



# ANNUAL REPORT 2023





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# EXECUTIVE SUMMARY

## **The energy context and GME markets**

The evolution observed in European energy systems and markets in the past few years reflects deep structural changes resulting from contingent factors of extraordinary significance.

Indeed, in the period from 2020 to 2022, the Covid-19 pandemic and the subsequent onset of the war between Russia and Ukraine caused repeated tensions in the equilibrium between energy supply and demand in Europe, making it imperative to take measures aimed at restoring stability in systems and markets.

In Europe, the complete filling of gas storage facilities, sustained by both low demand and consolidation of imports of Liquefied Natural Gas (LNG), relieved tensions in markets, favouring the return of gas and electricity prices to values definitely below their records in 2022, but however among the highest in the decade.

It is in this context that also the dynamics observed in GME markets operated.

In the electricity sector, after a year affected by contingent and exceptional events, prices declined again, following a trend that was common to all European countries thanks to decreases in gas prices. The drop of *Prezzo Unico Nazionale* (PUN, national single price, i.e. the reference index for the national market) to 127.24 €/MWh had positive effects on the overall system, promoting a progressive mitigation of the cost of electricity in Italy.

In terms of liquidity, in spite of a sharp fall in electricity consumption, the volumes directly traded on GME exchange were fairly stable in the day-ahead timeframe (209.9 TWh) and reached an all-time peak in the intraday one (29.1 TWh). The latter result was driven above all by trades in the XBID market, managed under the mechanism of continuous-trading market coupling with the rest of Europe. Moreover, as regards national energy policies, the Day-Ahead Market (MGP) recorded a general growth in sales of electricity generated from renewable sources. Among these sources, hydro recovered, while all other sources showed a gradual and constant increase: an encouraging signal for pursuing the targets of energy transition towards environmentally sustainable production systems.

Positive results were achieved in the gas sector, too. The volumes of gas traded in the most liquid markets, i.e. the continuous-trading Day-Ahead Gas Market (MGP-GAS) and Intraday Gas Market (MI-GAS), confirmed their multi-year upward trend, thus making the prices expressed therein more representative.

During the year, given the success of these markets, GME developed and made available a new gas price index, called "IG Index GME" (Italian Gas Index), with a view to providing market participants with a useful tool to interpret and assess the dynamics of spot gas markets and, at the same time, offering a benchmark to be used for hedging operations, procurement contracts, and by institutional parties in the activities falling within the scope of their responsibilities.

## **GME and the future of energy markets**

Despite the occurrence of extraordinary events of unexpected and unexpectable complexity outside energy markets, progress was made in the implementation of European and national energy policies aimed at completing the evolution of energy systems towards solutions that are financially and environmentally sustainable and that maximise market integration.

With regard to these processes, GME, as the entity in charge of organising and managing energy markets in Italy, continued its efforts at national and international level, supporting institutions and acting in coordination with European Transmission System Operators (TSOs) and Nominated Electricity Market Operators (NEMOs), in order to facilitate the attainment of the above-mentioned targets.

In 2023, proceeding on the path towards European integration of electricity markets and with a view to extending its benefits to the intraday timeframe, GME cooperated with other entities involved in regulatory and operational activities in preparation of the go-live of pan-European Intraday Auctions (IDAs), in accordance with Commission Regulation (EU) 2015/1222 (CACM, Capacity Allocation and Congestion Management), aimed at implementing a joint and coordinated allocation of intraday transmission capacity. IDAs will broaden the range of options that market participants have available to optimise their commercial schedules arising from day-ahead markets, while enabling cross-zonal trading consistently with cross-border price spreads.

Furthermore, with the progressive development of renewable sources, distributed generation, and smart grids, GME launched a Local Flexibility Market (MLF), making its know-how and experience available for the implementation of a pilot electricity distribution project, as set forth in Decision 352/2021/R/EEL adopted by *Autorità di Regolazione per Energia, Reti e Ambiente* (ARERA, Italian Regulatory Authority for Energy, Networks and Environment). The MLF provides Distribution System Operators (DSOs) with the opportunity to procure ancillary services, under transparent and non-discriminatory criteria, for an efficient operation of their local distribution grids and, at the same time, to establish a better operational coordination with TSOs.

GME commitment to ensuring a positive evolution of processes of transition and integration of energy markets will go on in 2024. During this year, GME will be mainly engaged in activities related to the revision of the electricity market design in compliance with the provisions of *Testo Integrato del Dispacciamento Elettrico* (TIDE – Integrated Text of Electricity Dispatching Rules), approved by ARERA with its Decision 345/2023/R/EEL and entering into force on 1 January 2025.

GME will continue to make its expertise available for the evolution of the overall energy system and to offer market platforms that are organised and operated in effective and efficient ways.

*The Chairman*

Prof. Angelo Spena



*The Chief Executive Officer*

Prof. Pietro Maria Putti



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The Company



## GME PROFILE

*Gestore dei Mercati Energetici S.p.A.* (GME) is a company (*società per azioni*) that was established in 2000 as part of the process of liberalisation of the energy sector. GME is wholly owned by *Gestore dei Servizi Energetici S.p.A.* (GSE), whose shares are held by the Italian Ministry of Economy and Finance. GME is a **multi-commodity company** operating in accordance with the guidelines given by the Italian Ministry of Environment and Energy Security and the regulatory provisions laid down by *Autorità di Regolazione per Energia, Reti e Ambiente* (ARERA, Italian Regulatory Authority for Energy, Networks and Environment).

## GME MARKETS

GME organises and manages electricity and gas markets – **with physical commodity delivery obligation** – as well as environmental and fuel markets. In particular, GME operates:

- ▶ in the **electricity sector**, *i)* the Spot Electricity Market (MPE), consisting of the Day-Ahead Market (MGP), the Intraday Market (MI), and the Daily Products Market (MPEG); *ii)* the Forward Electricity Market (MTE); *iii)* the Forward Account Registration Platform (PCE), where participants register forward electricity purchase and sale contracts concluded off the market system; *iv)* the Bulletin Board of long-term renewable electricity purchase and sale contracts (PPA Bulletin Board), consisting of three sections (Notice Section, Contract Registration Section, and Energy Release Section); and *v)* the Local Flexibility Market (MLF)<sup>1</sup>, through which participating Distribution System Operators (DSO) may procure local ancillary flexibility services as part of pilot projects established under ARERA Decision 352/2021/R/EEL of 3 August 2021. Within the MPE, GME also operates the Ancillary Services Market (MSD), where participants procure resources for the dispatching service and whose economic management falls under the responsibility of *Terna S.p.A.* (Terna);
- ▶ in the **gas sector**, *i)* the Spot Gas Market (MP-GAS), consisting of the Day-Ahead Gas Market (MGP-GAS), the Intraday Gas Market (MI-GAS), organised in turn into continuous-trading segments and auction-trading (AGS) segments, the Locational Products Market (MPL), and the Regulated Market for the Trading of Gas Stored (MGS); as well as *ii)* the Forward Gas Market (MT-GAS). GME runs the Platform for fulfilling the obligations referred to in article 11 of Law 40/07 (P-GAS), and the Platform for allocating regasification capacity (PAR);
- ▶ in the **environmental sector**, *i)* the Energy Efficiency Certificates Market (MTEE); *ii)* the Market of Guarantees of Origin (GOs), which certify production of electricity from renewable sources (M-GO); and *iii)* the Market for Certificates of Release to Consumption of Biofuels (MCIC). GME also runs the Platforms for registering bilateral transactions of Energy Efficiency Certificates (TEE) and Guarantees of Origin (GOs), i.e. the TEE Register and the PB-GO, respectively;
- ▶ in the **fuel sector**, *i)* the Mineral-Oil Storage and Transit Capacity Data Reporting Platform (PDC-OIL); and *ii)* the Trading Platform for Mineral-Oil Logistics Services (P-LOGISTICS).

<sup>1</sup> For more details, see the paragraph on NEW INITIATIVES in this Report.

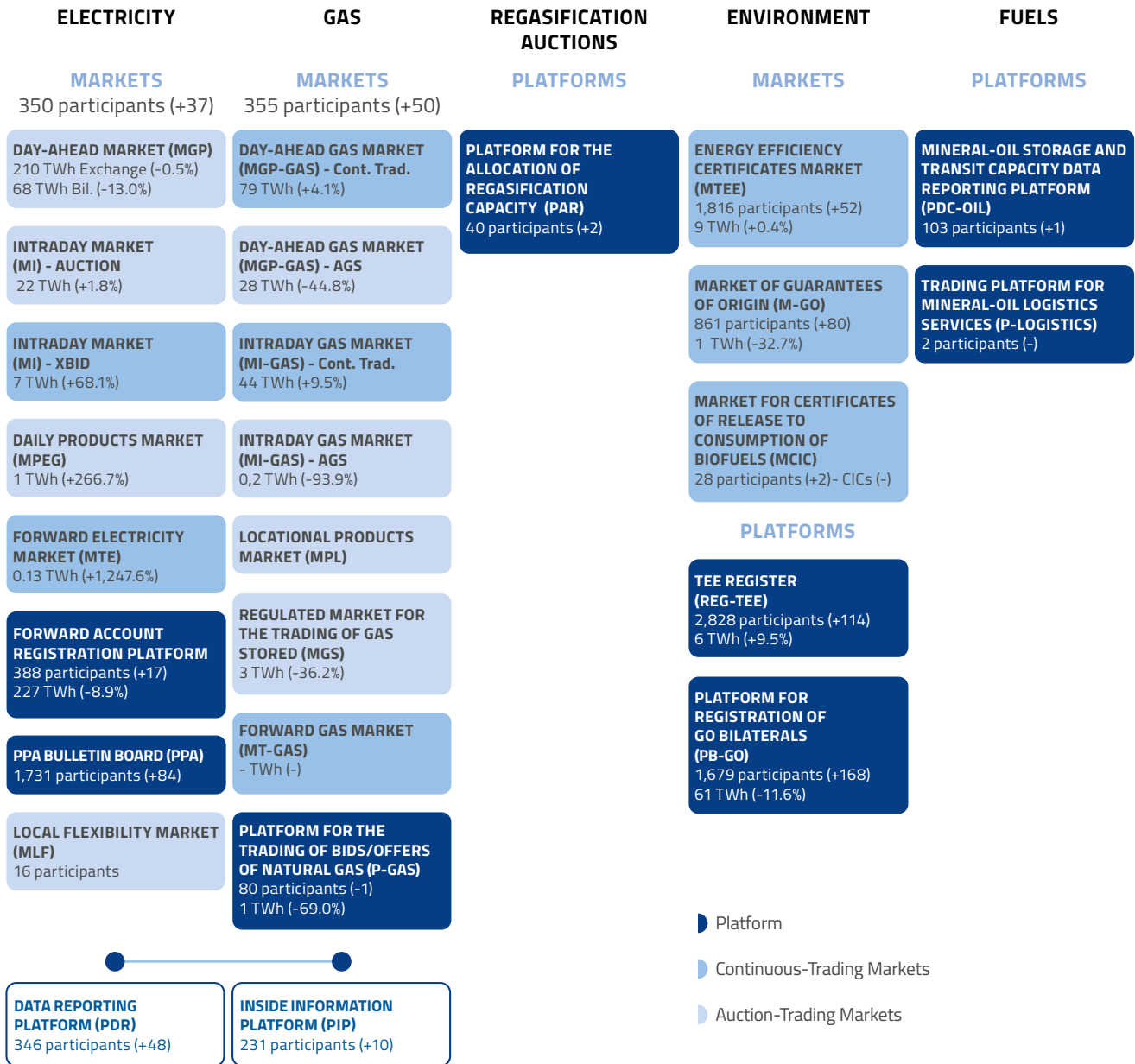
GME acts as a central counterparty in its markets and on its platforms, except in the MSD where the central counterparty is Terna, and on the PPA Bulletin Board, P-GAS, PAR, and Platforms for registering bilateral contracts in respect of GOs and TEE.

The year 2023 further confirmed the multi-year increasing trend of participants in/on these markets/platforms. The number of participants rose to 3,033 (+182 on 2022), whereas the overall volume of trades had a slight contraction, in line with the decline in energy demand caused by the inflationary spiral that began in 2022. Nonetheless, in the electricity sector, the volumes traded directly on the exchange managed by GME (MGP Exchange + MI: 239.02 TWh) remained practically stable. Conversely, in the gas sector, the volume of trades diminished, but remained close to its all-time peaks, driven by a new significant increase recorded in the most liquid markets (continuous-trading MGP-GAS + MI-GAS: 123.13 TWh). It is worth stressing that the bearish trend observed in gas trades was only the reflection of a natural contraction in the volumes traded in the AGS segment in 2023. Indeed, Snam used this segment to respond to the gas scarcity emergency in 2022 and procure the resources needed to fill gas storage facilities<sup>2</sup> (from Fig. 1.1 to Fig. 1.3).

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<sup>2</sup> For more details about market trends, see section 2.

Fig. 1.1 Volumes and participants by market/platform in 2023



- ▶ Platform
- ▶ Continuous-Trading Markets
- ▶ Auction-Trading Markets

Fig. 1.2 GME market participants

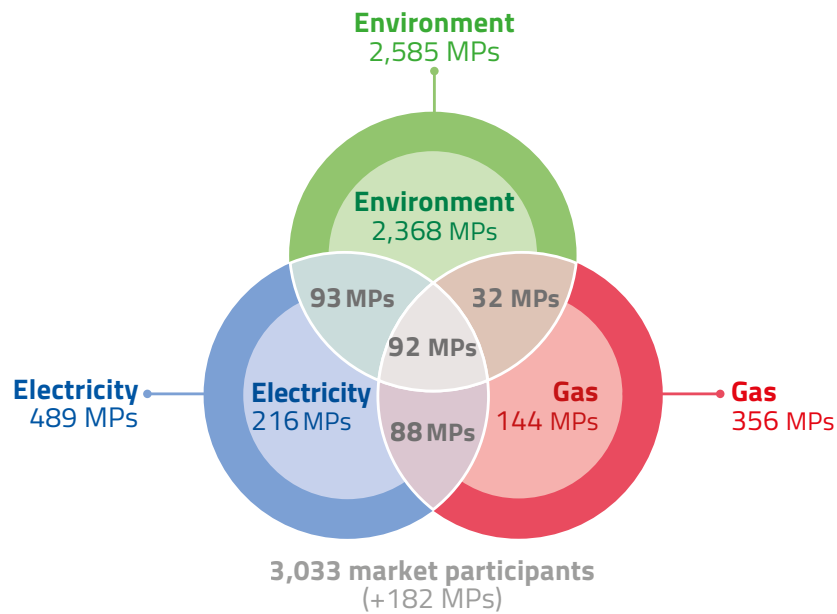
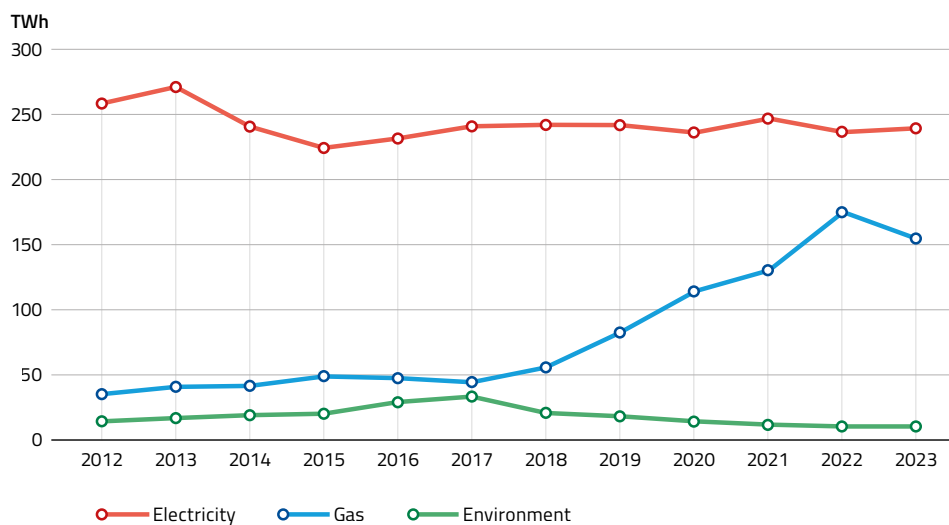


Fig. 1.3 Trend of volumes by sector<sup>3</sup>



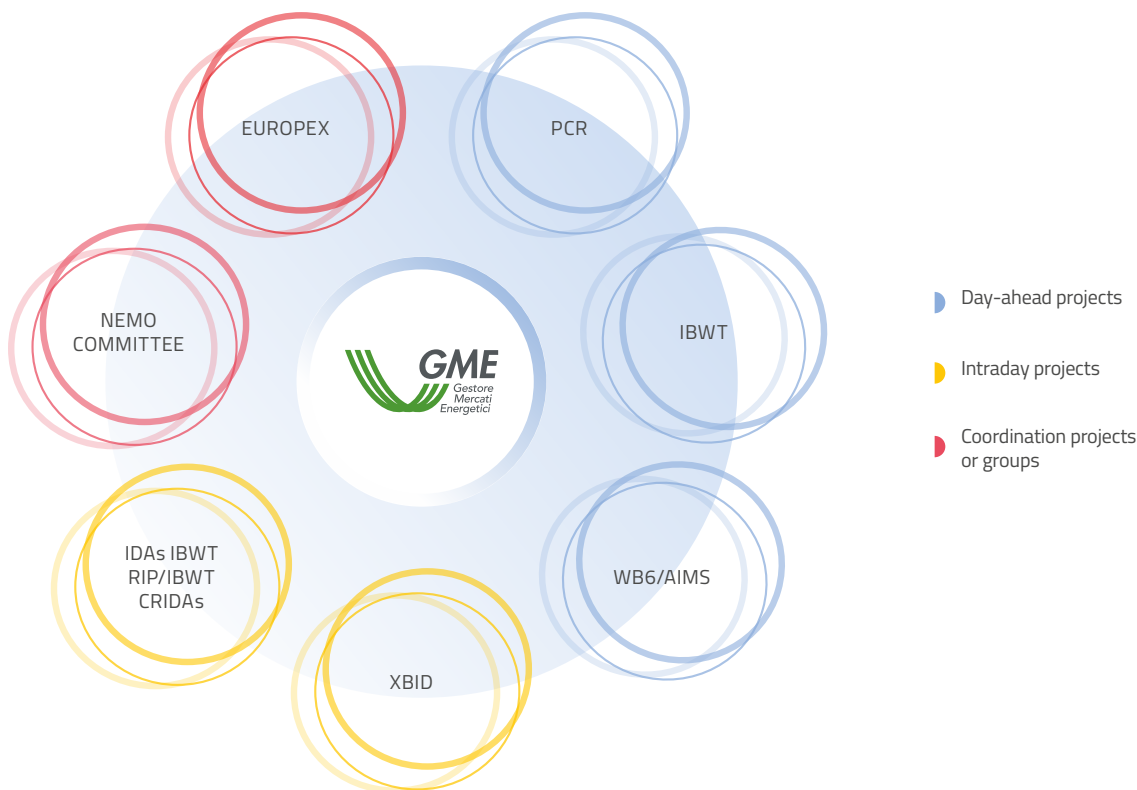
<sup>3</sup> The Electricity sector includes the volumes of the MGP Exchange, MI (auction + XBID), and MPEG. The Gas sector includes the volumes of the MGP-GAS (auction + continuous trading), MI-GAS (auction + continuous trading), MGS, and MPL. The Environment sector includes the volumes of the MTEE, M-GO, and MCIC.

## INTERNATIONAL ACTIVITIES

GME is a member of Europex (Association of European Energy Exchanges) and, as a NEMO<sup>4</sup>, it cooperates with the other designated European exchanges and European TSOs<sup>5</sup> in projects of coordination and integration of day-ahead and intraday electricity markets (NEMO Cooperation, SDAC, SIDC)<sup>6</sup> for an efficient management of market coupling processes and the full implementation of Commission Regulation (EU) 2015/1222 (CACM Regulation). Additionally, jointly with ARERA, Terna, and the Ministry of Environment and Energy Security, GME takes part in the Western Balkans 6 (WB6)<sup>7</sup>, project, aimed at promoting the integration of Balkan countries with the EU SDAC and SIDC, based on the experience acquired in the organisation and operation of national markets, and of the integrated European electricity market.

In particular, in 2023, in coordination with European NEMOs and TSOs, GME finalised the process required to initiate the pan-European Intraday Auctions (IDAs) in accordance with the CACM Regulation (as referred to in ACER Decision 01/2019), in view of the joint and coordinated intraday allocation of transmission capacity, and it committed to implementing the activities needed for their go-live, which is planned to take place during 2024 (Fig. 1.4).

**Fig. 1.4 International projects**



<sup>4</sup> NEMO is the Nominated Electricity Market Operator, as defined in article 4 of Commission Regulation (EU) 2015/1222 (hereafter CACM Regulation), a role that in Italy was assigned to GME by the Ministry of Economic Development (now Ministry of Environment and Energy Security).

<sup>5</sup> Transmission System Operator.

<sup>6</sup> SDAC and SIDC are operational coordination projects for the full implementation of the European Single Day-Ahead Coupling (SDAC) and Single Intraday Coupling (SIDC), whose governance was integrated within the Market Coupling Steering Committee (MCSC).

<sup>7</sup> WB6 is an initiative of cooperation involving national Regulators, Transmission System Operators, and Market Operators of Albania, Bosnia–Herzegovina, Macedonia, Montenegro, and Serbia for creating a regional electricity market in the Balkan region, to be integrated with the EU energy market. The WB6 initiative coordinates a set of subprojects aimed at promoting the development and integration of electricity markets in WB6 countries (with the exception of Kosovo), at both local and regional level. The initiative is supported by the EU and by the Energy Community.

## NEW INITIATIVES

In 2023, in coordination with the relevant institutions and by agreement with the parties directly involved, GME launched and/or completed projects in the different areas of interest, confirming its role of support to national and EU policies aimed at market integration and energy transition. It is in this framework that GME undertook the following initiatives in the electricity, gas, and environmental sectors.

- ▶ In the electricity sector:
  - **launch of the Local Flexibility Market (MLF)** on 7 August 2023, after ARERA approval (Decision 372/2023/R/eel). The MLF, organised and managed by GME, enables Distribution System Operators that have put in place projects similar to the *RomeFlex* one to procure local ancillary services for an efficient and secure operation of their distribution grids, as part of pilot projects established under ARERA Decision 352/2021/R/EEL. The MLF consists of: *i*) a local forward flexibility market (MLT-Flex) for procurement of long-term flexibility services; the first forward auction was held in this market on 22 November 2023; and *ii*) a local spot flexibility market (MLP-Flex), which is planned to become operational during 2024;
  - **activities to replace the national single price (PUN)**, beginning on 1 January 2025, as a price for valuing electricity demand bids in the Day-Ahead Market and, at the same time, to define and calculate (in continuity with the national single price) a reference index for valuing electricity traded in the national wholesale market, also in view of pricing long-term electricity contracts;
  - **start of activities to implement the provisions of *Testo Integrato del Dispacciamento Elettrico (TIDE – Integrated Text of Electricity Dispatching Rules)***, approved by ARERA with its Decision 345/2023/R/EEL of 25 July 2023. With the adoption of TIDE, which is expected to enter into force on 1 January 2025, GME will have to revise the design of the electricity market and of the PCE, as well as the related Integrated Text of the Electricity Market Rules and PCE Rules, in coordination with Terna and the reference institutions;
  - **start of activities to implement a platform for allocating electricity storage capacity**, in compliance with Legislative Decree 210/2021 and with the organisational and operational requirements defined by ARERA in its Decision 247/2023/R/EEL of 6 June 2023.
- ▶ In the gas sector:
  - **introduction of the IG Index GME**, a price index that GME made available on 19 July 2023; this index is calculated for each gas-day, on the basis of prices of transactions concluded in the continuous-trading MGP-GAS, with a view to providing market participants with a useful tool to interpret and assess the dynamics of prices observed in gas markets with delivery at the PSV. The IG Index GME is an extremely robust, reliable, and market-based index, as it is calculated in a market having an adequate level of liquidity;
  - **introduction of the Trade Cancellation (TC)**, procedure, a tool made available to market participants in addition to those already introduced to mitigate and manage the risk of errors when entering bids/offers into the continuous-trading gas market. This procedure, approved by the Ministry of Environment and Energy Security, has been operational since 28 November 2023. Thanks to the TC procedure, market participants who/which have made errors in submitting bids/offers into the M-GAS may cancel the related transactions by entering a TC request, to be validated and accepted by GME;
  - **introduction of the *FSRU Italia*** segment into the Platform for the Allocation of Regasification Capacity (PAR) with a view to enabling Snam FSRU Italia S.r.l. to use the services offered on the platform in order to allocate the regasification capacity of the Piombino terminal that it manages. The first auction for allocating capacity in such segment was held on 28 June 2023;



- **start of activities for implementing the Gas Release Platform**, where gas release allocation procedures (referred to in article 16, paragraph 8 of Law Decree no. 17 of 1 March 2022, converted into Law no. 34 of 27 April 2022, as replaced by article 2 of Law Decree no. 181 of 9 December 2023, converted into Law no. 11 of 2 February 2024) will take place. These procedures will enable final customers to procure nationally produced natural gas in the long term at reasonable prices.
- ▶ In the environmental sector:
  - **introduction of additional types of tradable products into the M-GO, PB-GO, and MCIC**, in compliance with Decree no. 224 of 14 July 2023 of the Ministry of Environment and Energy Security and ARERA Decision 496/2023/R/COM on GOs, and with Decree no. 107 of 16 March 2023 of the Ministry of Environment and Energy Security on Certificates of Release to Consumption of Biofuels (CICs).

## MONITORING AND REMIT SERVICES

GME monitors the regularity of trading and transactions in its markets, while ensuring their integrity, in coordination with the main relevant institutions (namely, ACER<sup>8</sup> and ARERA) and in accordance with the applicable European and national legislation and regulations (REMIT<sup>9</sup>, TIMM<sup>10</sup> and TIMMIG<sup>11</sup>).

Moreover, as a Registered Reporting Mechanism (RRM)<sup>12</sup> and as an Inside Information Platform (IIP) registered with ACER, GME supports participants in fulfilling obligations in terms of data reporting and inside information disclosure under the REMIT Regulation. To this end, GME manages two platforms, the Data Reporting Platform (PDR) and the Inside Information Platform (PIP), with 346 and 231 participants, respectively, and with a yearly total of about 119 million records transmitted to ACER by the PDR and about 186,000 messages recorded on the PIP.

In 2024, the activities of monitoring and those associated with GME responsibilities as RRM and IIP will be thoroughly revised to incorporate the changes approved by the European Parliament in February 2024 to strengthen reporting and monitoring provisions, as well as to address and prevent market abuses (so-called REMIT 2).

<sup>8</sup> European Agency for the Cooperation of Energy Regulators.

<sup>9</sup> Regulation (EU) No. 1227/2011.

<sup>10</sup> *"Testo integrato del monitoraggio del mercato all'ingrosso dell'energia elettrica e del mercato per il servizio di dispacciamento"* (ARERA Decision ARG/elt 115/08, as subsequently amended and supplemented).

<sup>11</sup> *"Testo integrato del monitoraggio del mercato all'ingrosso del gas naturale"* (Annex A to ARERA Decision 631/2018/R/gas).

<sup>12</sup> A Registered Reporting Mechanism is an entity registered with ACER to carry out reporting activities on behalf of market participants subject to REMIT obligations.





02

Market Trends



## 2.1 ENERGY MARKETS

**EUROPEAN ENERGY MARKETS.** The year 2023 saw a progressive and significant reversal of the bullish trends recorded in 2022 in the prices of the main European energy commodities, which were among the highest in the recent history.

In particular, Brent prices dropped close to 84 \$/bbl (-19% vs. 2022); the variations of these prices were lower than those recorded for the price of coal, decreasing to about 135 \$/MT (-53%), and especially of gas, going back to 41 €/MWh (-67%) after protracted reductions during the year.

Electricity prices experienced the same dynamics, as they practically returned to their 2021 values as a result of the evolution occurred in gas markets and of a stagnant consumption on very low levels and lower even than in 2020, the year of the explosion of the Covid-19 pandemic (Italy: 127.2 €/MWh, France: 96.9 €/MWh, Germany: 95.2 €/MWh) (from Fig. 2.1.1 to Fig. 2.1.6).

**NEW EQUILIBRIA IN THE GAS SYSTEM.** The impact of the Russia–Ukraine war on European gas systems clearly emerges from an analysis of demand, stocks, and structure of imports.

Indeed, in 2023, *i)* the consumption of central-northern European countries and of Italy significantly decreased, reflecting the long wave of record prices observed in 2022, positive climate conditions, and growing investments in energy conservation projects; *ii)* the filling of storage facilities went back to very high values, favoured in part by a weak demand, but above all by massive injections of gas carried out by European countries in 2022; *iii)* the flows of supply of the raw material consolidated the deep structural change initiated in 2022, confirming the practical zeroing of gas supplies via pipelines from Russia, which were replaced above all by the growth of LNG (mainly from the US).

These trends drove the strong reduction of European gas prices. Although the latter went back to their 2021 levels, they continued to be twice the values observed prior to the pandemic (TTF: 40.8 €/MWh, -67%; PSV: 43.0 €/MWh, -66%).

Moreover, the higher stability of the system induced a general decrease in price volatility. However, despite the wide availability of the raw material, the equilibrium in and expectations of gas markets in Europe appeared to be still unstable, as demonstrated, for instance, by the price fluctuations recorded between August and September in connection with a dreaded strike of some regasification sites in Australia and, consequently, a possible reduction of planned LNG shipments to Europe at the beginning of the winter semester (Fig. 2.1.3 and Fig. 2.1.4).

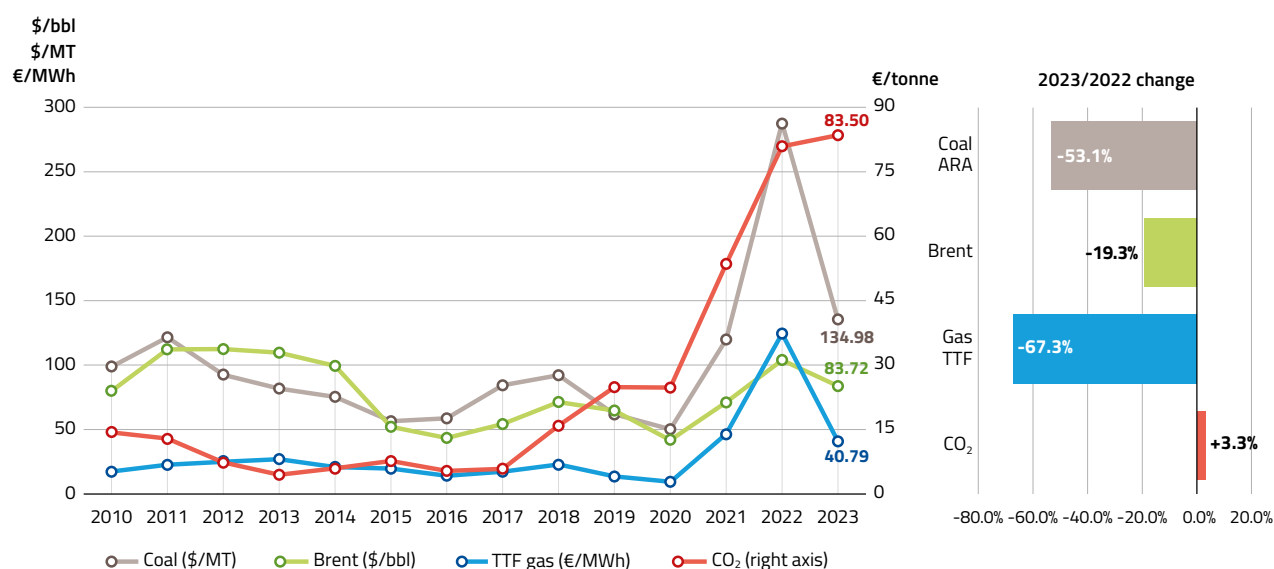
**TRANSITION IN EUROPEAN ELECTRICITY MARKETS.** The trends of gas markets had repercussions on European electricity markets. Although the prices in these markets were definitely lower than their record levels in 2022 and below the expectations expressed by futures markets at the end of the same year, their values were, again, definitely higher than those historically observed on power exchanges before 2021.

The yearly change in prices was more marked in Italy and France (-179/-180 €/MWh), compared to Germany (-140.3 €/MWh). This fact caused the price spread between northern Italy and France to practically remain around the high values of the previous year (roughly 30.9 €/MWh); conversely, the price spread between northern Italy and Germany and, above all, between France and Germany narrowed to 32.6 €/MWh (just above the level of 2021) and to 1.68 €/MWh (minimum value since 2011), respectively. Furthermore, an analysis of the hourly microstructure of the market showed a growth in the frequency of hours in which the German price proved to be higher than that of the northern zone (859 hours, equal to 10% of the total, maximum value since 2010) and higher than or equal to the French one (4,988 hours, i.e. 57% of the total). These market conditions induced a reversal of energy flows along the French–German border, so that France became again, after

two years, a net exporting country towards Germany<sup>13</sup>. The narrowing of the price spread between Germany and the other countries took place in the context of a German generating mix in which: *i*) in May 2023, the phase-out of nuclear plants was completed, with a concurrent sharp increase in import flows from France; *ii*) the amount of electricity generated by coal and brown-coal plants radically decreased.

The latter dynamics was certainly not yet mature and potentially affected by other contingent factors (e.g. low level of demand and higher availability of electricity from renewable sources). However, it is worth mentioning it, because it is part of the process of decarbonisation and transition towards environmentally sustainable production systems, promoted by the EU and known as Green Deal<sup>14</sup>, a process that will increasingly involve all EU countries in the coming years. Signs of this evolution were observed in Italy, too. After reactivating coal-fired plants to face the exceptional gas crisis in 2022, Italy planned the progressive decommissioning or conversion of such plants, given the increasing coverage of demand by renewable sources (36.8% in 2023 vs. 31% in 2022, and 35.4% in 2021)<sup>15</sup> (from Fig. 2.1.5 to Fig. 2.1.7).

**Fig. 2.1.1 Prices of the main European fuels. Yearly average**

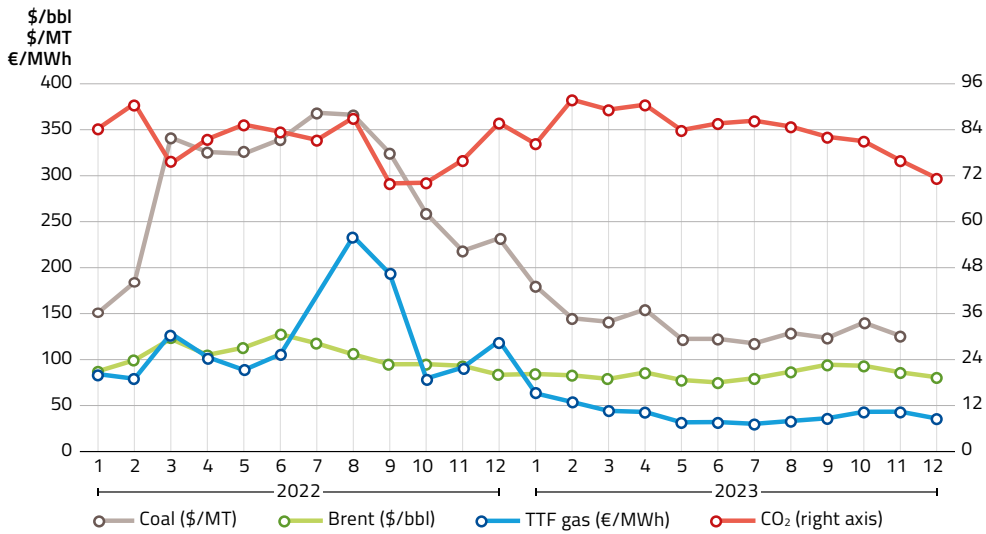


<sup>13</sup> Source: RTE-France (<https://analysesetdonnees.rte-france.com/en/markets/imports-exports>).

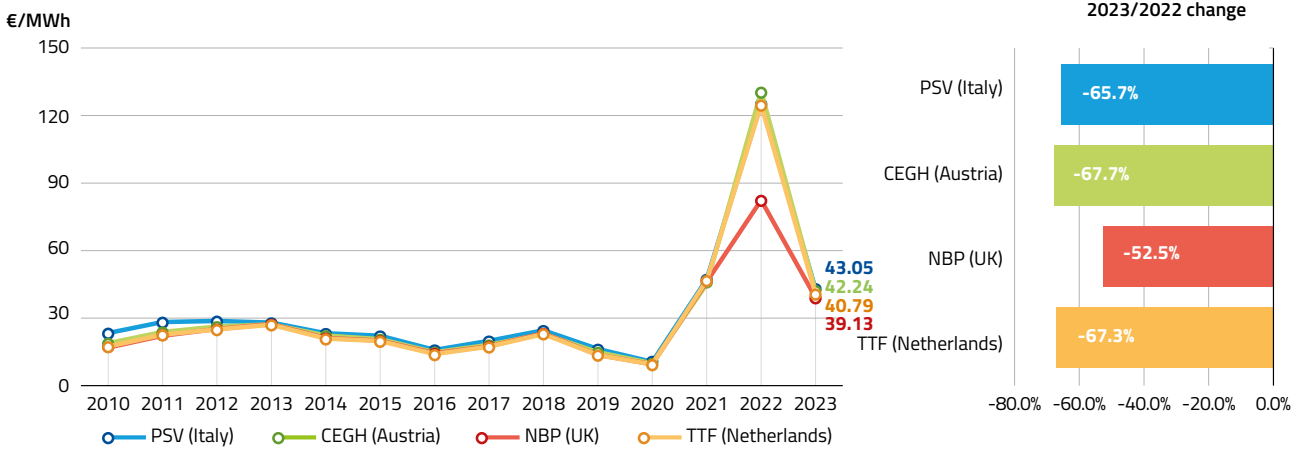
<sup>14</sup> Package of measures and initiatives adopted by the European Union and aimed at ensuring climate neutrality, i.e. the "net zero" emission target, to be achieved by phasing out the use of GHG-emitting fossil sources (foremost among them, coal) and promoting the concurrent expansion of renewable energy sources.

<sup>15</sup> Source: Terna - *Rapporto mensile sul Sistema Elettrico, December 2023*.

**Fig. 2.1.2 Prices of the main European fuels. Monthly trend for the years 2022–2023**



**Fig. 2.1.3 Prices at the main European gas hubs. Yearly average**



**Fig. 2.1.4 Prices at the PSV and TTF. Monthly trend for the years 2022–2023**

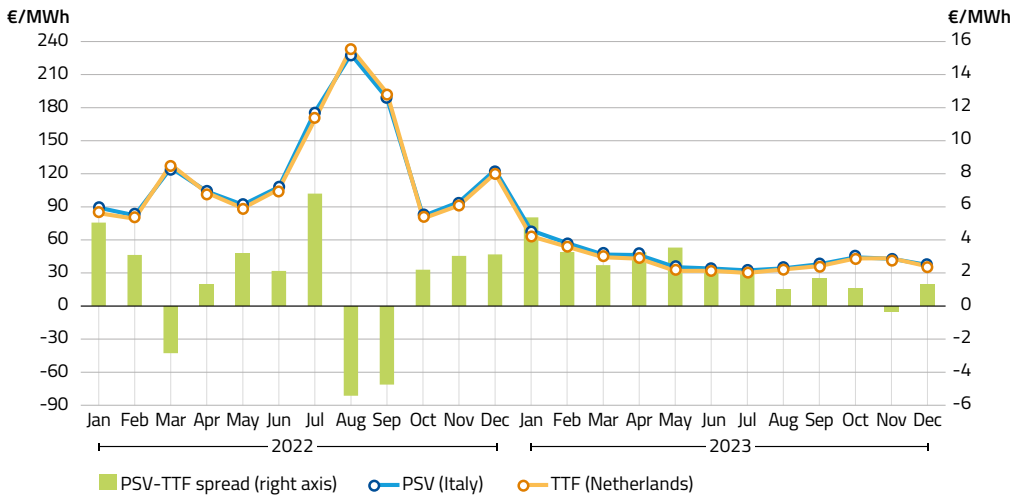


Fig. 2.1.5 Day-ahead prices on the main European power exchanges. Yearly average

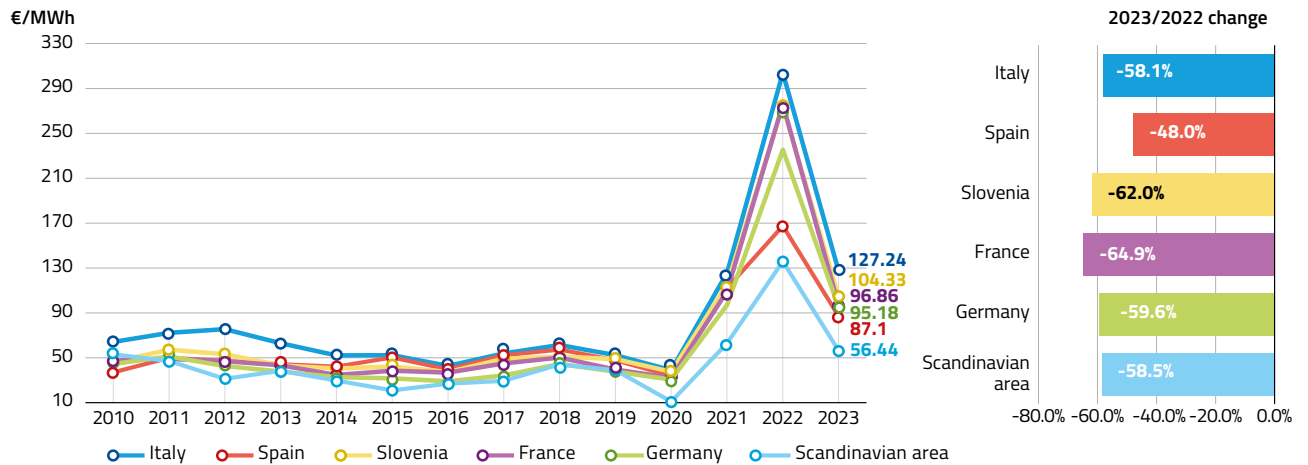


Fig. 2.1.6 Day-ahead prices on the main European power exchanges. Monthly trend for the years 2022 and 2023

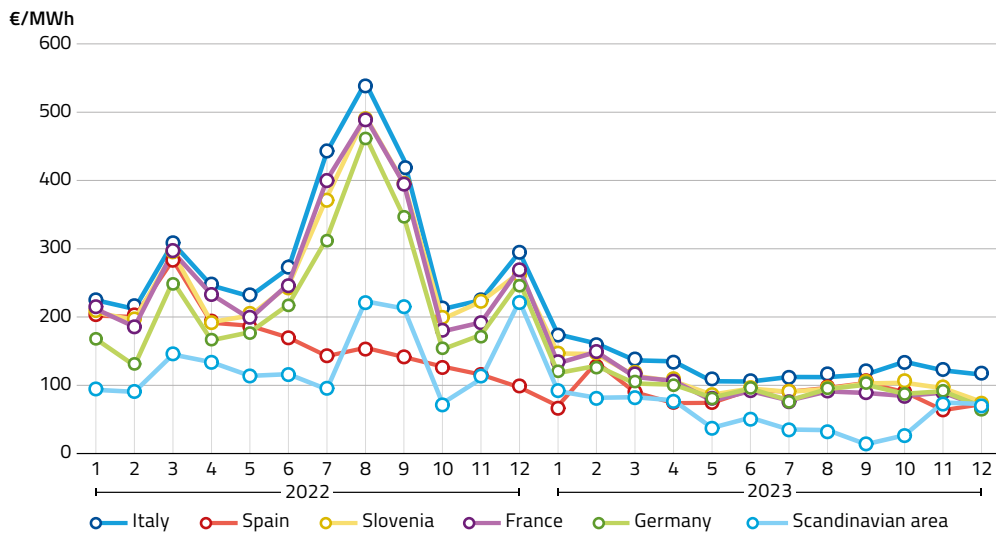
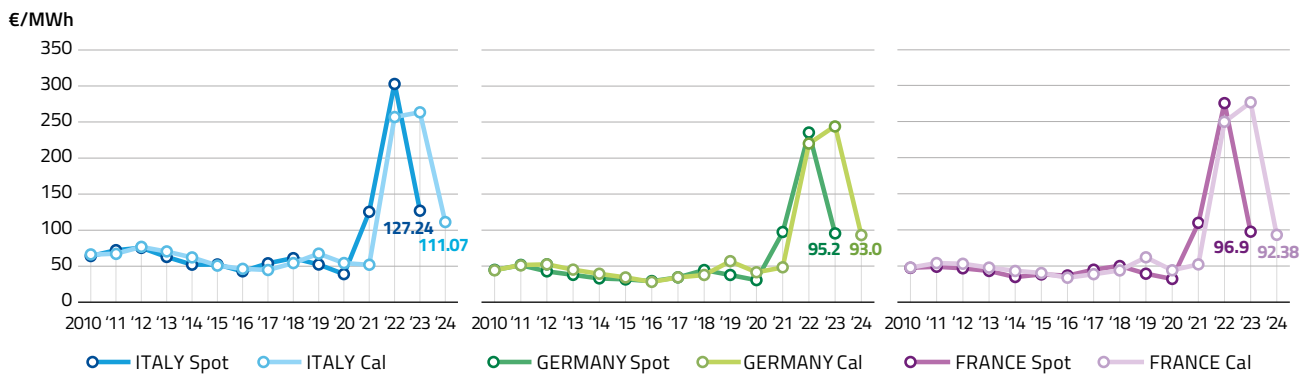


Fig. 2.1.7 Day-ahead prices and corresponding baseload calendar prices





## 2.2 ELECTRICITY MARKETS IN ITALY

### 2.2.1 Day-Ahead Market (MGP)

**THE MARKET IN BRIEF.** The general dynamics observed at European level repeated themselves in a similar way in the Italian MGP, though reflecting the distinctive features of a market where the role of gas was still crucial to driving price trends. In 2023, all the main indicators, first among them the Clean Spark Spread (CSS) and zonal price spreads, showed the progressive return of the market to “normal”, after a year of contingent and exceptional events. The decline of demand, still affected by the inflationary spiral initiated in 2022, was counterbalanced by positive signs (however, to be monitored in the coming years) coming from the distribution of national sales by source. Indeed, this distribution indicated not only an overall increase in the volumes of renewable sources (RES), especially hydro, but also a constantly growing share of non-hydro RES, an encouraging phenomenon in view of the process of energy transition to green production systems.

**PRICES.** In 2023, similarly to what happened in gas markets and in the other European electricity markets, the national single price (PUN) in the Italian MGP sharply dropped in terms of both value and volatility, equal to 127.24 €/MWh (-176.72 €/MWh) and to 8.9% (-1.2 p.p.), respectively, thereby nullifying its record increases in 2022. The drop in the PUN concerned all groups of hours, given a general flattening of the price profile expressed by both the reduction of the peakload/baseload ratio (reaching an all-time low of 1.09) and the higher frequency of sessions with day-time prices lower than night-time ones (38.6% vs. 26.6% in 2022).

The price of Italian electricity closely reflected the dynamics of gas. Indeed, the two commodities had a similar trend over the months. In particular, a downward trend was observed in the first half of the year, when the PUN fell from a yearly maximum in January (174.49 €/MWh) to a minimum in June (PUN: 105.34 €/MWh), rising again until October and declining again in the last two months of the year. In view of the above, also the CSS went back to its normal ranges prior to 2022, dropping on a year-on-year basis close to 15 €/MWh (about -25 €/MWh) and varying in the year from about 7 €/MWh in May to about 20 €/MWh in October.

The same occurred at local level, in which prices were around 128/129 €/MWh in central-northern zones (-180/-179 €/MWh), 125/126 €/MWh in central-southern zones and Sicily (-172/-169 €/MWh) and, finally, 123 €/MWh in Sardinia (-164 €/MWh). The attenuation of critical conditions (especially the low level of hydraulicity and the driving effect of foreign countries), which in 2022 had led the North to have a record spread with respect to the South, thus favoured a renewed convergence of zonal prices, with a narrower North-South price spread of 2.7 €/MWh (as against 12 €/MWh in 2022) and a growth of their frequency of alignment over the hours to 84% (+5 p.p.) (from Fig. 2.2.1 to Fig. 2.2.6 and Table 2.2.1).

**VOLUMES AND LIQUIDITY.** The long wave of sharp price increases recorded in 2022 showed its effects on electricity consumption even in 2023, during which both demand measured by Terna (306.1 TWh, -2.8%) and purchases recorded by GME in the MGP (278.0 TWh, -3.9%), structurally around 91% of system demand, decreased to (or close to) their minimum levels in 2005<sup>16</sup>. Nonetheless, market liquidity rose again, hitting a second all-time high (75.5%, +2.6 p.p.), thanks to

<sup>16</sup> As regards the data of Terna, the lowest level from 2005 on was recorded only in 2020, the year of the Covid-19 lockdowns.

the stability of volumes traded directly on IPEX (209.9 TWh, -0.5%), and to the concurrent reduction of over-the-counter (OTC) transactions registered on the PCE and nominated in the MGP (68.1 TWh, -13.0%). With regard to IPEX, the most significant element was the intensification of the upward trend of volumes traded and shares held by non-institutional participants, which went up to 167 TWh and 60% (+30 TWh and +13 p.p. as against only 3 years ago), respectively; an opposite and similarly strong trend was recorded for the volumes traded by *Acquirente Unico*, which decreased to 18 TWh (-25 TWh as compared to 3 years ago) (Tables 2.2.2 and 2.2.3, Fig. 2.2.7 to Fig. 2.2.9).

**STRUCTURE OF NATIONAL SALES.** Also the structure of national sales by source progressively returned to more stable conditions; among them, the weight of RES went up again, thanks above all to higher hydraulicity.

In particular, sales of electricity generated by national power plants dropped to a historical minimum (222.1 TWh, -7.6%), involving the volumes of conventional thermal ones (126.6 TWh, -29.7 TWh vs. 2022), which experienced the highest level of stress in 2022. The drop concerned both coal-fired plants (12.4 TWh, -8.6 TWh) – whose generation in 2022 was maximised by institutions and Terna to respond to the instability of gas supplies due to the war in Ukraine – and Combined Cycle Gas Turbine (CCGT) plants, which absorbed the most part of the decrease recorded in MGP purchases and consequently lost market shares (96.8 TWh, -22 TWh), though being more often at the margin (CCGT ITM - Price-Setting Technology Index: 60.2%) and thus crucial to price setting. A contribution to the reduction of the volumes of thermal generation also came from increased sales by renewable power plants (roughly 93 TWh, +10.5 TWh), thanks to the performance of hydro power plants (42.1 TWh, +8.4 TWh), which grew again after a year of extreme drought, and of wind and photovoltaic/solar power plants (46 TWh, +2.1 TWh). Therefore, the share of volumes bought in the MGP and covered by RES mounted to 33.6% (+4.9 p.p.), one of the highest values in the past decade (Table 2.2.4, from Fig. 2.2.10 to Fig. 2.2.11).

**TRADES WITH FOREIGN COUNTRIES.** In 2023, also foreign countries experienced a less critical situation in terms of gas imports. Italian imports from these countries hit an all-time high of 52.7 TWh (+8.8 TWh vs. 2022), a value that ensured the coverage of 20% of purchases in the MGP (+3.2 p.p.). As imports from the southern border had a moderate increase (5.1 TWh, +1.8 TWh), the growth was driven above all by imports from the northern border (43.4 TWh, +7.2 TWh), whose prices were often lower than the reference price of the North (France-Italy: about 83% of hours, +24 p.p.). However, net imports from Austria slightly declined (approximately 1.5 TWh, -0.5 TWh): transit capacity was equal to zero from mid-September to the last days of October, but Net Transfer Capacity (NTC) had a structural increase starting from mid-December.

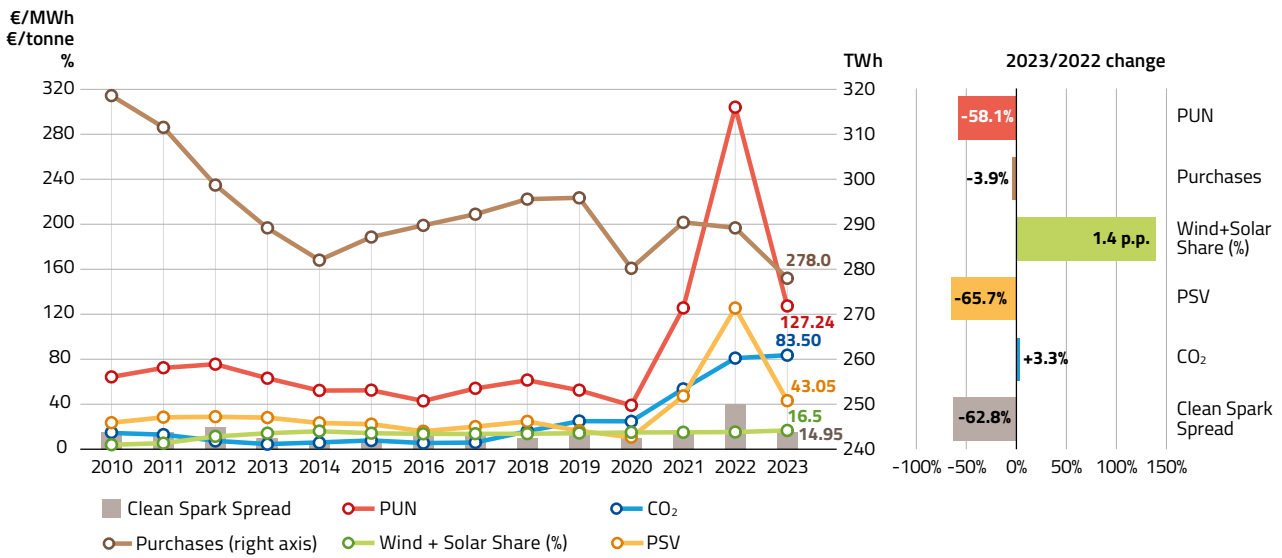
Finally, as regards the management of coupling along the Italian northern border, it is worth pointing out that, in 2023, the so-called “generalised constraint” was activated more frequently. This is a mechanism whereby, for system security purposes, Terna (national TSO) may impose limits to the import capacity that is jointly available along the North-France, North-Austria and North-Slovenia borders. The activation of this mechanism in the MGP may give rise to import flows that are lower than the sum of capacities available along such borders (hereafter “import decreases”), or even import flows that are contrary to the price delta (hereafter “counterflows”), aimed at satisfying the constraint imposed by Terna<sup>17</sup>.

More specifically, in 2023, Terna activated this mechanism for imports in 17% of hours (vs. 6% in 2022),

<sup>17</sup> To satisfy the grid constraint imposed by Terna, the relevant algorithm might generate export flows from the fictitious zone COUP (suitable for managing the generalised constraint) to one of the coupled borders, even in the presence of a price in such zone that is lower than the Italian one.

with the following results: import decreases in 8% of hours; import decreases with counterflows in 6% of hours – mainly towards Austria and Slovenia, often having prices higher than the French one<sup>18</sup>; and no impacts in the remaining 3% of hours (in which flows were lower than the constraint). Terna applied the generalised constraint predominantly on holidays (72% of cases), during which lower demand might bring about a low rate of acceptance of national thermal power plants, causing more dispatching difficulties to Terna. The dynamics observed in the various months of 2023 confirm this correspondence, revealing a higher frequency of activation of this mechanism in months having a higher number of holidays (January and December) (Fig. 2.2.12 and Fig. 2.2.13).

**Fig. 2.2.1 Trend of the national single price (PUN) and of its determinants**



<sup>18</sup> In counterflow situations, energy, without ever entering Italy, is channelled by the algorithm from the coupled zone with the lower price to the one with the higher price.

Fig. 2.2.2 National single price (PUN) by groups of hours. Yearly average

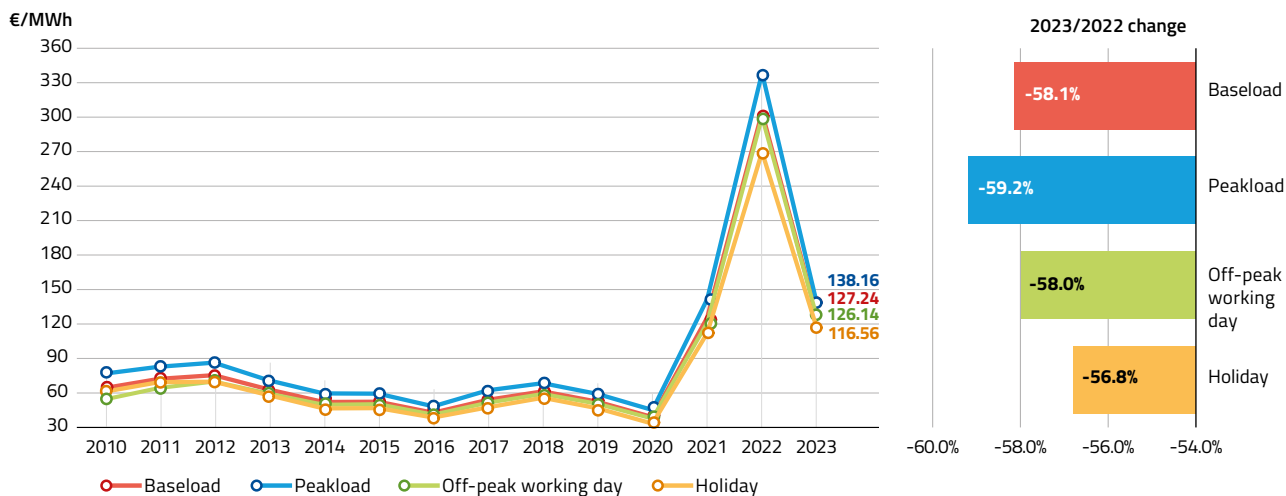


Fig. 2.2.3 Zonal prices in the MGP. Yearly average

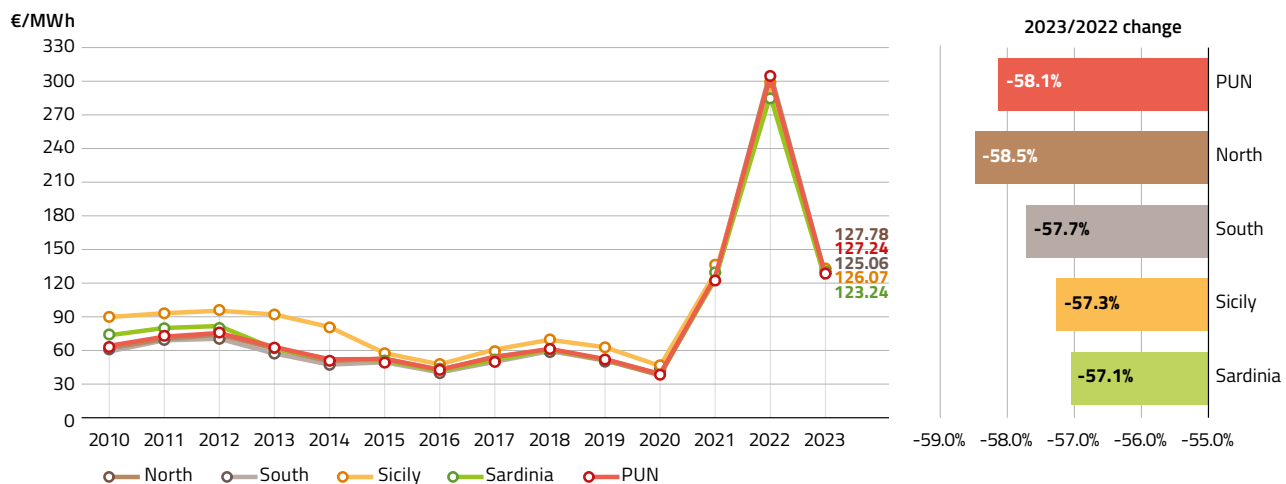


Fig. 2.2.4 Zonal prices. Monthly trend for the years 2022 and 2023

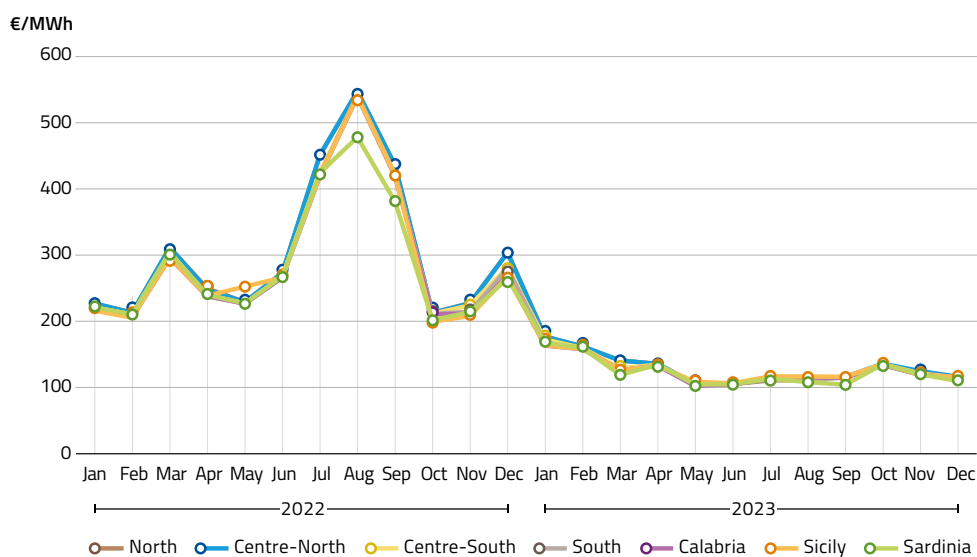


Fig. 2.2.5 Price volatility

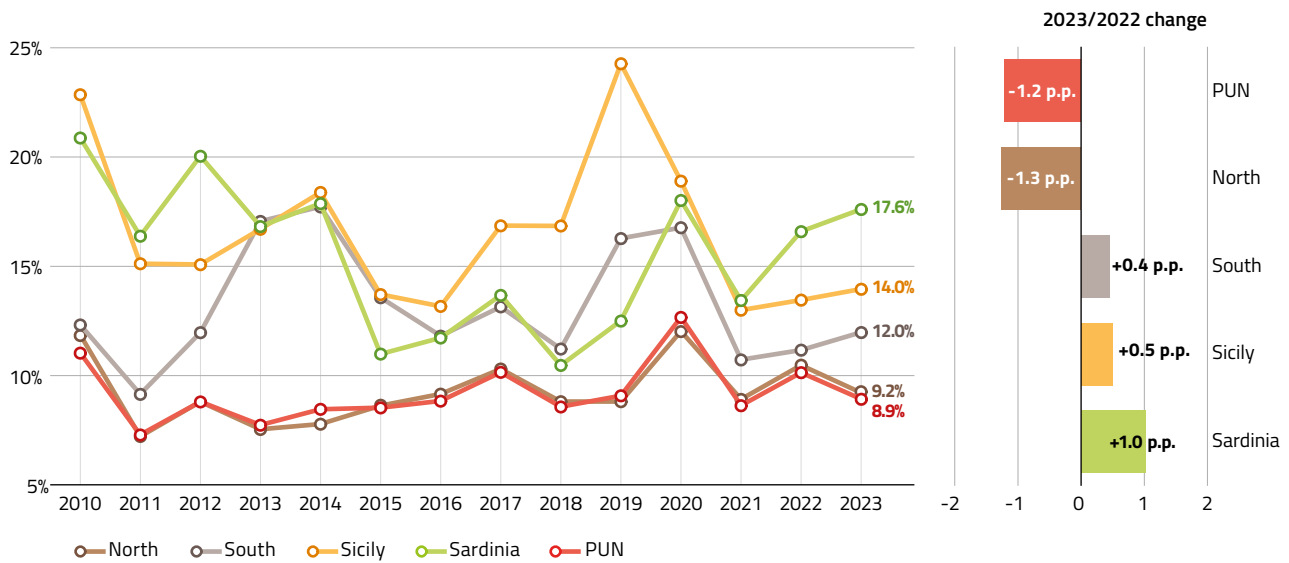


Table 2.2.1 Zero prices and day-time/night-time price reversals in the MGP. Year 2023

	PUN		North		Centre-North		Centre-South		South		Calabria		Sardinia		Sicily	
No. of hours with zero price	-	(0)	-	(0)	-	(0)	2	(0)	3	(2)	4	(3)	167	(101)	5	(48)
No. of sessions with at least one hourly price equal to zero	-	(0)	-	(0)	-	(0)	1	(0)	2	(1)	3	(1)	24	(18)	4	(8)
No. of sessions with day prices < night prices	141	(97)	128	(93)	135	(93)	150	(119)	166	(133)	175	(136)	171	(137)	184	(145)
% of sessions with day prices < night prices	38.6%	(26.6%)	35.1%	(25.5%)	37.0%	(25.5%)	41.1%	(32.6%)	45.5%	(36.4%)	47.9%	(37.3%)	46.8%	(37.5%)	50.4%	(39.7%)
Average difference in sessions with day prices < night prices /MWh	-15.69	(-36.84)	-15.59	(-36.45)	-15.61	(-37.72)	-17.82	(-35.52)	-18.28	(-36.34)	-18.84	(-35.87)	-21.19	(-62.89)	-18.67	(-37.34)

( ) Values in the previous year

Fig. 2.2.6 Frequency of zonal alignment. Monthly trend for the years 2022 and 2023

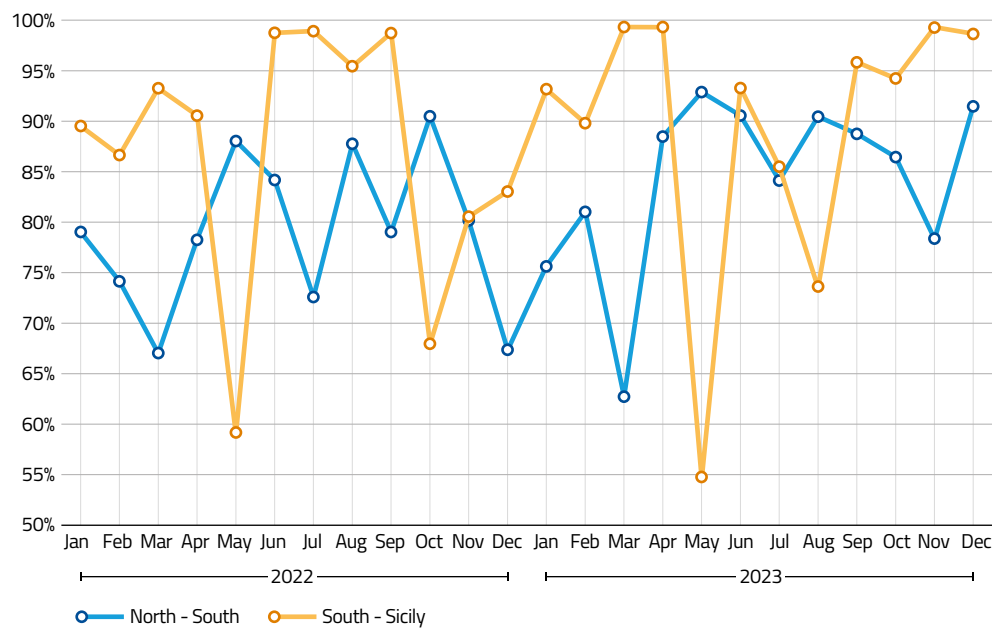


Table 2.2.2 Trend of volumes in the MGP

TWh	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023/2022 change
<b>Terna demand</b>	<b>316.9</b>	<b>314.3</b>	<b>320.5</b>	<b>321.4</b>	<b>319.6</b>	<b>301.2</b>	<b>319.9</b>	<b>315.0</b>	<b>306.1</b>	<b>-2.8%</b>
<b>Demand</b>	<b>305.3</b>	<b>301.5</b>	<b>297.4</b>	<b>301.6</b>	<b>302.3</b>	<b>287.2</b>	<b>298.6</b>	<b>296.1</b>	<b>288.2</b>	<b>-2.7%</b>
<i>rejected</i>	<i>18.2</i>	<i>11.8</i>	<i>5.2</i>	<i>6.0</i>	<i>6.5</i>	<i>7.1</i>	<i>8.2</i>	<i>6.9</i>	<i>10.3</i>	<i>48.4%</i>
<b>Purchases</b>	<b>287.1</b>	<b>289.7</b>	<b>292.2</b>	<b>295.6</b>	<b>295.8</b>	<b>280.2</b>	<b>290.4</b>	<b>289.2</b>	<b>278.0</b>	<b>-3.9%</b>
% of the request of Terna	90.6%	92.2%	91.2%	92.0%	92.6%	93.0%	90.8%	91.8%	90.8%	-1.1%
<b>Supply</b>	<b>500.2</b>	<b>502.4</b>	<b>489.9</b>	<b>507.5</b>	<b>503.6</b>	<b>496.7</b>	<b>472.4</b>	<b>455.5</b>	<b>485.5</b>	<b>6.6%</b>
<b>Sales</b>	<b>287.1</b>	<b>289.7</b>	<b>292.2</b>	<b>295.6</b>	<b>295.8</b>	<b>280.2</b>	<b>290.4</b>	<b>289.2</b>	<b>278.0</b>	<b>-3.9%</b>
at a price <= 0	190.5	172.2	162.6	165.6	166.2	168.8	166.2	156.5	164.3	5.0%

Fig. 2.2.7 Liquidity of the MGP

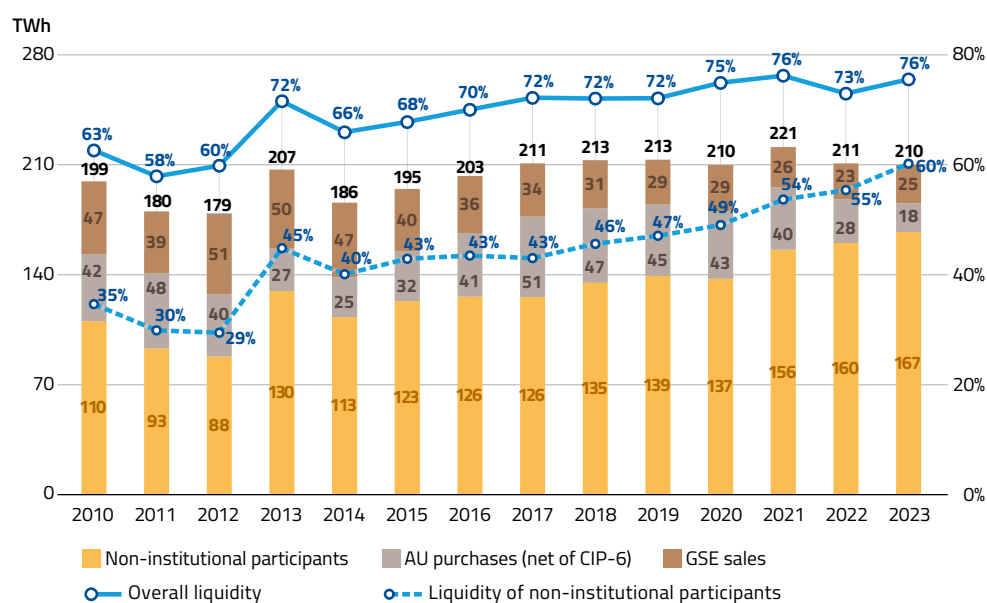


Fig. 2.2.8 Supply in the MGP

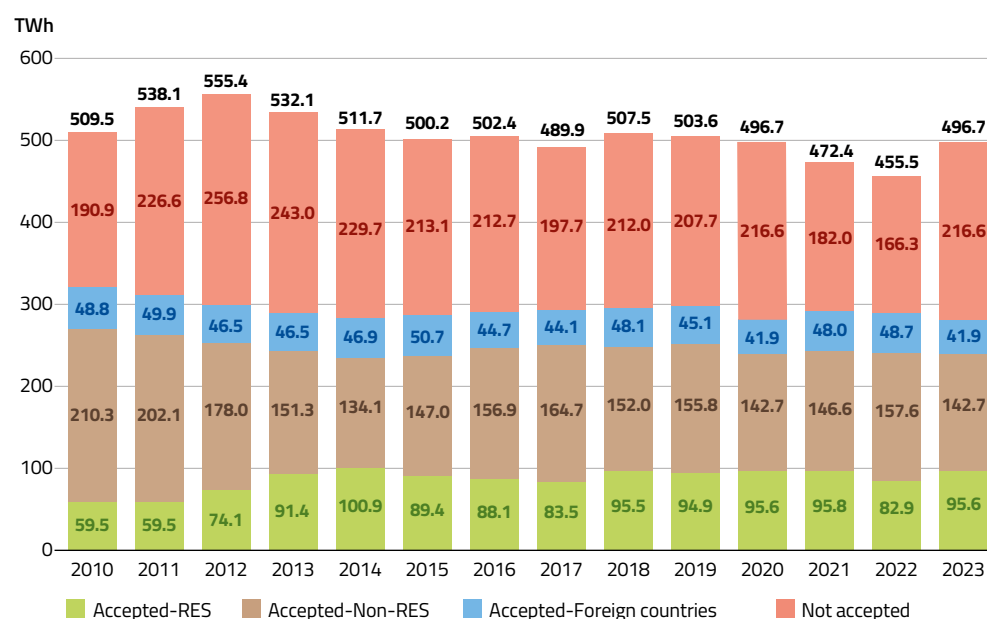


Fig. 2.2.9 Volumes in the MGP. Monthly trend for the years 2022 and 2023

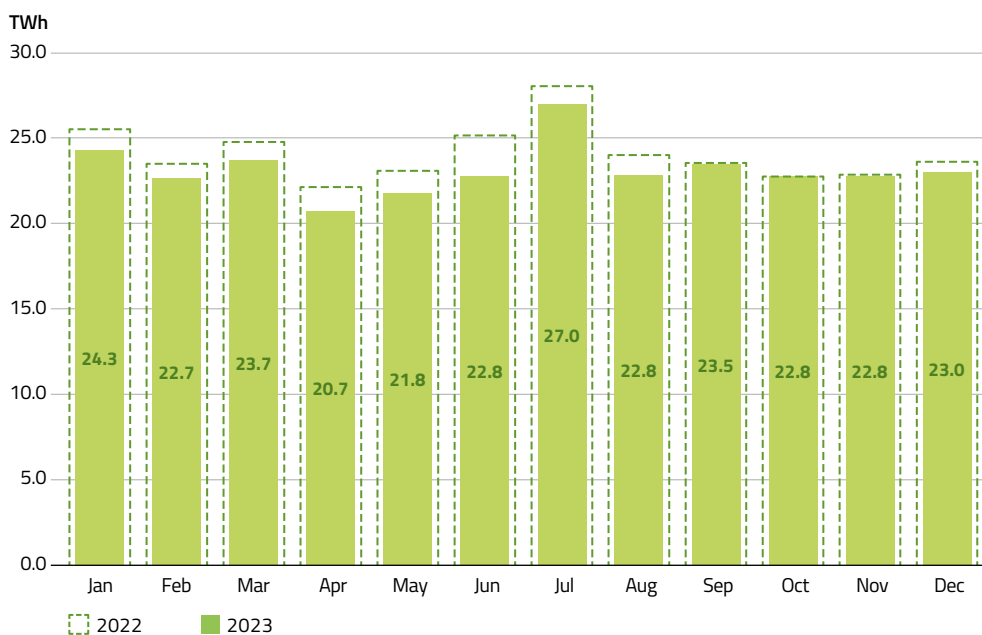


Table 2.2.3 Zonal volumes in the MGP (TWh). Year 2023

Zone	Purchases		Sales		Supply		Demand		Rejected bids/offers	
North	154.19	(-3.5%)	111.72	(-3.9%)	215.52	(+9.8%)	155.88	(-3.4%)	103.80	(+29.9%)
Centre-North	23.73	(-3.2%)	14.89	(-0.3%)	17.71	(+0.3%)	24.24	(-2.4%)	2.82	(+4.0%)
Centre-South	48.60	(-2.3%)	25.21	(-13.7%)	66.31	(+2.9%)	48.97	(-2.3%)	41.10	(+16.7%)
South	17.63	(-2.3%)	31.03	(-15.1%)	59.13	(+9.6%)	17.81	(-2.1%)	28.10	(+61.5%)
Calabria	5.38	(-4.1%)	13.16	(-9.5%)	27.02	(-7.8%)	5.40	(-4.2%)	13.85	(-6.1%)
Sicily	16.49	(-5.2%)	14.50	(-11.7%)	28.33	(-2.0%)	16.70	(-4.3%)	13.83	(+10.6%)
Sardinia	8.14	(-3.9%)	11.63	(-7.0%)	14.88	(-0.1%)	8.28	(-3.9%)	3.25	(+35.3%)
Foreign countries	3.81	(-31.1%)	55.83	(+14.6%)	56.57	(+12.9%)	10.96	(+10.9%)	0.74	(-46.8%)
<b>Italy</b>	<b>277.97</b>	<b>(-3.9%)</b>	<b>277.97</b>	<b>(-3.9%)</b>	<b>485.47</b>	<b>(+6.6%)</b>	<b>288.25</b>	<b>(-2.7%)</b>	<b>207.50</b>	<b>(+24.7%)</b>

(l) Change from previous year

Table 2.2.4 Zonal sales by source and technology (average MWh). Year 2023

	North		Centre-North		Centre-South		South		Calabria		Sicily		Sardinia		Sistema Italia	
	MWh	Change	MWh	Change	MWh	Change	MWh	Change	MWh	Change	MWh	Change	MWh	Change	MWh	Change
<b>Conventional Sources</b>	<b>7,650</b>	<b>-16.7%</b>	<b>647</b>	<b>-7.4%</b>	<b>1,385</b>	<b>-30.2%</b>	<b>1,762</b>	<b>-28.2%</b>	<b>1,088</b>	<b>-12.1%</b>	<b>1,008</b>	<b>-18.9%</b>	<b>914</b>	<b>-12.5%</b>	<b>14,455</b>	<b>-19.0%</b>
Gas	6,519	-18.4%	583	-10.4%	746	-31.6%	1,111	-22.7%	1,003	-9.6%	848	-14.3%	444	-11.4%	11,254	-18.3%
Coal	225	-44.9%	-	-	401	-38.7%	392	-54.1%	-	-	-	-	401	-16.2%	1,420	-40.8%
Other	906	+15.5%	63	+34.2%	239	-0.2%	259	+61.7%	85	-34.0%	160	-36.8%	69	+7.9%	1,781	+6.2%
<b>Renewable sources</b>	<b>4,902</b>	<b>+23.2%</b>	<b>1,053</b>	<b>+4.5%</b>	<b>1,463</b>	<b>+9.8%</b>	<b>1,780</b>	<b>+3.6%</b>	<b>414</b>	<b>-2.0%</b>	<b>642</b>	<b>+2.5%</b>	<b>410</b>	<b>+7.6%</b>	<b>10,665</b>	<b>+12.6%</b>
Hydro	3,217	+34.5%	204	+27.2%	619	+21.8%	433	-0.3%	107	-	147	-0.8%	74	-3.6%	4,803	+25.1%
Geothermal	-	-	611	-1.8%	-	-	0	-	0	-100.0%	-	-	-	-	611	-1.8%
Wind	24	+44.6%	27	+18.5%	491	+5.9%	1,070	+7.4%	244	+0.2%	372	+4.1%	226	+16.3%	2,454	+7.0%
Solar and other	1,660	+5.8%	210	+4.3%	353	-2.2%	276	-3.9%	64	+2.5%	123	+1.6%	110	+0.2%	2,797	+3.1%
<b>Pumped storage</b>	<b>202</b>	<b>+77.4%</b>	<b>-</b>	<b>-</b>	<b>30</b>	<b>+62.2%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4</b>	<b>+229%</b>	<b>2</b>	<b>+2438%</b>	<b>238</b>	<b>+74.7%</b>
<b>Total</b>	<b>12,754</b>	<b>-3.9%</b>	<b>1,700</b>	<b>-0.3%</b>	<b>2,878</b>	<b>-13.7%</b>	<b>3,542</b>	<b>-15.1%</b>	<b>1,503</b>	<b>-9.5%</b>	<b>1,655</b>	<b>-11.7%</b>	<b>1,327</b>	<b>-7.0%</b>	<b>25,358</b>	<b>-7.6%</b>

Fig. 2.2.10 Share of RES sales

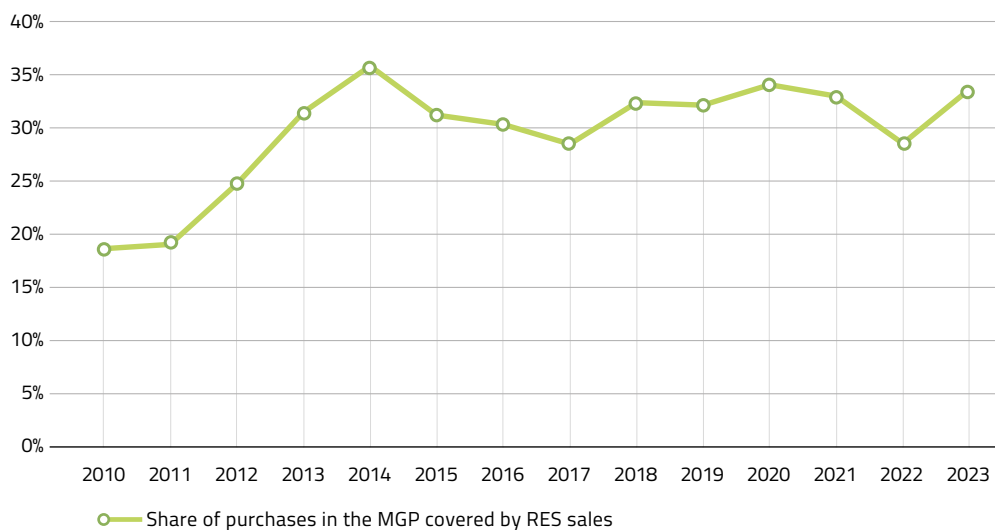




Fig. 2.2.11 Competitiveness indicators

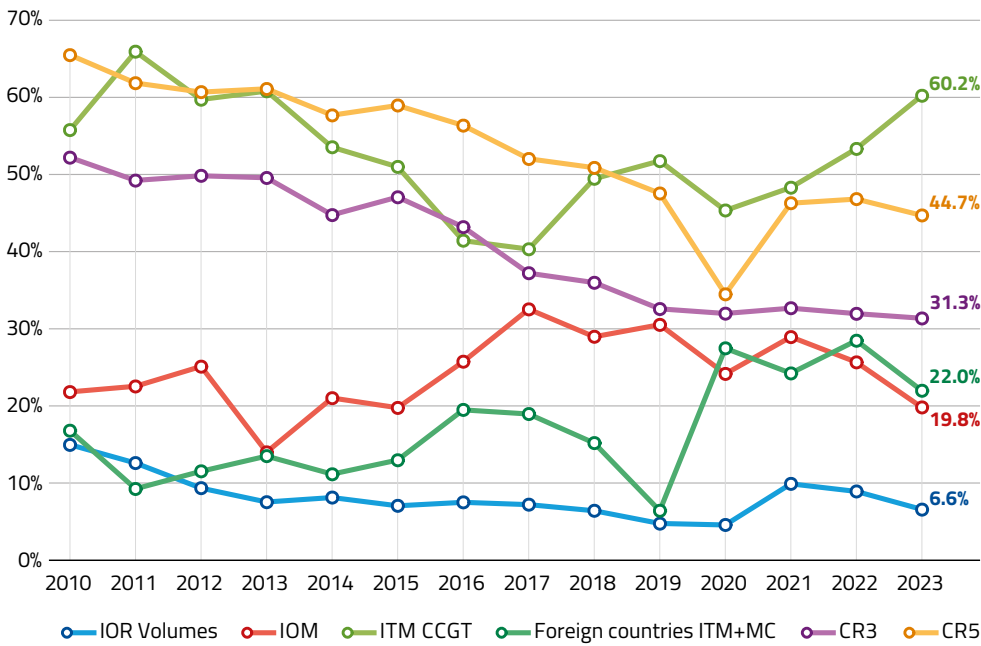


Fig. 2.2.12 Distribution of sales. Monthly trend for the years 2022 and 2023

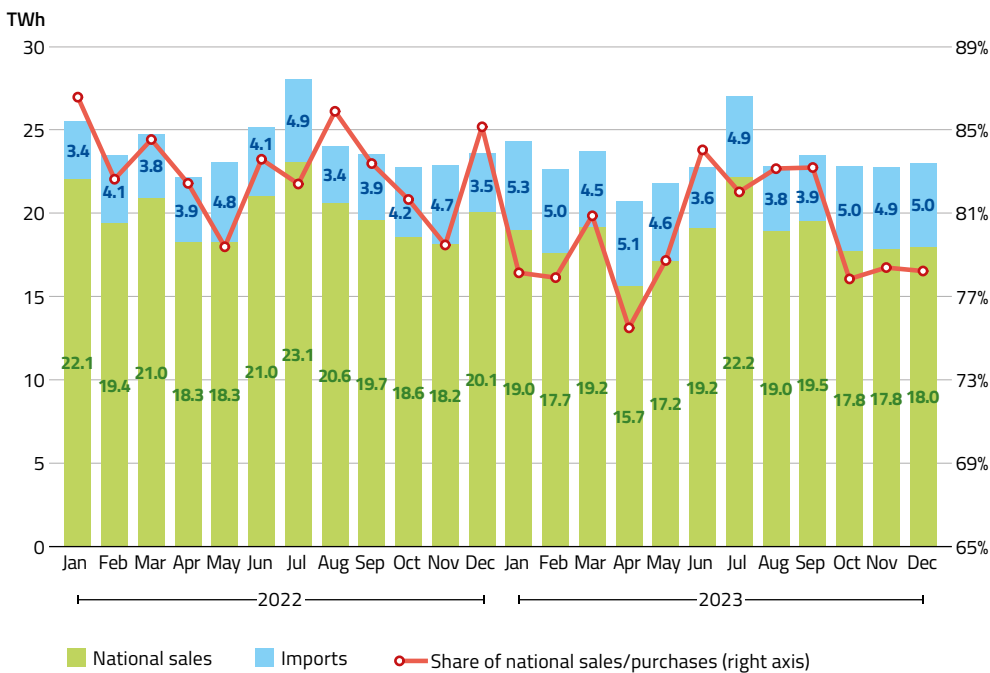
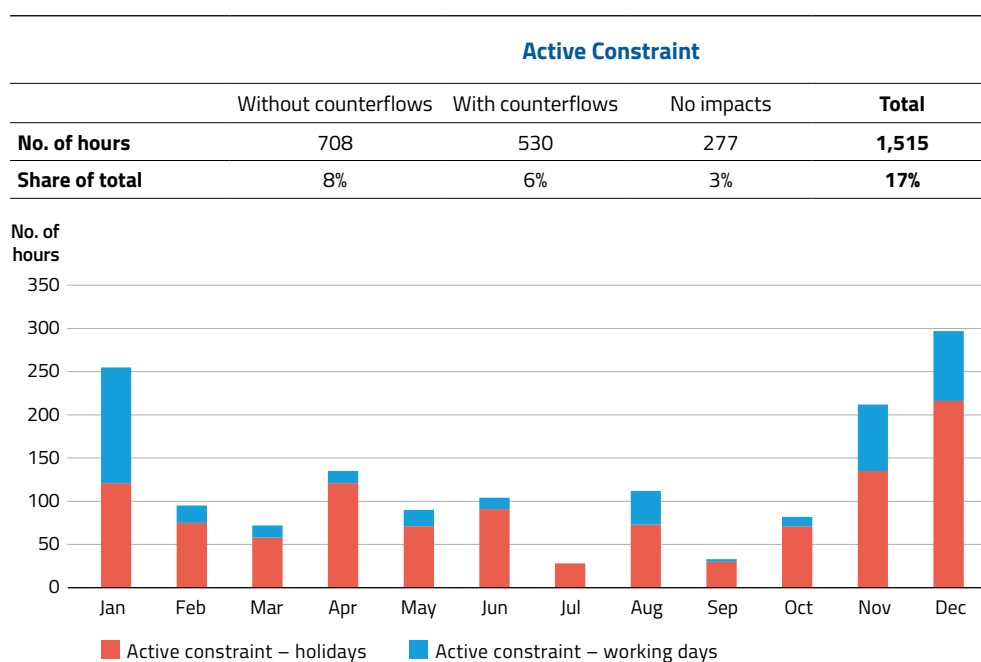


Fig. 2.2.13 Distribution of hours of activation of the generalised constraint. Year 2023



## 2.2.2 Intraday Market (MI)

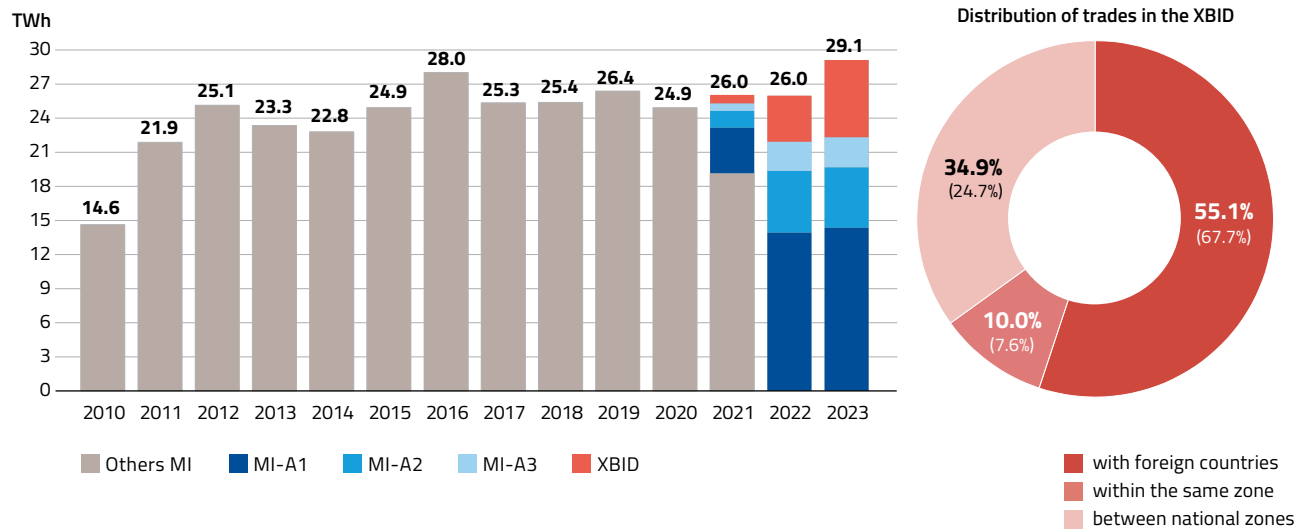
**VOLUMES AT ALL-TIME PEAKS.** In the second year of full operation of the new market design, featuring one continuous-trading session in coupling with the rest of Europe (XBID) and three local auctions (MI-A1, MI-A2, and MI-A3), the MI confirmed to be an important tool, supporting market participants in defining their generation schedules and recording a historical peak in the volume of trades (29.1 TWh, +3.1 TWh vs. 2022). In 2023, too, auction trading was dominant (22.3 TWh, +0.4 TWh vs. 2022), especially in the MI-A1 (14.4 TWh, +0.4 TWh from 2022), accounting for about 49% of the total, -4 p.p.). However, it was the XBID, with over 3.5 million matched orders (more than doubled with respect to 2022) and nearly 6.8 TWh (+2.8 TWh), that drove the overall growth, becoming the second segment of the MI in terms of liquidity (23% of the total, +8 p.p.).

During the year, the trend of trades in the XBID confirmed its structure characterised by: *i)* concentration of trades after the MI-A2 auction (phases 2 and 3), although the volumes traded in phase 1 almost tripled (13% of the total XBID, +6 p.p.); *ii)* prevalence of trades with foreign counterparties (55%), albeit declining (-13 p.p., with levels always below 50% in the last quarter) at the same time as the expansion of trades between national zones (35%, +10 p.p.); *iii)* propensity to trade close to real time, with a share of trades in the four and eight hours preceding delivery that remained practically unaltered, i.e. roughly 50% and 70%, respectively; *iv)* high reliance on the XBID by renewable power plants, which were counterparties in about 57% of the volumes matched on the buy side and about 66% of those matched on the sell side (both +5 p.p.); *v)* good utilisation of tools made available for continuous trading, such such as portfolio orders, always above 20% of the total (buy and sell orders), and basket orders (43% of the total).

With regard to zones, the moderate increase in volumes of auction trades was concentrated, for both purchases and sales, in the northern zone, which remained the most significant zone in terms of volumes traded, and the central-northern zone. Conversely, in the XBID, the sharp growth on both sides of the market extended to all zones and was particularly evident in foreign zones (demand side).

Finally, both the dynamics and levels of prices were in line with those in the MGP. Prices progressively decreased during the year with respect to their peak levels in 2022 and were equal to 126/128 €/MWh in the first two auction sessions and in the XBID, and to 131 €/MWh in the MI-A3. These values were slightly lower than the corresponding ones of the MGP in day-ahead markets (-1 €/MWh) and slightly higher in the XBID (+1 €/MWh). As regards continuous trading, prices had a high intra-session variability, and numerous sessions featured by matched orders at negative prices, especially in the southern zone (27%) and Sicily (23%), particularly in November (from Fig. 2.2.14 to Fig. 2.2.17 and Table 2.2.5).

**Fig. 2.2.14 Volumes traded in the MI**



**Fig. 2.2.15 Volumes traded in the MI. 2022-2023 monthly trend**

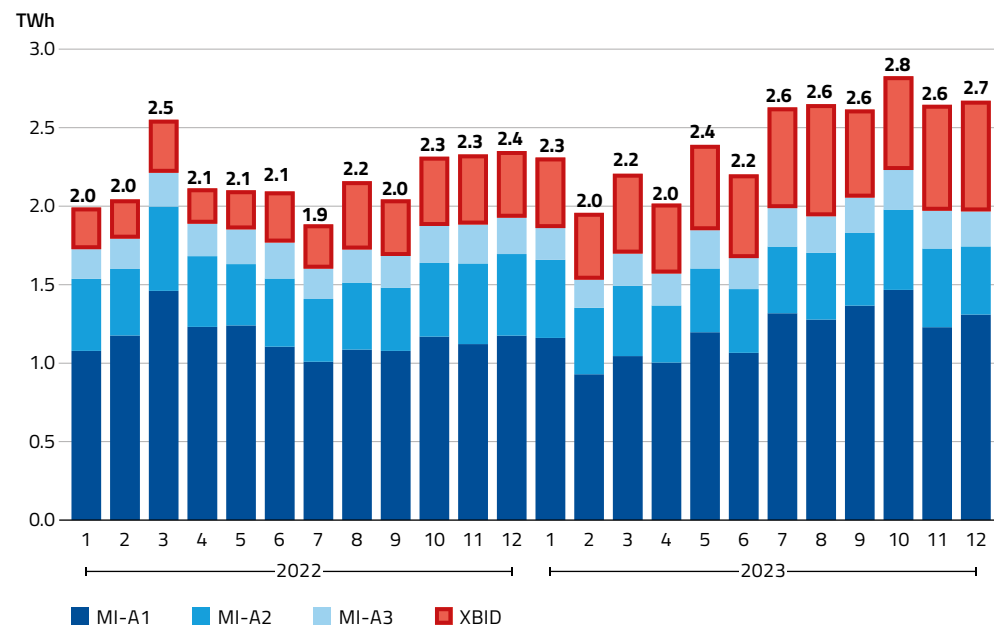


Fig. 2.2.16 Prices in the MI. Yearly trend

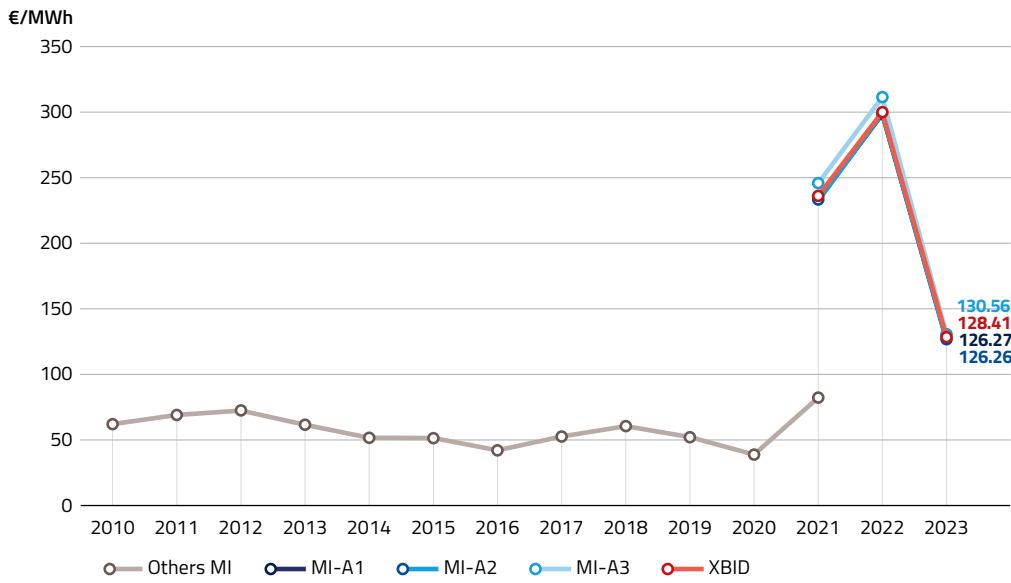


Fig. 2.2.17 Prices in the MI. 2022-2023 monthly trend

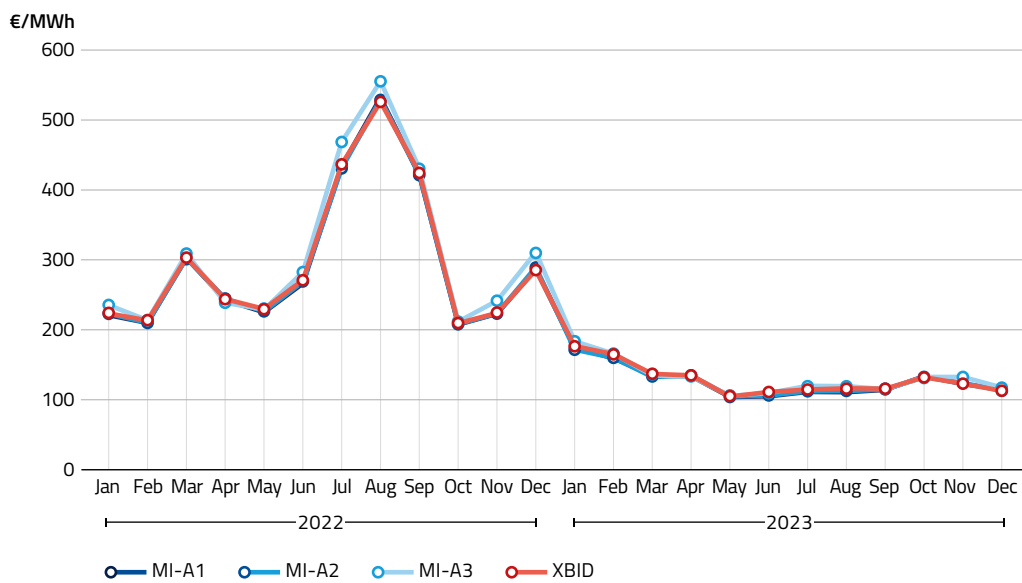


Table 2.2.5 Zonal purchases and sales in the MI. Year 2023

PURCHASES	AUCTION				CONTINUOUS TRADING	INTRADAY MARKET	
	MI-A1 (1-24 h)	MI-A2 (1-24 h)	MI-A3 (13-24 h)	TOTAL	XBID (1-24 h)	TOTAL	
	MWh	MWh	MWh	MWh	MWh	MWh	% change
	North	6,944,296	1,895,236	990,805	<b>9,830,337</b>	<b>1,610,278</b>	<b>11,440,616</b>
Centre-North	893,505	397,532	179,813	<b>1,470,850</b>	<b>413,420</b>	<b>1,884,270</b>	20.8%
Centre-South	2,202,035	858,769	392,313	<b>3,453,117</b>	<b>638,222</b>	<b>4,091,339</b>	3.4%
South	1,856,848	934,793	463,133	<b>3,254,774</b>	<b>802,899</b>	<b>4,057,672</b>	5.8%
Calabria	312,411	146,098	79,321	<b>537,830</b>	<b>111,597</b>	<b>649,427</b>	5.5%
Sicily	1,070,083	339,194	193,327	<b>1,602,605</b>	<b>272,461</b>	<b>1,875,065</b>	5.4%
Sardinia	320,744	252,901	130,150	<b>703,795</b>	<b>122,351</b>	<b>826,147</b>	2.9%
Foreign countries	762,074	478,046	221,903	<b>1,462,023</b>	<b>2,827,590</b>	<b>4,289,612</b>	47.5%
<b>Total</b>	<b>14,361,996</b>	<b>5,302,569</b>	<b>2,650,765</b>	<b>22,315,330</b>	<b>6,798,818</b>	<b>29,114,148</b>	<b>12.1%</b>

SALES	AUCTION				CONTINUOUS TRADING	INTRADAY MARKET	
	MI-A1 (1-24 H)	MI-A2 (1-24 H)	MI-A3 (13-24 h)	TOTAL	XBID (1-24 h)	TOTAL	
	MWh	MWh	MWh	MWh	MWh	MWh	% change
	North	7,291,393	2,139,660	1,105,692	<b>10,536,744</b>	<b>2,136,090</b>	<b>12,672,834</b>
Centre-North	847,017	204,468	101,677	<b>1,153,163</b>	<b>340,617</b>	<b>1,493,780</b>	32.9%
Centre-South	2,081,621	768,165	347,025	<b>3,196,811</b>	<b>668,492</b>	<b>3,865,303</b>	0.7%
South	1,458,511	831,765	389,368	<b>2,679,643</b>	<b>848,467</b>	<b>3,528,110</b>	4.0%
Calabria	546,837	206,512	96,668	<b>850,016</b>	<b>141,178</b>	<b>991,195</b>	18.5%
Sicily	1,338,490	369,423	171,814	<b>1,879,727</b>	<b>269,345</b>	<b>2,149,072</b>	13.3%
Sardinia	226,155	186,609	89,355	<b>502,120</b>	<b>124,611</b>	<b>626,731</b>	-12.2%
Foreign countries	571,972	595,967	349,167	<b>1,517,106</b>	<b>2,270,019</b>	<b>3,787,125</b>	30.1%
<b>Total</b>	<b>14,361,996</b>	<b>5,302,569</b>	<b>2,650,765</b>	<b>22,315,330</b>	<b>6,798,818</b>	<b>29,114,148</b>	<b>12.1%</b>

### 2.2.3 Other electricity markets

**MPEG.** Trades on the “unit price differential” product, interrupted in August 2022, restarted in April 2023, recording a sharp growth in terms of both trades (299 as against 101 in 2022) and volumes (0.55 TWh vs. 0.15 TWh), almost exclusively attributable to the baseload profile. Average prices hit all-time peaks during the year, as they were equal to 1.25 €/MWh for the baseload profile (+0.97 on 2022) and 1.40 €/MWh for the peakload one (Fig. 2.2.18).

**PCE.** Transactions registered on the Forward Account Registration Platform (PCE) with delivery/ withdrawal in 2023 fell to 229.2 TWh (-8.0% on 2022), i.e. at their minimum value since 2011 as a consequence of the decline of transactions arising from bilateral contracts (-8.2%). In contrast, registered transactions resulting from contracts concluded in the MTE and MPEG, though

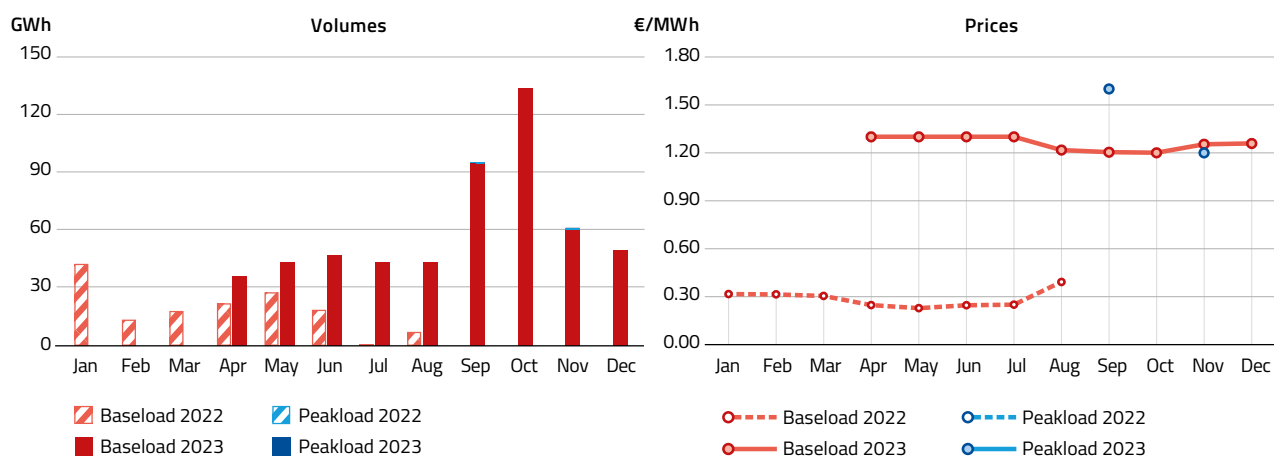
confirming their residual nature, grew again after two years. The net position of forward accounts (given by the set of registered transactions) diminished to its lowest level since 2010, as it was equal to 135.3 TWh (-10.2%), vs. a slight growth of the turnover<sup>19</sup> (1.69, +0.04). A bearish trend was also observed for the schedules registered on injection accounts (68.1 TWh, -13.8%) and withdrawal accounts (96.9 TWh, -9.2%), and of the related imbalances with respect to schedules (67.2 TWh, -6.6%, and 38.4 TWh, -12.6%, respectively) (Fig. 2.2.19, Fig. 2.2.20, Table 2.2.6).

**MTE.** In the MTE, trades were 24 (+18 vs. 2022, of which 16 transactions registered for clearing purposes, absent since 2015), while volumes traded amounted to 134 GWh (+125 GWh). The check prices of products being traded, similarly to what was observed in spot markets, progressively decreased during the year (in particular, the yearly product for 2024 closed the trading period at the end of December at 111.07 €/MWh (baseload) and 118.17 €/MWh (peakload) (Table 2.2.7).

Fig. 2.2.18 Prices and volumes traded in the MPEG by type

Type	Trades No.	Traded products No.	Price			Volumes	
			Average €/MWh	Minimum €/MWh	Maximum €/MWh	MWh	MWh/d
Baseload	297 (101)	128/365 (56/365)	1.25 (0.28)	1.20 (0.20)	1.50 (0.45)	548,400 (149,784)	4,284 (2,675)
Peakload	2 (-)	2/259 (0/260)	1.40 (0.00)	1.20 (0.00)	1.60 (0.00)	840 (-)	420 (-)
<b>Total</b>	<b>299</b> <b>(101)</b>					<b>549,240</b> <b>(149,784)</b>	

() Value in the previous year



<sup>19</sup> Ratio of registered transactions to net position.

Fig. 2.2.19 Registered transactions, net position and turnover

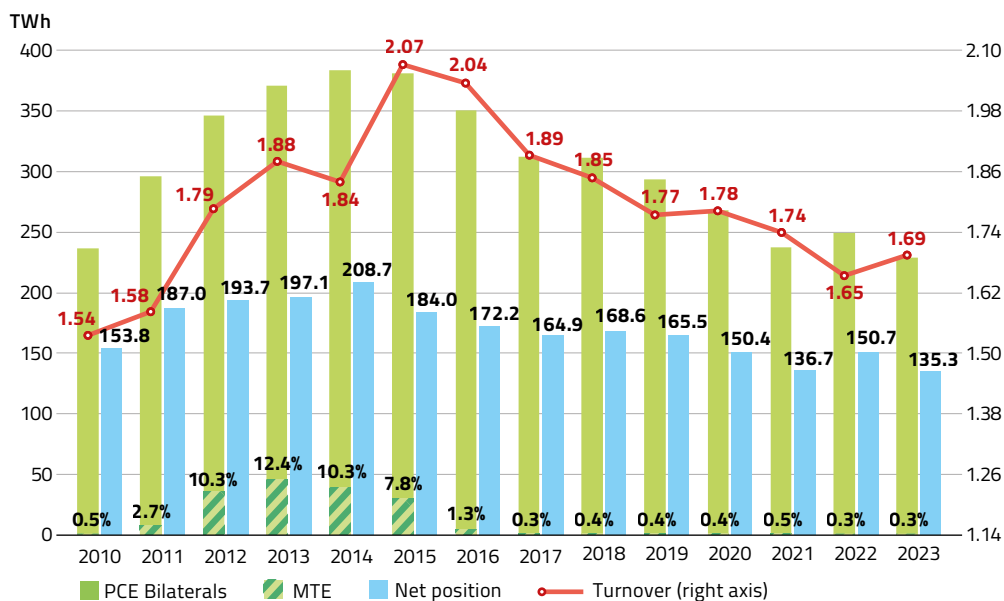


Table 2.2.6 Profile of registered transactions and schedules

REGISTERED TRANSACTIONS				SCHEDULES						
Profile	MWh	Change	Structure	Injection			Withdrawal			
				MWh	Change	Structure	MWh	Change	Structure	
Baseload	25,753,571	-62.9%	11.2%							
Off Peak	38,522	-98.4%	0.0%							
Peak	28,128	-98.8%	0.0%							
Week-end	-	-100.0%	0.0%							
<b>Total Standard</b>	<b>25,820,221</b>	<b>-65.3%</b>	<b>11.3%</b>							
<b>Total Non-standard</b>	<b>202,785,220</b>	<b>16.0%</b>	<b>88.5%</b>							
<b>PCE bilaterals</b>	<b>228,605,440</b>	<b>-8.2%</b>	<b>99.7%</b>							
<b>MTE</b>	<b>84,888</b>	<b>632.4%</b>	<b>0.0%</b>							
<b>MPEG</b>	<b>549,240</b>	<b>266.7%</b>	<b>0.2%</b>							
<b>CDE</b>	<b>-</b>	<b>-</b>	<b>0.0%</b>							
<b>Total</b>	<b>229,239,568</b>	<b>-8.0%</b>	<b>100.0%</b>							
<b>Net position</b>	<b>135,311,768</b>	<b>-10.2%</b>								
				<b>Demanded</b>	81,801,840	-16.4%	100%	96,927,909	-9.3%	100.0%
				<b>Registered</b>	<b>68,087,061</b>	<b>-13.4%</b>	<b>83.2%</b>	<b>96,915,818</b>	<b>-9.2%</b>	<b>100.0%</b>
				Rejected	13,714,779	-28.5%	16.8%	12,091	-92.6%	0.0%
				<b>Imbalance with respect to schedules</b>	<b>67,224,707</b>	<b>-6.6%</b>		<b>38,395,950</b>	<b>-12.6%</b>	
				<b>Balance of schedules</b>	<b>32,070</b>	<b>-</b>		<b>28,860,827</b>	<b>1.3%</b>	

Fig. 2.2.20 Registered physical schedules and imbalances with respect to schedules

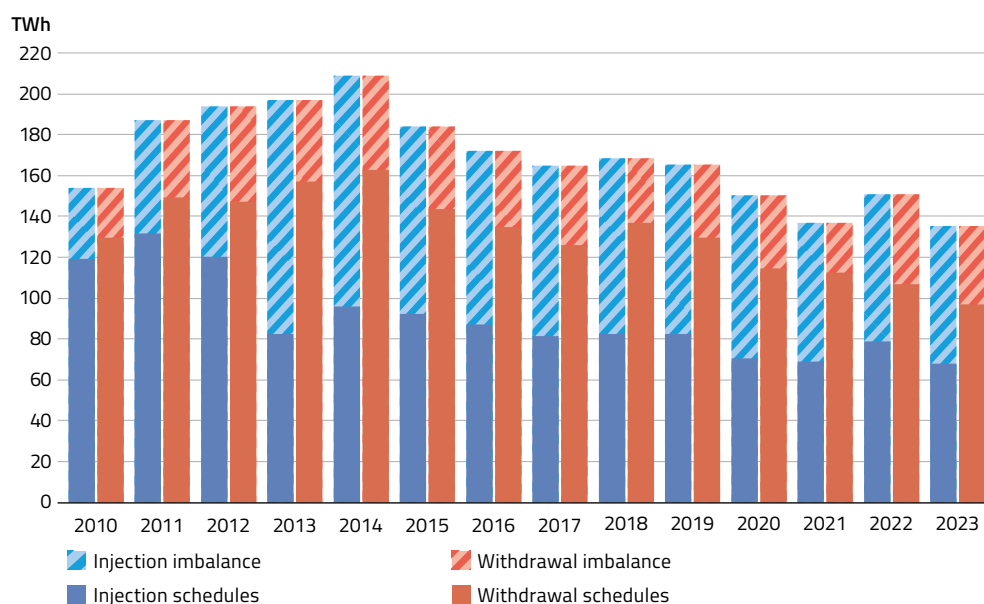


Table 2.2.7 MTE: volumes traded by year of trading

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Δ% 2023/2022
<b>Contracts (MW)</b>														
<b>Total</b>	<b>8,228</b>	<b>12,697</b>	<b>6,096</b>	<b>4,550</b>	<b>1,004</b>	<b>411</b>	<b>518</b>	<b>391</b>	<b>596</b>	<b>213</b>	<b>19</b>	<b>10</b>	<b>61</b>	<b>510%</b>
Baseload	6,018	11,633	4,604	4,410	899	323	449	357	561	174	19	10	59	490%
Peakload	2,210	1,064	1,492	140	105	88	69	34	35	39	0	0	2	-
<b>Volumes (TWh)</b>														
<b>Total</b>	<b>33.44</b>	<b>54.96</b>	<b>41.10</b>	<b>32.27</b>	<b>5.09</b>	<b>1.07</b>	<b>1.36</b>	<b>1.19</b>	<b>1.64</b>	<b>0.77</b>	<b>0.02</b>	<b>0.010</b>	<b>0.134</b>	<b>1,248%</b>
Baseload	29.75	52.27	36.72	32.21	5.01	1.00	1.33	1.16	1.60	0.73	0.02	0.010	0.128	1,185%
Peakload	3.69	2.69	4.38	0.07	0.08	0.07	0.02	0.04	0.04	0.04	0.00	0.000	0.006	-
<b>No. of matched bids/offers</b>														
<b>Total</b>	<b>681</b>	<b>972</b>	<b>458</b>	<b>553</b>	<b>252</b>	<b>85</b>	<b>139</b>	<b>130</b>	<b>176</b>	<b>62</b>	<b>7</b>	<b>6</b>	<b>24</b>	<b>300%</b>
Baseload	493	884	252	540	239	73	123	119	165	52	7	6	23	283%
Peakload	188	88	206	13	13	12	16	11	11	10	0	0	1	-
<b>Share of OTC volumes</b>														
<b>Total</b>	<b>5%</b>	<b>45%</b>	<b>81%</b>	<b>43%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>80%</b>	<b>-</b>
Baseload	6%	45%	90%	43%	-	-	-	-	-	-	-	-	79%	-
Peakload	1%	46%	0%	29%	-	-	-	-	-	-	-	-	100%	-



## 2.3 THE GAS MARKET IN ITALY

### 2.3.1 Spot Gas Market (MP-GAS)

**THE ITALIAN GAS SYSTEM CONTEXT.** In 2023, the geopolitical scenario was still unstable, owing to the continuing Russia-Ukraine war and the beginning of tensions in the Middle East. In the gas system, the supply and demand dynamics already recorded in 2022 became consolidated. What was observed in Italy was the reflection of a more general trend, common to all of Europe, in which gas demand dropped to its lowest levels in the past few years, as a consequence of a still high inflation and of consumption reduction policies. Moreover, the structure of procurement of the raw material confirmed the replacement of Russian gas with a higher utilisation of Liquefied Natural Gas (LNG), especially from the United States, whose supplies increased to about half of the overall LNG imports to Europe.

In this scenario, Italian natural gas consumption decreased to 667.4 TWh (-8.4%), i.e. to its minimum levels since 2015, and showed more intense bearish trends in the first half of the year (but in the second half, this consumption compared with the already low levels of 2022). The decrease concerned the three distribution sectors, but it was more marked in the thermal power generation and household sectors (223.0 TWh, -16.2% and 281.7 TWh, -7.4%, respectively), and more moderate in the industrial sector (121.0 TWh, -4.0%), which experienced an appreciable year-on-year recovery from August. Still on the demand side, exports and other types of consumption increased (41.8 TWh, +28.5%).

In a situation of lower demand and domestic production at an all-time low, also natural gas imports dropped to their minima since 2015 (641.1 TWh, -85.5 TWh, -11.7%), with a growing strategic role of LNG (159.9 TWh, +9.6 TWh), whose share in total imports mounted to 27% (+6 p.p. vs. 2022 and +13 p.p. vs. 2021). Conversely, pipeline gas flows sharply diminished (469.1 TWh, -107.17 TWh), both those from Russia at the Tarvisio entry point (26.9 TWh, -89.4 TWh) and those at other entry points: Mazara (243.6 TWh, -5.7 TWh), which however remained the main gas supply route with a 38% share; Melendugno (104.0 TWh, -3.7 TWh) and Gries Pass (67.9 TWh, -7.2 TWh), whose shares accounted for 16% and 11%, respectively.

As regards the gas storage system, the regulatory framework was still the one defined by ARERA Decisions 165/2022/R/GAS of 8 April 2022 and 274/2022/R/GAS of 24 June 2022, aimed at favouring an adequate level of gas stocks. On the last day of 2023, gas stocks in storage facilities were at their historical peaks (109.3 TWh), with a balance between injections and withdrawals that remained positive in 2023 (3.3 TWh), even if both injections and withdrawals experienced a year-on-year decline (from Fig. 2.3.1 to Fig. 2.3.5).

**VOLUMES.** Against this background, the key phenomena that occurred in GME Spot Gas Market (MP-GAS) were as follows: *i)* new significant growth of trades in continuous-trading markets, corroborating their multi-year positive trend; this growth concerned both the day-ahead market, at an all-time peak, and the intraday market, which ranked again as the second market in terms of liquidity; *ii)* consolidation of the increase in volumes traded by non-Snam market participants (116 TWh, +9 TWh), especially in continuous-trading markets; *iii)* reduction of the volumes moved by Snam as a TSO; this reduction, ascribable only to the change in the system, was naturally concentrated in AGS segments: the end of the national emergency associated with the filling of storage facilities made less necessary for Snam to operate in such markets as a last-resort provider of such service. This is why trades in the MP-GAS shrank to 155 TWh (-20 TWh, -12% from their historical peak in 2022), although their share in total consumption in the gas system remained close to its all-time levels (23%, -1 p.p. from last year), with a monthly peak of 31% in October (Fig. 2.3.6).

- Day-Ahead Gas Market (MGP-GAS).** The volumes traded in the continuous-trading MGP-GAS confirmed the growth trend observed in the previous years. Thus, the MGP-GAS became progressively the first market in terms of liquidity, with 78.7 TWh (+4.1% from 2022, a new historical peak), accounting for 51% of total spot trades (+8 p.p. on a year-on-year basis). Trades were mostly concentrated in the G+1 session (58 TWh, 74% of the total), with an increasing preference for the weekend product, whose volumes reached 18.7 TWh, with a share in total trades practically remaining stable at 24%. On a month-on-month basis, the growth in volumes was concentrated in the initial months of the year, especially in January, when trades had an absolute record (9.4 TWh). In the AGS segment, trades amounted to 28.2 TWh (-44.8% from their historical maximum in 2022), equal to 18% of total spot trades (-11 p.p.), of which 17.7 TWh ascribable to sales by the TSO (63% of volumes).
- Intraday Gas Market (MI-GAS).** Trades in the continuous-trading MI-GAS reverted the trend that they had had in the previous two years, rising to 44.4 TWh (+9.5%), i.e. 29% of total spot trades (+6 p.p. from 2022). This growth may be attributed to the sizeable increase in trades between market participants other than the Balance Service Provider (BSP), which were equal to 35.7 TWh (+17.7%), i.e. to 80% total trades in the segment (+5 p.p.). Conversely, movements by the BSP, mostly purchases (7.1 TWh, +100%), declined (8.7 TWh, -14.7%). In the AGS, the intraday segment confirmed to be less liquid, with volumes equal to 0.2 TWh (as against 2.6 TWh in 2022), 75% of which were purchases by the TSO.
- Regulated Market for the Trading of Gas Stored (MGS).** The volumes traded in the MGS, only for the Stogit company, showed a further reduction to 3.3 TWh (-36.2% on 2022), with a 2% share of total trades (3% last year). Volumes handled by Snam for balancing purposes, especially on the supply side, diminished (0.9 TWh vs. 3.1 TWh in 2022), whereas trades between third market participants slightly grew (1.5 TWh vs. 1.2 TWh last year).
- Locational Products Market (MPL).** Again, in 2023, Snam did not activate any session in this market.

**PRICES.** The political-economic scenario described in the previous paragraphs featured a low demand, a new redistribution of the supply side, and a high level of stocks. This scenario favoured a sharp reduction of prices and of their volatility from their record levels in 2022, and an intra-year trend that was consistent with the traditional seasonality of gas.

With regard to Italian gas prices, beginning on 19 July 2023, GME started publishing, on a daily basis, a new gas price index, the IG Index GME<sup>20</sup>, so as to provide market participants with a useful tool for interpreting and evaluating the dynamics of gas markets with delivery at the PSV. During the initial months of its publication, the IGI was equal to 37.78 €/MWh on average, i.e. practically in line with the trends of prices recorded at the main European hubs.

Considering the entire year, prices in the individual spot markets of GME had very similar patterns on both a year-on-year and a month-on-month basis, as they all lay below 43 €/MWh, in line with the main international and national reference prices (43.05 €/MWh). The only exception was recorded in the intraday AGS segment, whose frequency of activation by Snam was lower and whose yearly average price was 47 €/MWh.

<sup>20</sup> For insights into the procedure of calculation of the IG Index GME, please refer to the documents available at <https://gme.mercatoelettrico.org/en-us/Home/Results/Gas/IGIndex/Results/Overview>

Given the above trends, the System Average Price (SAP)<sup>21</sup> in 2023 decreased to 42.40 €/MWh, always showing a narrow spread with respect to that at the PSV<sup>22</sup> and a decline as compared to 2022 (SAP-PSV: 0.32 €/MWh in 2023, 1.04 €/MWh in 2022). The same applied to volatility of the SAP: by absorbing the higher stability of prices in the MGP-GAS and MI-GAS, it dropped to 5.4% (about -2.5 p.p.) and was lower than that at the PSV (6.7%) (Fig. 2.3.7 and Fig. 2.3.8).

**MOVEMENTS OF SNAM AS A BSP.** In 2023, the volumes handled by Snam as a BSP generally diminished and were chiefly concentrated in the MI-GAS (8.7 TWh, -1.5 TWh). This contraction only concerned sales, which dropped to their all-time minima (1.6 TWh, -75.5%). Conversely, the presence of the BSP on the demand side was much more significant (7.1 TWh, +100%, accounting for 81% of the total trades of the BSP).

A detailed analysis of movements shows that Snam intervened above all under long system conditions (339 matched orders vs. 95); this dynamics was also favoured by the higher frequency with which the system had a negative imbalance, in countertrend with respect to last year (4,700 publications/hours when the system was short vs. 2,886 publications/hours when the system was long). In particular, when the system had a negative residual imbalance, purchases by Snam totalled 6.9 TWh (79% of total movements), with an average value of 20,508 MWh; these purchases were mostly made when system imbalances ranged within the following classes: [31,400-60,000 MWh] and [60,000-100,000 MWh]. Conversely, when the system had a positive residual imbalance, sales by Snam amounted to 1.6 TWh (18% of the total), with an average value of 17,867 MWh; these sales, too, were concentrated in the intermediate imbalance classes: [31,400-60,000 MWh] and [60,000-100,000 MWh]. Finally, the volumes traded by the BSP that proved to be inconsistent with the imbalance sign were low; this situation occurred under both short and long system conditions (4 and 7 cases, respectively, totalling 0.2 TWh) (Table 2.3.1).

**MARKET CONCENTRATION.** In 2023, too, competition increased in all the spot markets managed by GME, on both the demand side and the supply side. This scenario appears evident also considering the generalised reduction of the market share held by top market participants (CR5). Exceptions were the intraday AGS segment, with a low number of trades in 2023, and purchases in the continuous-trading MI-GAS, where the presence of the BSP was significant, whereas that of CR5 stood below 45% (Fig. 2.3.9).

<sup>21</sup> The SAP is the average of prices recorded in the continuous-trading MGP-GAS and MI-GAS, weighted for the respective matched orders. Its spread with respect to the PSV is calculated only on the days in which PSV prices are available.

<sup>22</sup> The average spread is calculated by considering the given session and only the gas-days in which the PSV price is available.

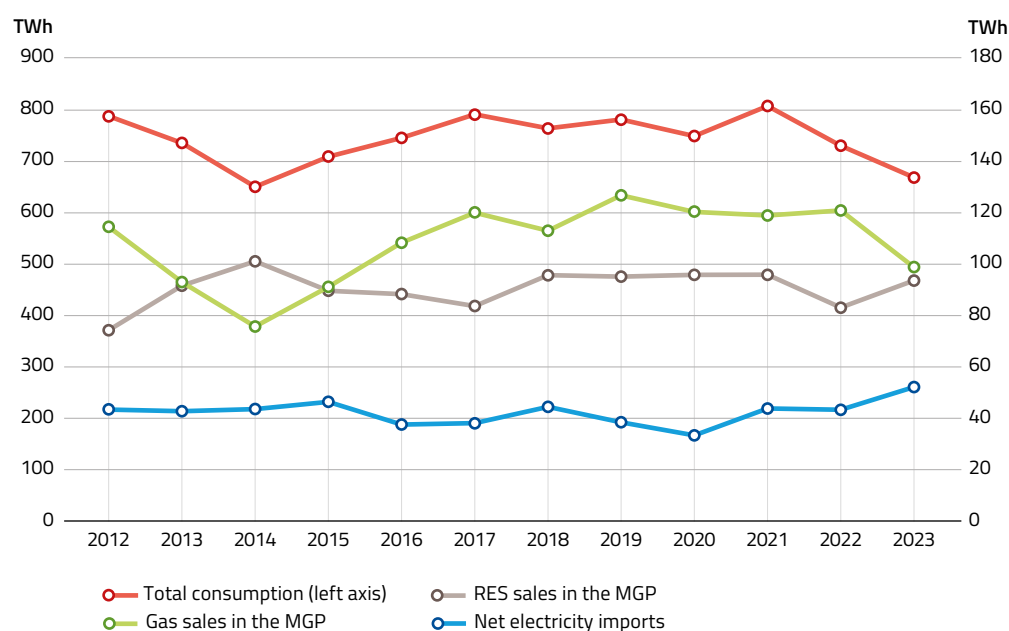
### 2.3.2 Other gas markets

**MT-GAS.** In 2023, no trades were recorded in the forward MT-Gas.

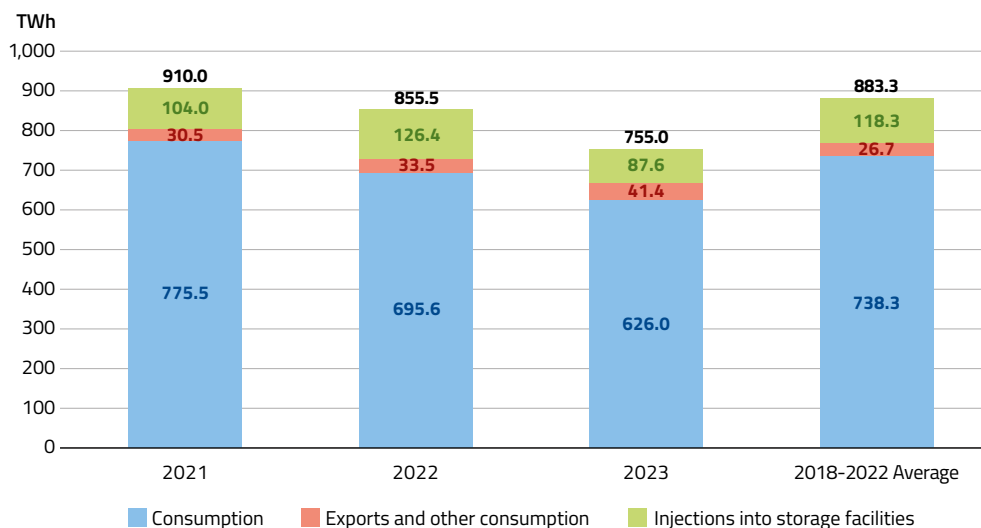
**P-GAS.** In the Royalties segment, 0.6 TWh were traded at an average price of 55.02 €/MWh. There were instead no trades in the Imports segment.

**PAR.** On the Platform for Allocation of Regasification Capacity, in the three segments dedicated to *GNL Italia*, *OLT Offshore LNG Toscana*, and *FSRU Italia*, a total of 42 slots were allocated (vs. 193 in 2022), equal to 5.5 million m<sup>3</sup> of liquefied gas (as against 19.0 million m<sup>3</sup> last year), at an average price of 11.7 €/m<sup>3</sup> of liquefied gas.

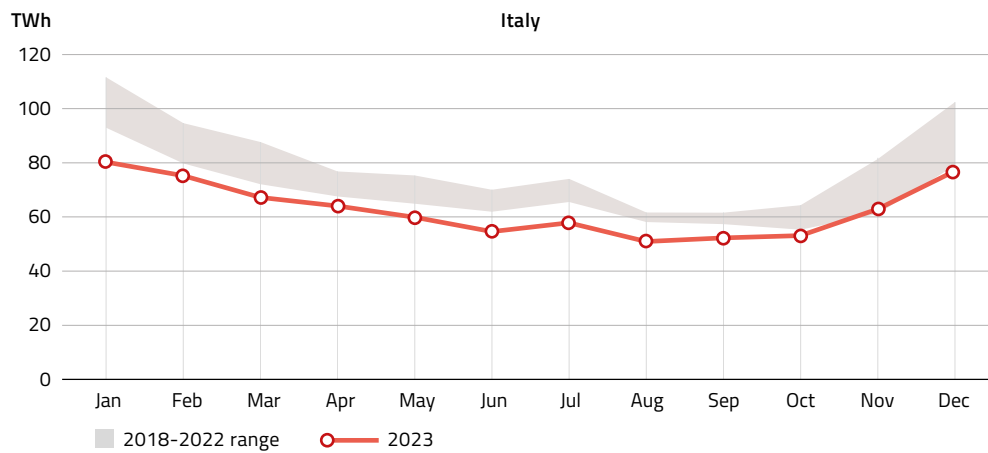
**Fig. 2.3.1 Trend of natural gas consumption**



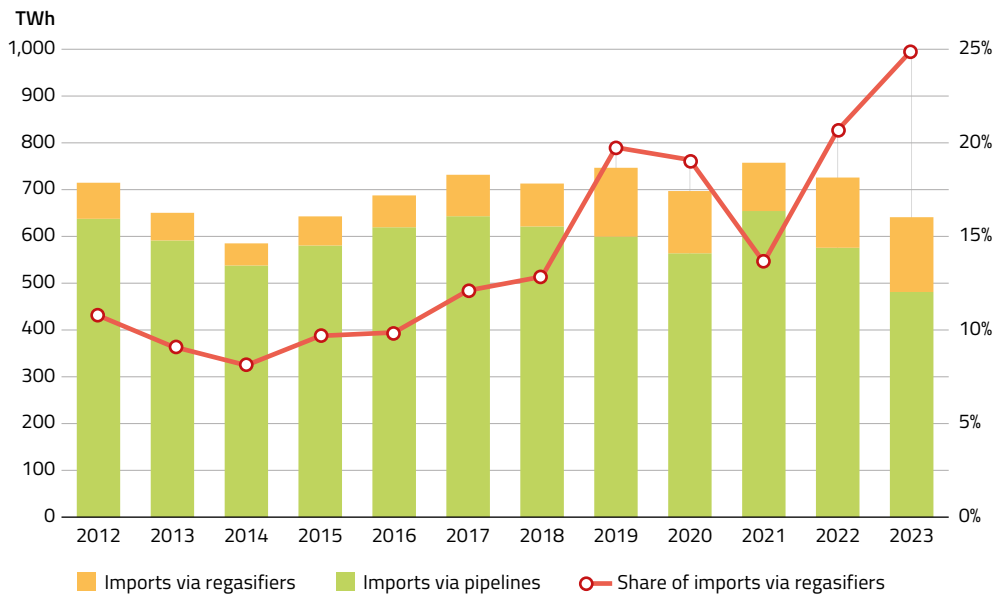
**Fig. 2.3.2 Natural gas demand in Italy**



**Fig. 2.3.3 Monthly trend of natural gas demand in Italy**



**Fig. 2.3.4 Trend of gas imports**



**Fig. 2.3.5 Gas stocks in storage facilities at the end of the year**

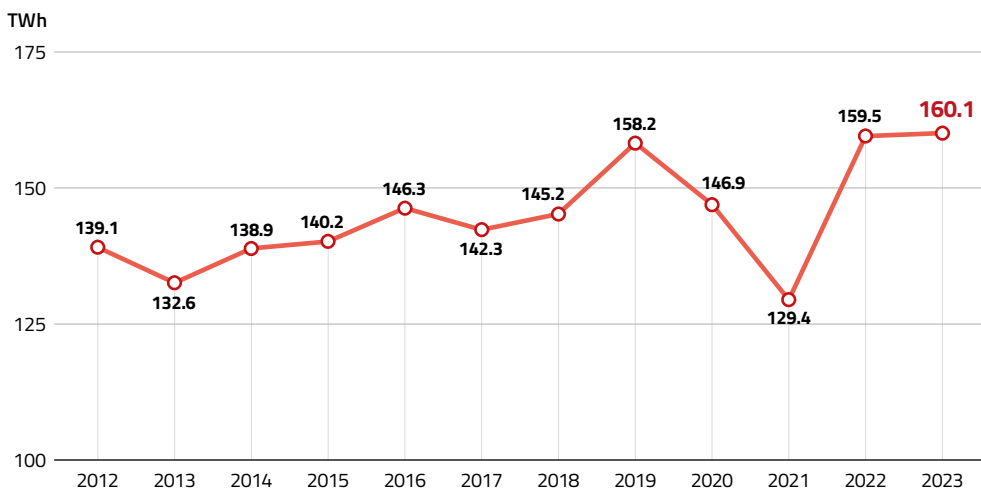


Fig. 2.3.6 Trend of trades

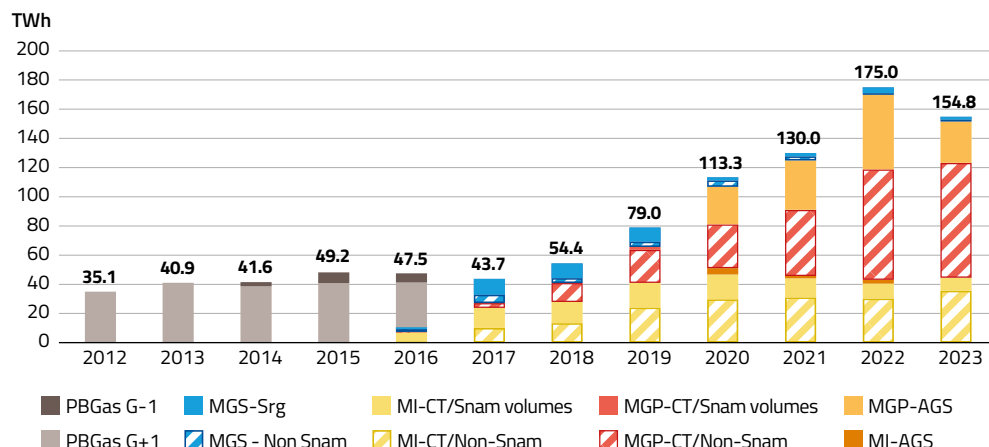


Fig. 2.3.7 Average prices and volatility in the MP-GAS

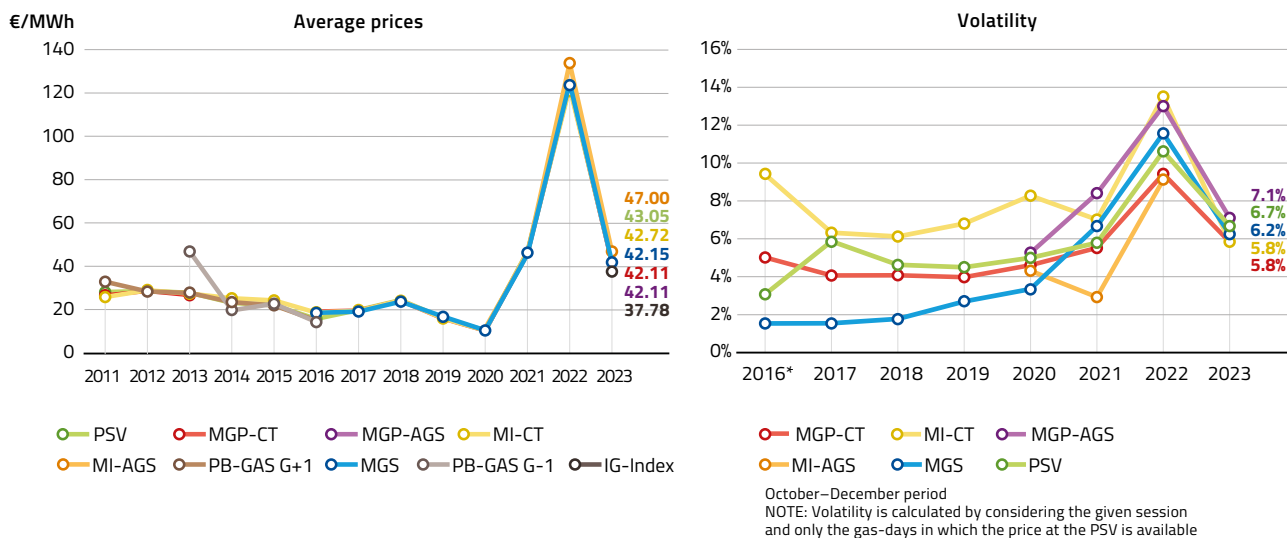


Fig. 2.3.8 Average prices and volatility. Comparison of SAP with PSV and TTF

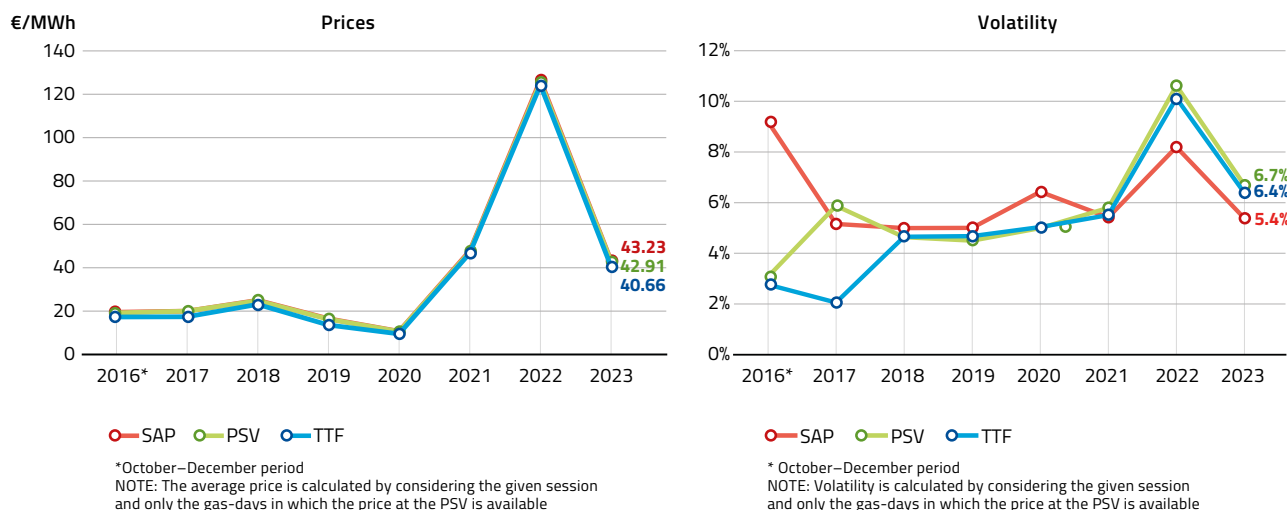


Fig. 2.3.9 Market shares (CR5)

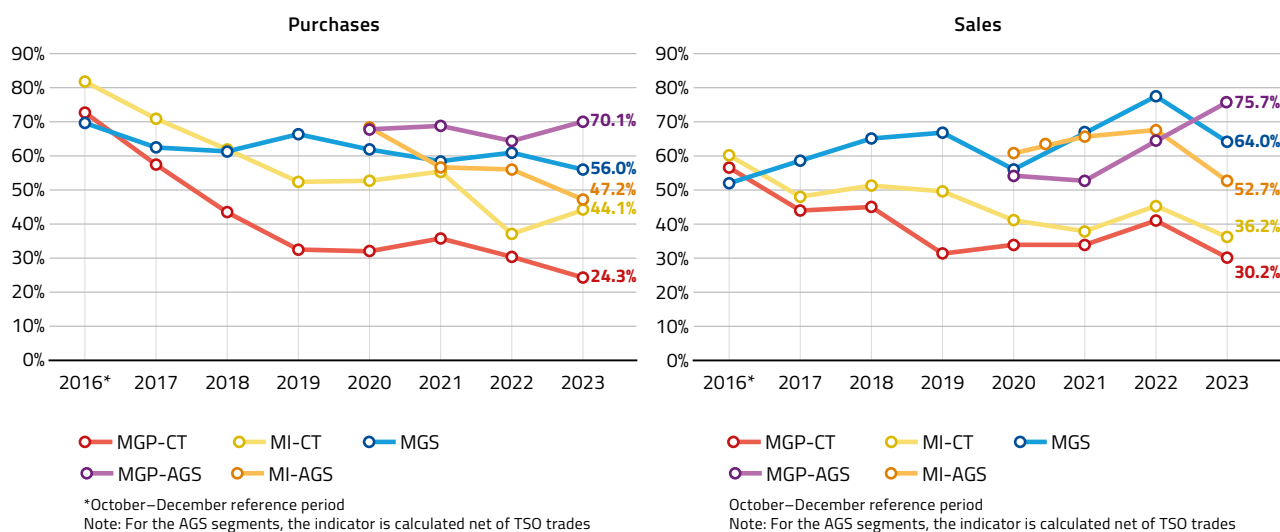


Table 2.3.1 Movements of Snam in the MI-Gas. Year 2023

SHORT SYSTEM (negative residual imbalance)								
Imbalance classes MWh	Imbalance MWh		Purchases MWh			Sales MWh		
	Average	No. of publications	Average	% of imb.	No. of matched orders	Average	% of imb.	No. of matched orders
[0-15,000]	7,447	715	30,516	518%	4			
[15,000-31,400]	23,223	955	21,501	90%	19	11,592	53%	1
[31,400-60,000]	44,537	1,553	20,045	41%	120	18,448	43%	3
[60,000-100,000]	76,815	885	19,769	26%	119			
[100,000-200,000]	131,993	493	21,377	16%	59			
>200,000	269,596	99	22,905	9%	14			
<b>Total</b>	<b>54,556</b>	<b>4,700</b>	<b>20,508</b>	<b>26%</b>	<b>335</b>	<b>16,734</b>	<b>44%</b>	<b>4</b>

LONG SYSTEM (positive residual imbalance)								
Imbalance classes MWh	Imbalance MWh		Purchases MWh			Sales MWh		
	Average	No. of publications	Average	% of imb.	No. of matched orders	Average	% of imb.	No. of matched orders
[0-15,000]	7,418	693	17,056	153%	3	7,632	215%	2
[15,000-31,400]	23,164	765	34,764	103%	2	6,414	23%	4
[31,400-60,000]	44,376	805	41,880	103%	1	13,077	26%	32
[60,000-100,000]	76,369	430				21,542	28%	37
[100,000-200,000]	132,496	170	14,712	10%	1	23,234	21%	11
>200,000	271,094	23				30,120	12%	2
<b>Total</b>	<b>41,643</b>	<b>2,886</b>	<b>25,327</b>	<b>66%</b>	<b>7</b>	<b>17,867</b>	<b>25%</b>	<b>88</b>

## 2.4 ENVIRONMENTAL MARKETS

### 2.4.1 Energy Efficiency Certificates Market (MTEE)

**CONTEXT.** The geopolitical and economic events taking place in the past few years further accelerated the European transition to green energy sources and lower reliance on fossil fuels. On 18 May 2022, the REPowerEU Plan was adopted. In addition to introducing a number of measures to rapidly reduce dependence on Russian fossil fuels and speed up the green transition, the plan provided for: *i)* a 20% increase in EU renewable source targets to be achieved by 2030; and *ii)* as part of the energy efficiency incentive scheme, the streamlining and optimisation of the entire process of recognition of energy savings, especially in terms of project approval timeframes, consequent issuing of energy efficiency certificates, and their placement in the market.

In 2023, the Italian legislative and regulatory framework (the Ministerial Decree of 11 January 2017, as amended and supplemented by the Ministerial Decree of 21 May 2021, and by ARERA Decision 547/2021/R/EFR) was completed with the publication of: *i)* a Decree issued by the Director-General of Competitiveness and Efficiency/Ministry of Environment and Energy Security on 4 May 2023, updating the list of standardised projects eligible for the white certificates scheme; and *ii)* another Decree issued by the above-mentioned Director-General on 13 October 2023, updating a non-exhaustive list of eligible energy efficiency projects, distinguished by type of action and energy source saved.

The estimations published by GSE<sup>23</sup> for the year of obligation 2023 showed a slightly higher availability of certificates than in 2022; these certificates will be sufficient to cover both 60% of the obligation for 2023 and the residual obligation for 2021 (Table 2.4.1, Fig. 2.4.1).

**VOLUMES AND LIQUIDITY.** Although estimated emissions in the year of obligation 2023 were higher than last year (2.1 million toe, +0.3 million toe), the system capability of issuing energy efficiency certificates was still low as compared to the previous decade (5.1-7.5 million toe). This fact had a direct impact on overall trades, which experienced a slight increase (+0.1 million toe) in 2023 with respect to the previous year, after five decreases in a row, remaining however among the lowest since 2010 (2.8 million toe).

The recovery of trades was more intense on the bilateral platform (1.1 million toe, +0.9 million toe) than on the regulated market (MTEE), where trades were practically in line with those of 2022 (1.8 million toe, +0.06 million toe). Given the above-mentioned dynamics, market liquidity dropped to 62% (-2 p.p. on a year-on-year basis), confirming however a higher propensity of participants to procure certificates in the market. An intra-annual analysis of volumes in the MTEE reveals a year-on-year decrease in the months from May to August, when traded volumes declined by 22% vs. the similar period of 2022, as against a growth of 24% and 13% recorded in the first and last quarters of the year, respectively. Moreover, in both the regulated market and on the bilateral platform, trades were concentrated in May (yearly deadline of the obligation) and in the September–November quarter (high availability of certificates issued) (Fig. 2.4.2).

**PRICES.** In 2023, the prices and volatility of TEE dropped with respect to the previous year. The yearly average price recorded in the MTEE decreased to 251.73 €/toe (-2.4%), ranging on a month-on-month basis from 255 €/MWh to 257 €/MWh in the first five months for the year of obligation 2022, and it had a more marked downward trend in subsequent months, hitting a minimum of 246 €/toe in December.

<sup>23</sup> GSE, *Rapporto annuale Certificati Bianchi 2023*, page 47.



On the bilateral platform, the price was 224.22 €/toe (-3.3%), as a result of a fairly erratic monthly trend ranging from 153 €/MWh in August to 241 €/MWh in October. Hence, the spread between bilateral prices and market prices widened to 27.5 €/toe; however, this value drops to about 4 €/toe considering only bilateral transactions registered at a price above 1 €/toe, accounting for 90% of the total in 2023. As regards volatility, the index proved to be very low and below 1% in the MTEE and equal to 10% (minimum since 2016) for registrations made at strictly positive prices on the bilateral platform (Fig. 2.4.3, Fig. 2.4.4 and Fig. 2.4.5).

**MARKET CONCENTRATION.** The level of competitiveness in the market reflects the structure underlying the incentive scheme, featuring a low number of purchasing participants, subject to the obligation, with respect to the high number of selling participants, including Energy Service Companies (ESCOs)<sup>24</sup>. In view of the above, also in 2023, the competitiveness indicators in the MTEE moved within a well-established range, demonstrating to be higher for purchases than for sales (CR3: 67.7%, CR10: 15.3%) (Fig. 2.4.6).

## 2.4.2 Market of Guarantees of Origin (M-GO)

**VOLUMES AND LIQUIDITY.** The EU legislation on promotion of production of energy from renewable sources extended the utilisation of Guarantees of Origin (GOs) to other renewable energy carriers, namely gas, including biomethane, hydrogen, and heating and cooling energy products. In November 2023, GME amendments to the "Rules governing the operation of the regulated market and of the platform for registration of bilaterals of guarantees of origin" entered into force. GME had made the amendments with a view to: *i)* complying with the provisions of Decree no. 224 issued by the Ministry of Environment and Energy Security on 14 July 2023; and *ii)* incorporating the provisions set forth in point 5) of ARERA Decision 496/2023/R/COM of 31 October 2023 into the above Rules. In particular, the changes were made to introduce, into the P-GO systems (M-GO/PB-GO), the activities of registration of additional types of GO in respect of electricity and gas. In the electricity sector, given the above legislative and regulatory framework, a lower demand for electricity (-2.8%), and a recovery of renewable energy (+15.4%)<sup>25</sup>, the scheme experienced a halt with respect to its bullish trend in the previous years. Consequently, the trades of GOs, including intra-group trades, were down to 72 TWh (-23% vs. 2022 and at their minima since 2016). The contraction of volumes was significant and common to all trading systems. On the Bilateral Platform (PB-GO), the main form of procurement of GOs, registrations dropped to 61.2 TWh (-8.0 TWh), with a share in total trades, net of intra-group trades, which grew to 88% (+9 p.p.). Likewise, in the Market of Guarantees of Origin (M-GO) and in GSE auctions, trades declined to their minima in the past seven years, i.e. to 0.7 TWh (-0.3 TWh) and 7.5 TWh (-10.2 TWh), respectively.

In 2023, the distribution of trades by year of production<sup>26</sup> showed that volumes traded in respect of the previous year of production had a predominant share and that they were concentrated in the January-March quarter, a trend driven by the PB-GO (77% of registrations).

<sup>24</sup> An Energy Service Company (ESCO) is a company capable of providing the technical, commercial, and financial services required to implement energy efficiency projects.

<sup>25</sup> TERNA, *Rapporto mensile sul Sistema Elettrico* – December 2023, page 5.

<sup>26</sup> The year of production goes from April to March of the following year. For the year of production 2023, data is calculated until 31 December 2023.

On the PB-GO, the distribution of trades by type of renewable source, for GOs in respect of the year of production 2023, revealed a higher liquidity for GOs from Hydro (44%) and Wind sources (42%), the latter growing significantly vs. 2022 (+18 p.p.). In contrast, in the M-GO, the share of the Other types of renewable sources was dominant (47%), whereas that from Wind sources was minor and declining (2%). Finally, in GSE awarding auctions, the prevailing type of renewable source was Solar (48%), while the Wind source increased (14%) (Fig. 2.4.7, Fig. 2.4.8, Fig. 2.4.11).

**PRICES.** The average prices of GOs observed in the three trading systems (M-GO/PB-GO/GSE auctions) had a generalised and cross-cutting increase, updating their historical peaks in all three. The growth in the M-GO was more intense, as the average price reached 6.10 €/MWh (+3.88 €/MWh), whereas price increases on the PB-GO and in GSE auctions were lower (2.12 €/MWh and 5.67 €/MWh, respectively). As a result of these changes, the 2023 spread between the price in the market and that on the bilateral platform rose to 3.98 €/MWh (+2.40 €/MWh vs. 2022); however, considering only bilateral transactions registered with a strictly positive price (93% of total trades on the PB-GO), this value drops to 3.82 €/MWh. A monthly analysis of prices in the M-GO showed higher average prices (in the 6-8 €/MWh range) until August and a subsequent downward trend until reaching the minima of the year, i.e. about 3 €/MWh. As concerns the individual types of GO traded by year of production, the Other category recorded the highest price (around 6 €/MWh), whereas the Bio category, newly introduced and traded only in November and December, had a price of about 3 €/MWh in the M-GO and in GSE auctions, proving to be the most expensive on the PB-GO (7.08 €/MWh) (Fig. 2.4.9 and Fig. 2.4.10).

**Table 2.4.1 Energy efficiency certificates (TEE) needed to fulfil the obligation**

Year of obligation	Actual obligations Total distributors	Actual obligations Electricity distributors	Actual obligations Gas distributors	Cumulative total for fulfilment of the obligation	Certificates issued since the start of the scheme	Issued certificates-obligations delta	Certificates issued January-May**	Certificates available upon expiry (net of GSE account)
	(Mtoe/yr)	(Mtoe/yr)	(Mtoe/yr)					
2005	0.16	0.10	0.06	0.16	-			
2006	0.31	0.19	0.12	0.47	-			
2007	0.64	0.39	0.25	1.11	1.79	0.68	0.52	1.31
2008	2.20	1.20	1.00	3.31	3.73	0.42	1.14	2.62
2009	3.20	1.80	1.40	6.51	6.63	0.12	1.42	3.45
2010	4.30	2.40	1.90	10.81	9.64	-1.17	1.64	4.05
2011	5.30	3.10	2.20	16.11	14.74	-1.37	3.32	5.62
2012	6.00	3.50	2.50	22.11	20.69	-1.42	3.46	6.00
2013	5.51	3.03	2.48	27.62	28.17	0.55	4.19	7.75
2014	6.75	3.71	3.04	34.37	34.65	0.28	2.38	7.66
2015	7.75	4.26	3.49	42.12	40.04	-2.08	2.32	7.14
2016	9.51	5.23	4.28	51.63	47.57	-4.06	3.61	8.27
2017	5.34	2.39	2.95	56.97	53.62	-3.35	2.62	5.47
2018	5.57	2.49	3.08	62.54	58.72	-3.82	2.23	4.45
2019	6.20	2.77	3.43	68.74	63.83	-4.91	1.38	4.49
2020	2.84	1.27	1.57	71.58	66.07	-6.37	1.31	2.56
2021	1.00	0.45	0.55	72.58	67.83	-4.75	1.17	1.98
2022	1.68	0.75	0.93	74.26	70.23	-4.03	1.22	2.11
<b>2023</b>	<b>2.35</b>	<b>1.05</b>	<b>1.30</b>	<b>76.61</b>	<b>72.46*</b>	<b>-4.15</b>	<b>0.79*</b>	<b>3.02*</b>

\* The figure has been calculated on the basis of an estimation of the number of available certificates published by GSE in its *Rapporto annuale Certificati Bianchi 2023*.

\*\* Number of certificates issued in the period from January to May of each year of obligation.

**Fig. 2.4.1 Available TEE and obligations**

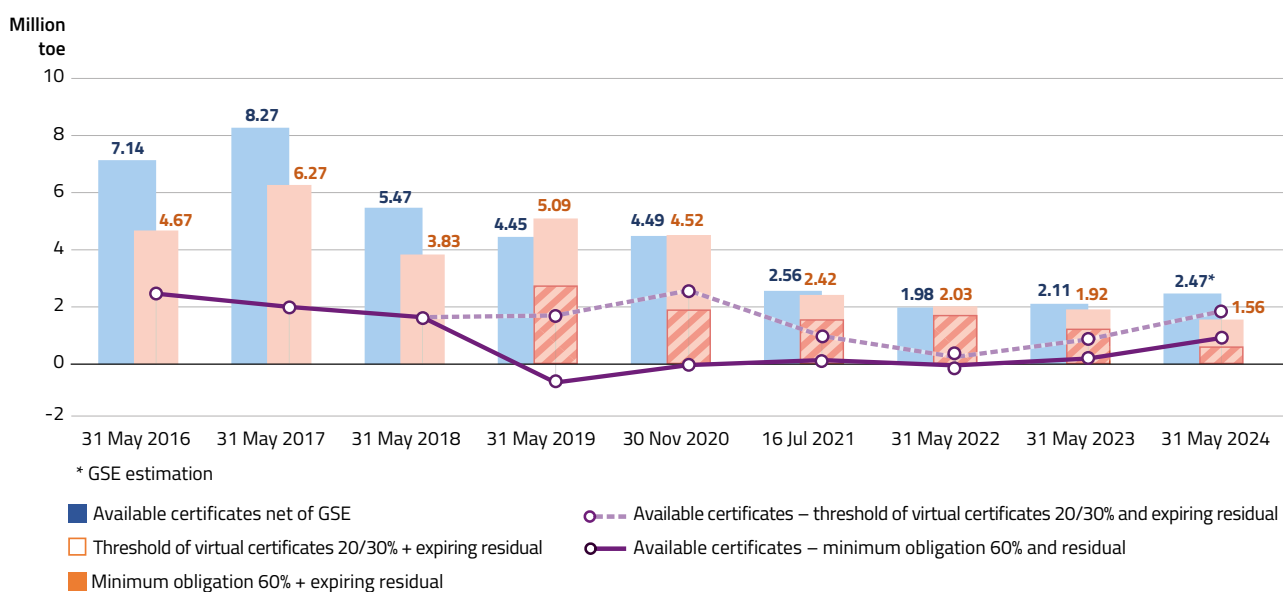


Fig. 2.4.2 Volumes of TEE traded

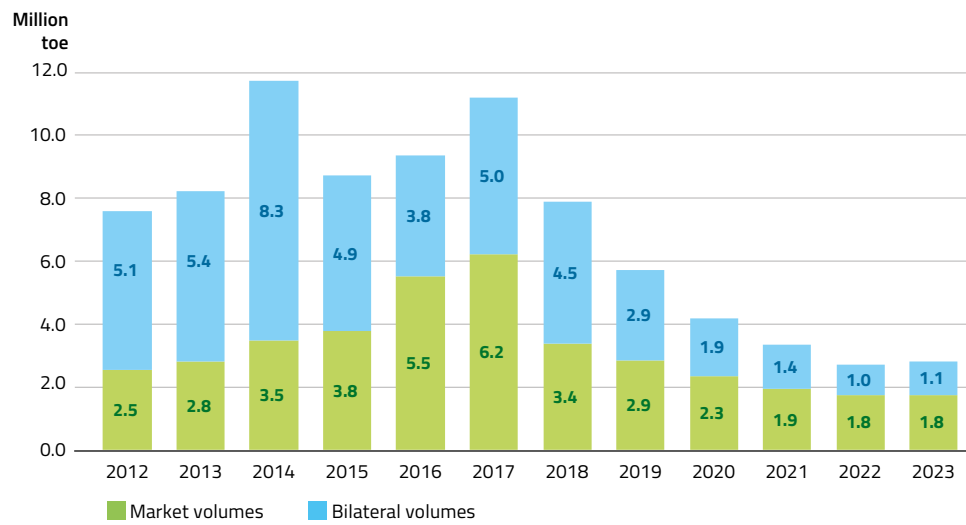


Fig. 2.4.3 Prices of TEE. Yearly average

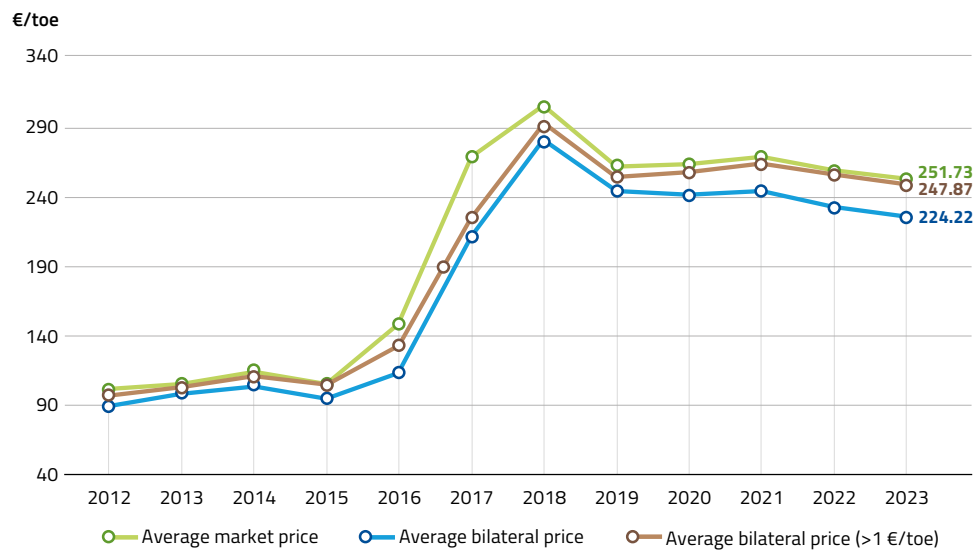


Fig. 2.4.4 Trend of MTEE session prices. Year 2023

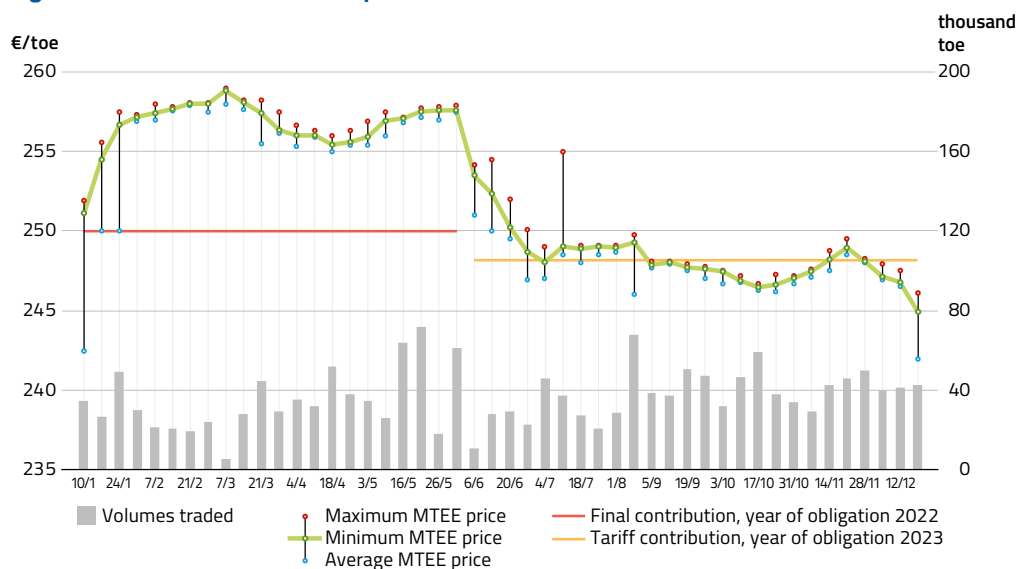


Fig. 2.4.5 Volatility of TEE prices

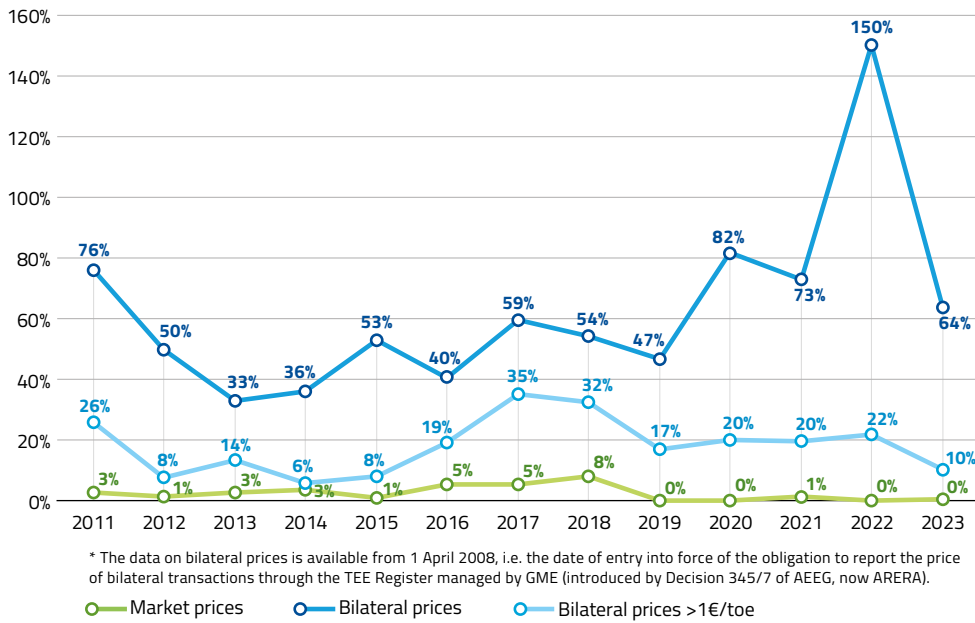


Fig. 2.4.6 Market concentration

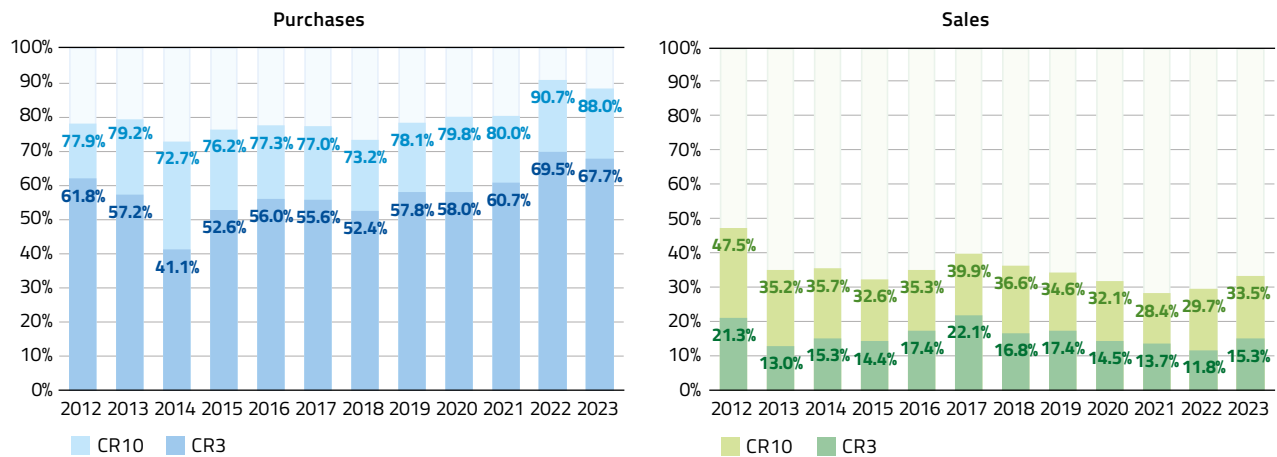


Fig. 2.4.7 Volumes of Guarantees of Origin (GOs) traded

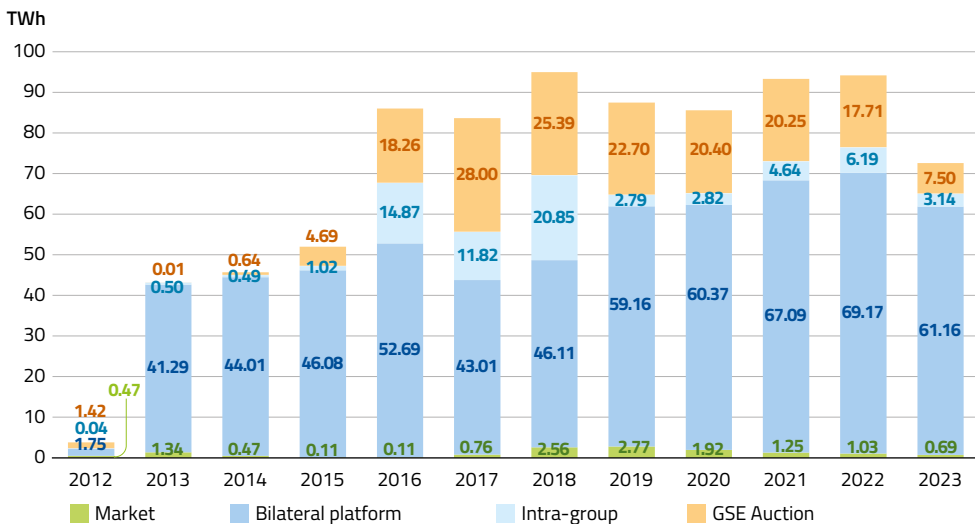


Fig. 2.4.8 Distribution of volumes traded by year of production

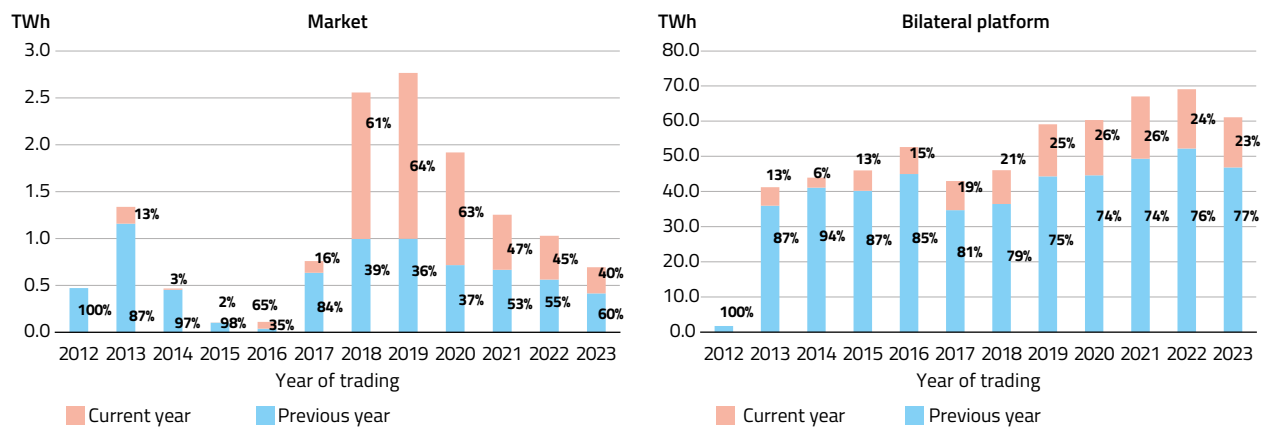


Fig. 2.4.9 Prices of GOs. Yearly average

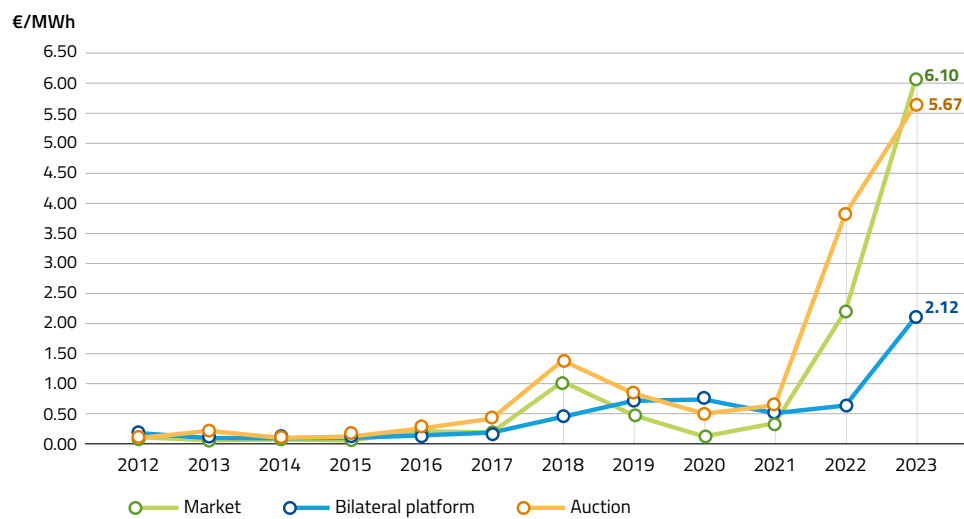
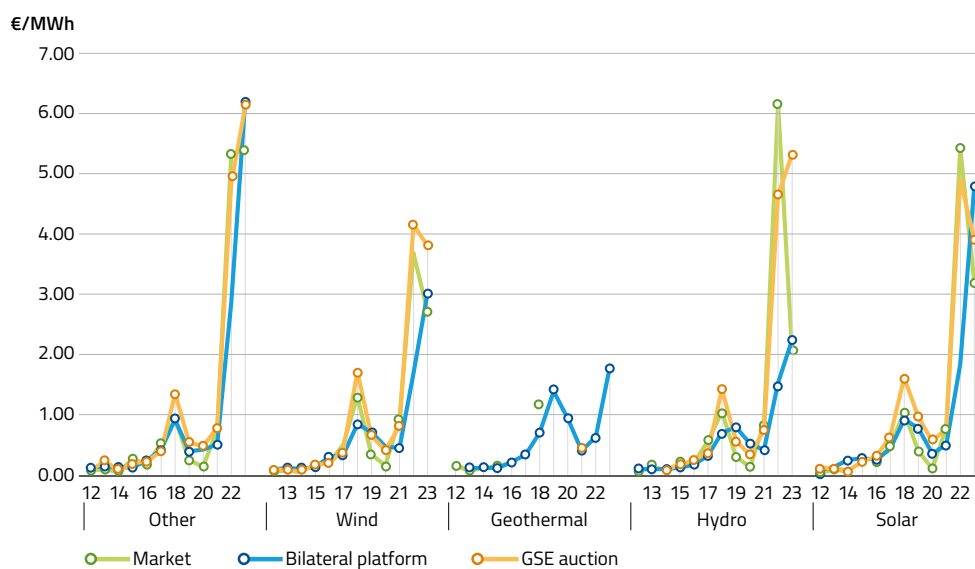
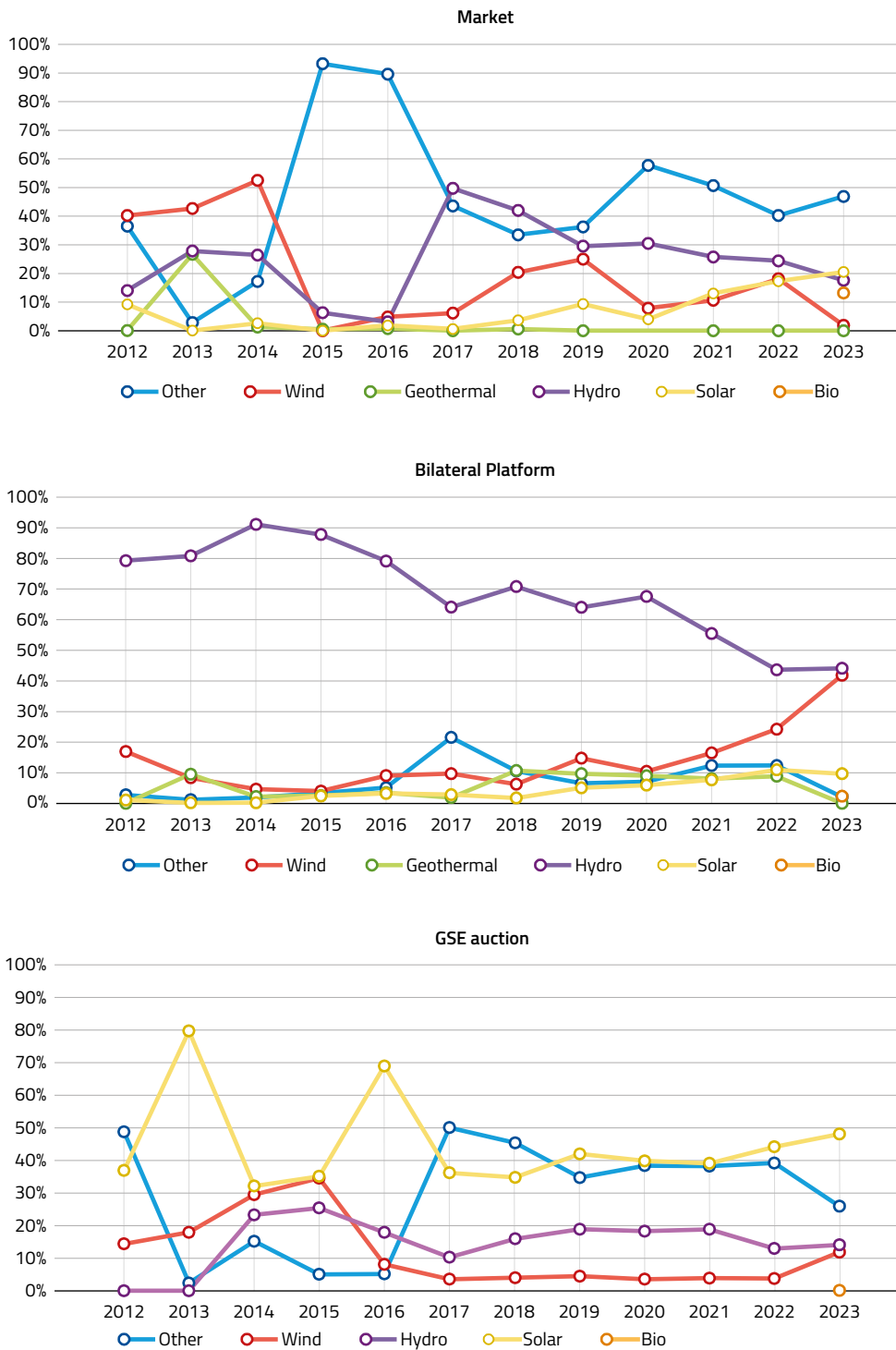


Fig. 2.4.10 Prices of GOs by type and year of production<sup>27</sup>



<sup>27</sup> The data pertaining to the year of production 2023 is calculated as of 31 December 2023.

Fig. 2.4.11 Distribution of volumes traded. Year of production<sup>28</sup>



<sup>28</sup> The data is calculated as of 31 December 2023.

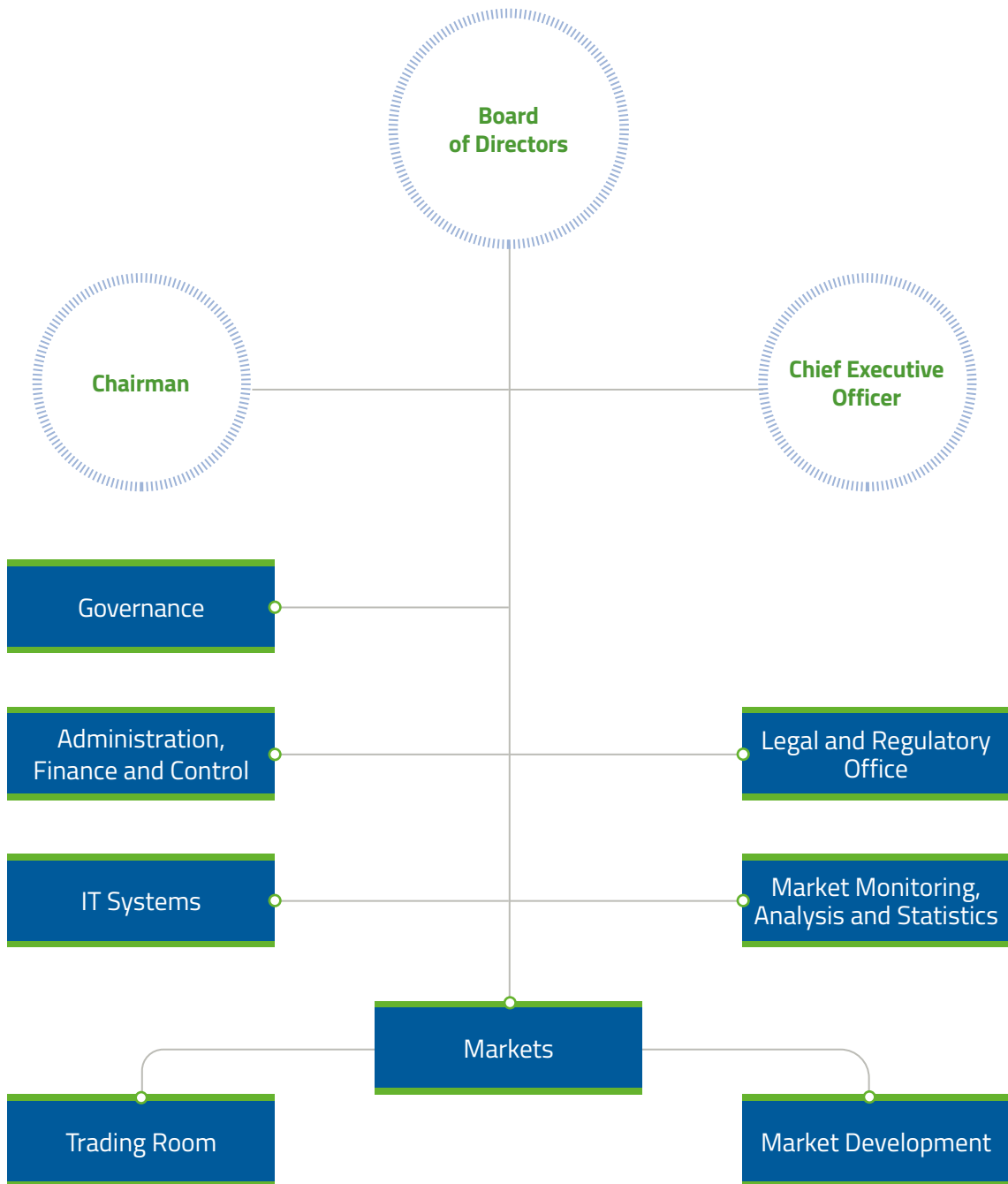
# Appendix

# 1

## GME Organisational Chart









# Appendix 2

## Market Rules



## Market Rules

## ELECTRICITY

	ELECTRICITY MARKET		PCE	PPA	FLEXIBILITY MARKET
	MPE	MTE			MLT-FLEX
<b>Participation</b>	Voluntary in MGP, MI, and MPEG Mandatory in MSD	Voluntary	Voluntary	Voluntary	Voluntary
<b>Requirements for admission to the markets and participation in trades*</b>	Ownership of an offer point needed to operate	Ownership of an electricity account needed to operate	Only dispatching users and their delegated agents are admitted	Enabled users	Enabled users
<b>Products traded</b>	Opening hours MGP: 1-24 MI1: 1-24 MI2: 1-24 MI3: 4-24 MI4: 8-24 MI5: 12-24 MI6: 16-24 MI7: 20-24 MI-A1: 1-24 ** MI-A2: 1-24 ** MI-A3: 13-24 ** XBID: 1-24 ** MPEG Daily (with baseload and peakload profiles)	Yearly, quarterly, monthly (with baseload and peakload profiles)	OTC contracts	Long-term contracts of purchase and sale of electricity from renewable sources	Forward products tradable in the MLT-Flex are defined by DSOs
<b>Trading mechanism</b>	Auction in MGP, MI, and MSD Continuous trading in XBID and MPEG	Continuous trading	Bilateral trading	Auction (Energy Release)	Auction
<b>Price rule</b>	Zonal marginal price in MGP and MI Pay-as-bid in XBID, MPEG, and MSD	Pay-as-bid	N/A	N/A	Pay-as-bid
<b>Guarantees</b>	Bank guarantee and/or cash deposit		Bank guarantee. Cash deposit only if necessary and urgent	N/A	Cash deposit ***
<b>Central counterparty</b>	GME in MGP, MI, and MPEG Terna in MSD	GME	GME (only for CCTs)	N/A	GME
<b>Payments</b>	W+1 (from 1 December 2016) for MGP and MI M+2 for MPEG	M+2	W+1 (from 1 December 2016)	N/A	M+1 for energy to be delivered M for the amount of capacity actually made available

\* Market participation requirements are laid down in the rules and regulations of the individual markets.

\*\* Valid from September 2021.

\*\*\* Offers of step-up services in the MLF (Technical Rule no. 5 MLF) with a unit price higher than or equal to zero do not generate exposure.

## GAS

	GAS MARKET				P-GAS			PAR
	MGP-GAS MI-GAS	MGS	MPL	MT-GAS	Imports	Virtual Storage	Royalties	
<b>Participation</b>	Voluntary	Voluntary	Voluntary	Voluntary	Mandatory (supply side)	Mandatory (supply side)	Mandatory (supply side)	Voluntary
<b>Requirements for admission to the markets and participation in trades*</b>	Need to be a PSV user to operate	Need to be a user of the PSV and of storage services to operate	Need to be a PSV user and authorised to bid at the offer points of the transport network	Need to be a PSV user to operate	PSV users subject to the obligation to bid for imported quotas	PSV users participating in the virtual storage service	PSV users subject to the obligation to bid for royalties	Users authorised for the regasification terminal
<b>Products traded</b>	Daily	Daily	Daily	BoM, monthly, quarterly, half-yearly, yearly (both thermal and calendar)	Monthly, yearly, thermal	Monthly, half-yearly	Monthly	Yearly and multi-year capacity; Capacity during the thermal year; Residual capacity of the thermal year; Regasification capacity no longer available for the auction
<b>Trading mechanism</b>	Continuous trading/ Auction (AGS)	Auction	Auction	Continuous trading	Continuous trading	Continuous trading	Auction	Auction/FCFS
<b>Price rule</b>	Pay-as-bid/ Marginal price (AGS)	Marginal price	Marginal price	Pay-as-bid	Pay-as-bid	Pay-as-bid	Marginal price	Pay-as-bid/ Marginal price
<b>Guarantees</b>	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit	Defined by each selling participant	Defined by each selling participant	Defined by each selling participant	N/A
<b>Central counterparty</b>	GME	GME (from 1 April 2017)	GME (from 1 April 2017)	GME	N/A Invoicing and payments between participants	N/A Invoicing and payments between participants	N/A Invoicing and payments between participants	Regasification terminal
<b>Payments</b>	W+1 for transactions (from 1 September 2016) M+3 for closing non-delivered positions	W+1 for transactions M+3 for closing non-delivered positions	W+1 for transactions M+3 for closing non-delivered positions	W+1 for transactions (from 1 September 2016) M+3 for closing non-delivered positions	Deadline defined by each selling participant	Deadline defined by each selling participant	Deadline defined by each selling participant	Regasification terminal

\* Participation requirements are laid down in the rules and regulations of the individual markets.

## ENVIRONMENT

	MTEE	M-GO	MCIC
<b>Participation</b>	Voluntary	Voluntary	Voluntary
<b>Requirements for admission to the markets and participation in trades*</b>	Ownership of an account in the TEE Register is needed to trade in the MTEE	Ownership of an account in the GO Register is needed to trade in the M-GO	Ownership of an account in the CIC Register is needed
<b>Products traded</b>	Single order book for unified type (1 toe)	GO by type of source (1MWh)	CIC by type of source (1 CIC)
<b>Trading mechanism</b>	Continuous trading	Continuous trading	Continuous trading
<b>Price rule</b>	Pay-as-bid	Pay-as-bid	Pay-as-bid
<b>Guarantees</b>	Cash deposit for total coverage of purchases	Cash deposit for total coverage of purchases	Cash deposit for total coverage of purchases
<b>Central counterparty</b>	GME	GME	GME
<b>Payments</b>	D+3	D+3	D+3

\* Participation requirements are laid down in the rules and regulations of the individual markets.







# Appendix 3

Statistical Data



Table 1 - Volumes traded

TWh	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023/2022 change
<b>ELECTRICITY MARKETS</b>													
<b>MGP</b>	<b>298.67</b>	<b>289.15</b>	<b>281.98</b>	<b>287.13</b>	<b>289.70</b>	<b>292.20</b>	<b>295.56</b>	<b>295.83</b>	<b>280.18</b>	<b>290.40</b>	<b>289.17</b>	<b>277.97</b>	<b>-3.9%</b>
Exchange	178.66	206.90	185.85	194.59	202.82	210.92	212.93	213.26	209.83	221.28	210.91	209.91	-0.5%
Bilaterals	120.00	82.25	96.13	92.54	86.88	81.28	82.63	82.56	70.35	69.12	78.27	68.05	-13.0%
<b>MI</b>	<b>25.13</b>	<b>23.34</b>	<b>22.79</b>	<b>24.92</b>	<b>28.01</b>	<b>25.35</b>	<b>25.38</b>	<b>26.37</b>	<b>24.91</b>	<b>26.04</b>	<b>25.97</b>	<b>29.11</b>	<b>+12.1%</b>
MI-A1										4.01	13.92	14.36	+3.1%
MI-A2										1.47	5.42	5.30	-2.2%
MI-A3										0.67	2.58	2.65	+2.9%
XBID										0.73	4.04	6.80	+68.1%
MI1	15.99	12.80	12.23	12.91	15.04	13.81	13.35	12.73	11.39	9.19			
MI2	6.21	6.07	6.47	6.15	6.97	5.45	4.53	4.44	4.58	3.10			
MI3	1.72	2.00	2.01	2.39	2.50	2.38	3.34	4.19	3.65	2.72			
MI4	1.21	2.47	2.09	1.22	1.20	0.78	0.93	1.20	1.34	1.07			
MI5				2.24	2.31	1.12	1.15	1.40	1.31	1.10			
MI6						1.47	1.59	1.82	1.96	1.47			
MI7						0.34	0.48	0.61	0.68	0.49			
<b>MTE</b>	<b>54.96</b>	<b>41.10</b>	<b>32.27</b>	<b>5.09</b>	<b>1.07</b>	<b>1.36</b>	<b>1.19</b>	<b>1.64</b>	<b>0.77</b>	<b>0.02</b>	<b>0.01</b>	<b>0.13</b>	<b>+1.247.6%</b>
Exchange	30.36	8.00	18.40	5.09	1.07	1.36	1.19	1.64	0.77	0.02	0.01	0.03	+170.2%
OTC clearing	24.60	33.10	13.87	-	-	-	-	-	-	-	-	0.11	-
<b>MPEG</b>						<b>0.00</b>	<b>3.93</b>	<b>3.16</b>	<b>0.70</b>	<b>0.72</b>	<b>0.29</b>	<b>0.15</b>	<b>+266.7%</b>
<b>PCE *</b>	<b>307.61</b>	<b>325.50</b>	<b>345.72</b>	<b>354.47</b>	<b>342.14</b>	<b>302.83</b>	<b>311.57</b>	<b>291.74</b>	<b>265.14</b>	<b>232.22</b>	<b>249.72</b>	<b>227.39</b>	<b>-8.9%</b>
Registrations	307.61	325.50	345.72	354.47	342.14	302.83	0.00						
<b>GAS MARKETS</b>													
<b>M-GAS</b>	<b>0.17</b>	<b>0.02</b>	<b>0.10</b>	<b>1.01</b>	<b>10.69</b>	<b>43.92</b>	<b>55.16</b>	<b>82.17</b>	<b>113.79</b>	<b>129.99</b>	<b>175.01</b>	<b>154.75</b>	<b>-11.6%</b>
MGP-Cont. Trad.	0.14	0.01	0.00	0.00	0.33	3.28	13.01	24.56	30.08	45.40	75.64	78.74	+4.1%
MGP-AGS									25.72	33.79	51.11	28.19	-44.8%
MI-Cont. Trad.	0.04	0.00	0.10	1.01	7.09	23.83	27.86	41.05	46.70	44.09	40.53	44.39	+9.5%
MI-AGS									4.36	1.61	2.60	0.16	-93.9%
MGS					3.27	16.63	13.50	13.37	6.45	5.08	5.13	3.27	-36.2%
MPL					-	-	-	-	-	-	-	-	
MT-GAS		-	-	-	-	0.19	0.79	3.19	0.48	0.02	-	-	
<b>PB-GAS</b>	<b>34.93</b>	<b>40.88</b>	<b>41.52</b>	<b>48.19</b>	<b>36.79</b>								
G+1 segment	34.93	40.83	38.58	40.86	30.57								
G-1 segment		0.05	2.94	7.33	6.22								
<b>P-GAS</b>	<b>2.87</b>	<b>0.62</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1.95</b>	<b>2.43</b>	<b>0.44</b>	<b>-</b>	<b>2.22</b>	<b>2.03</b>	<b>0.63</b>	<b>-69.0%</b>
Imports	-	-	-	-	-	-	-	-	-	-	-	-	
Seg. as per Leg. Decree 130/10	-	-	-	-	-	-	-	-	-	-	-	-	
Royalties	2.87	0.62	-	-	-	1.95	2.43	0.44	-	2.22	2.03	0.63	-69.0%
<b>ENVIRONMENTAL MARKETS</b>													
<b>Green Certificates</b>	<b>32.33</b>	<b>44.81</b>	<b>43.05</b>	<b>36.78</b>	<b>9.23</b>								
Exchange	3.81	7.57	8.20	6.95	1.26								
Bilaterals	28.52	37.25	34.85	29.84	7.98								
<b>Energy Efficiency Certificates</b>	<b>40.73</b>	<b>44.04</b>	<b>62.88</b>	<b>46.67</b>	<b>50.15</b>	<b>60.04</b>	<b>42.30</b>	<b>30.60</b>	<b>22.48</b>	<b>17.87</b>	<b>14.52</b>	<b>15.05</b>	<b>+3.6%</b>
Exchange	13.56	15.06	18.66	20.21	29.64	33.26	18.03	15.27	12.55	10.32	9.36	9.40	+0.4%
Bilaterals	27.17	28.98	44.22	26.45	20.52	26.78	24.27	15.33	9.93	7.55	5.16	5.65	+9.5%
<b>Guarantees of Origin</b>	<b>2.22</b>	<b>42.63</b>	<b>44.48</b>	<b>46.18</b>	<b>52.80</b>	<b>43.77</b>	<b>48.67</b>	<b>61.93</b>	<b>62.29</b>	<b>68.35</b>	<b>70.21</b>	<b>61.86</b>	<b>-11.9%</b>
Exchange	0.47	1.34	0.47	0.11	0.11	0.76	2.56	2.77	1.92	1.25	1.03	0.69	-32.7%
Bilaterals	1.75	41.29	44.01	46.08	52.69	43.01	46.11	59.16	60.37	67.09	69.17	61.16	-11.6%
<b>MCIC **</b>									421	-	-		-

\* Contracts registered on the PCE by year of trading, net of contracts pertaining to the MTE (including OTC clearing) and to the CDE.

\*\* The data is expressed in terms of number of CICs.

Table 2 - Participants

No. of participants*	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023/2022 change
<b>ELECTRICITY MARKETS</b>													
IPEX	200	223	254	264	245	258	269	282	280	278	313	<b>350</b>	+37
PCE	259	287	317	321	321	331	332	350	345	352	371	<b>388</b>	+17
<b>GAS MARKETS</b>													
M-GAS	42	66	71	88	158	179	186	201	207	227	305	<b>355</b>	+50
PB-GAS	65	74	86	96	107								
P-GAS	72	77	78	80	86	85	85	80	80	81	81	<b>80</b>	-1
<b>ENVIRONMENTAL MARKETS</b>													
MCV **	745	852	901	908	911								
PBCV **	1,177	1,381	1,466	1,509	1,509								
MTEE	447	588	838	1,055	1,281	1,499	1,558	1,623	1,673	1,730	1,764	<b>1,816</b>	+52
TEE Register	635	866	1,196	1,469	1,775	2,155	2,307	2,409	2,529	2,643	2,714	<b>2,828</b>	+114
M-GO	180	262	291	299	325	396	469	651	709	739	781	<b>861</b>	+80
PB-GO	219	324	359	374	405	509	713	1,022	1,225	1,400	1,511	<b>1,679</b>	+168
MCIC									19	26	28	<b>28</b>	0

\* The number of participants is the one calculated as of 31 December of each year.

\*\* The number of participants for the year 2016 is the one calculated as of 30 June.

# ANNUAL REPORT 2023

## ГІДИНОВА БІЛІТІВКА 2023



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