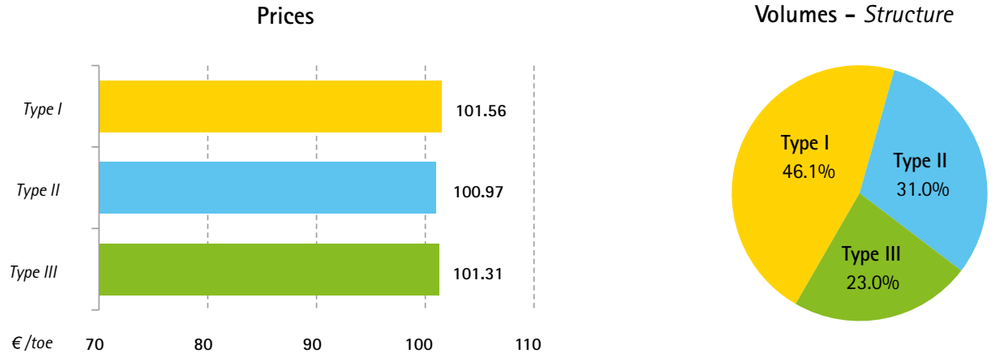
In 2012, TEEs prices (all three types) were quite stable at around 101 €/toe, the same level as in 2011. More specifically, the average price of type I TEEs reached a record level of 101.56 €/toe (+1.4%); the average price of type II and type III amounted to 100.97 (-0.2%) and 101.31 €/toe (-1.8%), respectively.

As a consequence, the overall trading activity was worth a record figure of 257 million euro (Tab. C.4.4 and Fig. C.4.11).

Tab C.4.4 **Energy Efficiency Certificates Market: results - 2012**

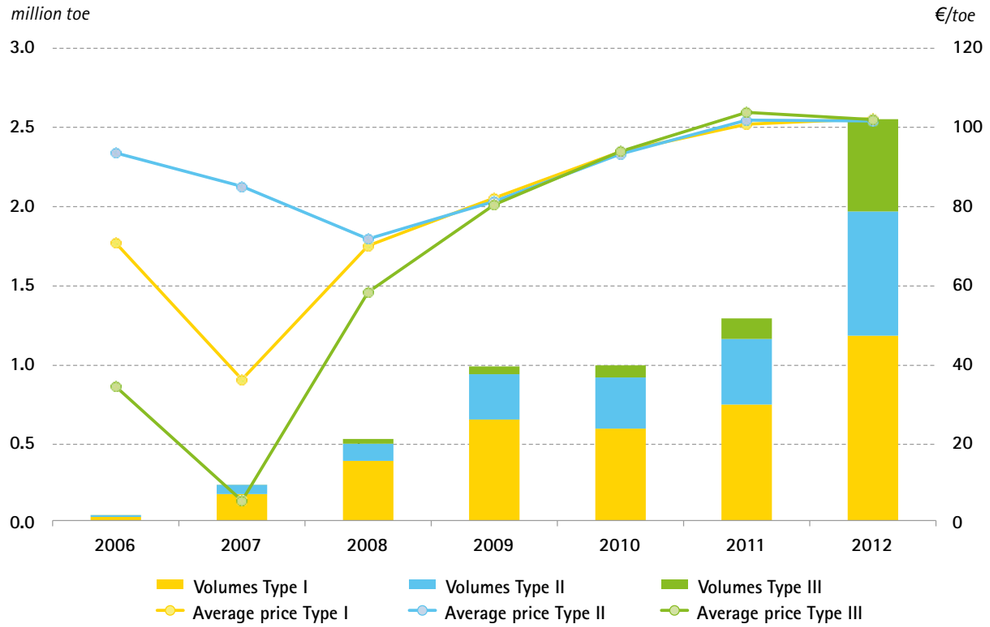
	Type I	Type II	Type III
Volumes traded (toe)	1,167,444	785,219	582,267
Total Value (€)	118,560,995	79,282,474	58,987,927
Minimum price (€/toe)	86.98	87.40	8.00
Maximum price €/toe)	115.00	116.39	115.00
Average price (€/toe)	101.56	100.97	101.31

Fig C.4.11 **Energy Efficiency Certificates Market: prices and structure of volumes - 2012**



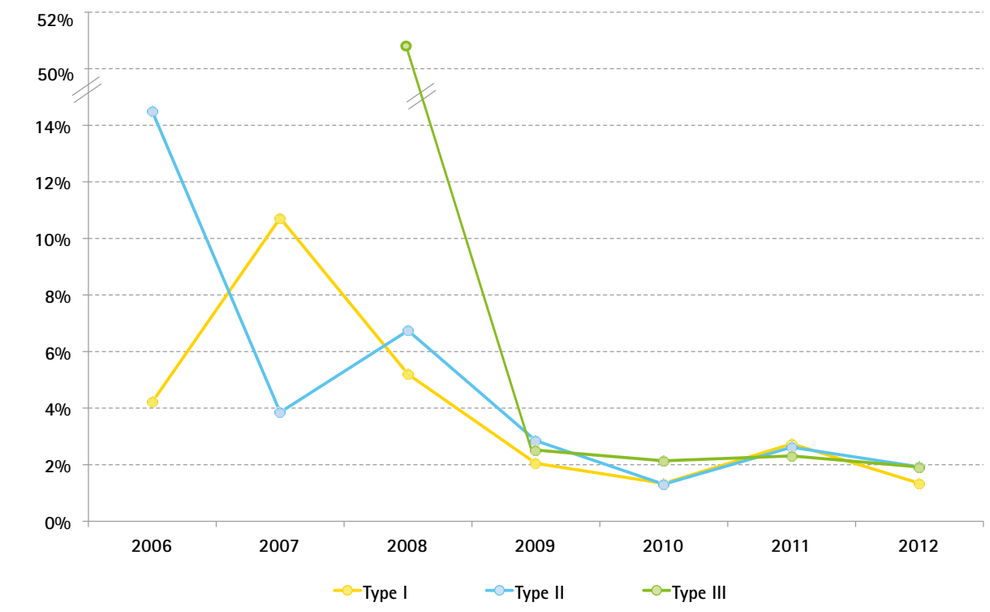
The analysis of the time series of prices shows that the equalization of certificates (obliged distributors are allowed to fulfill the obligation by surrendering any type of certificate: this measure was launched in 2008 for type I and II TEEs; one year later, it was allowed also for type III TEEs) has led to a substantial alignment of prices, for type I and II first and, subsequently, also for type III certificates (Fig. C.4.12).

Fig C.4.12 **Energy Efficiency Certificates Market: prices and volumes traded**



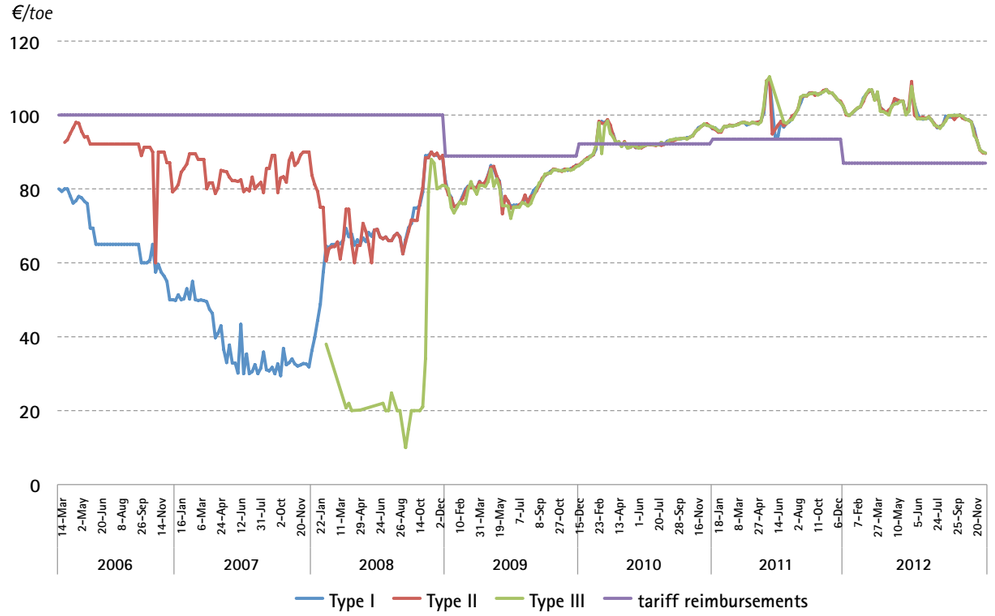
Since 2009, the price volatility for the three types of TEEs has been gearing down to lower levels than in previous years. In 2012, the price volatility of TEEs was 1.3% for type I and 1.9% for types II and III (Fig. C.4.13).

Fig C.4.13 **Energy Efficiency Certificates Market: price volatility**



It should be noted that the price level depends upon the tariff reimbursement paid for each energy efficiency certificate cancelled; this sum is paid to distributors who have fulfilled their obligation so as to partially cover any incurred costs. The amount of reimbursement is established by AEEG; it was equal to 100 €/toe until 2008: it then began declining down to approximately 90 €/MWh in the subsequent years. In the early years of the incentive mechanism, characterized by an excess of supply over the demand from the obliged parties, the market price has remained below the tariff reimbursement. In the following years and until the end of 2012, however, the demand exceeded the supply; thus, starting from 2010, the price level has been higher than the value of reimbursement applicable to each year (Fig. C.4.14).

Fig C.4.14 **Energy Efficiency Certificates Market: prices and tariff reimbursements**



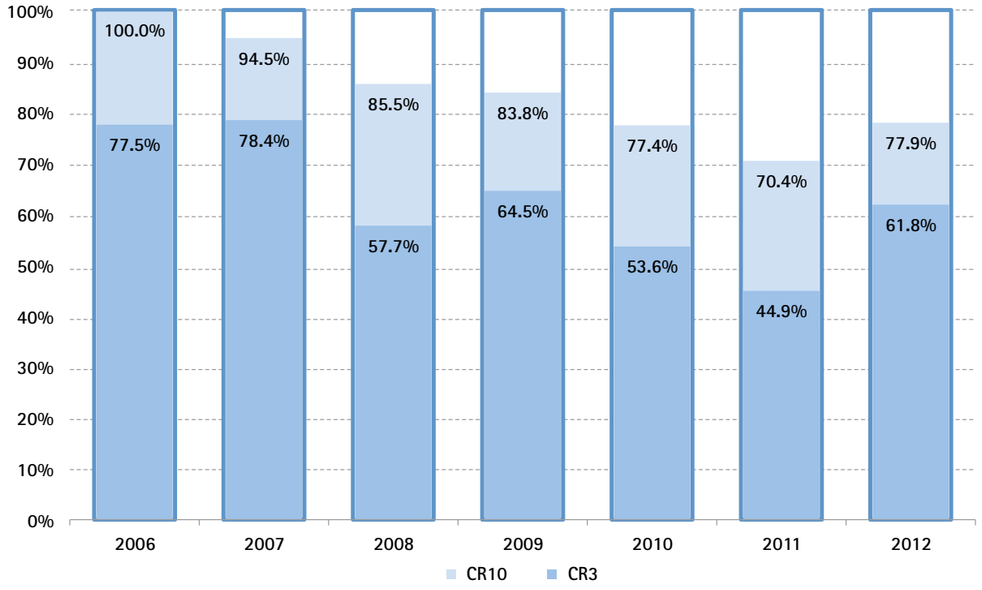
Again, a comparison between the number of certificates issued since the beginning of the incentive mechanism and the level of cumulative targets for each year shows that, as of 2008, the market has been characterized by an excess demand, with the total number of TEEs issued always below the cumulative target (Tab. C.4.5).

Tab C.4.5 **Energy Efficiency Certificates needed for compliance with the obligation: cumulative values**

Obligation year	Actual obligations of electricity distributors (Mtoe/yr)	Actual obligations of gas distributors (Mtoe/yr)	Total cumulative certificates needed for compliance (Mtoe/yr)	Certificates issued since the start of the scheme (Mtoe)
2005	0.10	0.06	0.16	
2006	0.19	0.12	0.47	
2007	0.39	0.25	1.11	1.26
2008	1.20	1.00	3.31	2.6
2009	1.80	1.40	6.51	5.23
2010	2.40	1.90	10.81	8.02
2011	3.10	2.20	16.11	11.44
2012	3.50	2.50	22.11	**17.23**

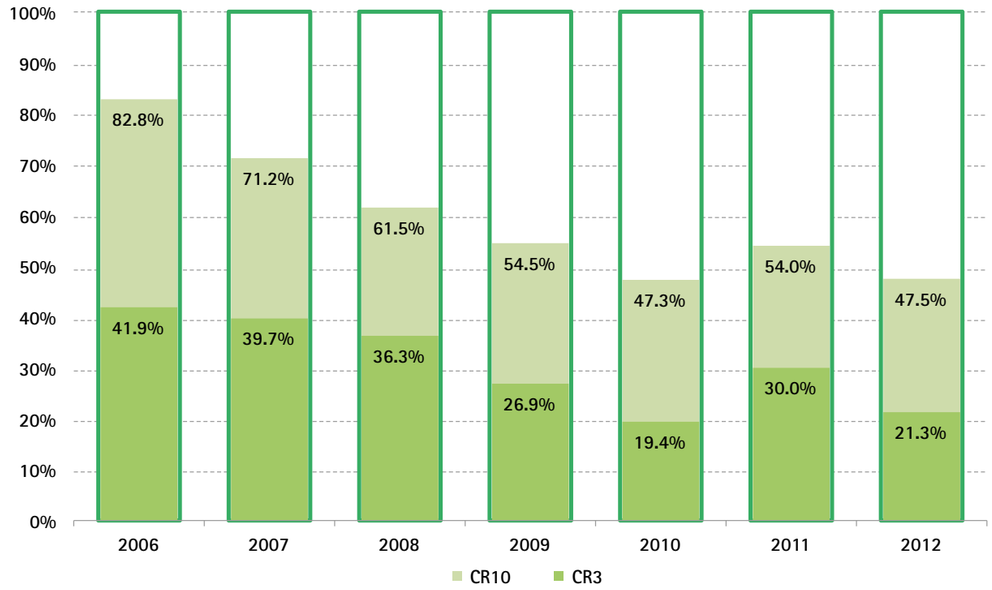
An analysis of the market concentration in 2012 shows an increased concentration on the demand side; this is clearly highlighted by the main indicators which interrupted a long series of declines observed since the beginning of the market. In 2012, in fact, the share of purchases for the top three participants (CR3) and for the top ten (CR10) rose to 61.8% (44.9% in 2011) and 77.9% (70.4 % in 2011), respectively (Fig. C.4.15).
In 2012, the rise of CR3 most likely was due to the need, for the main obliged parties, to purchase more certificates on the market; at the same time, their yearly obligation has also increased and they had to make up for fewer certificates of their own, as their projects' lifecycle was gradually coming to an end.

Fig C.4.15 **Energy Efficiency Certificates Market: market shares – demand side**



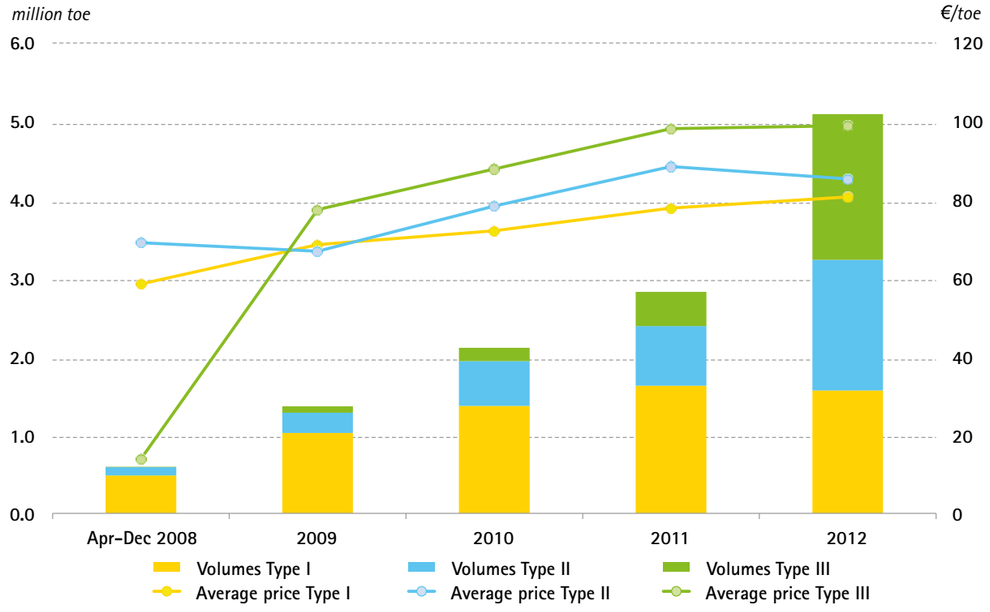
On the supply side, CR3 and CR10 historically have shown a lower, declining concentration vis-à-vis the demand side; they did increase in 2011 and returned back to levels close to the all-time low of 2010. More specifically, in 2012 CR3 was down to 21.3% and CR10 to 47.5% (Fig. C.4.16).

Fig C.4.16 **Energy Efficiency Certificates Market: market shares – supply side**



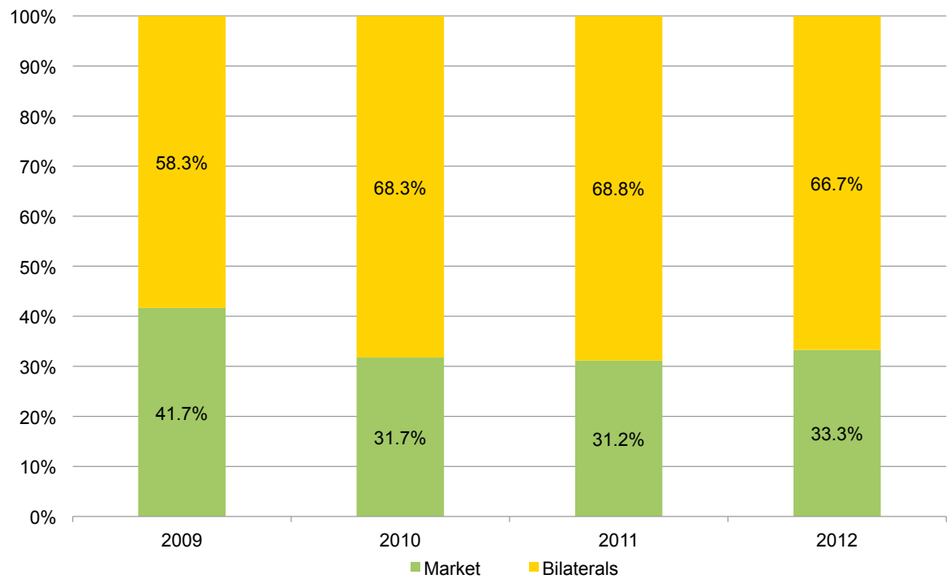
The structural difference of concentration on the two sides of the market depends on the following: while the Obliged Parties, representing the demand, are few in numbers (distributors of electricity and gas with more than 50,000 connected users), the supply includes a large number of participants (mainly non obliged distributors, but especially ESCOs) who presented energy-saving projects and, therefore, received TEEs that they could sell in the market.
In 2012, bilateral trading was characterized by a record number of TEEs trades, equal to 5.1 million toe, with a 80.2% growth over the previous year. In particular, similarly to the regulated market, the type III TEEs more than quadrupled from a year before (+325.5%) whereas type II TEEs more than doubled in number (+119.3%). Type I TEEs, however, slightly decreased for the first time (-3.8%) (Fig. C.4.17).
The price of type I and type III TEEs, slightly rising compared to 2011, reached 80.54 and 98.70 €/toe, respectively. On the other hand, type II TEEs slightly dropped down to 85.14 €/toe.

Fig C.4.17 **Energy Efficiency Certificates Bilaterals: prices and volumes**



The share of registered bilateral transactions vis-à-vis the TEEs traded in 2012 was equal to 66.7%, slightly less than the previous two years.

Fig C.4.18 **Comparison between market and bilaterals: shares**



The increased use of bilateral trades vis-à-vis the regulated market is probably related to the need of large distributors subject to the obligation to get large quantities of certificates with the lowest number of transactions possible.

4.4 RECOs

AEEG Decision 28 July 2011 - ARG/elt 104/11 on "Conditions for promoting transparency in the contracts of sale of renewable-generated electricity to final customers" established the requirements of the contracts of sale of renewable energy in order to ensure the protection of consumers, according to principles of competition and transparency, while making sure that the same electricity produced from renewable sources is not included in other sales contracts. For this reason, the above Decision requires that every contract for the sale of renewable energy must be proven by a number of Guarantees of Origin equal to the amount of electricity sold as renewable under the same contract.

To this end, each sales company by 31 March of the year following the year during which electricity was delivered to end customers under contracts of sale of renewable energy, shall procure a number of Guarantees of Origin equal to the electricity sold as renewable, referred to the same year, giving proof to GSE in accordance with procedures laid down by GSE itself.

The "guarantee of origin" (i.e. RECO) is the document referred to in Article 15 of Directive 2009/28/EC, aimed at showing to final customers the share or quantity of electricity from renewable sources in the energy mix offered by an electricity supplier.

Also, it is envisaged that the Guarantees of Origin can be traded in the venue for the trading of Guarantees of Origin arranged by GME; they may also be freely traded or awarded through auctioning procedures referred to in paragraph 4.2 of Decision 104/11.

In the latter two cases, holders of bilateral contracts and awardees are required to register the volumes and prices set out in the purchase and sale contracts on GME's electronic platform.

To this purpose, the RECOs Bilateral Platform was established by GME in June 2012; it operates on the basis of the RECOs auction allocation (competitive procedures) mechanism adopted by GSE; in July of the same year the first market session organized by GME was held.

The types of RECOs which can be traded in the venue for the trading of Guarantees of Origin arranged by GME are referred to the following renewable energy sources: hydro, wind, solar, geothermal, other.

4.4.1 RECO Market (MRECO), Bilateral Platform (PB-RECO), GSE's Auctions

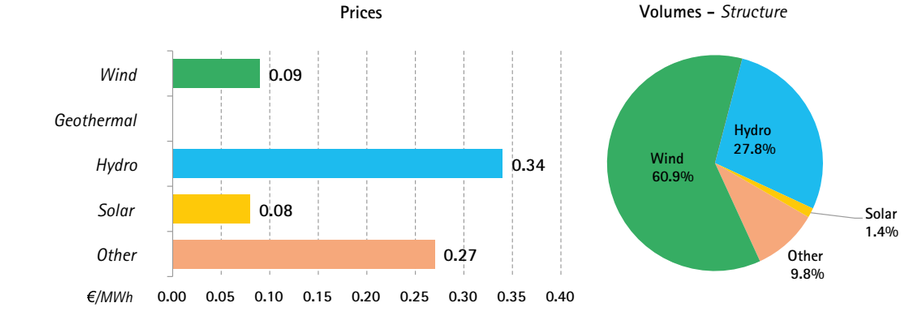
In the six sessions of the RECOs Market held in 2012, 473,000 MWh (1 RECO = 1 MWh) were traded. The 'Other' type, with 256,000 MWh, was the largest one (54.2% of the total) whereas no trade was made for the 'Solar' type Guarantees of Origin.

The average price of the various types of traded RECOs was around 0.11 €/MWh, to the exception of Geothermal which was traded at 0.15 €/MWh (Tab. C.4.4 and Fig. C.4.11).

Tab C.4.6 **RECO Market: results – 2012**

	Wind	Geothermal	Hydro	Solar	Other
Volumes traded (MWh)	168,048	1,002	47,451	-	256,101
Total Value (€)	17,812	150	5,280	-	28,927
Minimum price (€/MWh)	0.09	0.04	0.11	-	0.08
Maximum price (€/MWh)	0.18	0.15	0.13	-	0.18
Average price (€/MWh)	0.11	0.15	0.11	-	0.11

Fig C.4.19 **RECO market: prices and structure of volumes – 2012**



In 2012, Guarantees of Origin worth 1,750,000 MWh were registered on the Bilateral Platform, net of 43,454 MWh traded intra-group. The 'Wind' type, with 1,066,000 MWh (60.9% of the total) was the most traded type, followed by the 'Hydro' with 487,000 MWh.
As to the 2012 average price, 'Hydro', with 0.34 €/MWh, and 'Other', at 0.27 €/MWh, were quite higher than 'Wind' and 'Solar', respectively priced at 0.09 and 0.08 €/MWh (Tab. C.4.7 and Fig. C.4.20).

Tab C.4.7 **RECO Bilaterals: results – 2012**

	Wind	Geothermal	Hydro	Solar	Other
Volumes traded (MWh)	1,065,826	-	487,139	24,954	171,888
Total Value (€)	97,611	-	164,455	1,996	47,100
Minimum price (€/MWh)	0.07	-	0.00	0.08	0.10
Maximum price (€/MWh)	0.20	-	3.00	0.08	0.40
Average price (€/MWh)	0.09	-	0.34	0.08	0.27

Fig C.4.20 **RECO Bilaterals Platform: prices and structure of volumes – 2012**

In the three auctions of 2012, GSE offered Guarantees of Origin worth over 8.5 million MWh, about 87% of which of the type 'Other'. Altogether, Guarantees of Origin were awarded for 1,417,000 MWh, 691,000 MWh of which for the type 'Other' (62.9% of the total), 523,000 MWh of the 'Solar' and 204,000 MWh of the 'Wind' type.
The average weighted prices ranged between 0.08 €/MWh (Other) and 0.12 €/MWh (Solar) (Tab. C.4.8 and Fig. C.4.21).

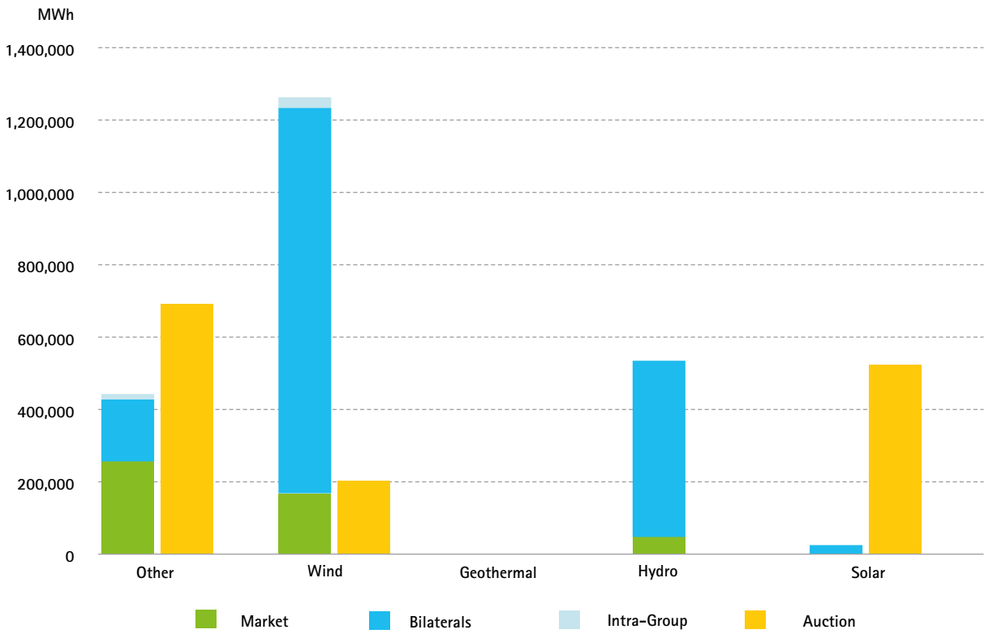
GSE's auctions: results – 2012 Tab C.4.8

	Wind	Hydro	Solar	Other
Volumes offered (MWh)	291,561	509	803,879	7,406,288
Volumes awarded (MWh)	203,953	-	522,501	691,000
Minimum price (€/MWh)	0.04	-	0.13	0.03
Maximum price (€/MWh)	0.14	-	0.12	0.13
Weighted average price (€/MWh)	0.10	-	0.12	0.08
Value (€)	20,755	-	60,210	52,600

GSE's auctions: prices and structure of volumes – 2012 Fig C.4.21

In 2012, nearly half (48.1%) of the total Guarantees of Origin traded and/or awarded were registered on the RECO Bilaterals Platform, with average prices significantly higher than those in GME's regulated market, in GSE's awards for 'Hydro' and 'Other' types (Fig. C.4.22).

Fig C.4.22 **Volumes traded – 2012**



APPENDIX I

GME'S PROFILE

APPENDIX I

GME's profile 136

1. GESTORE DEI MERCATI ENERGETICI 136

1.1. Governance 136

1.2 . Institutional tasks 139

1.2.1. Market management 139

1.2.2. Electricity market monitoring 141

1.3. International activities 142

1.4. Fees 145

GME'S PROFILE

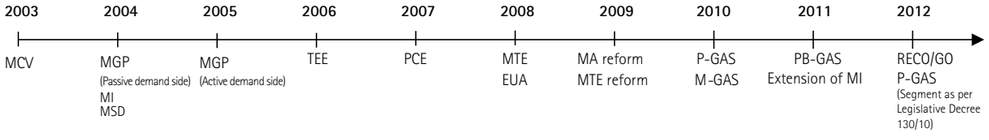
1. GESTORE DEI MERCATI ENERGETICI

1.1 Governance

Gestore dei Mercati Energetici S.p.A. (GME) is a publicly owned company and was set up in 2001 pursuant to art. 5, Legislative Decree 79/99 (the so called "Bersani Decree"); it is vested with the organization and economic management of the electricity and natural gas markets according to criteria of neutrality, transparency, competition and objectivity. The Company is also entrusted with the management of the OTC Registration Platform (PCE) to register electricity sale and purchase forward contracts entered outside the bidding system.
Moreover, GME, organizes and manages the Environmental Markets, i.e. markets where Green Certificates, Energy Efficiency Certificates (the so called "white certificates"), Emission Allowances as well as Certificates of Origin for Renewable Energy Plants (RECOs/Guarantees of Origin) are traded.

Fig 1.1 **Markets managed by GME**

Electricity	Environment	Gas
▪ **MTE** - Forward Electricity Market	▪ **MCV** - Green Certificates Market	▪ **P-GAS** - Natural Gas Trading Platform
▪ **MGP** - Day-Ahead Market	▪ **TEE** - Energy Efficiency Certificates Market	▪ **M-GAS** (Day-Ahead and Intra-Day Gas Markets)
▪ **MI** - Intra-Day Market	▪ **EUA** - Emissions Trading Market	▪ **PB-GAS** - Gas Balancing Platform
▪ **MSD** - Ancillary Services Market	▪ **PBCV** - Green Certificates Bilaterals Registration Platform	▪ **P-GAS** (Segment as per Legislative Decree 130/10)
▪ **PCE – OTC** - Registration Platform	▪ **RECO/GO** - Systems for trading Certificates of Origin	



GME's sole shareholder is Gestore dei Servizi Energetici (GSE), a company supporting the development of renewable sources through incentives for electricity generation. Also, GSE promotes sustainable development by means of public awareness campaigns on the efficient use of energy. GSE' shareholder is the Ministry of Economy and Finance (MEF), which exercises its rights as agreed with the Ministry of Economic Development (MiSE).
The rules for the electricity market, Green Certificates market, Gas Market and P-GAS Bilateral Platform functioning are defined by GME and approved by the Ministry of Economic Development, after hearing the Electricity and Gas Regulator's opinion.
The rules for the Energy Efficiency Certificates Market functioning - the market was set up pursuant to article 10 of Ministerial Decrees 20 July 2004 - , for the Registration Platform for bilateral transactions of the Energy Efficiency Certificates, as well as the rules of operation for the OTC Registration Platform and the Gas Balancing Platform are defined by GME in agreement with the Electricity and Gas Regulator.

The rules for the regulated Market and the Registration Platform of bilateral trades of the Guarantees of Origin (RECOs/GOs) are drafted by GME and forwarded to AEEG for its approval, pursuant to Decision ARG/elt 104/11.
As to the operation of the Emissions Trading Market, set up by GME in compliance with Directive 2003/87/EC, its rules are drafted and approved by GME.
Trading on electricity markets is subject to supervision and monitoring by AEEG, pursuant to AEEG Decision ARG/elt 115/08 and following amendments.
The EU Regulation No 1227/2011 on the transparency and integrity of energy markets (REMIT), published in the Official Journal of the European Union on 8 December 2011 defines the notion of "market abuse" on wholesale energy markets (classified as "market manipulation" and "insider trading"). Also, it adds up for European electricity exchanges, including GME, new oversight and monitoring activities. These imply a mandatory reporting of any potential market abuse to AEEG, as well as the establishment and maintenance of appropriate procedures aimed at the identification of any "market manipulation" and "insider trading" conduct.
The Company's management body is its Board of Directors, consisting of three members, appointed through a Shareholder's Meeting resolution for three financial years. The Board of Directors is exclusively responsible for the management of the Company; current Directors carry out any operations required to implement the corporate object.
GME's Board of Directors has designated a member who acts as both Chairman and Chief Executive Officer, who:

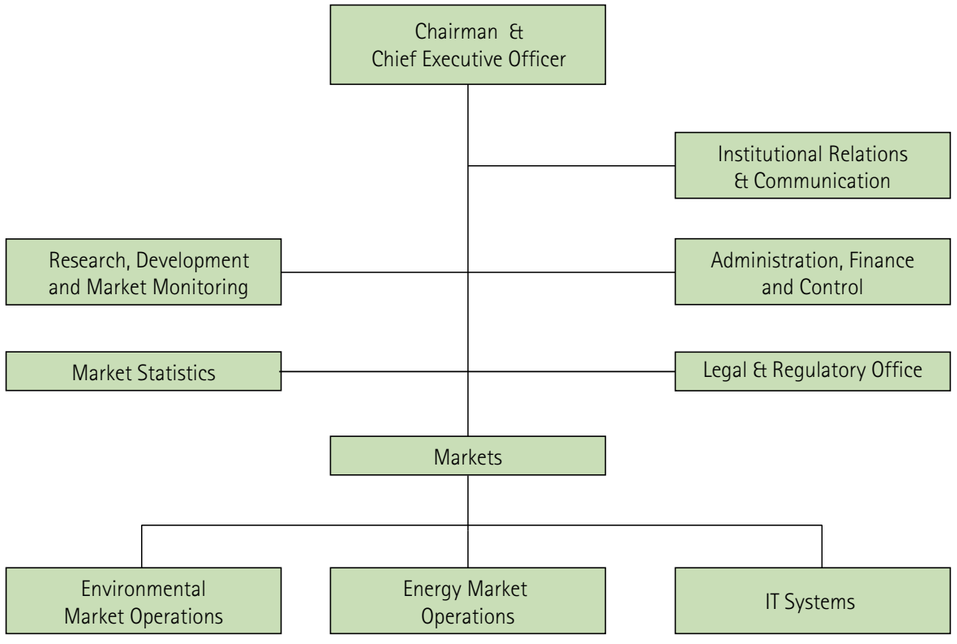
- holds the legal representation of the Company under the by-laws. He is also vested with the signing authority and chairs the Meeting;
- calls and chairs the Board of Directors and checks the Board Resolutions' implementation;
- according to a Board resolution, he is vested with all management powers for the administration of the Company, to the exception of those assigned by law or by the corporate by-laws to other parties or those under the exclusive control of the Board of Directors;
- furthermore, at least on a quarterly basis, he reports to the Board of Directors and to the Board of Auditors on the corporate management, on the predictable development of this latter as well as on any significant transactions, given their size or characteristics, conducted by the Company.

The remaining GME's corporate bodies include the following:

- Board of Auditors;
- Supervisory Board;
- Internal Appeal Board.

As of 31 December 2012, the company had 95 personnel members (three of whom are seconded), divided into nine units, as shown in the diagram in Fig.1.2.

Fig 1.2 **GME's organizational chart**



1.2 Institutional tasks

1.2.1 Market management

GME is in charge of organizing and managing the natural gas and electricity markets where physically deliverable products are traded, as well as Environmental Markets. The Company is also in charge of managing the OTC Registration Platform (PCE), for the registration of electricity sale and purchase forward contracts.

Within the framework of the electricity market, GME organizes and manages the following platforms:

- **Spot Electricity Market (MPE).** Governed by decree of the Minister of Productive Activities of 19 December 2003 and any subsequent amendments, the MPE was started on 1 April 2004 in compliance with article 5 of Legislative Decree 79/99. This market has been partially redesigned since 1 November 2009, pursuant to Law 2/2009, and is split into three submarkets:
  a. **Day-ahead market (MGP)**, where producers, wholesalers and eligible final customers can sell/buy electricity for the following day;
  b. **Intra-day market (MI)**, replacing the former Adjustment market's function; it enables spot market participants to change their injection/withdrawal schedules as established in the MGP. The market includes four sessions: two are held on day d-1 after the MGP (MI1 and MI2) and have been in operation since 31 October 2009; another two intra-day sessions (MI3 and MI4) are held on day d and were introduced on 1 January 2011;
  c. **Ancillary Services Market (MSD)**, where Terna S.p.A procures the dispatching services it requires in order to manage and control the power system. The MSD consists of one ex- ante session for purchasing congestion relief and reserve services and one intra-day stage of acceptance of offers for balancing purposes (MB). The ex-ante MSD includes three scheduling sub-stages (MSD1, MSD2 and MSD3) while the MB consists of 5 sessions.
- **OTC Platform (PCE).** Entrusted to GME pursuant to AEEG Decision no. 111/06 and any subsequent amendments, it was officially started on 1 April 2007. This platform is used by participants to register forward purchase/sale bilateral contracts (the so called over the counter or OTC) or contracts closed in the MTE.
- **Forward Electricity Market (MTE).** The MTE took off on 1 November 2008, pursuant to the decree of the Ministry of Economic Development of 17 September 2008 and has been redesigned since 1 November 2009 under Law 2/2009 and in compliance with Ministerial Decree 29 April 2009. It is a regulated market where participants can sell and buy forward electricity contracts with a delivery taking-making obligation.
- **Electricity Derivatives Platform (CDE).** Since 26 November 2009, in compliance with Ministerial Decree 29 April 2009, GME has been managing a platform where participants in the electricity market can settle by physical delivery, through registration on the PCE, any contracts made on IDEX (electricity derivatives market, managed by Borsa Italiana SpA).

Within the framework of the organization and economic management of the electricity market, GME is also responsible for environmental markets, i.e.:

- **Green Certificates Market (MCV).** Operational since March 2003 pursuant to article 6 of Ministerial Decree 11 November 1999 (finally repealed under Ministerial Decree 18 December 2008), it is aimed at trading certificates proving generation of electricity from renewable sources, in order to comply with obligations to import/inject a given quota thereof into the grid, as provided for by Legislative Decree 79/99;
- **Green Certificates Bilaterals Registration Platform (PBCV).** This MCV functionality was introduced

in 2007 to register bilateral trading of green certificates between market participants. In compliance with Ministerial Decree 18 December 2008, it is mandatory to report such bilateral trades, as well as their volumes and price.

- **Energy Efficiency Certificates Market (TEEs).** This market became operational in March 2006; its goal is to trade the so called "white certificates", proving the adoption of measures to curb energy consumption levels and allow obliged parties to comply with saving obligations established by Ministerial Decrees of 20 July 2004 and any subsequent amendments. Ministerial Decree of 5 September 2011 governs the new support system for high efficiency cogeneration (HEC), by introducing the so called TEEs of type HEC-II. As to the future evolution of Energy Efficiency Certificates, GME has amended, in the first quarter of 2013, the regulatory framework applicable to white certificates trading and registration systems, in compliance with Ministerial Decree 28 December 2012. In particular, it introduced two further classes of TEEs ("IN" and "E" type, respectively) which are issued in accordance to art. 8, para 3, Ministerial Decree 28 December 2012, on the incentives for technological innovation and for curbing atmospheric emissions.
- **Energy Efficiency Certificates Register (TEEs Register).** In operation since 2006 to allow TEE market activities, the TEEs Register allocates an ownership account to each registered participant; the account is an "electronic portfolio" where the total number of TEEs held by each participant is entered. Thanks to the Register's functionalities, participants can check in real time the status of their portfolio and directly register individual bilateral transactions entered off the market. GME, in compliance with provisions under AEEG' Decision EEN no. 5/08 on the "Approval of the Rules for the registration of bilateral transactions of Energy Efficiency Certificates as per article 4, para 1, of AEEG's Decision of 28 December 2007, no. 345/07 and article 4, para 1, of the decree of the Ministry of Economic Development of 21 December 2007" prepared the Rules for the Register's operation.
- **Emissions Trading (EUA).** This market became operational in April 2007, within the framework of the European Directive 2003/87/EC establishing a European Emission Trading Scheme; purpose of this latter is to promote trading of the so called "black certificates", representing CO_2 emission allowances within a set of specifically regulated economic activities (for example, energy activities); emissions are allocated through National Allocation Plans. On 1 December 2010, GME's Board of Directors passed a resolution to halt the Emissions Trading Market operation, effective immediately until a subsequent notice; this decision was made in the light of the unusual trading pattern observed during the last market sessions and, in particular, of alleged irregular or illicit conduct, promptly reported by GME to the Institutions in charge - Ministry of Economic Development, Ministry of Economy and Finance - and Supervisory Authorities.
- **Certificates of origin for renewable energy power plants (RECOs).** Through AEEG Decision ARG/elt 104/11, GME was entrusted with the task of managing and setting up the RECOs trading system (Certificates of Origin), as well as managing the regulated market (M-RECO), started on 5 July 2012, and its platform for the registration of bilateral transactions (PB-RECO), in operation since 11 June 2012.

As to the gas sector, Law no. 99 of 23 July 2009 entrusted GME with the management of gas markets, as detailed below:

- **Natural Gas Trading Platform (P-GAS).** This platform became operational on 10 May 2010. Importers of gas produced in non-EU countries and holders of leases of exploitation of national gas fields shall fulfill their obligation of bidding quotas of imported gas on this platform, as provided for by art. 11, Law 40/07. To this end, the P-GAS consists of two segments, "Imports" and "Royalties": in the Imports segment, gas quotas are offered as per art. 11, para 2, Law 40/07, along with other quotas offered by any party who is not subject to statutory obligations; in the Royalties segment, royalties owed to the State under art. 11, para 1, Law 40/07 are offered. In the light of provisions under Legislative Decree no. 130/10 on "Measures for a greater competitiveness in the natural gas market and the transfer of the ensuing benefits to final customers, pursuant to article 30, paras 6 and 7, Law 23 July 2009, no. 99", including measures aimed at promoting the development of storage capacity, and in compliance with AEEG Decisions ARG/Gas 193/10, ARG/Gas 79/11 and 67/2012/R/gas, GME, starting from April 2012, within its own natural gas trading systems, allows to negotiate gas quotas delivered by virtual storage operators associated with investors who avail themselves of measures under art. 9, Legislative Decree 130/10. More specifically, participating investors can fulfill the mandatory requirement to bid gas volumes made available by their associated virtual storage operators, alternately or altogether, in the M-GAS and P-GAS. With regard to the P-GAS, GME established an additional segment on the same platform, named "segment as per Legislative Decree 130/10", to allow investors to fulfill the above said obligation.
- **Spot gas market (M-GAS).** In operation since 10 December 2010, this is a spot market consisting of the day-ahead market – where transactions are performed under the continuous and auction trading mechanisms – one after another - and of the intra-day market, where transactions are conducted on a continuous trading basis.
- **Natural gas balancing platform (PB-GAS).** Since 1 December 2011, GME has been organizing and running, on behalf of Snam Rete Gas, the natural gas balancing platform (PB-GAS). On this platform, authorised users, as under article 1, para 1, letter k), AEEG Decision ARG/gas 45/11 (users of storage services, to the exception of transport firms and users of strategic storage service only), offer for sale and purchase any storage resources available, on a daily basis. Likewise, Snam Rete Gas, as balance responsible party, , offers on the PB-GAS, either for sale or purchase, a gas volume equal to the overall system imbalance, in order to procure the resources offered by participants, as required to keep the system balanced. The selection of offers accepted on the PB-GAS is made according to auction trading mechanisms. As to the evolution of the balancing market, to provide the network operator with one further market instrument to balance the system and participants with an additional market participation method, GME, pursuant to Decision 538/2012/R/gas, will draft, in the course of 2013, the rules of operation of a balancing session to be held on the day before the gas delivery day (G-1). Said rules, after hearing the stakeholders' opinion, will be subject to AEEG final approval.

1.2.2 Electricity market monitoring

Ever since the beginning of transactions in the electricity market in April 2004, GME has been carrying out several activities to support the monitoring functions exercised by the institutional parties in charge, e.g. the Electricity and Gas Regulator (AEEG), Autorità Garante della Concorrenza e del Mercato (AGCM, the Competition Regulator) and the Ministry of Economic Development (MiSE). More specifically, GME supports AEEG electricity market monitoring activities, in compliance with AEEG Decision ARG/elt 115/08 (Integrated Text on Market Monitoring) (hereinafter TIMM), subsequently amended and supplemented by decisions ARG/elt 60/09, ARG/elt 50/10, ARG/elt 77/10, ARG/elt 180/10, ARG/elt 110/11, 66/2012/R/EEL and 180/2012/R/EEL.

Under the TIMM, GME:

- implements and runs a specific data warehouse (DWH) putting together electricity market data and those listed in the main European spot electricity markets and in the various forward electricity markets (physical and financial, regulated and OTC); the data warehouse is made available to AEEG through an appropriate business intelligence tool (article 3);
- creates specific monitoring indicators and develops actual what-if market simulations aimed at evaluating the impact of alternative bidding policies by market participants, according to instructions given by AEEG (articles 4 and 5);

- collects from participants, by means of a specific External Data Platform (PDE), confidential data on forward electricity contracts and on their generating capacity (article 8);
- has set up a specific "monitoring unit".

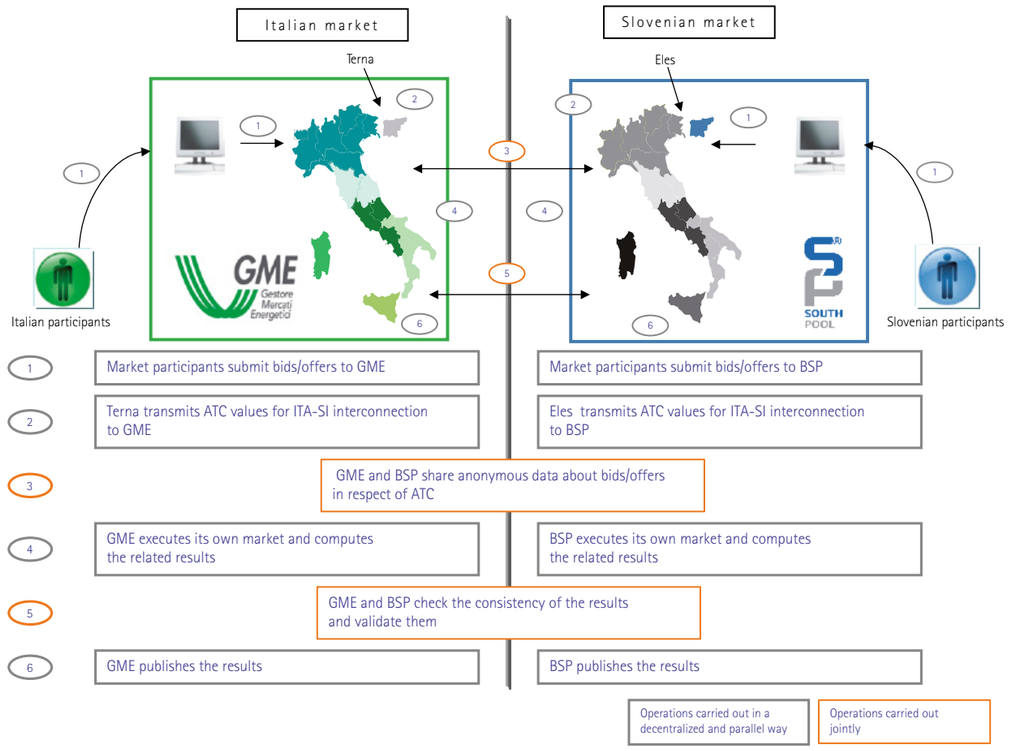
In compliance with the above provisions, GME created the External Data Platform (PDE) to collect participants' forward contracts.
On 28 December 2011, Regulation (EU) No 1227/2011 became effective. It establishes monitoring duties for "persons professionally arranging transactions in wholesale energy products", including, therefore, any exchanges. Such persons shall report any alleged market abuse and/or insider trading conduct to the relevant authorities and shall "establish and maintain effective arrangements and procedures to identify (the above said) breaches" (art.15).

1.3 International activities

Within the framework of the integration of wholesale electricity markets across the EU, a process designed by the "Third Package", GME is committed to international activities aimed at developing a single European electricity market.
In this respect, GME takes part in the Market Coupling project along the Italian-Slovenian border. This mechanism allows the implicit allocation of physical daily interconnection rights between the two countries by resolving their day-ahead electricity markets run by GME and BSP (Slovenian market operator), respectively.
More specifically, implicit auctions integrate the allocation of interconnection capacity with the execution of electricity markets; in so doing, they ensure an efficient utilization of capacity since they define a transit from the lowest price market zone to the highest price one.
On the Italian-Slovenian border, a decentralized price coupling method[1] was adopted. In this context, GME and BSP adopted a common matching algorithm reproducing the matching rules of both markets. Also, the algorithm considers a grid model representing both the Italian and Slovenian electricity grids. The algorithm is run, in a parallel and decentralized way, by each market operator. Both operators receive offers from their respective market participants; prior to running their own market, they mutually exchange any significant information on the demand and supply curves as resulting from the bids/offers received and from grid constraints over their respective market zones.
After sharing such information, thanks to their common matching algorithm, GME and BSP simultaneously calculate their market results, keeping into account the grid and market conditions in each other's country; at the same time, they determine the flow of energy over the Italy-Slovenia interconnection (i.e. they allocate capacity over such interconnection) at the prices being set in their respective electricity markets.

1 For more information on the decentralized price coupling model, refer to the document published in GME website: http://www.mercatoelettrico.org/It/Mercati/MercatoElettrico/MC_Modello.aspx

Operation of market coupling between Italy and Slovenia Fig 1.3



To realize an integrated single energy market across the EU, GME has been focusing on the so called Price Coupling of Regions (PCR) project since 2010 along with the major European exchanges (EPEX - France/Germany; OMEL– Spain, NordPool – Scandinavian countries, APX Endex – UK/Netherlands; Belpex – Belgium; OTE – Czech Republic). The Price Coupling of Regions (PCR) is aimed at putting in place a market coupling project across Europe, based on a decentralized methodology. The project, now quite advanced, rests upon three pillars:

- creating a common algorithm incorporating the specific features of the various markets;
- creating a data exchange system supporting an algorithm decentralized management (the so called Broker & Matcher);
- a governance structure based on contracts containing rules of cooperation among exchanges and on the joint ownership of said assets.

After the startup and a significant progress in the development of the algorithm prototypes and the data exchange infrastructure required to manage coupling, this project is heading toward its final stages and subsequent implementation, in line with the roadmap designed by the European institutions (in particular, the European Agency for the Cooperation of Energy Regulators – ACER).
At the same time, in July 2012 as part of the regional initiatives within the Central Southern Europe macro-region, the electricity exchanges and TSOs of countries which share an electricity border with

Italy (Austria, Slovenia, Switzerland, France, Greece) set up, along with GME and Terna, a forum to start a project in the day-ahead market. Its goal is to define, in a coordinated and shared manner, pre- and post-coupling[2] operating processes, consistently with the EU market integration timing, outlined by ACER Roadmap to establish the single market of energy. This new project, named "Italian Borders Working Table – Pre-Post Coupling project" (IBWT - PPC), is going to analyze every operating activity which needs to be carefully evaluated and verified both by electricity exchanges and grid operators, in view of the start off of European market coupling in 2014.

GME is also engaged, together with other members of Europex[3], in the European Intraday cross borders project for integrating the European intraday energy markets for the implicit allocation of available cross-border capacity, according to the characteristics of the target model identified at EU level.

In this context, the Cooperation Agreement between the PXs members of Europex is currently being finalized; it should constitute the contract defining the roles and responsibilities of each European exchange in the coordinated management of the project with particular reference to aspects related to the management and use of the software/IT system to be used in handling cross-border flows in the EU intra-day markets.

Finally, GME is one of the founders of Europex; one of its principal aims is to support the process of liberalization of energy markets, through the promotion of the role of exchanges in the process of market integration, and is involved in the definition of the Association's policies by regularly attending its expert group meetings.

2 Pre-coupling processes mostly include preliminary activities to calculate the available capacity, to share information on submitted bids/offers. On the other hand, post-coupling processes largely concern the commercial settlement of cross-border flows based on market results, procedures to nominate the cross-border physical schedules as well as the calculation and distribution of the congestion rent generated by the price gap among the electricity markets of nearby countries.

3 Association of European Energy Exchanges.

1.4 Fees

Participation in GME-managed markets is subject to the payment of fees, based on the diagram reported in the following table.

The MPE still represents the largest market in terms of both central-counterparty turnover (84.6%) and fees (54.2%). However, while environmental markets account for a significantly smaller central-counterparty turnover (1.3%), they generate a remarkable share of fees (13.8%) (Tab. 1.2).

Fees for participating in GME's markets – 2012 Tab 1.1

	One-time fixed (€)	Yearly fixed (€)	Variable (€/MWh)	Remarks
MPE	7,500	10,000	- no fee for the first 0.02 TWh of electricity traded monthly; - fee of 0.04 €/MWh for volumes exceeding the threshold of 0.02 TWh up to a maximum of 1 TWh; - fee of 0.03 €/MWh for volumes exceeding the threshold of 1 TWh up to a maximum of 10 TWh; - fee of 0.02 €/MWh for volumes exceeding 10 TWh.	
PCE	1,000		- fee of 0.012 €/MWh for each MWh of registered transactions.	If the PCE participant is at the same time an electricity market participant, no access fee shall be payable to GME
MTE			Variable fee of 0.01 € for each traded MWh.	
CDE			Variable fee of 0.045 € for each registered MWh.	
MCV – PBCV			- for the first 2,500 certificates traded (each of 1 MWh): € 0.06 per certificate; - above 2,500 certificates traded (each of 1 MWh): € 0.03 per certificate.	
TEE			0.2 € per certificate traded.	
CO2			0.0025 € per emission allowance traded (each of 1 t/CO_2).	
P- RECO			- fee of 0.005 € per RECO traded in the market and/or bilaterally.	
P-GAS			- trading fee of 0.0025 €/GJ for Import and Royalties' segments; - fee of 0.009 €/MWh for the segment as per legislative decree 130/10.	
M-GAS[4]			Variable fee of 0.01 € per MWh traded.	
PB-GAS			Variable fee of 0.003 € per GJ traded.	

4 Starting from 1 May 2012, yearly access and fixed fees – initially equal to 7,500 euro and 10,000 euro, respectively - have been set equal to "0" euro.

Tab 1.2 **Key data of GME's markets**

Year 2012	Volumes	Central-counterparty turnover (thousands of €)	Fees	(thousands of €) (*)	Fees %
ELECTRICITY MARKETS		**22,832,063**		**29,737**	**81.4%**
MPE (**)	250.1 TWh	19,566,908		19,801	54.2%
MTE (***) and CDE	55.0 TWh	2,906,683		1,099	3.0%
PCE (****)	344.5 TWh	n/a		8,298	22.7%
Other items	n/a n/a	358,472		539	1.5%
ENVIRONMENTAL MARKETS		**289,840**		**5,058**	**13.8%**
MCV	3.8 Mln	289,788		1,982	5.4%
PBCV	28.5 Mln	n/a			
TEE - regulated market	2.5 Mln	n/a		1,014	2.8%
TEE - bilaterals	5.1 Mln	n/a		2,033	5.6%
M-RECO	0.5 Mln	52		5	0.0%
PB-RECO	1.7 Mln	n/a		17	0.0%
RECO auctions	1.4 Mln	n/a		7	0.0%
EUA	n/a n/a	n/a		n/a	n/a
GAS MARKETS		**4,868**		**556**	**1.5%**
P-GAS	2.9 TWh	n/a		52	0.1%
M-GAS	0.2 TWh	4,868		107	0.3%
PB-GAS	34.9 TWh	n/a		397	1.1%
Other marginal revenues	**n/a n/a**	**n/a**		**1,175**	**3.2%**
Total		**23,126,771**		**36,526**	**100.0%**

(*) The amount of fees pertaining to the MPE and the M-GAS also includes the total of yearly fixed fees and access fees paid by participants in the different markets managed by GME
(**) Volumes pertaining to the MGP and the MI only. Moreover, MGP volumes are gross of: deviations pursuant to art. 43, para. 43.1 of the Integrated Text of the Electricity Market Rules; and cases of default pursuant to art. 89, para. 89.5 b) of the same Rules
(***) Volumes of electricity contractualized in the period under review (regardless of their delivery periods), including OTC clearing volumes.
(****) Transactions registered on the PCE

LIST OF ACRONYMS

BBL	Barrel of Oil
BEN	Bilancio Energetico Nazionale (National Energy Balance)
CACM	Capacity Allocation and Congestion Management
CCT	Fee for assignment of rights of use of transmission capacity
CDE	Electricity Derivatives Delivery Platform
CEGH	Central European Gas Hub
CER	Certified Emission Reduction
CFD	Contracts for Differences
CH	Clearing House
CIP6	Provision 6/1992, Interministerial Price Committee
CV	Green Certificates (GCs)
EBIT	Earnings before interest and taxes
ERIs	Electricity Regional Initiatives
ESCO	Energy Service Company (Società di Servizi Energetici)
ETS	Emission Trading Scheme
EUA	Emission Unit Allowance
GCs	Green Certificates
GDP	Gross Domestic Product
GO	Guarantees of Origin
GJ	Gigajoule
GRIs	Gas Regional Initiatives
GW	Gigawatt
GWh	Gigawatthour
HHI	Hirschmann Herfindal Index
IOM	Price-setting Operator Index
IOR	Residual Supply Index
ITEC®	Italian Thermoelectric Cost
ITM	Price-setting Technology Index
IZM	Price-setting percentage, by zone and by year
LNG	Liquefied Natural Gas
MA	Adjustment Market
MB	Balancing Market
MCP	Market Clearing Price
MCV	Green Certificates Market
MGP	Day-ahead Market
MGP-GAS	Day-ahead Gas Market
MI	Intra-day Market
MI-GAS	Intra-day Gas Market
MPE	Spot Electricity Market
MSD	Ancillary Services Market
MTE	Forward Electricity Market
MW	Megawatt
MWh	Megawatthour
MZ	Zonal Market
NBP	National Balancing Point
OTC	Over The Counter
PAB	Bilaterals Adjustment Platform
PBCV	Green Certificates Bilaterals Registration Platform
PCE	OTC Registration Platform
PCG	Project Coordination Group
PCR	Price Coupling of Regions
P-GAS	Gas trading platform (gas import quotas and royalties)
PSV	Virtual Trading Point
PUN	National Single Price
PX	Power Exchange
PZ	Zonal Price
ROE	Return on Equity
ROI	Return on Investment
RTN	National Transmission Grid
TEEs	Energy Efficiency Certificates
TOE	Tonne of Oil-Equivalent
TSO	Transmission System Operator
TTF	Title Transfer Facility
TW	Terawatt
TWh	Terawatthour

GLOSSARY

Agency for cooperation of Energy regulators (ACER)
A European Union body set up in 2010 pursuant to Regulation (EC) 713/2009 (Third Energy Package). On a Community level, its mission consists of assisting national regulators in performing their regulation function and, where necessary, coordinate their actions.

Ancillary Services Market (MSD)
Venue for trading supply offers and demand bids in respect of ancillary services. Terna S.p.A. uses this market to acquire resources for relieving intra-zonal congestion, procuring its reserve capacity and balancing injections and withdrawals in real time. Participation in the MSD is restricted to units authorized to supply ancillary services and to their dispatching users. Participation in the MSD is mandatory. The MSD produces two separate results: 1) the first result (Ex-Ante MSD) concerns bids/offers that Terna S.p.A. has accepted on a scheduled basis for relieving congestion and creating an adequate reserve margin; 2) the second result (ex-post MSD) concerns bids/offers that Terna S.p.A. has accepted in real time for balancing injections and withdrawals (by sending balancing commands). Bids/offers accepted in the MSD determine the final Injection and Withdrawal Schedules of each Offer Point. In the MSD, bids/offers are accepted by economic Merit Order, taking into account the need for ensuring the correct operation of the system. Offer/bids accepted in the MSD are valued at the offered price (Pay as bid).

Autorità Garante per la Concorrenza e il Mercato (AGCM)
Also known as Antitrust Regulator, it is an independent regulator set up by Law n. 287 of 10/10/1990 ("Rules on the protection of market and competition"). Also, it has responsibilities in the field of misleading and comparative advertising, and in the field of conflicts of interest.

Bilateral contract
Contract for supply of electricity entered outside the Power Exchange between participants. The price for the supply, as well as the injection and withdrawal profiles are freely agreed by the parties. However, the delivery is performed by means of registration on the specific platform run by GME on behalf of Terna (PCE).

Cascading
Procedure under which quarterly and yearly forward contracts (futures, forward and Contracts for Differences) are replaced upon maturity with an equivalent number of contracts with a shorter maturity. The new positions are opened at a price equal to the final settlement price of the original contracts.

Churn Ratio
Indicator measuring the liquidity of gas hubs, as a ratio between the gas volume exchanged and delivered.

CIP 6
Resolution no. 6 adopted in 1992 by Comitato Interministeriale Prezzi (CIP - Interministerial Committee on Prices). The resolution promotes the construction of plants for generation of electricity from renewable and/or the so-called "assimilated" sources, as per Law 9/91. GSE purchases the electricity generated by such plants under art. 3.12 of Legislative Decree 79/99, and sells it in the Power Exchange under art. 3.13 thereof. In the years elapsing between the approval of Legislative Decree 79/99 and the start of the Power Exchange, GSE sold such electricity to final customers by selling yearly and monthly electricity bands (similar to Bilateral Contracts). From 1 January 2005, GSE offers CIP-6 electricity directly in the Power Exchange: Market Participants with CIP-6 allocations are required to enter into a Contract for Differences with GSE, under which they undertake to procure the volumes of electricity corresponding to their allocations in the Electricity Market.

Clean Development Mechanism (CDM)
One of the flexible mechanisms identified in the Kyoto Protocol to help developing countries to move from their present development model to a less carbon-intensive one. Through the CDM, a developed country invests in a project of emission reduction or greenhouse gas capture in a developing country. In this way, the developing country may have access to a less polluting technology, while the industrialized country and/or its companies may reduce their cost of compliance with emission reduction constraints.

Clearing House
A Stock Exchange mechanism ensuring the positive outcome of obligations underlying transactions entered by operators. It acts as a central counterparty, replacing the original parties to a contract.

Clearing price
It generally identifies the price of electricity, as determined in the MGP and MA in each hour, at the point of intersection of demand and supply curves, so as to ensure they are equal. In case of market split into 2 or more zones, both in the MGP and MA, the clearing price can be different in each market zone (see zonal price). In the MGP, the zonal clearing price is applied to all supply offers, to demand bids for mixed units and to demand bids for consuming units belonging to virtual zones. Demand bids referred to consuming units belonging to geographical zones are anyway valued at the national single price (PUN). In the MA, in the event the market is split into two or more zones, the zonal clearing price is applied to all demand bids and supply offers.

Contract for differences
In this type of contract, the parties exchange financial flows on the basis of the price spread defined by the contract (strike) and the price in the underlying market on given maturity dates and for pre-established volumes. There exist two-way contracts for differences, where the price spread is traded whether positive or negative; also, there exist "one-way" contracts actually representing call options. In this event, the buyer pays an advance premium; if the market price of the underlying instrument is higher than the contract-set strike price, the counterparty pays the difference; in the opposite case, no financial flows develop.

Day-ahead gas market (MGP-GAS)
Venue for trading gas supply offers and demand bids in respect of the applicable period following the one in which the auction-trading session of MGP-GAS ends. All operators authorized to carry out transactions at the Virtual Trading Point (PSV) may participate in the MGP-GAS. The MGP-GAS unfolds in two subsequent stages: in the first stage, transactions take place under the continuous-trading mechanism; in the second stage, they take place under the auction-trading mechanism. In the MGP-GAS, gas demand bids and supply offers are selected for the gas-day following the one on which the auction trading session ends.

Day-ahead market (MGP)
Venue where electricity supply offers and demand bids for each hour of the next day are traded. All electricity operators may participate in the MGP. In this market, supply offers may only refer to Injection and/or Mixed Points and demand bids only refer to Withdrawal and/or Mixed Points. Bids/offers are accepted by Merit Order, taking into account the Transmission Limits notified by Terna S.p.A.. Accepted supply offers are remunerated at the Zonal Clearing Price. Accepted demand bids are remunerated at the National Single Price (PUN). Accepted bids/offers determine the preliminary Injection and Withdrawal Schedules of each Offer Point for the next day. Participation in this market is optional.

Derivative contract
Financial instrument; its price and valuation depend on the value of a different good, defined as underlying instrument. This category includes options and futures.

Electricity Derivatives Platform (CDE)
Platform organized by GME to exercise the physical delivery option for electricity future contracts traded in the IDEX.

Emission Allowance (UE)
Certificate worth 1 tonne of CO2 emissions, which may be traded and used to demonstrate compliance with the obligation to minimize greenhouse gas emissions, as defined in the Emission Trading Scheme.

Emission Trading Scheme (ETS)
Scheme of greenhouse gas emission allowance trading among EU Member States. Emissions trading is one of the mechanisms identified under the Kyoto Protocol.

Energy Efficiency Certificates (TEEs) or White Certificates
Energy Efficiency Certificates (TEEs) were established by Decree of the Ministry of Productive Activities in agreement with the Minister of the Environment and Land Protection of 20 July 2004 (Ministerial Decree 20/7/04). TEEs prove the energy savings that electricity and gas distributors with over 50,000 customers are required to achieve.

***Ex - ante* MSD**
It consists of three scheduling sub-stages: MSD1, MSD2 and MSD3. There is only one session for bid/offer submission in the ex-ante MSD which starts at 3.30 p.m. the day before the day of delivery and ends at 5 p.m. the day before the day of delivery. The results of ex-ante MSD are made known by 2 p.m. of the day of delivery. In the ex-ante MSD, Terna accepts energy demand bids and supply offers to relieve any residual congestions and create reserve margins.

Fee for assignment of rights of use of transmission capacity (CCT)
Hourly fee, as defined in article n.43 of AEEG Decision 111/06 and any subsequent amendments. For injection schedules and withdrawal schedules (referred to mixed points, i.e. withdrawal points belonging to virtual foreign zones registered in accordance with the PCE Rules), this fee is equal, for each hour, to the product between: 1) the difference between the national single price and the zonal price of the zone where dispatching points are located; 2) the forward electricity account schedule resulting from the MGP. To GME, such fee in each hour, both in the MGP and MI, amounts to the difference between the purchasing value and the selling value of power exchange volumes.

Forward contract
Contract to sell or buy an asset where the price and volumes are set at the time of entering into the contract, although it will become effective in a future, pre-set date. Hence, it is a deferred delivery sale/purchase contract.

Forward Electricity Market (MTE)
Venue where forward electricity contracts with delivery and withdrawal obligation are traded.

Future contract
Forward contract different from a conventional forward contract since the main covenants are standardized and it is traded on a regulated market.

Gas day
A gas day covers 24 hours, from 06.00 a.m. on each calendar day through 06.00 a.m. on the following calendar day.

Gas spot market
The regulated gas market, consisting of the day-ahead gas market (MGP-GAS) and of the intra-day gas market (MI-GAS).

Green certificates
Certificates giving evidence of generation of electricity from renewables, in compliance with art. 5 of the Ministerial Decree of 24 Oct. 2005 (as amended). Producers and importers of electricity from non-renewable sources exceeding 100 GWh/year are subject to the renewable quota obligation. Green Certificates are issued by GSE for the first twelve years of operation of plants. Conversely, the electricity from renewables generated by plants, which have gone into operation or have been repowered since 1 January 2008, is entitled to a certified generation from renewables for the first fifteen years of operation. Green Certificates, each of which is worth 1 MWh, may be purchased or sold in the Green Certificates Market (MCV) by parties with a deficit or surplus of generation from renewables.

Green Certificates Bilaterals Registration Platform (PBCV)
Electronic platform enabling the registration and settlement of bilateral transactions covering green certificates, in accordance with specific provisions contained in the relevant Regulation.

Greenhouse gases
See Kyoto protocol.

Guarantees of origin (GOs)
Guarantees of origin are the RECO certificates, namely the papers proving the generation of electricity from renewables, issued by GSE for the purposes set out by Ministerial Decree 31 July 2009; they are traded in the M-RECO and registered in the PB-RECO.

Hirschmann-Herfindahl Index (HHI)
Aggregate market index measuring the degree of concentration and dispersion of volumes offered and/or sold by Market Participants. The value of the HHI may range from 0 (perfect competition) to 10,000 points (monopoly). If the value is below 1,200, the market is competitive; if it is above 1,800, it is poorly competitive. The HHI is calculated by aggregating the volumes offered and/or sold by the individual Market Participants, including those sold through bilateral contracts, based on their belonging group. CIP6 volumes are included in this calculation and assigned to GSE, regarded as a Market Participant[1].

IDEX
Segment of the financial derivatives market – IDEM – organized and managed by Borsa Italiana S.p.A., where financial electricity derivatives are traded.

Intra-day Gas Market (MI-GAS)
Venue for trading gas demand bids and supply offers for the gas-day corresponding to the one on which the session ends. The MI-GAS takes place in a single session under the continuous trading mechanism.

1 Further details on the calculation method are published in www.mercatoelettrico.org

Intra-day Market (MI)
Venue for trading electricity supply offers and demand bids for each hour of the next day, modifying the injection and withdrawal schedules resulting from the MGP. GME accepts bids/offers by merit order, taking into account any transmission limits remaining after the MGP. If accepted, bids/offers are remunerated at the zonal clearing price. Accepted offers modify any preliminary schedules and determine the updated injection/withdrawal schedules of each offer point for the next day. Participation in the MI is optional.

Italian Power Exchange (IPEX)
Foreign name given to the Italian Power Exchange.

Kyoto protocol
International environmental treaty signed in the Japanese city from which it takes its name. The treaty was signed on 11 December 1997 by over 160 countries on the occasion of the Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (UNFCCC) and global warming. The treaty entered into force on 16 February 2005, after its ratification by Russia. The treaty requires industrialized countries to sharply cut down their emissions of pollutants (carbon dioxide and five other greenhouse gases, i.e. methane, nitrogen oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride) by at least 5.2% from their 1990 levels (base-year) in the 2008-2012 period. The protocol also covers the trading (purchase and sale) of greenhouse gas emission allowances.

Liquefied natural gas (LNG)
Natural gas being liquefied to allow sea transportation through LNG carriers. Upon destination, special facilities called regasification units are employed to return LNG to its original state.

Limited production pole
Set of generating units connected to a portion of the national electricity transmission grid (RTN) without withdrawal points; its maximum output which can be exported to the remaining RTN portion is smaller than the maximum output due to an insufficient transmission capacity. In the Italian market, it is defined as a national virtual zone.

Liquidity
Ratio of volumes traded on the Exchange (MGP) to total volumes (including bilateral contracts) traded in the "Sistema Italia".

Margin
In derivatives or financial instruments transactions, it expresses the percentage value of securities (either purchased or sold) that need to be held in cash or cash equivalents by market participants as a guarantee of any possible change in the investment value.

Market Clearing Price (MCP)
Clearing price or equilibrium price. By extension, it identifies the rule for remunerating bids/offers accepted in the MGP and MA on the basis of the price of the marginal offer/bid.

Market coupling
Mechanism to address network congestions, quite similar to market coupling; however, unlike market coupling, its market zones are run by one entity only. GME's Italian market falls under this classification, having a zone-based structure.

Market splitting
Mechanism to address network congestions, quite similar to market coupling; however, unlike market coupling, its market zones are run by one entity only. GME's Italian market falls under this classification, having a zone-based structure.

Mark to Market
Daily write-up of a portfolio of derivatives contracts on the basis of market prices; it is employed in forward exchanges to manage margins paid in by market participants as a guarantee of their positions.

Merit-order dispatch
Such activity consists in determining the hourly injection and withdrawal schedules of the units associated with offer points on the basis of the offer price and, if this price is equal, on the basis of priorities specifically assigned to the different types of units by Terna S.p.A. In particular, supply offers are accepted – and injection schedules are determined accordingly – by increasing offer price order, whereas demand bids are accepted – and withdrawal schedules are determined accordingly – by decreasing offer price order. Furthermore, bids/offers are accepted consistently with the transmission limits between pairs of zones, defined daily by Terna S.p.A. Merit-order dispatch covers volumes directly offered in the market and volumes generated by plants with a capacity less than 10 MVA, CIP6 plants, by plants selling electricity under bilateral contracts, as well as electricity import volumes.

M-RECO
The RECO market, i.e. the trading venue of RECOs, organized and run by GME.

National single price (PUN)
Average of zonal prices in the MGP weighted for total purchases, net of those coming from abroad and from pumped-storage units.

National Transmission Grid (RTN)
In Italy, the set of lines being part of the grid employed for transmission of electricity from production sites to where it is distributed and used.

Nomination
Procedure through which each participant notifies to the transmission system operator its electricity injection/withdrawal schedules into (from) the transmission grid.

Offset
Typical procedure on forward markets; it allows to close a position prior to its maturity by entering a contract opposite to the original one. This mechanism is made possible thanks to standardized regulated contracts.

Option
Contract whereby the buyer is given the option to buy (call option) or sell (put option) a given real or financial asset at a pre-set price (strike) on a given date (European option) or by a given date (American option). This right is granted by the seller (writer) to the buyer against the immediate payment of a premium, the option price.

OTC (Over the Counter) Markets
Unregulated markets, i.e. every market where financial operations outside the official stock exchange or regulated market are traded. Generally, trading terms are not standardized and "atypical" contracts can be entered. Broadly speaking, contracts traded in such markets are characterized by a smaller liquidity than contracts traded on regulated markets.

OTC Registration Platform (PCE)
Platform to register bilateral contracts, introducing a significant flexibility relative to the previous Bilaterals Platform. The PCE operates on specific terms outlined by AEEG Decision 111/06 and by GME's Rules. The PCE allows to register five types of contracts, including four standard ones (base-load, peak-load, off-peak, weekend) and one non standard contract. Participants can register forward electricity volumes and delivery length two months (maximum) ahead of the physical delivery date.

P-GAS
Trading platform organized and managed by GME to sell natural gas; it consists of the import and royalties segments.

PB-RECO
Platform where RECO bilateral transactions are registered; bilateral transactions resulting from competitive procedures are also registered on this platform.

Peak power
The highest power (supplied or used electricity) on any point over the grid in a given time interval.

P-GAS Importer
An importer is an entity authorized by the Ministry of Economic Development to import gas produced in non-EU countries, pursuant to article 3, legislative decree no. 164/00; an importer shall offer import quotas pursuant to art.1, Ministerial Decree 19.03.2008.

Price Coupling of Regions (PCR)
Cooperation agreement among the six leading European power exchanges (APX/ENDEX, Belpex, EPEX, GME, OMEL, NordPool). It aims at identifying a coordinated mechanism to set the price of electricity in such markets. The project is intended to lay the foundations of a true European energy market.

Price-setting Operator Index (IOM)
Index referred to individual participants who have set the sale price at least once. For each participant and each macro-zone, in a given time period, it is defined as the share of volumes based on which a price has been set. For each price-setting market participant and each macro-zone, it is calculated as the ratio between the sum of quantities sold in the geographical areas where a price has been set for the macro-zone (including bilateral contracts) and the sum of total volumes sold in the macro-zone.

Price-setting technology Index (ITM)
Similar as IOM (see Price-setting Operator Index). This index considers the production technology in lieu of the market participant.

PSV
System to trade/sell gas at the Virtual Trading Point - PSV module (gas trading system at the Virtual Trading Point – PSV), referred to in AEEG Decision no. 22/04, organized and managed by Snam Rete Gas.

RECOs
RECOs are the guarantees of origin (GOs).

RECO Registry
Registry of the guarantees of origin, organized and run by GSE; under the Registry, RECOs held by each participant are entered into the relevant ownership account.

Renewable energy sources
This category includes sun, wind, water resources, geothermal resources, tides, wave motion and the transformation of vegetables or organic and inorganic waste into electricity.

Residual Supply Index (IOR)
Index referred to individual market participants submitting offers in the market. It measures the presence of residual market participants, i.e. those that are necessary to cover demand. For each market participant, it is defined as the ratio of the overall volumes offered by competitors to the overall volumes sold. The index is < 1 when one residual participant is present and the closer to 0 the higher the offer share that can be sold, regardless of the offer price. The IOR is calculated by aggregating the volumes offered by individual market participants, based on their belonging group, including the volumes covered by bilateral contracts. Even volumes from CIP6 contracts are included in this calculation and assigned to GSE, regarded as a market participant. Utilization of the volume accepted in the denominator allows to discount the effect, on the internal demand of each zone, of transits with surrounding zones. For each macro-zone, the following are published at regular intervals: percentage of hours during which at least one necessary participant was present; percentage of electricity sold as residual volume out of the overall electricity sold, equal to the mean of hourly residual volumes in a macro-zone (which, in turn, are defined as the sum, for all participants, of volumes offered by each, less the overall volume offered, plus the overall volume sold); the number of necessary participants and the percentage of hours during which they were required.

Shale Gas
Special and very common type of unconventional gas obtained from shale. It is increasingly important, especially in the United States, thanks to new drilling techniques making its extraction cost-effective.

Spark spread
Sustainability indicator of electricity prices for combined cycle plants; it results from the difference between the sale price of electricity and the variable cost of fuel in a combined cycle plant.

Spot price
Current price; it reflects the current «market value» of a good or financial asset.

Storage year
The storage year of gas begins on 1 April and ends on 31 March of the following year.

Terna – Rete Elettrica Nazionale S.p.A.
Company in charge of electricity transmission and dispatching over the high-voltage and extra-high voltage grid throughout Italy. Terna is a listed company. Its shares were first traded in June 2004. At present, its relative majority shareholder is "Cassa Depositi e Prestiti".

TOE (Tonnes of Oil Equivalent)
Conventional unit commonly used in energy balances to express energy sources through a common measurement unit, keeping into account their calorific power.

Transmission limits
Maximum electricity transmission capacity between a pair of zones, expressed in MWh. Transmission limits are part of the preliminary information that Terna S.p.A. daily notifies to GME and that GME posts in its website. Such limits are utilized by GME to identify clearing prices in both the MGP and MI.

Transmission System Operator (TSO)
Entity in charge of managing the electricity and gas transmission grid.

Unconstrained
In the MGP, virtual price or volumes that would develop in the lack of any transmission constraint.

Variation coefficient
Price volatility index, expressed as a percentage. It is calculated as the ratio of the standard deviation to the average price value.

Volatility
The indicator evaluating volatility is calculated monthly as a standard deviation of logarithmic returns of daily prices, subsequently aggregated on a yearly basis through an arithmetic mean calculation.
In the Green Certificates Market (MCV), characterized by just a weekly session, the volatility indicator is calculated on a yearly basis as a standard deviation of logarithmic returns of weekly sessions.

White Certificates
See Energy Efficiency Certificates

Zonal price (Pz)
Clearing price characterizing each geographical and virtual zone in the MGP.

Zone
Portion of the power grid where, for system security purposes, there are physical limits to transfers of electricity to/from other geographical zones. The Zones are defined by Terna SpA and approved by AEEG. At present, the zones are as follows:

- **Geographical Zone:** representing a portion of the national grid. Geographical zones are northern Italy (NORD), central-northern Italy (CNOR), central-southern Italy (CSUD), southern Italy (SUD), Sicilia (SICI), Sardegna (SARD).
- **National Virtual Zone:** Constrained Zone ("Point or Pole of Limited Production"). It includes: Monfalcone (MFTV), Rossano (ROSN), Brindisi (BRNN), Priolo (PRGP) and Foggia (FOGN).
- **Foreign Virtual Zone:** point of interconnection with neighboring countries. Foreign virtual zones include: France (FRAN), Switzerland (SVIZ), Austria (AUST), Slovenia (SLOV), BSP (zone representing the Slovenian Electricity Market managed by BSP and connected to IPEX via the Market Coupling mechanism), Corsica (CORS), Corsica AC (COAC) and Greece (GREC). Moreover, AEEG Decision ARG/elt 243/10 of 16 December 2010, approving the Pentalateral Agreement on operational procedures aimed at implementing the market coupling with Slovenia, introduced, amongst others, a BSP foreign virtual zone representing the Slovenian electricity market managed by BSP exchange. Unless specified otherwise, volumes (purchases/sales) under the "Foreign countries" heading add the volumes of the foreign virtual zones France, Switzerland, Austria, Slovenia, Corsica, Corsica AC and Greece to the energy flow resulting from the market coupling mechanism; more specifically, the flow outgoing toward the BSP zone is included into purchases, whereas the flow incoming from the BSP zone is included into sales.
- **Market Zone:** aggregation of geographical and/or virtual Zones such that the flows between the same zones are lower than the Transmission Limits notified by Terna SpA. This aggregation is defined on an hourly basis as a result of the resolution of the MGP and MI. In the same hour, different Market Zones may have non-different Zonal Prices.

REFERENCES

AEEG (2012), Relazione Annuale sullo stato dei servizi e sull'attività svolta
AEEG (2012), statistical data
AIEE - Associazione Italiana Economisti dell'Energia (2012), I mercati energetici internazionali nel 2013 e le prospettive per l'Italia - Rapporto Osservatorio Energia AIEE
British Petroleum (2012), Energy Outlook
British Petroleum (2012), Statistical Review of World Energy
CEGH (2008-12), Statistics
European Commission – DG ECFIN (2011), AMECO Data
Enerdata (2012), Yearbook
EEX (2008-12), Statistics
ERGEG (2012), Draft Framework Guidelines on Capacity Allocation and Congestion Management for Electricity
ERGEG (2011), Status Review on the ERGEG Regional Initiatives 2011
International Monetary Fund (2012), World Economic Outlook, October
Gas Infrastructure Europe (2012), statistical data
Gasunie TS (2008-12), statistical data
GME (2004), "Uniform purchase price algorithm", www.mercatoelettrico.org
GME (2012), Vademecum della borsa elettrica italiana
International Energy Agency (2012), Key World Energy Statistics
International Energy Agency (2012), World Energy Outlook
Istat (2012), monthly reports
Istat (2013) - Stima preliminare del PIL - IV trimestre 2012, febbraio
Meteogiornale.it (2012), statistical data
Ministero dell'Ambiente e della Tutela del Territorio e del Mare (2008), Piano Nazionale d'Assegnazione per il periodo 2008-2012
Ministero dello Sviluppo Economico – Bilanci Energetici Nazionali (2011)
National Grid Gas (2008-12), statistical data
PowerNext (2008-12), statistical data
REF (2012), Natural Gas Outlook
SNAM (2006-12), statistical data as of 31/12/2012
Stogit (2004-12), statistical data
Terna (2011), statistical data
Terna (2011), Piano di sviluppo della rete elettrica di trasmissione nazionale
Terna (2011), Previsioni della domanda elettrica in Italia e del fabbisogno di potenza necessario anni 2011 – 2021
Terna (2012), Rapporti mensile sul sistema elettrico
Thomson-Reuters (2008-12), statistical data
Unione Petrolifera (2011), Data Book
Unione Petrolifera (2012), Data Book
Zeebrugge Hub Operator (2008-12), statistical data

ANNUAL REPORT 2012

Gestore dei Mercati Energetici S.p.A.
Largo Giuseppe Tartini, 3/4
00198 Rome - Italy
Tel +39 06 8012 1
Fax +39 06 8012 4524
E-mail info@mercatoelettrico.org
www.mercatoelettrico.org