



ANNUAL REPORT 2021





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EXECUTIVE SUMMARY

Within the energy markets managed by GME, 2021 was characterised by an increase in trading liquidity and, consistently with the dynamics observed on other European energy exchanges, by high price volatility attributable to macroeconomic phenomena.

The past year also saw GME's commitment grow in the European context through initiatives aimed at fostering greater integration of the markets and the pursuit of decarbonisation objectives.

Climate protection policies, the exceptional nature of the events that have taken place over the last two years following the Covid-19 pandemic, as well as the uncertainty on the methods of supplying energy resources currently adopted by European countries (which became evident at the beginning of 2022 with the conflict between Russia and Ukraine) made it no longer possible to postpone the start of the energy transition process towards new sustainable balances in economic, environmental and social terms.

In this respect, the role that the market can guarantee in the management of this process and in the evaluation, by the political decision-makers, of the solutions to be adopted, appears to be fundamental, configuring itself as a tool capable of: i) allocating resources efficiently, as was the case, for example, in the "emergency" conditions of the two-year period 2020/21; ii) reducing supply risks through an increasing degree of market integration; iii) ensuring the transparency and security of the outcome of the tradings.

The markets managed by GME

The increase in energy consumption, resulting from the economic recovery following the COVID-19 pandemic, has led to an increase in volumes traded on the electricity Day Ahead Market (MGP) compared to 2020 which reached 290.4 TWh, thus returning substantially in line with the annual average of the 2015-2019 period. The liquidity of the MGP, instead, reached an all-time high since the birth of the power exchange, reaching a value of 76.2%.

The price at which electricity was traded on the MGP was subject to progressive growth, going from an average monthly value of 60.71 €/MWh in January to an average monthly value of 281.24 €/MWh in December. This dynamic, which has characterised all the main European power exchanges, is due to the constant increase in the wholesale prices of natural gas and of CO₂ observed during 2021.

Continuing in the field of electricity markets, in 2021 GME finalised the activities functional to guarantee **integration of the national intra-day** market in the European Single Intra-Day Coupling. From 22 September 2021, in fact, trading on the intra-day market managed by GME has taken place in continuous negotiation as part of the European XBID project, guaranteeing, already in the first phase of operation, the creation of approximately 256,000 matchings.

In the **spot gas markets** the overall volumes traded reached an all-time high since the creation of the gas exchange, hitting the value of 130 TWh. Also on the natural gas spot markets, in line with the other European exchanges, a significant increase in prices was observed, which reached their all-time high.

Among the **environmental markets**, the **market for energy efficiency certificates (MTEE)**, despite an incentive mechanism characterised by a progressive decrease in the issue of certificates, recorded an increase in liquidity, which stood at 58% (+2 p.p. compared to 2020), accompanied by a normalisation of average trading prices, which fell from the peak of 290 €/toe in March to 258.33 €/toe in December, in line with the average annual price in 2020. The **guarantees of origin market (MGO)** recorded an increase in volumes traded which, in 2021, totalled 68.3 GWh i.e. at an all-time high.

GME's commitment in Europe

GME's commitment to facilitate the pursuit of **European decarbonisation goals** was further consolidated in 2021.

The legislative decree transposing the EU Directive 2018/2021 on the promotion of the use of renewable sources assigned GME the task of creating an IT notice board to promote the meeting of parties potentially interested in the stipulation of **Power Purchase Agreements (PPA)**. The notice board will facilitate the meeting between long-term purchase and sale supplies of electricity produced from renewable sources, offering the possibility of placing parties in contact on the basis of the minimum information published and on the relative expressions of interest received. The same decree also provides for the possibility that the Ministry of Ecological Transition provides GME with guidelines so that it can create, in a later phase, an organised market platform for the long-term purchase and sale of electricity produced from renewable sources.

The Ukrainian crisis that broke out in February 2022 and the important legislative innovations issued at European level to achieve the objectives established by the **European Green Deal** make it even more important to pursue the process of market integration. In the current year, GME will therefore also strengthen its commitment in this direction through its participation in the European Association of Energy Exchange Managers (Europex).

Even more incisive will be the company's commitment to make available, in compliance with the activities assigned and in collaboration with the reference institutions, its skills and experience to promote the **correct functioning of the markets** managed and **timely evolution of the same** consistently with the growing need to transfer the benefits deriving from the transition to the entire energy system.

*The President
and Chief Executive Officer*

Andrea Péruzy

A handwritten signature in white ink, consisting of a large, stylized 'A' followed by 'i', enclosed within a white oval outline.

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The Company



1.1. THE PROFILE

Gestore dei Mercati Energetici S.p.A. (GME) is the joint stock company established in 2000 as part of the liberalisation process of the energy sector and wholly owned by Gestore dei Servizi Energetici S.p.A. (GSE), whose shares are in turn held by the Ministry of Economy and Finance (MEF). GME is a **multi-commodity company** which operates in compliance with the guidelines of the Ministry of Ecological Transition (MITE) and with the regulatory provisions defined by the Regulatory Authority for Energy, Networks and the Environment (ARERA).

1.2. THE MARKETS

GME organises and manages the electricity and gas markets - characterised by the obligation of **physical delivery of the commodity** - as well as the environmental and fuel markets. In particular, GME manages:

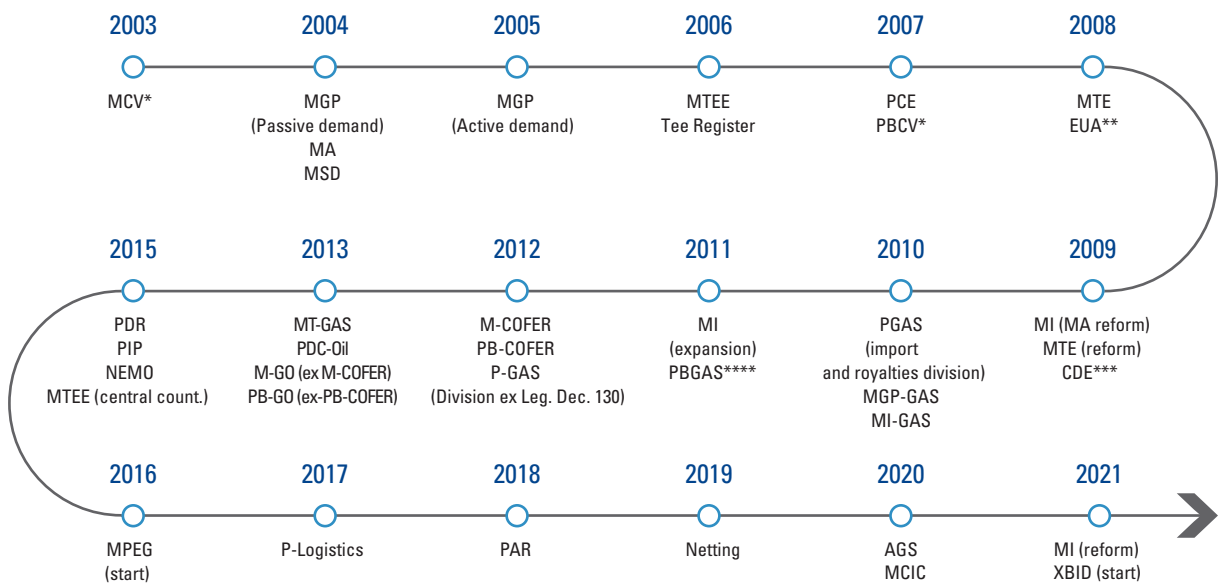
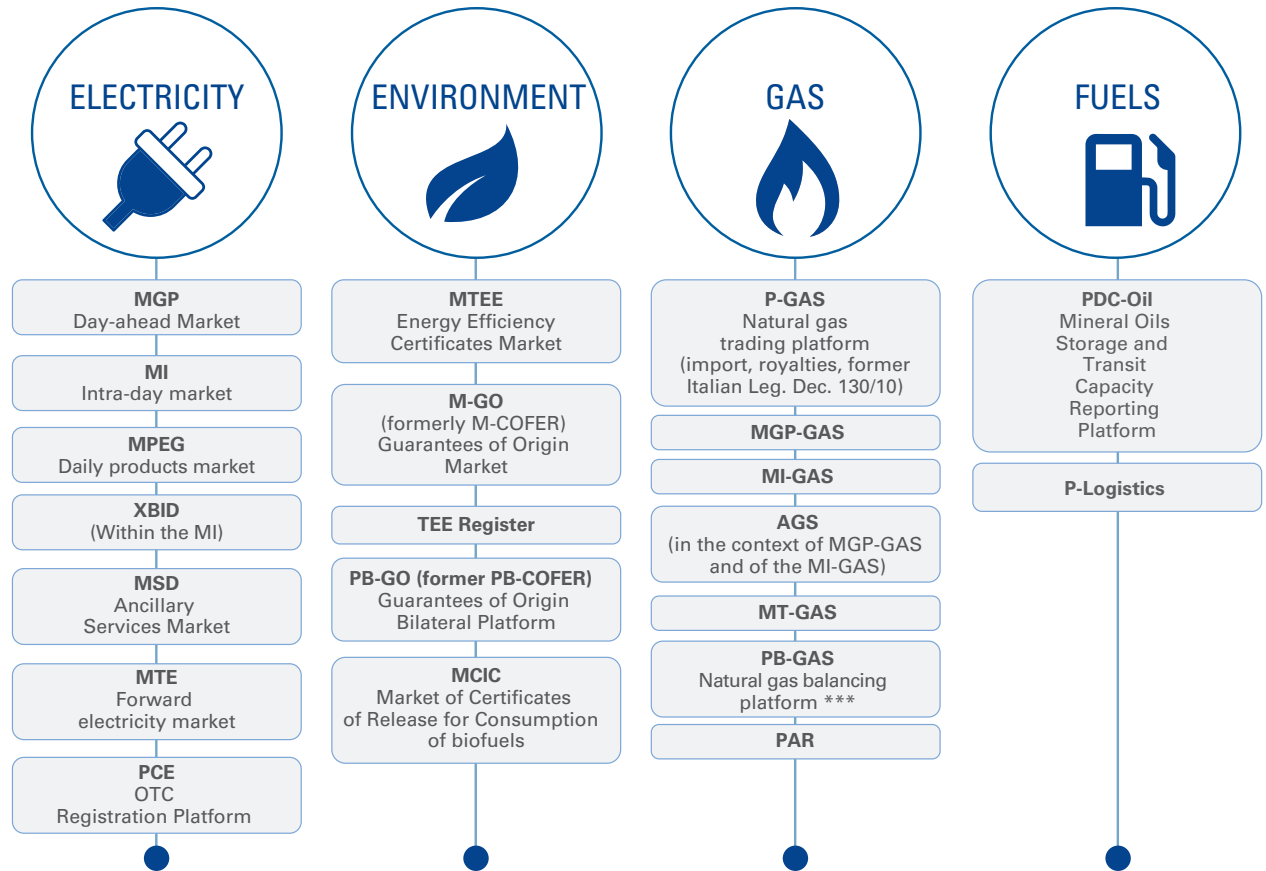
- ▶ in the **electricity sector**, *i)* the Spot Energy Market (MPE), divided into the Day-Ahead Market (MGP), the Intra-day Market (MI) and the Daily Products Market (MPEG), *ii)* the Forward Energy Market (MTE) and *iii)* the OTC Registration Platform (PCE) for the registration of forward contracts for the purchase and sale of electricity concluded outside the market system. Again within the MPE, GME manages the operations of the Dispatching Services Market (MSD), concerning the procurement of resources for the dispatching service and whose economic management is the responsibility of Terna S.p.A. (henceforth: Terna);
- ▶ in the **gas sector**, *i)* the Gas Spot Market (MP-GAS), divided into the Day-Ahead Market (MGP-GAS), the Intra-day Market (MI-GAS), organized in turn in continuously trading segments and in auction (AGS segment), in the Locational Product Market (MPL) and in the Market for the trading of Gas in Storage (MGS) and *ii)* the Forward Gas Market (MT-GAS). GME also manages the operations of the Platform for the fulfilment of the transfer obligations relating to national production, import and virtual storage (P-GAS), as well as the Regasification Capacity Allocation Platform (PAR);
- ▶ in the **environmental sector**, *i)* the Market for Energy Efficiency Certificates (MTEE), *ii)* the Market for Guarantees of Origin certifying the production of electricity from renewable sources (MGO) and *iii)* the Market for Certificates of Release for the Consumption of biofuels (MCIC). GME also manages the TEE and GO bilateral trading registration platforms (TEE and PB-GO Register);
- ▶ in the **fuel sector**, *i)* the Platform for measuring the Storage and Transit Capacity of Mineral Oils (PDC-OIL), *ii)* the Platform for the trading of petroleum logistics services for mineral oils (P-LOGISTICS).

GME operates as a central counterparty on its markets and platforms, with the exception of the MSD, where the central counterparty is Terna, the P-GAS, the PAR and the platforms for registering bilateral contracts of the GOs and TEEs.

In 2021, the number of participants registered on GME's markets/platforms rose to 2,717 units (+90 compared to 2020), confirming the multi-year growth trend. In terms of volumes traded on the markets, there is a recovery in the electricity sector, after the decline in 2020 linked above all to the consequences of the Covid-19 pandemic, and a further significant increase in the gas¹ sector (Fig. 1.1, Fig. 1.2, Fig. 1.3).

¹ For further details on the market trends, reference should be made to section 2.

Fig. 1.1 GME's markets and platforms



* Trading closed in 2016.
 ** Trading closed in 2014.
 *** Platform closed from 1/1/2020.
 **** Platform closed in 2017 and at the same time replaced by the MPL and MGS markets, which became part of the MGAS.

Fig. 1.2 Volumes and participants registered by market/platform in 2021

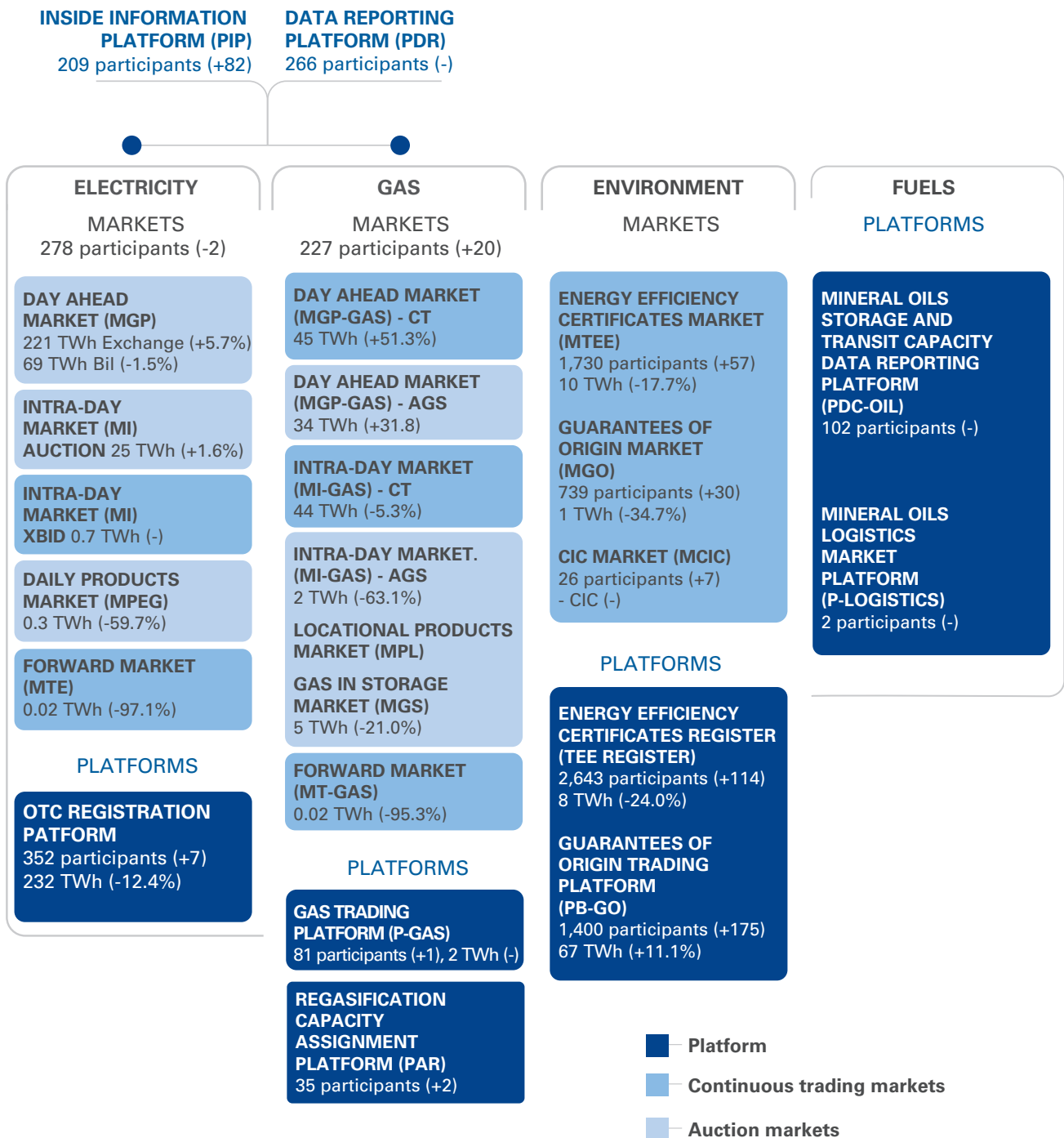
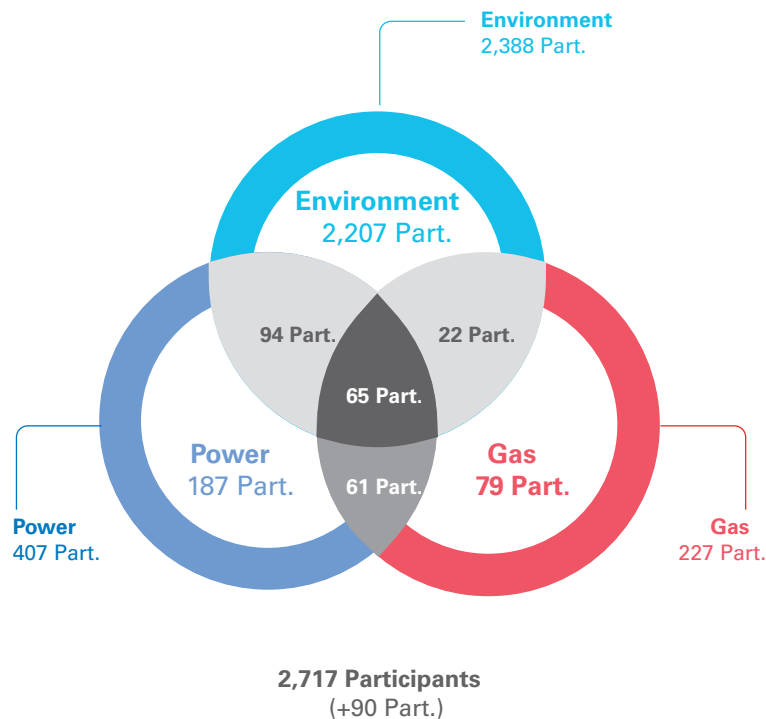


Fig. 1.3 Participants registered in GME's markets



1.3. INTERNATIONAL ACTIVITIES

GME is a member of Europex, the association of European energy exchanges, and cooperates with other designated European exchanges, such as NEMO², and the European network participants (so-called TSO³) in the coordination and integration projects of day-ahead and intra-day electricity markets (NEMO Cooperation, SDAC, SIDC)⁴ for the efficient management of market coupling processes and full implementation of European Regulation no. 2015/1222 (CACM). GME also participates, together with ARERA, Terna and MITE in the WB6 (Western Balcan 6) projec⁵, aimed at promoting the launch of a regional coupling in the Balkan area on the basis of the experience gained in the organisation and management of national markets and the integrated European electricity market.

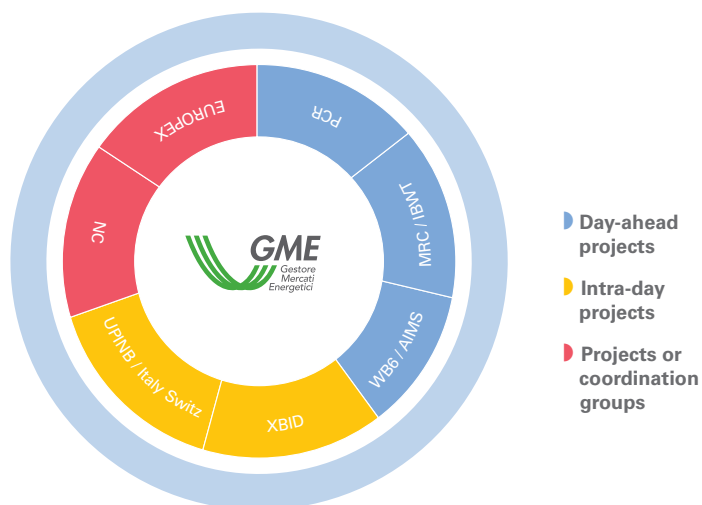
² NEMO refers to "Nominated Electricity Market Participant", as defined in article 4 of European Regulation no. 2015/1222 (hereinafter: CACM), a role assigned to GME for Italy by the Ministry for Economic Development.

³ Transmission System Operator.

⁴ SDAC and SIDC are the operation coordination projects for the full implementation of the Single Day-ahead Coupling and the Single Intra Day Coupling in Europe.

⁵ WB6 is a cooperation project between national Regulators, Network Participants and Market Participants from Albania, Bosnia and Herzegovina, Macedonia, Montenegro and Serbia for the creation of a regional electricity market in the Balkan region, to be eventually integrated with the European Union energy market. The WB6 Program coordinates a series of sub-projects aimed at promoting the development and integration of electricity markets in WB6 countries (with the exception of Kosovo) both locally and regionally. This project is supported by the European Union and by the Energy Community.

Fig. 1.4 International projects



1.4. NEW INITIATIVES

During 2021, in coordination with the competent institutions and in agreement with the subjects directly involved, GME launched and/or completed projects in the various sectors of interest, confirming its function of supporting national and European Community policies for the integration of markets and the energy transition. The following initiatives undertaken by GME in the electricity, gas and environmental sectors are placed in this context.

in the electricity sector:

- **integration of the Italian intra-day market (MI)** in the Single Intra-Day Coupling (SIDC) project. Starting from 21 September 2021, trading on the MI has been organised within a session in continuous negotiation referring to the borders between Italy-France, Italy-Austria and Italy-Slovenia, interspersed with three regional auctions, defined Complementary Regional Intra-day Auctions (CRIDA), on the borders between Italy-Slovenia and Italy-Greece. As part of the SIDC project, GME, in coordination with the European TSOs, is engaged in activities related to the introduction, by 2023, of the so-called Intra Day Auctions (IDA), the pan-European auctions dedicated to the enhancement of intra-day capacity provided to replace the CRIDA auctions;
- **the extension of the SIDC to the Greece-Italy border**, scheduled for the end of 2022, aimed at integrating the Greek intra-day market into the European intra-day coupling;
- **the creation of an IT notice board for the meeting of supply and demand for Power Purchase Agreements (PPAs)**, which took place on 30 March 2022, in compliance with the provisions of Italian Legislative Decree no. 199 of 8 November 2021. This initiative has the purpose of: *i)* promoting the meeting between the parties potentially interested in the stipulation of contracts concerning the long-term purchase and sale of electricity from renewable sources; *ii)* guaranteeing fulfilment of the obligation to record PPA data; *iii)* encouraging the maximum dissemination of the results of sales, as well as of monitoring the trend of the PPA market;
- **entry into operation of the RR Platform (Replacement Reserve)**, which took place on 13 January 2021, aimed at guaranteeing the European integration of the balancing



markets, as well as an economically efficient supply of services they offer. In particular, GME, in coordination with Terna, oversaw implementation of this platform as part of the T.E.R.R.E. project (Trans-European Replacement Reserves Exchange);

- **modification of the zonal configuration of the Italian electricity market**, in force since 1 January 2021, with the introduction of the new Calabria area (CALA) and simultaneous elimination of the limited production pole of Rossano (ROSN) pursuant to the provisions of ARERA Resolution 103/2019/R/eel.
- ▶ In the gas sector, GME has started the preparatory activities for the provision of trading platforms dedicated to the implementation of the so-called "Intergovernmental solidarity agreements", pursuant to Italian Legislative Decree no.14 of 2 February 2021. In particular, this Decree provided for **the introduction of "solidarity mechanisms"**, which can be activated on the basis of the afore-mentioned agreements, through which an EU Member State can request, in the event of exceptional situations of gas shortages, the intervention of one or more Member States directly connected, or interconnected to it through a third country in order to find the gas resources necessary to address the emergency. To date, two solidarity agreements are being defined between the Italian government and, respectively, the governments of Slovenia and Germany.
- ▶ In the environmental sector, noteworthy is **the start of activities functional to the introduction of the negotiation of Guarantees of Origin referring to the production of biomethane (GO biomethane)**, in implementation of the provisions of Italian Legislative Decree no. 199 of 8 November 2021. The expansion of the types of negotiable GOs is one of the measures introduced, at national level, to achieve the EU objectives of increasing the share of energy from renewable sources by 2030 and complete decarbonisation by 2050.

1.5. MONITORING AND REMIT SERVICES

GME oversees the regular conduct of tradings and transactions in the markets it manages through a monitoring activity that protects their integrity, in coordination with the main reference institutions on the subject (in particular ACER⁶ and ARERA) and pursuant to current European and national regulations (REMIT⁷, TIMM⁸ e TIMMIG⁹).

Furthermore, GME, as RRM (Registered Reporting Mechanism¹⁰) and supplier of an IIP (Inside Information Platform) certified by ACER, supports participants in fulfilling the obligations of data reporting and publication of privileged information provided for by the REMIT Regulation.

For this purpose, GME makes two platforms available to Participants, the PDR and the PIP, on which 264 and 209 Participants are registered in 2021, respectively, for an annual total of approximately 243,000 files and 98 million records transmitted to ACER by the PDR and approximately 32,500 messages recorded on the PIP.

The main events that involved the two platforms during 2021 were:

- ▶ in the context of the PIP, *i*) the strong growth of registered companies (+82), mainly foreign, mainly due to the entry into force, starting from January 2021, of the obligation

⁶ European Agency for the Cooperation of Energy Regulators.

⁷ European regulation no. 1227/2011.

⁸ "Integrated text of the monitoring of the wholesale electricity market and of the market for the dispatching service (Resolution ARG/elt 115/08, as subsequently integrated and amended).

⁹ "Integrated text of the monitoring of the natural gas wholesale market (Annex A of the Resolution ARERA 631/2018/R/gas).

¹⁰ The Registered Reporting Mechanism is the person qualified at ACER for reporting on behalf of market participants subject to the REMIT obligations.

of disclosure of privileged information exclusively through centralised platforms, imposed by ACER on participants; *ii*) adaptation of the platform to some new technical-IT methods envisaged by ACER for the communication of unavailability, in order to guarantee maintaining of full compliance of the platform with the ACER standards;

- as part of the PDR, the increase in the number of records sent to ACER, especially concentrated on the electricity markets.

02

Markets trend



2.1. ENERGY MARKETS

THE CONTEXT AND TREND OF ENERGY MARKETS. The effects of the Covid-19 pandemic continued to spread worldwide also in 2021, resulting in the exceptional conditions that have been recorded on the energy markets. The electricity and natural gas markets have therefore proved to be increasingly closely linked to causal links that lead to the search for the origin of local dynamics in the supranational context.

The transition from a demand crisis to a supply crisis has thus drastically reversed the bearish trend of 2020, pushing the prices of commodities and the relative volatility to very significant levels.

In fact, the phase of depression induced in 2020 by the collapse in consumption gave way, in 2021, to a progressive and incessant rush in the prices of raw materials, energy and non-energy, rooted in the unbalance between a rapidly and sharply recovering demand in advanced economies, including China, and a scarcely reactive supply characterised by slower production processes to incorporate the trend reversal.

The dynamics, in their exceptional nature, clearly manifested themselves on all energy markets and on those related to them: the prices of oil, gas, electricity and CO₂ emission permits followed an exponential growth path in 2021 which, beyond any form of seasonality, had resulted in them reaching unimaginable levels only a few months previously.

This trend also continued relentlessly in the first few months of 2022, also fuelled by the onset of the conflict between Russia and Ukraine and the global repercussions that ensued, linked to the perceived risk of a possible interruption of gas supplies from Russia.

The climate of profound uncertainty, linked both to the evolution of the conflict and to the risks associated with the interruption of Russian energy supplies to Western Europe, has in fact further exacerbated the dynamics on the commodities markets, increasing the possibility of the occurrence of repeated spikes in prices and their already high volatility.

OIL, COAL AND CO₂. In this context, the prices of Brent rose to 71.14 \$/bbl (+70% up on 2020), cancelling the depressive effects produced in 2020 by the Covid-19 pandemic and returning in line with or slightly above the values of the two-year period 2019-2020. Except for a brief period of stagnation between August and September, the progression of prices consolidated throughout 2021, coming to a halt in December.

Similar annual and monthly trends were also found on the US WTI, confirming the international extent of the phenomenon. European coal resumed growth, and to a decidedly significant extent, which on an annual basis stood close to 120 \$/MT, doubling the very low prices of 2019 and 2020, while on a monthly basis, thanks to a rather steep rise, especially since June, it even reached 240 \$/MT in October, before falling again below 150 \$/MT in the final two months of the year. The run of emission permits also continued without restraint, whose price in 2021 reached an all-time high of 53.55 €/ton, more than double the value observed in 2020, starting from around 33 €/ton in January and reaching 80 €/ton in December (Fig. 2.1.1, Fig. 2.1.2).

GAS PRICES. The shock produced by the Covid-19 pandemic on national supply systems also showed its effects at international level, where the bottleneck created between supply and demand, with the progressive relaxation of the restrictive measures adopted to contain the contagion, was further accentuated by the growing demand for natural gas, mainly coming from Asia, where the decarbonisation process is starting.

The increased attractiveness of the Asian market undermined the consolidated import structure of Europe, requiring a reshaping of the main sources of supply. The significant increase in gas entering from North Africa (via Italy and Spain) and the arrival of new gas from Azerbaijan (via Italy via the new TAP pipeline) was not, however, sufficient to compensate for the further reduction in supplies coming from Russia, which now represents 38% of the total gas imported into Europe (only in 2019 was it 50%), the decrease in production from internal fields, as well as the reduced use of imports of LNG, subject to a real and own world competition in the last cargo with consequent increase in prices. Hence, the massive use of stocks, less full than in previous years mainly due to the strategic choices of the Russian supplier in Germany and the consequent strong increase in hub prices.

On the international scene, natural gas prices reached their all-time highs everywhere and recorded significant increases compared to the low values of 2020, settling at 45-47 €/MWh in Europe (+35/+37 €/MWh), at 55 €/MWh in Asia (+42 €/MWh) and, finally, around 11-12 €/MWh in the United States (+4/+6 €/MWh), where both the level and the growth were less intense but still at record highs.

The net increase in prices appears to be the reflection of incessant and progressive dynamics that unfolded throughout the year, bringing prices in Europe from 18-21 €/MWh in the first quarter to over 110 €/MWh in December. Even steeper was the trend recorded in Asia, whose reference, after the singular rise observed between December 2020 and January 2021, closed 2021 at 119 €/MWh, generally resulting in higher European prices in the months.

In Europe, the Italian PSV and the Dutch TTF rose on an annual basis respectively to 47.4 €/MWh and 46.8 €/MWh, denoting a marked increase in their volatility, especially in the last quarter of the year, characterised by exogenous conditions of strong instability (among others: delays in the start-up of the North Stream 2, the slowdown in gas supplies from Russia, the Russia-Ukraine crisis) and seasonal demand trends that are often contrasted in Italy and continental Europe. In particular, between June and December, the volatility of the prices rose from 3.1% to 11.6% at the PSV and from 2.2% to 11.2% at the TTF, favouring, precisely in December, the formation of extreme and contrasting PSV-TTF daily spreads, of between -12.9 €/MWh and +10.0 €/MWh.

The greater fluctuation in prices was also reflected in a greater variability of the PSV-TTF spread, which fell to an all-time low of 0.6 €/MWh in 2021 (it was 1.63 €/MWh in 2020), completing a convergence process that had already started at the end of the previous year. In fact, during 2021, the differential between the two prices recorded several reversals of its indication, a positive result, but less than the previous five years, in the first part of the year, negative in the summer period (in particular in August: -1.2 €/MWh) and, finally, again positive and above 2 €/MWh in December. In general, in terms of frequency, during 2021 the share of sessions in which the Italian price was lower than the Dutch one increased significantly (37% vs. 11% in 2020), with a higher percentage in the three summer months (peak in August with 95%) and lower in the spring months and December (the latter at 14%) (Fig. 2.1.1, Fig. 2.1.2, Fig. 2.1.3 e Fig. 2.1.4).

PRICES IN EUROPEAN ELECTRICITY MARKETS. The strong upward trend also affected the prices observed on all the main continental exchanges in a transversal manner, underlining the international and cross-commodities dimension of a phenomenon whose origin goes beyond the European borders and has its roots in the global race of fuel prices.

In this context, historical price records were recorded on all the power exchanges, where, once again, *i)* the differences between the national prices were the reflection of the different structures of the power park, *ii)* coupling mechanisms permitted efficient management of cross-border flows in situations where these differences had been cancelled out (or reversed) as a result of local contingent situations.

As a result of a progression that over the months has led electricity prices to triple compared to 2020, prices stood just above 125 €/MWh in Italy, to 109/112 €/MWh in France and Spain and around 97 €/MWh in Germany, widening the price differentials between countries that had been very low in the previous year.

Therefore, some structural and peculiar drivers are grafted on the imprint dictated by the common bullish matrix - specifically the cost of gas in Italy, wind production in Germany, nuclear availability in France - capable of guiding the differences observed between the individual national prices in terms of *i)* levels, *ii)* infra-annual growth rate, *iii)* convergence, *iv)* volatility.

With particular reference to the first of the three points and to the spreads that emerged between the Italian prices¹¹ and those across the Alps, it can in fact be observed that: *i)* the daily differentials between Italy and Germany were decidedly higher (on average equal to 75 €/MWh) in situations where German wind production was able to guarantee a high coverage rate of local demand (over 40%, 15% of the days), instead drastically reducing (around 8 €/MWh), in the opposite cases (coverage less than 10%, 20% of days), *ii)* the daily differentials between Italy and France, most frequently between August and October, reached, as often happened in the past, very low values in the winter months (January, November and December), characterised by high demand and, especially in 2021, by a particularly low nuclear availability.

Similarly, regarding the second point, the analysis of the infra-annual trends of the three prices highlighted *i)* between January and August an intense growth especially in Italy, where prices rose from 60 €/MWh to 106 €/MWh (+72%, France: +30%, Germany: +57%), following a progressive trend dictated above all by the rise in gas costs, *ii)* between August and December, in the context of a significant increase in the Italian price (from 106 €/MWh to 287 €/MWh, +171%) still driven by generation costs, decidedly higher increases especially in France (from 73 €/MWh to 275 €/MWh, +255%), in the context of marked tension between consumption and nuclear supply.

It is therefore clear that, in the context of an annual widening of spreads, the peculiar dynamics of the relevant drivers can favour even broad periods in which European prices are not only less distant, but also more often aligned¹². This also happened in 2021, the year in which the macro-zone consisting of Italy, France and Germany, united in a single price area, occurred less frequently than in 2020 (18% of the hours), than what was recorded for the alignment between Italy and France, observed in 33% of the hours, concentrated in the winter months¹³.

Finally, in relation to volatility, it appears quite evident that in Germany the significant weight of wind capacity in the national generation park represents, at the same time, the prevailing factor in containing prices and the source of their high variability. The possibility of having ample renewable power, by nature intermittent, makes the prices in Germany structurally more

¹¹ For Italy, the price of the Northern area was used as a reference.

¹² Alignment refers to the situation characterised by a price differential between the countries that compose the macrozone simultaneously lower than 1 €/MWh.

¹³ The alignment percentage reached 59% in the three months January-November-December.



volatile (23% in 2021, Italy: 9%, France: 19%), also exposing them to large daily and intra-day fluctuations: in 2021 the price differential between one working day and the next was, in fact, higher than 50 €/MWh in 7% of cases (1% in Italy, 4% in France), while on the same day the range between the minimum and maximum hourly prices was higher than 150 €/MWh in 12% of the circumstances (5% in Italy, 10% in France).

However, the jump made in the final quarter of the year by volatility in Italy (12% on average, with a peak at 15% in December) should be noted. This trend appears to be closely related to the intensification of tensions on the natural gas markets, already marked by the low level of storage at the start of the winter season and further put under pressure by the succession of news and events relating to the possible cut in Russian gas supplies to Europe.

Finally, it should be noted that the prices on forward products anticipate a continuation of prices at the current record levels also for next year, with annual values exceeding € 200/MWh on all the main markets, apparently "discounting" a "quantity risk" on the availability of Russian gas that to date has not yet actually materialised (Fig. 2.1.5, Fig. 2.1.6, Fig. 2.1.7 and Fig. 2.1.8).

Fig. 2.1.1 Prices of the main European fuels. Annual average

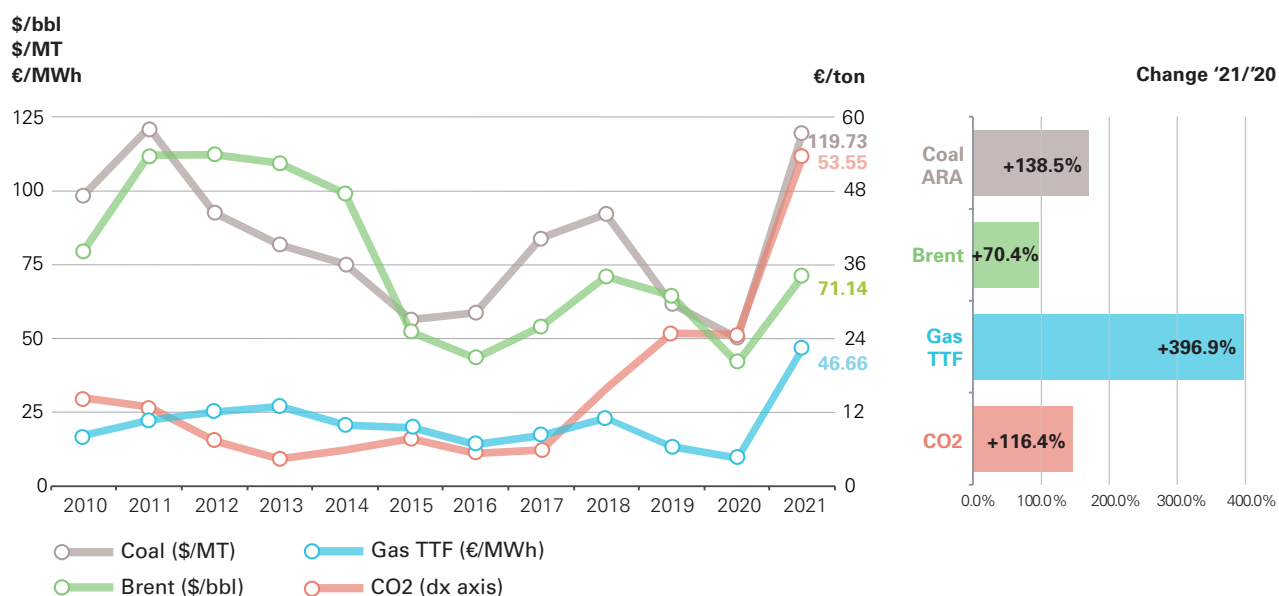


Fig. 2.1.2 Prices of the main European fuels. Monthly trend for the years 2020-2021

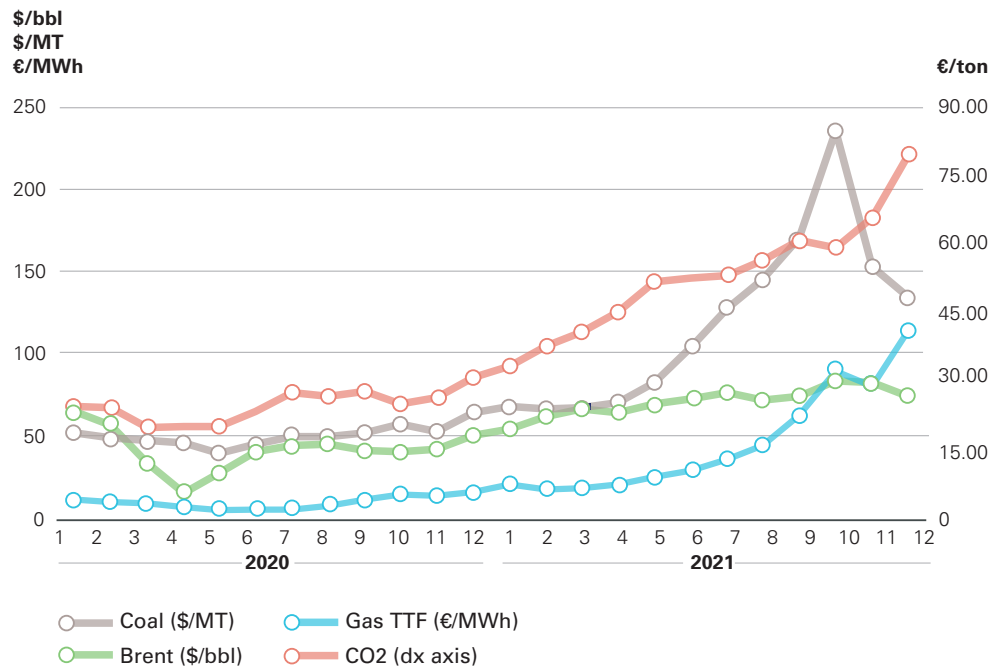


Fig. 2.1.3 Prices on the main European gas hubs. Annual average

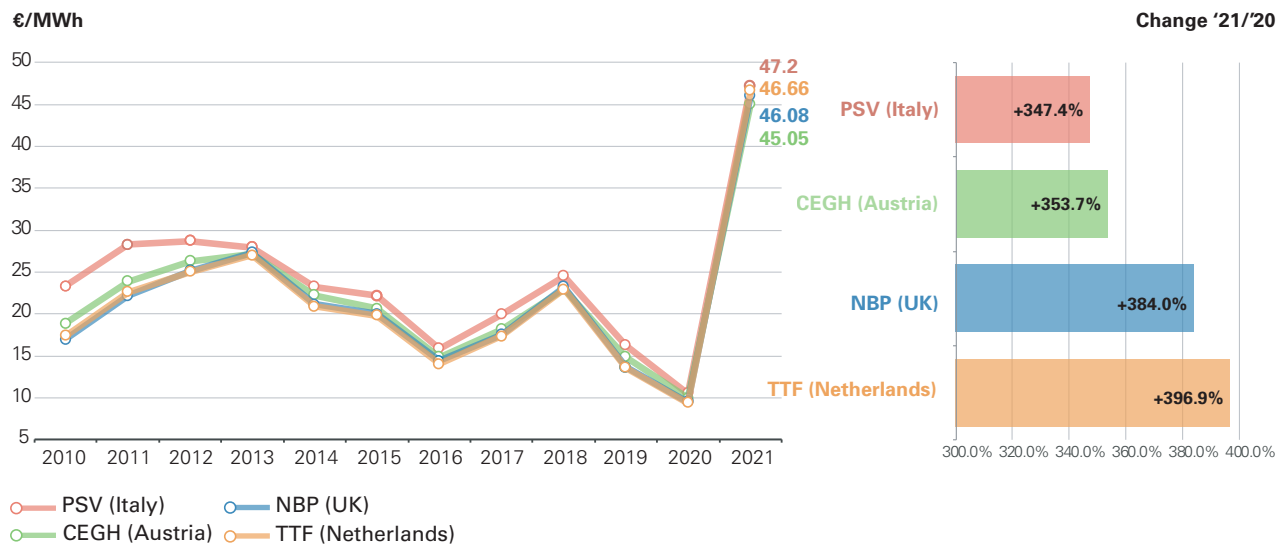


Fig. 2.1.4 PSV and TTF Prices. Monthly trend for the years 2020-2021

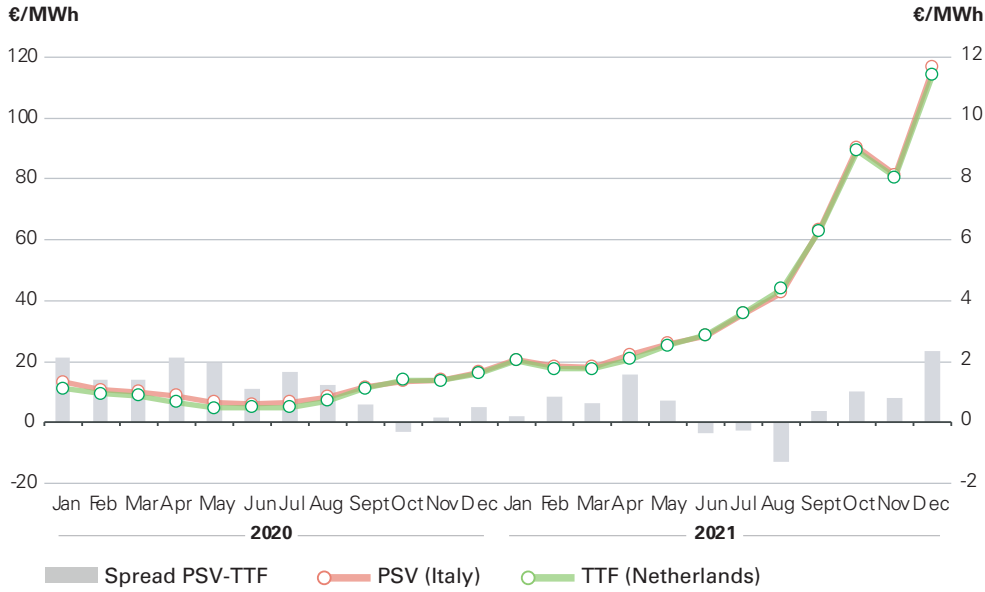
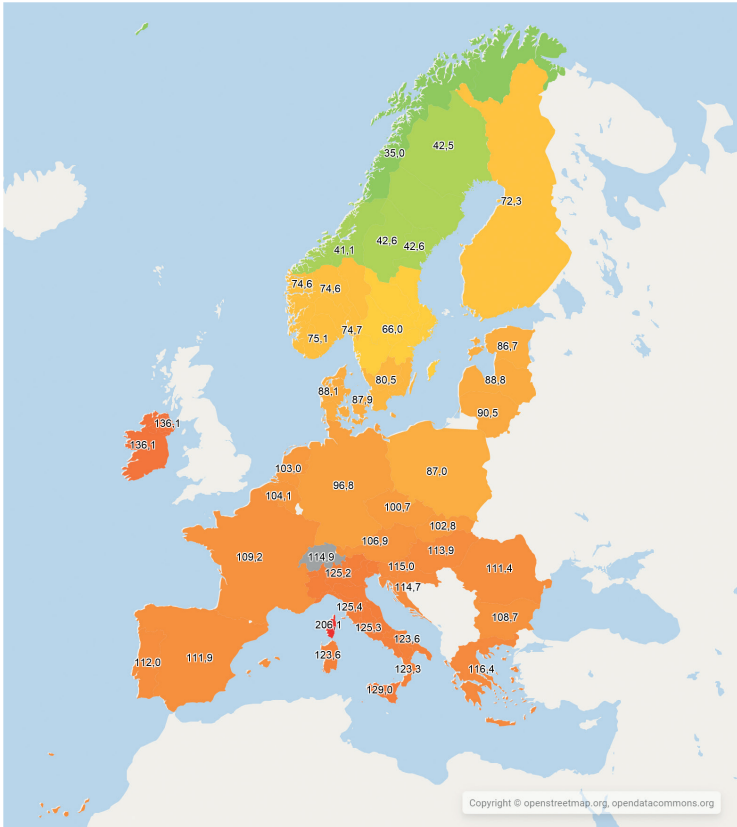


Fig. 2.1.5 Day-ahead prices on the main European power exchanges. Annual average



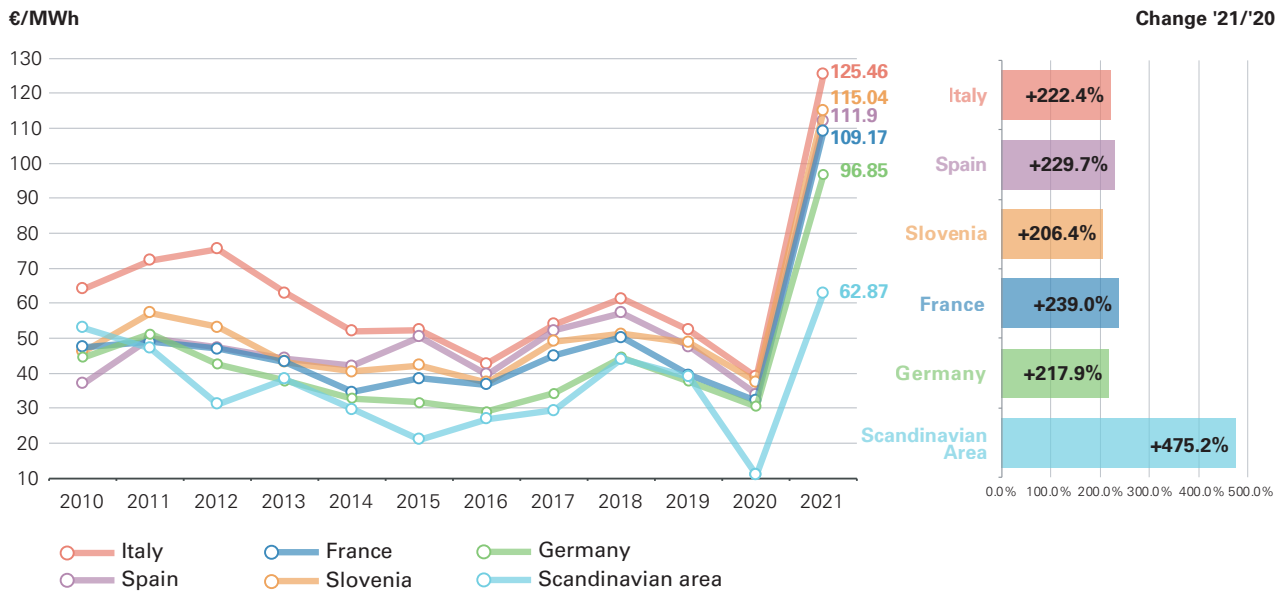


Fig. 2.1.6 Day-ahead prices on the main European power exchanges. Monthly trend for the years 2020-2021

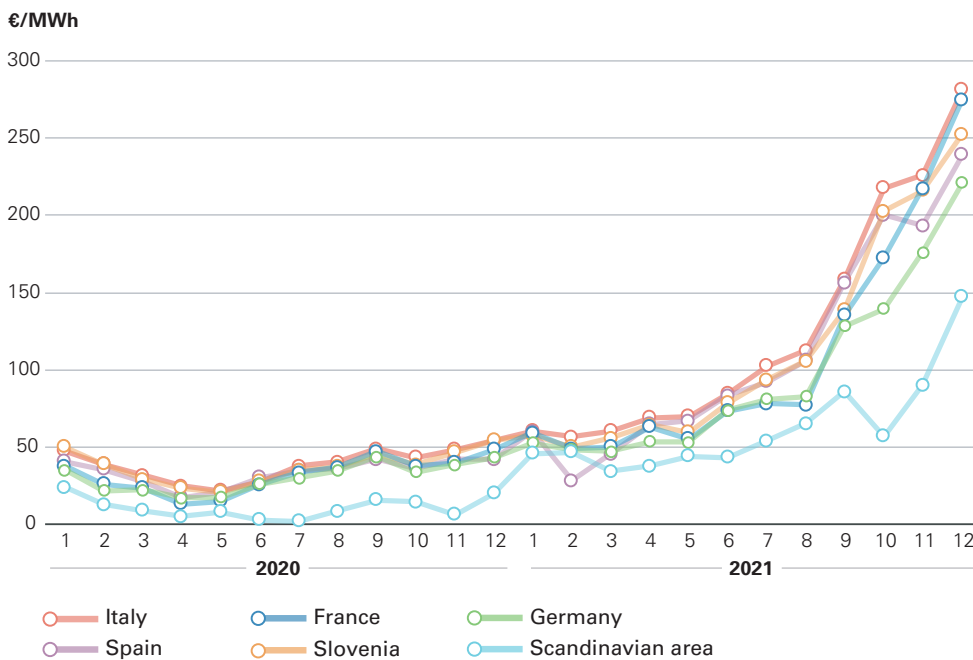


Fig. 2.1.7 Frequency of Italy-France and Italy-Germany alignment.
 Monthly trend for the years 2020-2021¹⁴

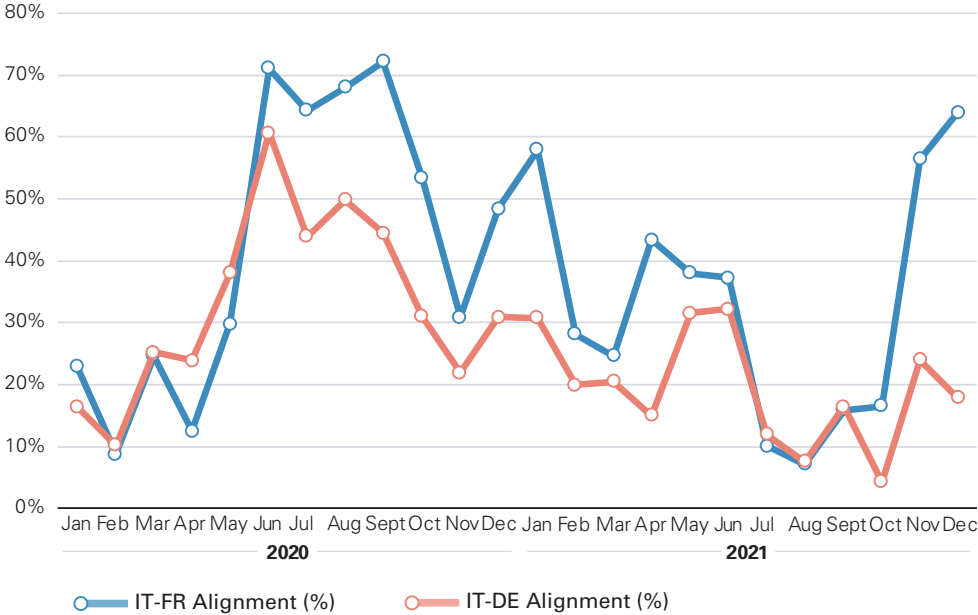


Fig. 2.1.8 Day ahead prices and corresponding calendar baseload prices



¹⁴ See note 12 for the definition of alignment.

2.2. ELECTRICITY MARKETS IN ITALY

2.2.1. Day-Ahead Market (MGP)

THE CONTEXT. The high degree of interaction between the various energy markets has led, in recent years, local markets to respond more and more often to drivers linked to international dynamics. In the context described above (see chapter 2.1), therefore, the dynamics observed on the Italian MGP must also be read and analysed in the context of both the strong unbalance that came to light at international level between supply and demand after the lockdowns imposed by the Covid-19 pandemic, and by the repercussions produced in the energy sector by the geopolitical tensions that became apparent in the last part of the year.

Reference is made, in particular, to *i)* the resumption of purchases with a simultaneous new record of market liquidity, *ii)* the price rush and the year-end growth of their volatility, both driven by trends in natural gas prices, *iii)* the frequent alignment of the MGP with foreign day-ahead markets, especially during certain periods of the year, with a consequent significant share of occasions in which the latter also fix the price for Italy.

VOLUMES AND LIQUIDITY. In the trend of general recovery in the demand for goods and services, Italian electricity consumption also marked a significant increase in 2021, rising from the minimum levels of 2020, the year of initial spread of Covid-19. In fact, both the energy demand measured by Terna (318.1 TWh, +5.6%) and the exchanges recorded by GME on the MGP returned to growth, not diverging excessively from the average data observed in the five-year period 2015-2019, repositioned to 290.4 TWh (+3.9%), a value equal to 91.3% of the system demand.

The increase in market volumes was concentrated in particular *i)* on stock exchange trading, which rose close to its all-time high (221.3 TWh, +5.7%) according to a trend opposite to that of over-the-counter quantities (69.1 TWh, -1.5%) which pushed liquidity of the market to a new record level of 76.2%, *ii)* on domestic purchases (286.1 TWh, +5.7%), whose momentum was only partially contained by the drop in exports, reduced after the exploit made in the lockdown months in 2020 (4.3 TWh, -50.3%), but still high in the final two months of the year in line with the narrowing of the differential between the Italian price and neighbouring ones, *iii)* in March and April (+16/20%), the months most impacted in 2020 by the contagion containment measures, continuing at relevant rates also in the remainder of the year, with a peak in June (+8%) and levels close to ten-year highs in August, November and December.

Finally, the national supply for sale (472.4 TWh, -4.6%) fell sharply, as a result of a trend shared by all months of the year, being very strong especially in November and December (-10%/-13%) (Tab. 2.2.1, Fig. 2.2.1, Fig. 2.2.2 e Fig. 2.2.3).

NATIONAL SINGLE PRICE (PUN) AND FUNDAMENTALS. As part of the broader international context, during 2021, the Pun, like other European day-ahead prices, experienced levels, rises and dynamics never seen before, fuelled above all by generation costs that have never been so high (PSV: 47.2 €/MWh, +347.4%; CO2: 53.6 €/ton, +116.4%) and also supported by an upturn in demand. The exceptional external conditions that characterised the last two years reverberated on the trend of the Italian electricity price, pushing it to the historical record of 125.5 €/MWh (+222.4%), after the minimum of 2020, by virtue of a uninterrupted series of monthly increases that took it from 60.7 €/MWh in January to 281.2 €/MWh in December.

Growth was vertical especially in the last quarter of the year, in which the dynamics relating to the clean spark spread (CSS), equal in 2021 to 17.2 €/MWh (+76.5%) were decisively accentuated

and result absolutely in line with the values recorded over the past years up to September (on average: 10.7 €/MWh) and then exploded between October and December (on average: 37.6 €/MWh) (see chapter 2.1 and subsequent paragraph “The October-December quarter”).

Against a higher average level, the Italian price confirmed in 2021, compared to the European counterparts, a microstructure characterised by a more contained variability, which materialised *i)* in the lower fluctuation between peak and off-peak working prices, the ratio of which in Italy fell further to 1.17 (France: 1.2; Germany: 1.24), *ii)* in the afore-mentioned lower volatility (9%), increasing only in the final part of the year (see chapter 2.1), *iii)* from less pronounced hourly price peaks (Pun: 533.2 €/MWh, France/Germany: 620 €/MWh), on a par with the max-min range (Pun: +530 €/MWh; France/Germany: +686/689 €/MWh) (Fig. 2.2.4, Fig. 2.2.5, Fig. 2.2.6, Fig. 2.2.7, Fig. 2.2.11, Fig. 2.2.12 and Tab. 2.2.2).

THE OCTOBER-DECEMBER QUARTER. The progression of the Pun, already particularly accentuated in the summer months, recorded a change of pace starting from October, with the entry into the winter gas season, highlighting, among other aspects, periods of particular tension and volatility which coincided with the conflicting announcements relating to gas supplies from Russia and the start-up of the Nord Stream 2 gas pipeline, as well as the first tensions between Russia and Ukraine.

In particular, between October and December, the price rose from 218 €/MWh to 281 €/MWh, showing a growth rate higher than that of generation costs, as evidenced by the expansion of the average monthly CSS, which rose to values included between 27 €/MWh and 50 €/MWh (it was 18 €/MWh in September). In the direction of a further boost to the Italian price, *i)* the climate of profound uncertainty around the costs of thermoelectric generation, generated by the strong variability of natural gas prices and such as to suggest the adoption of volatility risk hedging measures by participants active on the market, *ii)* the intense seasonal increase in energy demand recorded both in Italy and on the neighbouring French market, characterised among other aspects by nuclear availability at a minimum for the period, *iii)* the low level of national supply, compressed by the sharp drop in the volumes of hydroelectric plants and, limited to October, of coal-fired plants.

The impact of the large ups and downs followed by gas prices appeared quite evident in October, when, by incorporating a “volatility” component in the calculation of its value, the CSS settled at around 16 €/MWh, substantially returning to the values of July and September¹⁵. In November and December, however, the high frequency with which the Italian reference¹⁶ was equal to or lower than the transalpine price (62% in November, 73% in December), as well as the significant share of hours in which the price in Italy was set from abroad (44% in November, 36% in December), testify, instead, to the prevailing driving effect of France, opening, among other aspects, the way to several days of exports to foreign countries (Fig. 2.2.5, Fig. 2.2.15).

ZONAL DYNAMICS. The price dynamics already observed on the Pun were repeated in a similar way on all zonal prices, which rose to 123/125 €/MWh on the peninsula and in Sardinia (+85/+87 €/MWh) and just above 129 €/MWh in Sicily (+83 €/MWh). As observed in Europe, the progression was particularly intense in the final months of the year, especially in the North, where, in addition to the bullish effects associated with the increase in generation costs, the tensions recorded on the neighbouring French market were discharged. This led to a progressive separation of the North from the other areas (North-South equal to 22 €/MWh in December), by virtue of which the annual North-South spread returned positive and equal to 1.6 €/MWh (-1.2 €/MWh in 2020), while Sicily-North

¹⁵ The calculation was made by adding to the price at the PSV for day *g* a tolerance equal to the standard deviation observed on prices in the previous 5 working days.

¹⁶ The comparison between neighbouring prices was made for Italy with the price of the North zone.

spread fell to an all-time low of 3.8 €/MWh (8.4 €/MWh in 2020) also due to a high frequency of days in which the island evidenced a lower price than the northern one (29%, maximum since 2015). The peculiar zonal dynamics observed in December also induced a significant difference between the CSS of the North and that of the South, with the first double the second (43 €/MWh vs. 21 €/MWh), and an reversal of flows within the peninsula, with Sicily more often exporting to the peninsula.

As for volumes, the growth in domestic purchases has its roots in the increases recorded in the North (161 TWh, +7.1%) and in the Centre South (50.6 TWh, +15.8%), with the latter's levels at the new all-time high, by virtue of consistent increases recorded in all the months. Equal to 5.9 TWh, finally, the purchases of the Calabria area, in the first year of operation (Fig. 2.2.8, Fig. 2.2.9, Fig. 2.2.10, Fig. 2.2.11, Fig. 2.2.12 and Tab. 2.2.3).

FOREIGN TRADING. In strong recovery compared to 2020, Italy's net imports rose to 44.5 TWh, showing growth (+10.4 TWh) which covered a large part of the increase in domestic purchases. This trend substantially affected all Italian borders, with the sole exception of Switzerland (-2.4 TWh), and reflected the widening of the differential between Italian and foreign prices, as well as the greater frequency with which in the year 2021 the latter were lower than that of the neighbouring Italian area. The dynamics eased in the final two months of the year, when greater tensions on the continental European markets favoured a more frequent alignment between Italian and foreign prices and an overall reduction in net imports, a result approximately 40% lower than the same period of 2020. Finally, the frequency of exports from Italy to the Montenegrin and Greek borders significantly decreased, with the transit to/from the latter not used for maintenance in a significant number of hours (around 30%) (Tab. 2.2.3 and Fig. 2.2.13).

SOURCES AND CONCENTRATION. The overall decline in national supply was concentrated on thermal (ccgt and coal) and hydroelectric plants, although not always translating into a drop in corresponding sales. The latter, in fact, grew for thermal plants (144.5 TWh, +3%), especially in the final quarter of the year and in the two-month period March-April (the latter, however, highly conditioned by the occurrence of the lockdown period of 2020), and substantially stable for renewable ones (95.8 TWh). Among thermoelectric plants, the decrease observed in sales and market share of ccgt plants was slight (116.8 TWh, -1% and 49%, -1.4 p.p.), while the recovery of coal appeared to be significant (12 TWh, +69%) which recovered shares compared to the previous two years (5%, +2 p.p. on 2020).

The zonal dynamics are rather diversified: in the context of an increase in coal extended to the entire peninsula, there was, in fact, a marked decline in natural gas sales in the southern areas, partially offset by the positive performance recorded in the North (+5.5%), where thermal plants were called upon to replace the lower hydroelectric availability (-10.3%). With reference to renewable sources, the reduction in water volumes (-2.5% on a national basis) appeared to be fully offset by the increase in solar plants (+0.9%) and, above all, by wind power plants (+9%), the latter located in particular in the Central South and in Sicily.

Finally, in terms of market concentration, the recovery in volumes favoured a general rebound of the indices, now characterised by inertial trends, and a substantial return of their values to the levels of 2019 (Tab. 2.2.4, Fig. 2.2.14, Fig. 2.2.15 and Tab. 2.2.5).

Tab. 2.2.1 Volume trend in the MGP

TWh	2014	2015	2016	2017	2018	2019	2020	2021	Change '21/'20
Terna Request	310.5	316.9	314.3	320.5	321.4	319.6	301.2	318.1	5.6%
Demand	318.2	305.3	301.5	297.4	301.6	302.3	287.2	298.6	4.2%
<i>rejected</i>	<i>36.3</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>16.4%</i>
Purchases	282.0	287.1	289.7	292.2	295.6	295.8	280.2	290.4	3.9%
% on Terna request	90.8%	90.6%	92.2%	91.2%	92.0%	92.6%	93.0%	91.3%	-1.6%
Supply	511.7	500.2	502.4	489.9	507.5	503.6	496.7	472.4	-4.6%
Sales	282.0	287.1	289.7	292.2	295.6	295.8	280.2	290.4	3.9%
at price <= 0	212.7	190.5	172.2	162.6	165.6	166.2	168.8	166.2	-1.3%

Fig. 2.2.1 MGP Liquidity

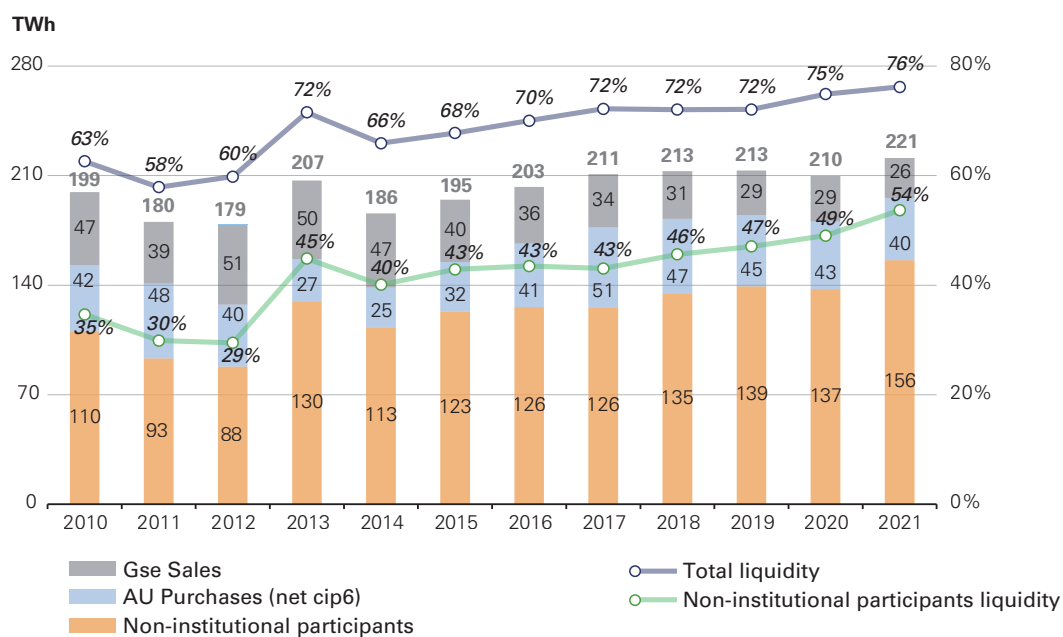


Fig. 2.2.2 Supply in the MGP

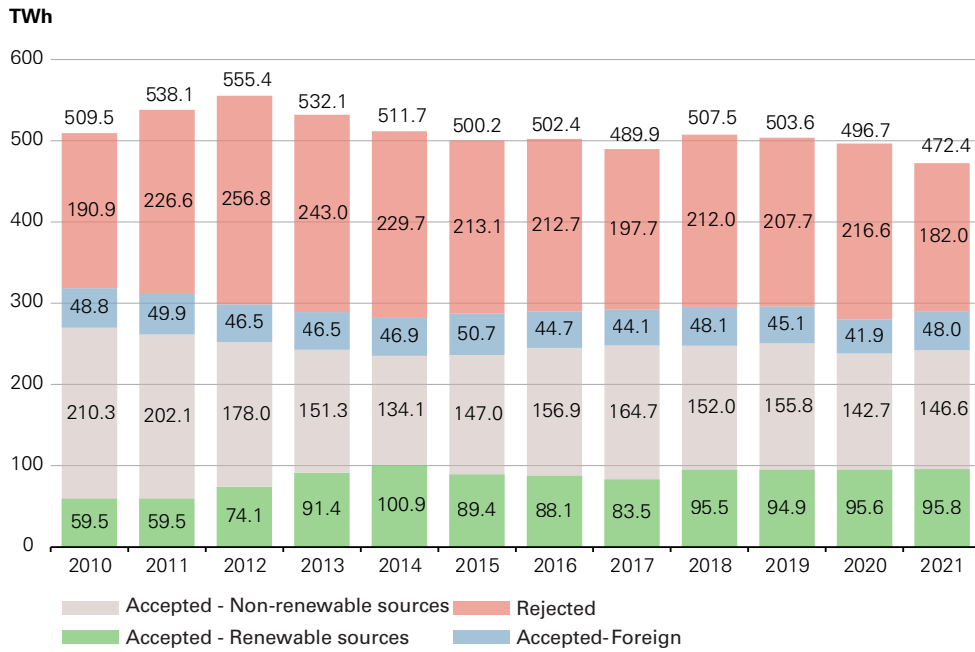


Fig. 2.2.3 MGP Volumes. Monthly trend for the years 2020-2021

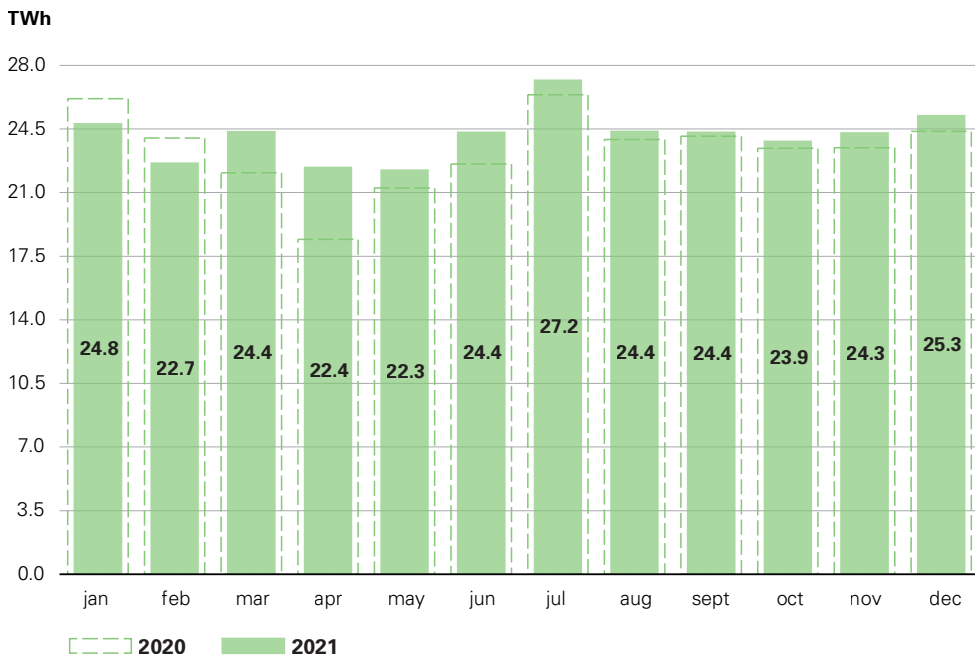


Fig. 2.2.4 Pun trend and its determinants

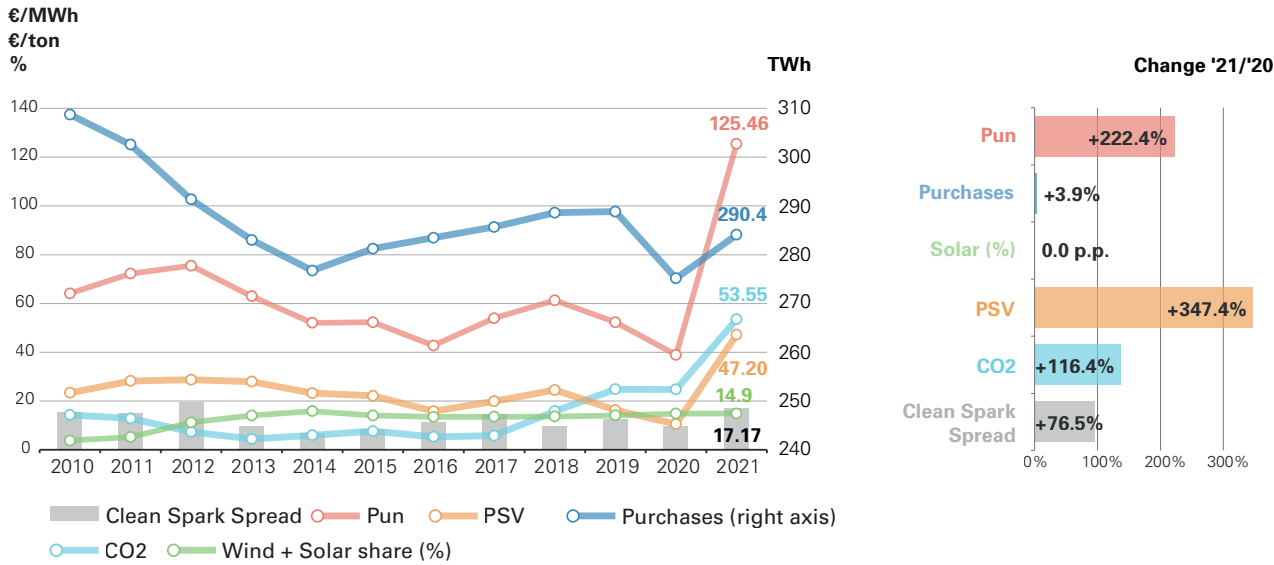


Fig. 2.2.5 Pun and clean spark spread. Monthly trend for the years 2020-2021

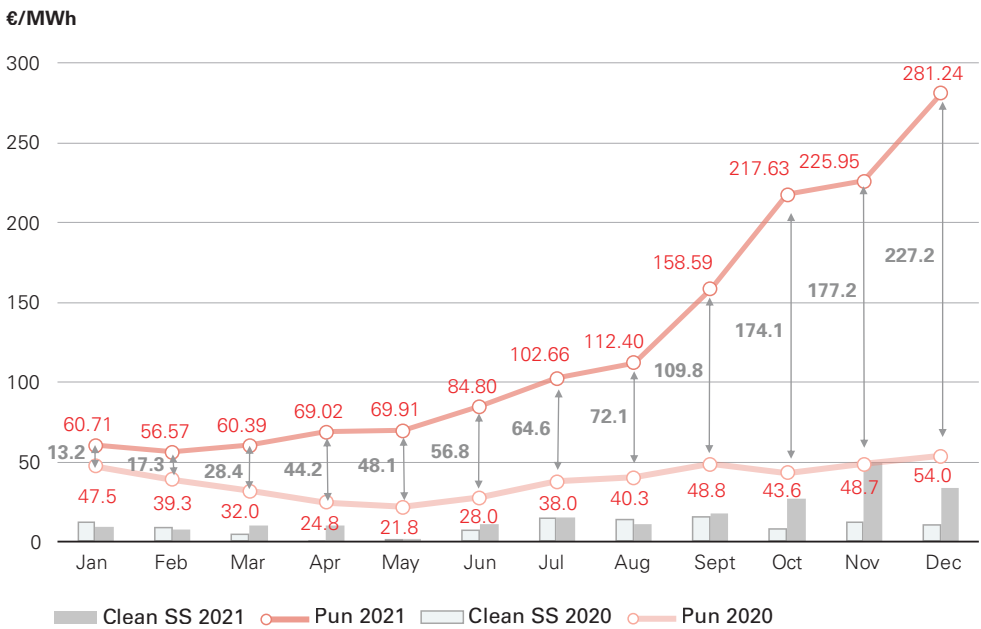


Fig. 2.2.6 Pun variation. Monthly trend year 2021

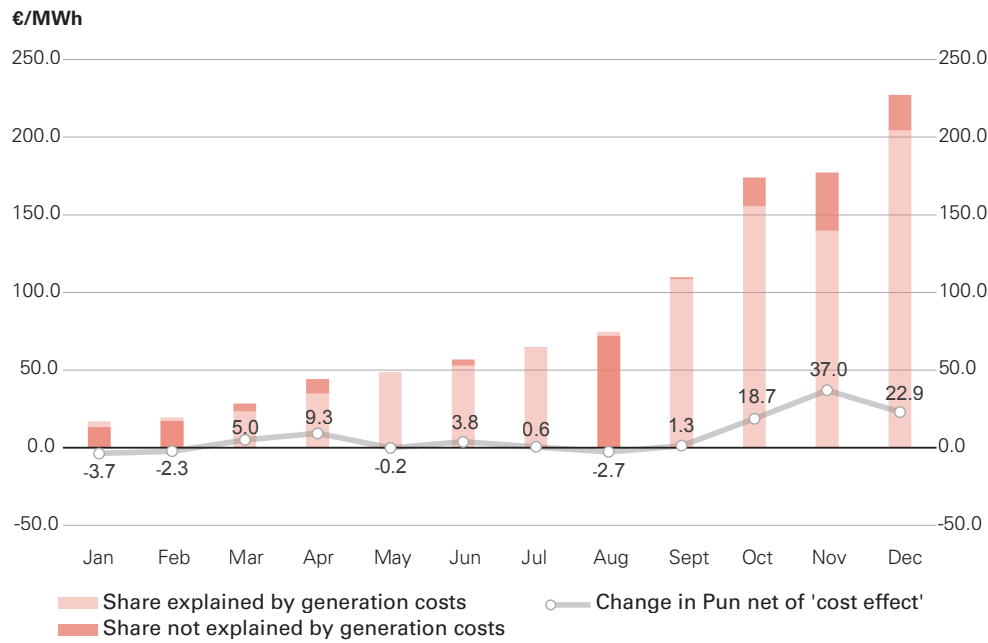


Fig. 2.2.7 Pun by groups of hours. Annual average

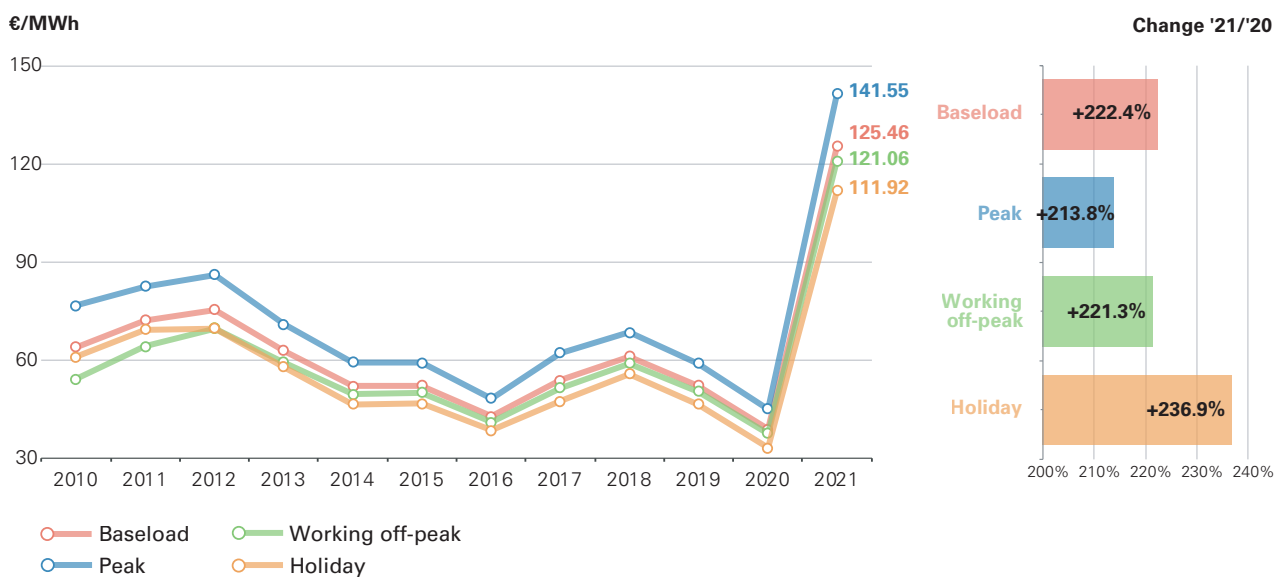


Fig. 2.2.8 Average annual zonal prices in the MGP

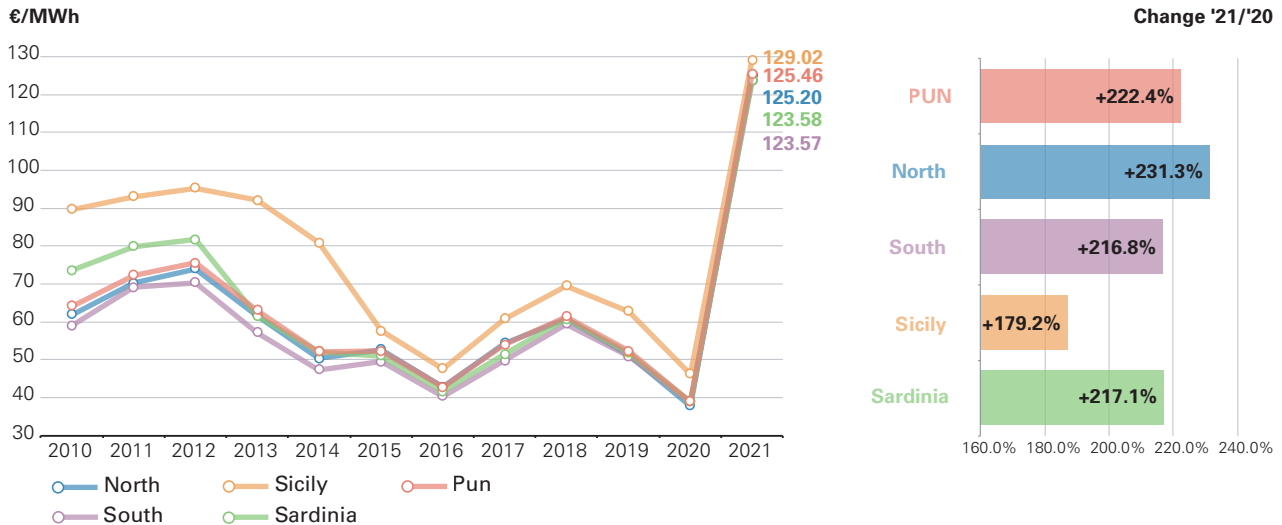


Fig. 2.2.9 Zonal prices. Monthly trend for the years 2020-2021

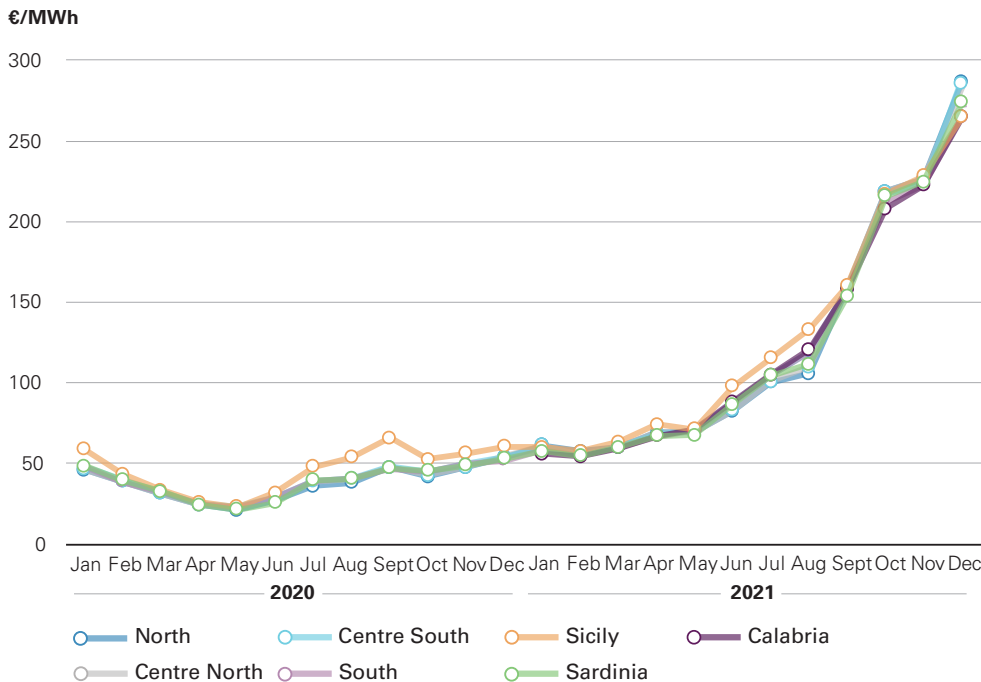


Fig. 2.2.10 Frequency of zonal alignment. Monthly trend for the years 2020-2021

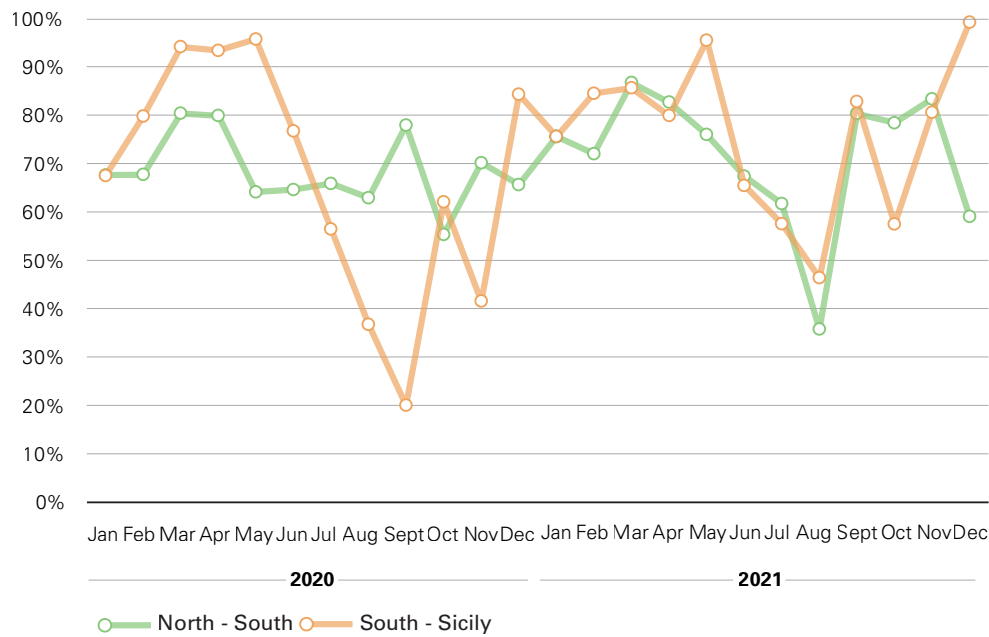


Fig. 2.2.11 Price volatility

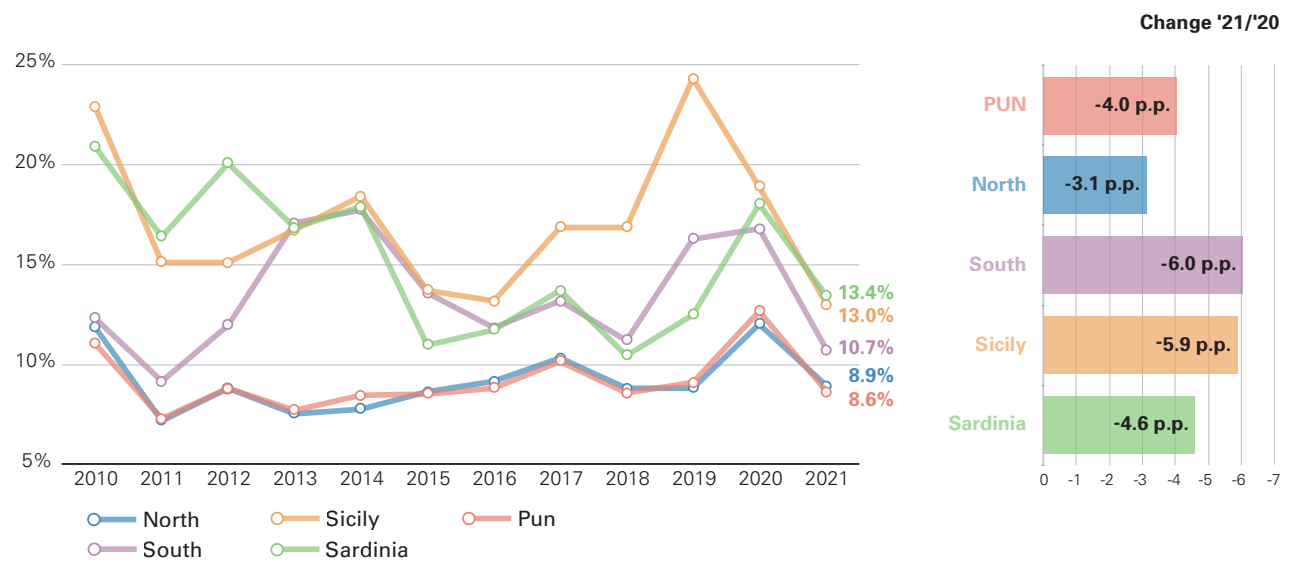
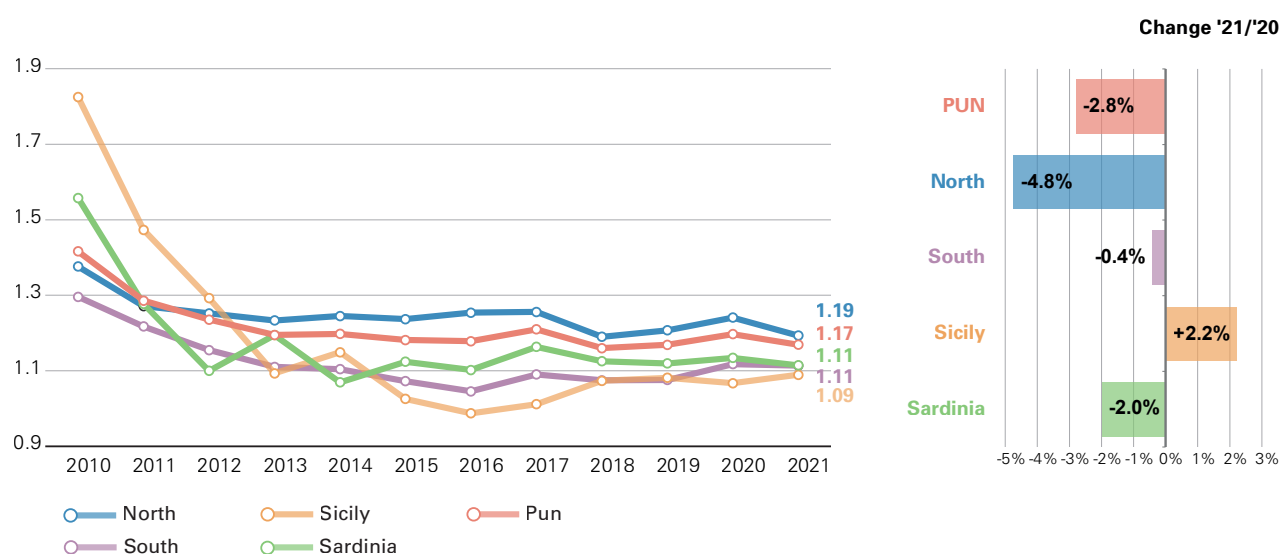


Fig. 2.2.12 Peak/off peak price ratio on working days



Tab. 2.2.2 Zero prices and day/night price reversals in the MGP. Year 2021

	PUN	North	Centre North	Centre South	South	Calabria	Sardinia	Sicily
N° hours with price equal to zero	- (5)	- (5)	- (5)	- (5)	- (5)	-	70 (142)	- (11)
No. sessions with at least an hourly price equal to zero	- (3)	- (3)	- (3)	- (3)	- (3)	-	16 (26)	- (5)
No. sessions with day-time prices < night-time	81 (101)	66 (83)	74 (98)	98 (127)	109 (143)	118	117 (141)	134 (175)
No. sessions with day-time prices < night-time prices	22.2% (27.6%)	21.1% (22.7%)	23.6% (26.8%)	31.3% (34.7%)	34.8% (39.1%)	37.7%	37.5% (38.5%)	42.9% (47.8%)
Average difference in sessions with daytime prices < night-time prices. €/MWh	-6.63 (-4.53)	-5.78 (-3.86)	-6.02 (-5.04)	-9.03 (-5.58)	-9.35 (-5.71)	-10.66	-15.29 (-6.58)	-10.59 (-7.41)

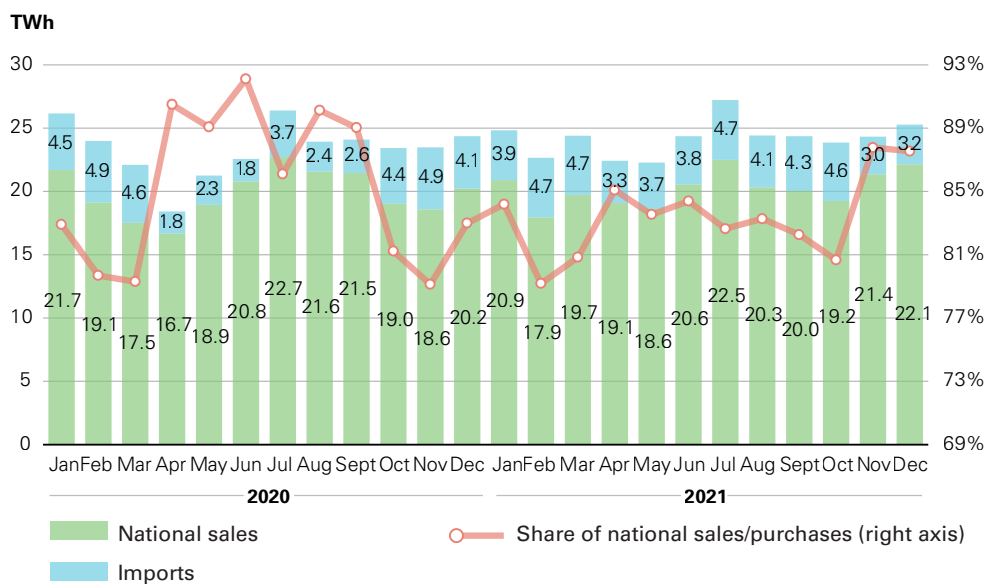
(l) The values of the previous year are shown in brackets

Tab. 2.2.3 Zonal volumes in the MGP (TWh). Year 2021

Zone	Purchases		Sales		Supply		Demand		Rejected supplies	
North	160.98	(+7.1%)	128.82	(+0.5%)	231.87	(-4.9%)	163.77	(+7.7%)	103.05	(-10.7%)
Centre North	24.57	(-14.8%)	16.10	(-13.5%)	19.26	(-22.0%)	25.15	(-14.8%)	3.16	(-47.8%)
Centre South	50.62	(+15.8%)	29.01	(+27.6%)	55.50	(+9.3%)	51.03	(+15.9%)	26.49	(-5.5%)
South	18.09	(-21.2%)	31.23	(-33.5%)	45.66	(-46.8%)	18.29	(-21.0%)	14.44	(-62.9%)
Calabria	5.89	-	15.10	-	27.37	-	5.92	-	12.26	-
Sicily	17.12	(+3.3%)	10.52	(-4.6%)	26.47	(-9.9%)	17.33	(+4.1%)	15.94	(-13.1%)
Sardinia	8.86	(+5.7%)	11.61	(+15.7%)	16.84	(-4.7%)	9.03	(+6.7%)	5.23	(-31.5%)
Foreign	4.27	(-50.3%)	48.00	(+14.9%)	49.42	(+14.0%)	8.07	(-35.5%)	1.41	(-8.7%)
Italy	290.40	(+3.9%)	290.40	(+3.9%)	472.39	(-4.6%)	298.60	(+4.2%)	181.99	(-15.7%)

(l) The values of the previous year are shown in brackets

Fig. 2.2.13 Distribution of sales. Monthly trend for the years 2020-2021



Tab. 2.2.4 Zonal sales by source and technology (average MWh). Year 2021

	North		Centre North		Centre South		South		Calabria		Sicily		Sardinia		Italy System	
	MWh	Var	MWh	Var	MWh	Var	MWh	Var	MWh	Var	MWh	Var	MWh	Var	MWh	Var
Traditional sources	9,101	+5.5%	745	-15.7%	1,837	+21.5%	1,956	-43.0%	1,282	-	626	-16.0%	943	+18.6%	16,490	+3.1%
Gas	8,108	+5.5%	693	-14.0%	1,175	+16.7%	1,461	-50.9%	1,154	-	513	-26.1%	443	-11.2%	13,547	-0.9%
Coal	146	+38.2%	-	-	427	+56.2%	347	+87.3%	-	-	-	-	445	+82.9%	1,366	+69.0%
Other	847	+1.8%	52	-33.8%	235	+1.5%	148	-45.2%	128	-	112	+121.9%	56	+4.2%	1,578	+4.1%
Renewable sources	5,396	-6.6%	1,092	-11.9%	1,442	+34.9%	1,608	-16.7%	442	-	573	+11.6%	381	+8.6%	10,935	+0.5%
Hydraulic	3,694	-10.3%	226	-28.7%	691	+69.7%	409	-11.4%	128	-	124	+0.1%	87	+25.4%	5,358	-2.5%
Geothermal	-	-	633	-1.9%	-	-	0	-	0	-	-	-	-	-	633	-1.9%
Wind power	11	+16.4%	27	+13.8%	404	+11.5%	906	-17.0%	253	-	341	+21.5%	192	+1.3%	2,134	+9.0%
Solar and others	1,692	+2.4%	206	-18.9%	346	+15.9%	294	-22.4%	62	-	108	-0.7%	101	+11.1%	2,809	+0.9%
Pumping	208	-12.0%	-	-	33	+1174%	-	-	-	-	2	+3895.5%	1	+11962.4%	245	-2.7%
Total	14,706	+0.5%	1,837	-13.5%	3,312	+276%	3,565	-33.5%	1,724	-	1,201	-4.6%	1,326	+15.7%	27,671	+2.0%

Fig. 2.2.14 Competitiveness indicators

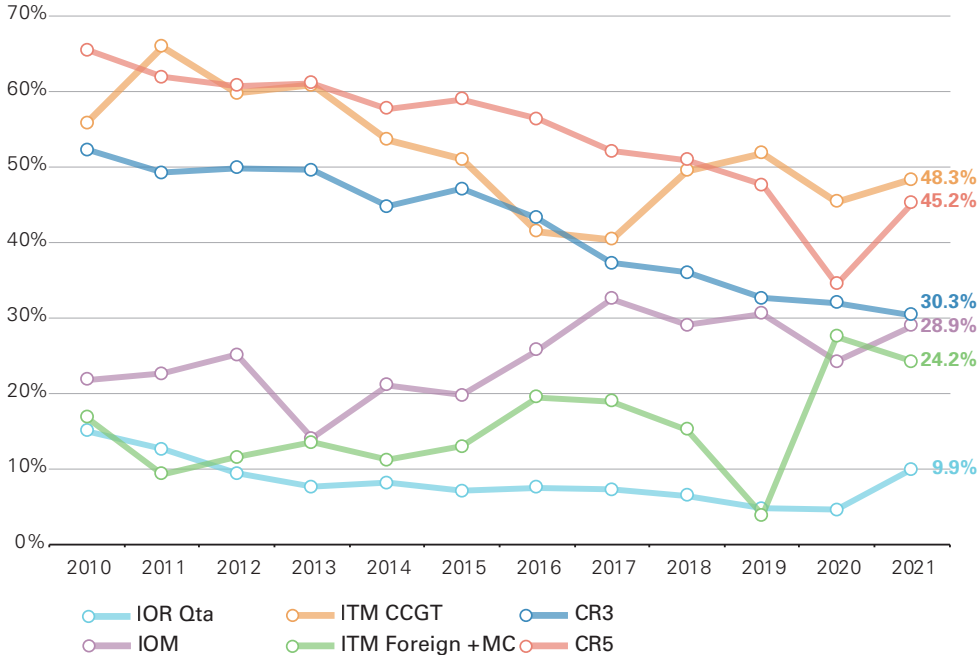
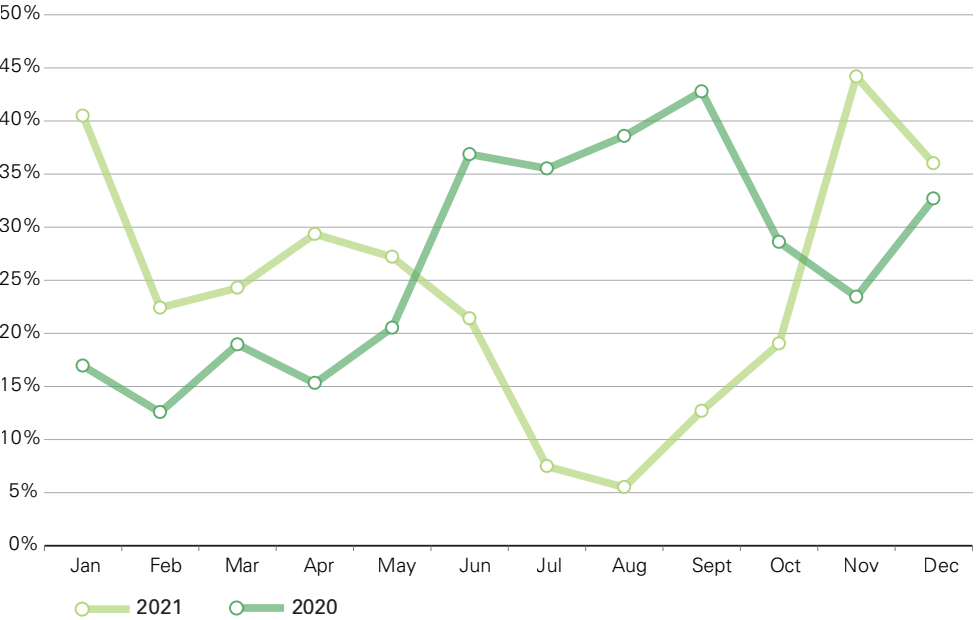


Fig. 2.2.15 Foreign price fixing quota. Monthly trend for the years 2020-2021



Tab. 2.2.5 Concentration indices in the MGP. Year 2021

Indicator	Total	North	Centre North	Centre South	South	Calabria	Sicily	Sardinia
HHI Supplies	1,463 (1,581) ▼	3,696 (3,019) ▲	2,899 (3,240) ▼	1,930 (1,622) ▲	2,914 (-) -	3,305 (3,778) ▼	3,065 (2,970) ▲	
HHI Sales	1,002 (965) ▲	3,366 (2,963) ▲	1,523 (1,360) ▲	1,464 (1,209) ▲	3,058 (-) -	1,642 (1,847) ▼	2,706 (3,441) ▼	
CR3	30.3% (32.0%) ▼	38.9% (36.9%) ▲	86.5% (79.0%) ▲	44.6% (41.1%) ▲	50.4% (39.8%) ▲	82.8% (-) -	51.5% (55.8%) ▼	75.8% (77.4%) ▼
CR5	45.2% (34.5%) ▲	60.4% (56.8%) ▲	92.0% (87.6%) ▲	61.2% (60.6%) ▲	64.9% (55.3%) ▲	90.6% (-) -	67.6% (71.7%) ▼	86.7% (86.2%) ▲
IOR Quantity	9.9% (4.6%) ▲	0.6% (0.4%) ▲	57.6% (38.1%) ▲	9.6% (8.1%) ▲	15.3% (0.4%) ▲	18.1% (-) -	6.5% (4.4%) ▲	25.2% (7.6%) ▲
IOM 1° Oper	28.9% (24.2%) ▲	27.1% (28.3%) ▼	27.9% (23.5%) ▲	31.7% (21.0%) ▲	29.9% (18.6%) ▲	31.9% (-) -	38.2% (10.6%) ▲	29.2% (20.4%) ▲
ITM Ccgt	48.3% (45.3%) ▲	46.8% (42.2%) ▲	49.2% (46.0%) ▲	47.4% (43.2%) ▲	49.9% (49.6%) ▲	51.1% (-) -	58.8% (66.4%) ▼	48.5% (45.6%) ▲

() The values referring to the same month of the previous year are shown in brackets

2.2.2. The Intra-day Market (MI)

THE START OF THE NEW MI. During 2021, GME completed the activities necessary to guarantee entry of the national intra-day market into the European SIDC, thus also extending the benefits deriving from harmonisation of the continental energy markets to this time horizon.

In this context, significant changes have been made to the market design of the MI which, starting from the flow date 22 September 2021, provides, in place of the previous seven auctions, a session in continuous trading in coupling with the rest of Europe (MI-XBID), interspersed with three local auctions (MI-A1, MI-A2, MI-A3).

In any case, the change observed in the structure during the year did not alter the main function of the MI, which proved to be the natural completion of the MGP and a useful tool available to participants for the definition of efficient system planning. With reference to the trends in volumes and prices observed on the market, the main dynamics that were revealed showed: *i)* confirmation of the greater propensity of participants to move high volumes of adjustments in the first session of the auction in order to allocate numerous, but lesser, variations in the programs to the phases closest to real time, *ii)* in the MI-XBID, a high share of exchanges carried out with a foreign counterpart, to highlight that this structure has offered new commercial opportunities, collecting market shares previously not intercepted, *iii)* the natural alignment of the average quotations of the MI to the values expressed by the previous MGP market, *iv)* in the MI-XBID, sessions characterised by high variability on trading prices between different zones and hours or within them.

VOLUMES AND PRICES. In the context described above, the overall volumes traded on the MI in 2021 increased and amounted to 26.0 TWh (+1.1 TWh), one of the highest values in the last decade, of which 19.1 TWh attributable to the old structure of the market and 6.9 TWh to the new set-up. This difference reflects only the different length of the two trading periods (just under nine months for the old set-up, just over three for the new one), as there were no significant variations in the average daily quantities traded between the two phases (approximately 70 GWh on average).

With reference to the new market structure, the significant part of trading was concentrated in auction trading (6.2 TWh), in which the share of MI-A1 (4.0 TWh, 65% of the auction total) was prevalent.

Instead, by analysing in detail the novelty element of the new market design, represented by the continuous negotiation session, carried out in coupling abroad (MI-XBID), the observation of the phenomena in the little more than three months in which the new mechanism operated showed *i)* the conclusion of over 256 thousand matchings for a total of 0.7 TWh, mostly negotiated after the MI-A2 auction (phases 2 and 3 of the MI-XBID), *ii)* a prevalence of such exchanges concentrated close to the delivery of each hourly product (approximately 43% in the four hours prior to delivery), *iii)* a significant share of exchanges with foreign counterparties (75% of the total MI-XBID), while the matchings performed within the same national area or between national areas were respectively 6% and 19%, *iv)* a high consistency, equal to approximately 50% of combined volumes both for sale and for purchase from renewable systems.

In the short period of observation, moreover, over the months, there was a progressive growth in both the overall volumes of the new MI, which rose from 2.0 TWh in October to 2.3 TWh in December, and of the trading of MI-XBID alone, which rose from 0.17 TWh to 0.28 TWh with an increase of 68%. In the same period, the share of supplies in the portfolio was also gradually consolidated, an opportunity provided by the new negotiation method, reaching approximately 30% of the total supply for sale and purchase.

At a local level, the analysis of the trades recorded in the MI during 2021 showed a distribution of sales by area that was substantially similar to that recorded in the MGP market, while in terms of purchases there was an increasing weight of the Southern area to the detriment above all of the Centre South.

Regarding prices, the clear difference between the average prices observed in the previous structure, which stood just above 82 €/MWh, and those which occurred in the new structure, ranging between 232/246 €/MWh, reflected the decisive change of gear followed by the spot electricity prices in the latter part of the year in response to the intense progression of natural gas and CO2. In general, even after the launch of the MI-XBID, the average prices confirmed the trend already observed on the MI over the past years, thus remaining at average levels similar to or lower than the corresponding values of the MGP. The observation of the inter-session prices in continuous trading highlighted transaction prices characterised by: *i)* a high dispersion by time and date of flow, *ii)* a high frequency of days with price differences between two consecutive transactions exceeding 50 €/MWh (from Fig. 2.2.16 to Fig. 2.2.20, Tab. 2.2.6).

Fig. 2.2.16 Volumes traded in the MI

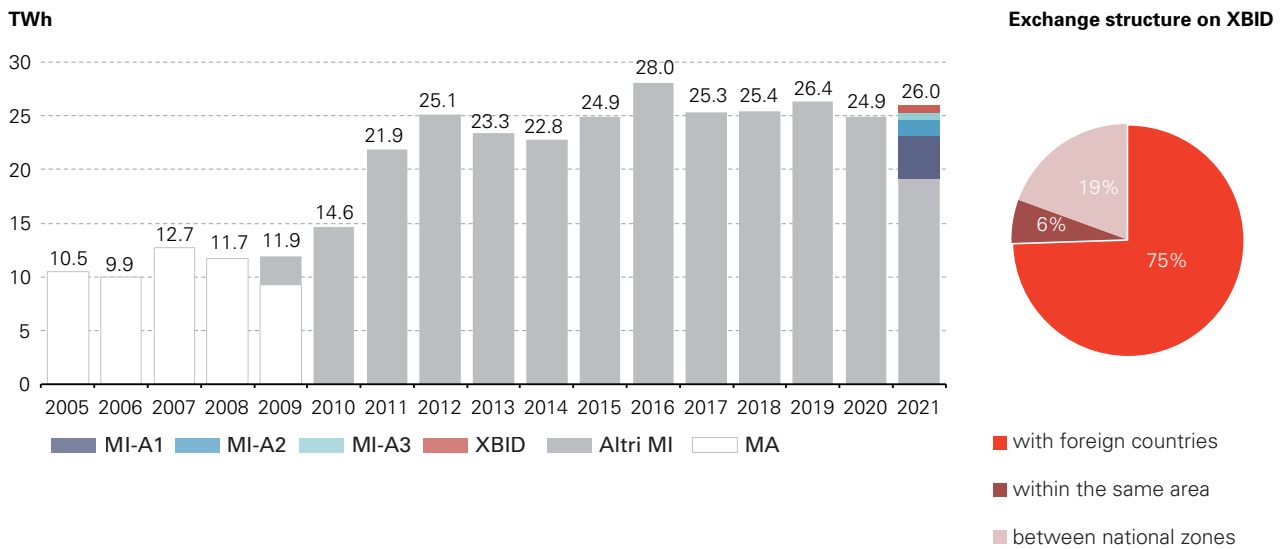


Fig. 2.2.17 Volumes traded in the MI. Monthly trend 2020-2021

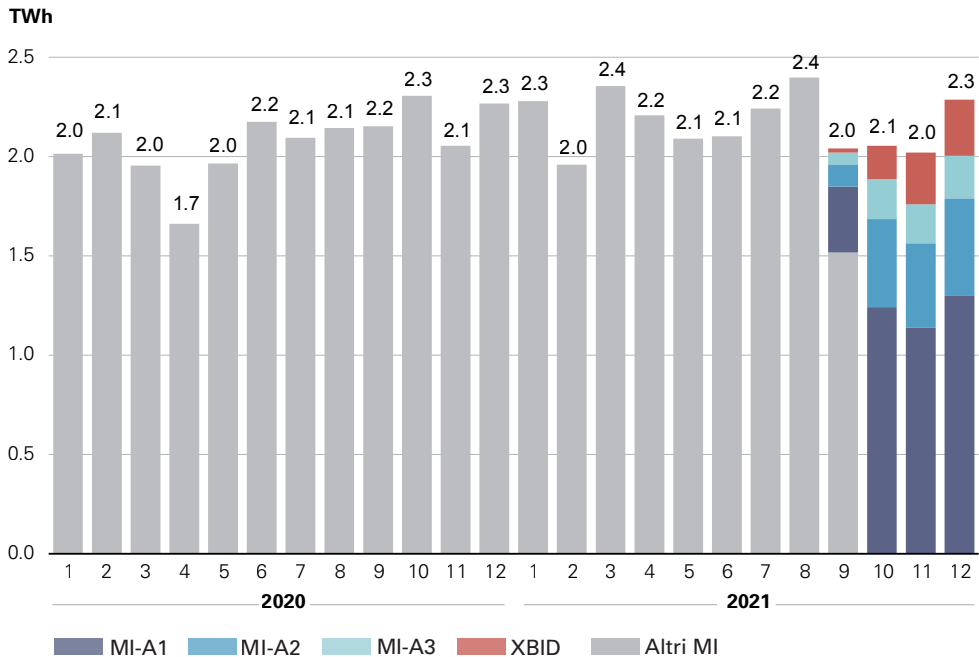


Fig. 2.2.18 MI prices. Annual trend

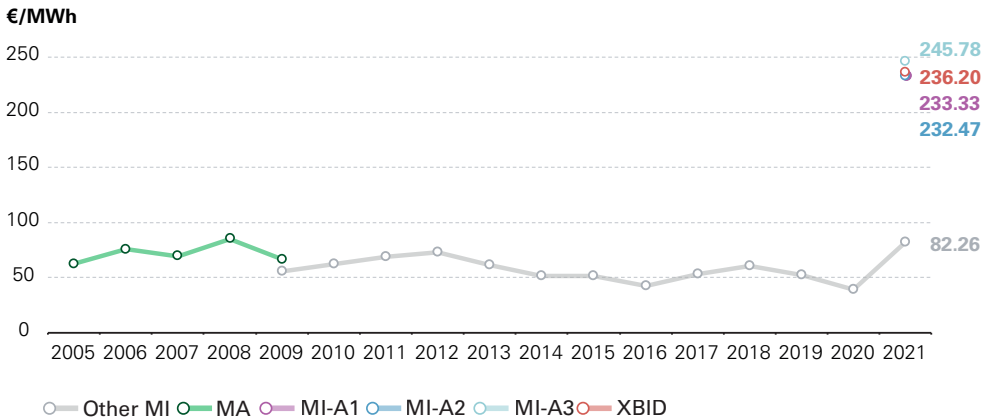


Fig. 2.2.19 MI prices. Monthly trend 2020-2021

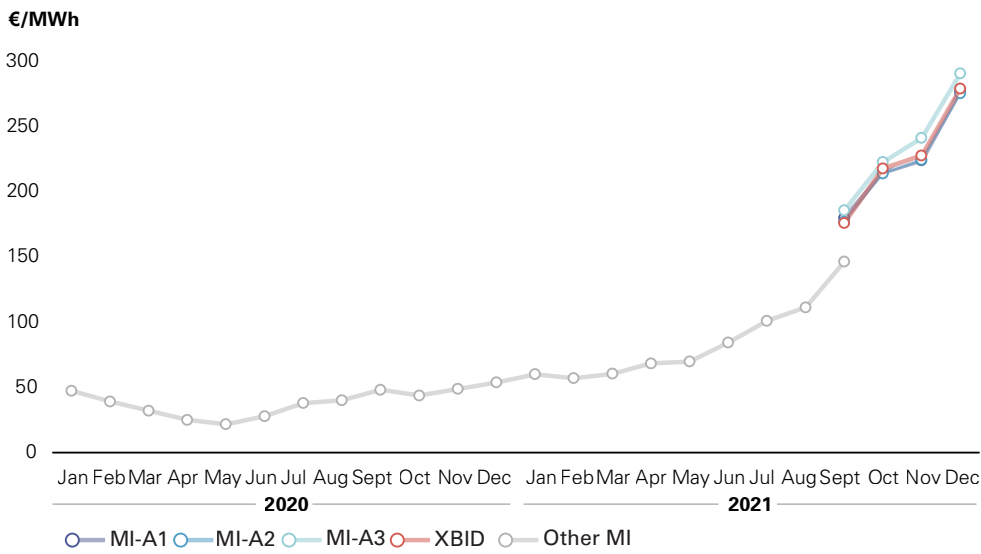
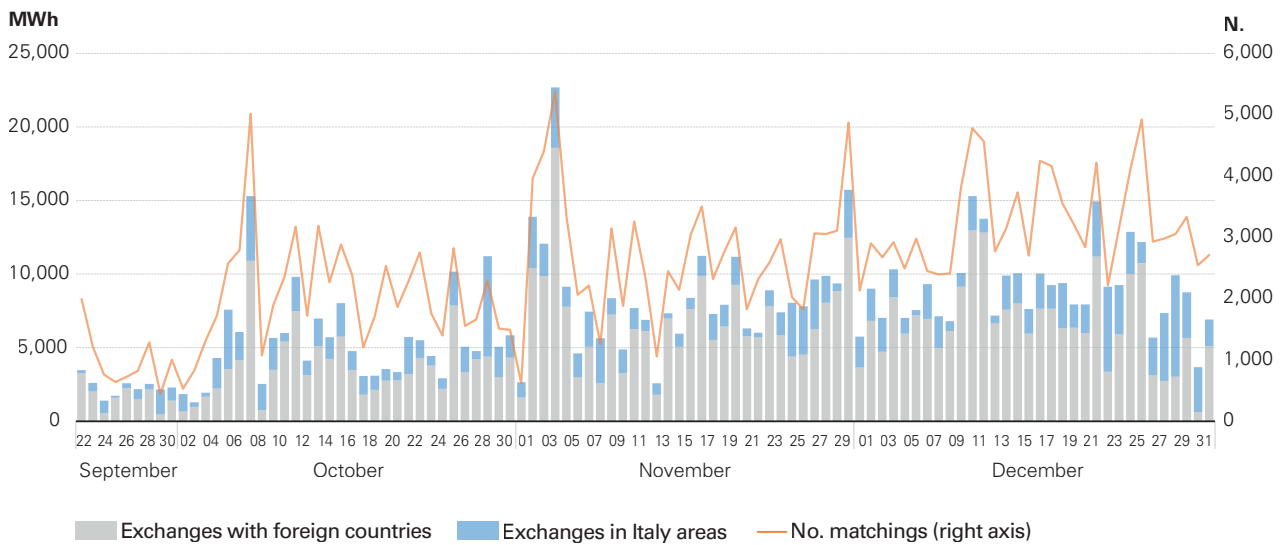


Fig. 2.2.20 Exchanges and matchings on the XBID. Monthly trend 2021



Tab. 2.2.6 Zonal purchases and sales in the MI. Year 2021

PURCHASES	AUCTION				TOTAL	CONTINUOUS TRADING	INTRA-DAY MARKET		var%
	OTHER MARKETS (1-24 h)	MI-A1 (1-24 h)	MI-A2 (1-24 h)	MI-A3 (13-24 h)		XBID	TOTAL		
	MWh	MWh	MWh	MWh	MWh	MWh	MWh		
North	8,700,309	2,183,424	542,405	236,750	11,662,887	206,879	11,869,766	-3.6%	
Centre North	1,149,803	263,717	82,344	31,715	1,527,579	36,359	1,563,938	-1.0%	
Centre South	2,266,555	385,087	168,022	84,176	2,903,840	68,081	2,971,921	18.9%	
South	3,650,516	418,749	257,097	128,323	4,454,685	100,531	4,555,216	5.9%	
Calabria	881,433	98,427	51,304	29,591	1,060,755	12,870	1,073,626	-	
Sicily	960,349	288,772	106,307	53,025	1,408,453	32,425	1,440,878	-9.0%	
Sardinia	540,034	115,976	56,451	34,711	747,172	33,165	780,338	19.5%	
Foreign	1,001,091	258,870	204,567	72,852	1,537,379	242,215	1,779,594	-6.7%	
Total	19,150,090	4,013,022	1,468,496	671,143	25,302,751	732,526	26,035,277	4.8%	

SALES	AUCTION				TOTAL	CONTINUOUS TRADING	INTRA-DAY MARKET		var%
	OTHER MARKETS (1-24 h)	MI-A1 (1-24 H)	MI-A2 (1-24 H)	MI-A3 (13-24 h)		XBID	TOTAL		
	MWh	MWh	MWh	MWh	MWh	MWh	MWh		
North	9,544,896	2,230,236	651,276	257,746	12,684,153	168,204	12,852,358	1.2%	
Centre North	776,591	205,357	59,215	32,840	1,074,003	36,570	1,110,573	-21.5%	
Centre South	2,499,798	518,734	175,091	78,008	3,271,631	56,776	3,328,407	35.3%	
South	2,670,163	506,750	223,015	91,619	3,491,548	66,943	3,558,490	-16.5%	
Calabria	1,190,023	95,800	64,167	27,265	1,377,254	17,613	1,394,867	-	
Sicily	1,005,656	244,265	102,826	55,169	1,407,917	24,811	1,432,727	-1.3%	
Sardinia	507,699	74,281	36,726	30,217	648,923	19,211	668,134	16.4%	
Foreign	955,264	137,599	156,181	98,277	1,347,322	342,399	1,689,720	-14.6%	
Total	19,150,090	4,013,022	1,468,496	671,143	25,302,751	732,526	26,035,277	4.8%	

2.2.3. Other electricity markets

MPEG. On the "unit price differential" product there was, in 2021, an annual decline in both trading (506, -55% on 2020) and volumes (0.3 TWh, -60%), and on minimum levels. The operations, attributable almost exclusively to the baseload profile, were particularly reduced in the months of April, July and October. The average trading price of baseload daily products rose to 0.23 €/MWh (substantially in line with the 2020 level), showing a progression to growth in the final months of the year, while the peakload price, limited to only two exchanges recorded in February, was equal to 0.11 €/MWh (Fig. 2.2.21).

PCE. Transactions recorded on the OTC Registration Platform (PCE) with delivery/collection in 2021 confirmed the downward trend of recent years, reaching the lowest levels since 2011, equal to 237.7 TWh (-11.6% compared to 2020), mainly due to the further decrease in transactions deriving from bilateral contracts (236.8 TWh, -11.3%). Similar decreases were also observed on the net position of the energy accounts determined by the total number of transactions recorded (136.7 TWh, -9.4%) and on the turnover¹⁷ (1.57, -0.21). The reduction in the programs recorded in the injection accounts appeared to be more modest (69.1 TWh, -2.0%) and in those in withdrawal (112.6 TWh, -2.2%), instead of a significant decrease in the related scheduled unbalances (respectively to 67.5 TWh and 24, 1 TWh, -15.9%/-32.7%) (Fig. 2.2.22, Tab. 2.2.7 and Fig. 2.2.23).

MTE. In the context of profound uncertainty about future scenarios, trading on the MTE fell to an all-time low in 2021 both in terms of matchings (7, -55) and volumes traded (22 GWh, -97%), relating only to baseload products, in particular of a monthly duration. With regard to the prices, the control price of the products being traded followed the strongly bullish dynamics found on the spot, with the calendar baseload 2022 product which closed the trading period at a price of 257 €/MWh (Tab. 2.2.8).

¹⁷ This means the ratio between the recorded transactions and the net position.



Fig. 2.2.21 MPEG prices and volumes traded by type

Type	Tradings	Traded products	Price			Volumes	
	N°	N°	Average €/MWh	Minimum €/MWh	Maximum €/MWh	MWh	MWh/g
Baseload	504 (1,132)	232/363 (361/366)	0.23 (0.24)	0.03 (0.06)	1.00 (2.50)	294,792 (720,825)	1,271 (1,997)
Peakload	2 (-)	2/260 (0/262)	0.11 (0.00)	0.11 (0.00)	0.11 (0.00)	3,000 (-)	1,500 (-)
Total	506 (1,132)					297,792 (720,825)	

The values of the previous year are shown in brackets

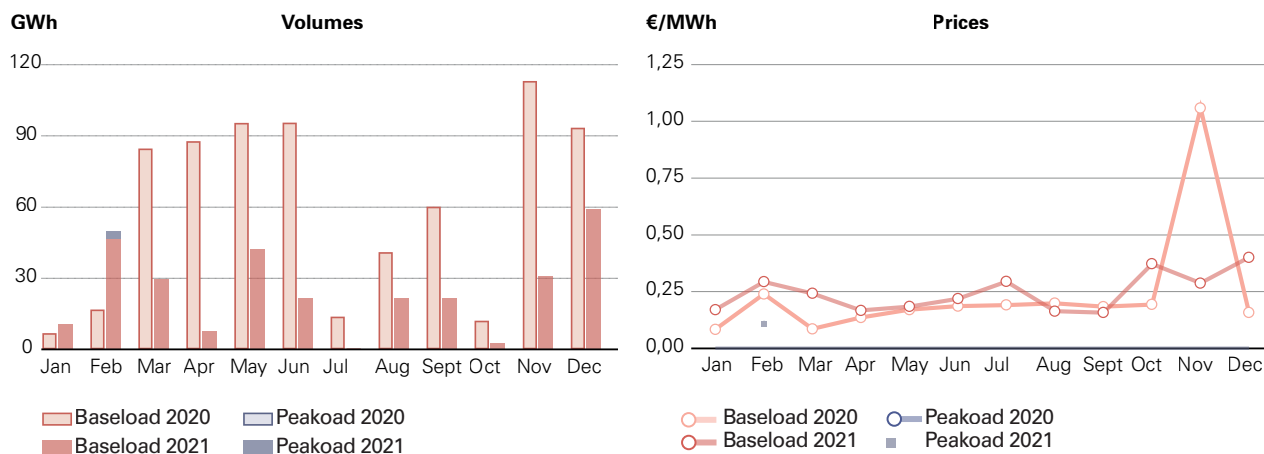
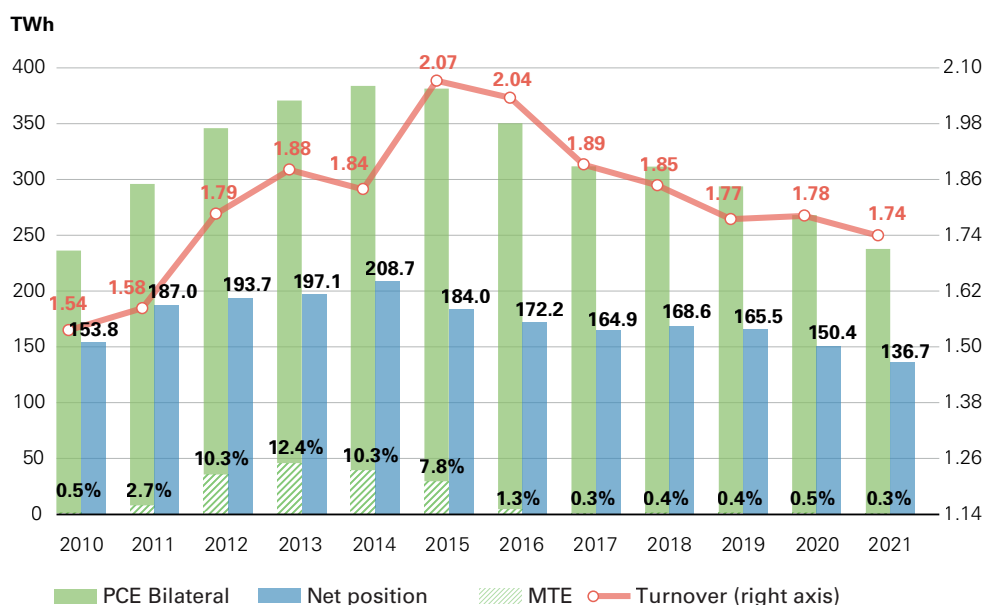


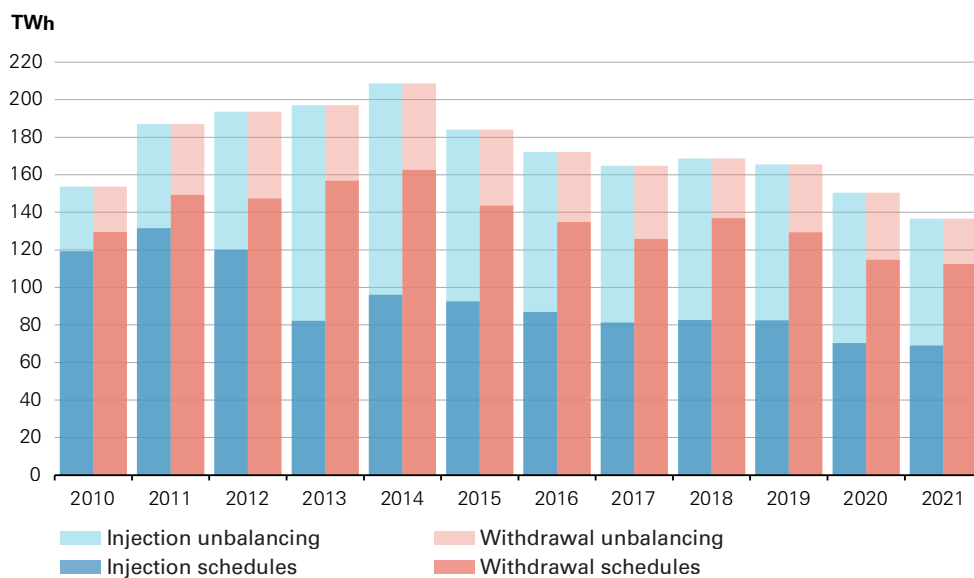
Fig. 2.2.22 Registered transactions, net position and turnover



Tab. 2.2.7 Profile of registered transactions and schedules

REGISTERED TRANSACTIONS				PROGRAMS						
Profile	MWh	Change	Structure	Injection			Withdrawal			
				MWh	Change	Structure	MWh	Change	Structure	
Baseload	69,850,262	-8.2%	29.4%							
Off Peak	965,985	-67.7%	0.4%							
Peak	1,084,608	-21.5%	0.5%							
Week-end	384	59.6%	0.0%							
Standard Total	71,901,239	-10.7%	30.2%	Registered	69,120,631	-2%	80.1%	112,565,132	-2.2%	99.7%
Non-Standard Total	164,855,169	-11.5%	69.4%	<i>of which with price indication</i>	<i>18,657,941</i>	<i>15.5%</i>	<i>21.6%</i>	<i>32,752,211</i>	<i>24732.6%</i>	<i>29.0%</i>
Bilateral PCE	236,756,407	-11.3%	99.6%	Rifiutati	17,164,632	-46.2%	19.9%	309,452	270%	0.3%
MTE	640,141	-49.1%	0.3%	<i>of which with price indication</i>	<i>17,148,070</i>	<i>-46.2%</i>	<i>19.9%</i>	<i>58,949</i>	<i>3523.7%</i>	<i>0.1%</i>
MPEG	297,552	-58.8%	0.1%	Schedule unbalance	67,533,334	-15.9%		24,088,833	-32.7%	
CDE	-	-	0.0%	Schedules balance	-	-		43,444,501	-2.4%	
Total	237,694,100	-11.6%	100.0%							
Net position	136,653,965	-9.4%								

Fig. 2.2.23 Registered physical programs and unbalance schedules



Tab. 2.2.8 MTE: volumes traded by trading year

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Δ% 2021/2020
Contracts (MW)												
Total	8,228	12,697	6,096	4,550	1,004	411	518	391	596	213	19	-91%
Baseload	6,018	11,633	4,604	4,410	899	323	449	357	561	174	19	-89%
Peakload	2,210	1,064	1,492	140	105	88	69	34	35	39	0	-100%
Volumes (TWh)												
Total	33.44	54.96	41.10	32.27	5.09	1.07	1.36	1.19	1.64	0.77	0.02	-97%
Baseload	29.75	52.27	36.72	32.21	5.01	1.00	1.33	1.16	1.60	0.73	0.02	-97%
Peakload	3.69	2.69	4.38	0.07	0.08	0.07	0.02	0.04	0.04	0.04	0.00	-100%
Number of Matchings												
Total	665	953	342	500	252	85	139	130	176	62	7	-89%
Baseload	478	884	136	488	239	73	123	119	165	52	7	-87%
Peakload	187	69	206	12	13	12	16	11	11	10	0	-100%
Number of OTC matching												
Total	2	25	33	14	0	0	0	0	0	0	0	-
Baseload	2	23	33	14	0	0	0	0	0	0	0	0%
Peakload	0	1	0	0	0	0	0	0	0	0	0	0%
OTC volumes share												
Total	5%	45%	81%	43%	0%	0%	0%	0%	0%	0%	0%	+0 p.p.
Baseload	6%	45%	90%	43%	0%	0%	0%	0%	0%	0%	0%	+0 p.p.
Peakload	1%	46%	0%	29%	0%	0%	0%	0%	0%	0%	-	-

2.3. GAS MARKETS IN ITALY

2.3.1. Gas Spot Market (MP-GAS)

THE CONTEXT IN THE ITALIAN GAS SYSTEM. In 2021, the national and international economic scenario was marked by a consistent and partly unexpected recovery in the demand for goods and services, which led to a vigorous growth in the demand for gas.

In Italy, as observed in Europe, gas consumption followed higher growth rates than imports via pipeline, requiring a significant use of storage, with the consequent progressive erosion of reserves, which at the beginning of the winter season were clearly below average. The unfolding of this dynamic on a global scale, together with the first effects of the energy transition in China from coal to natural gas, triggered an actual "world race for the last LNG cargo", which caused its price to explode, driving up the prices of all regional importing markets in Europe and Far East Asia.

In particular, the Italian consumption of natural gas reached the maximum of the last ten years (806.7 TWh, +8.1%), by virtue of a growth concentrated in the spring months (+12/+13%), characterised in 2020 by lockdown induced by the health emergency, and in the

final quarter of the year (+9/+11%), characterised by very significant levels of demand. The analysis by sector shows a rather uniform boost in consumption in the civil, thermoelectric and industrial sectors, with the first two never so high since 2012 (respectively 353.2 TWh and 274.9 TWh, +8.4% and +6.4%) and the third returned to pre-pandemic values (148.8 TWh, +6.7%). Exports and other consumption also increased (29.8 TWh, +31.8% on the historic low of the previous year), with the first climbs to an all-time high of 6 TWh and directed mainly towards Northern Europe (via Passo Gries). In this sense, the data recorded in the final days of December stands out, when, in correspondence with the inversion of the PSV-TTF differential (-8 €/MWh approximately between 25 and 31 December), Italian exports were overall equal to 1.1 TWh.

The recovery in demand was partly absorbed by the increase in imports via pipeline (654.9 TWh, +16% on 2020), mainly concentrated on the Algerian and Azerbaijani sides (Mazara: 224 TWh, +77%; Melendugno: 75.9 TWh), whose growth, however, in the presence of substantially stable supplies from Russia (Tarvisio: 298.4 TWh), was partially mitigated by the drop in volumes entering from Northern Europe (via Passo Gries: 22.0 TWh, -76%), from the reduction of inputs to the system from LNG terminals (103.3 TWh, -22%) and from the drop to historic lows in national production (33 TWh, -9%).

Therefore, the role of storage was decisive for the supply-demand balance, the stock of which at the end of the year fell to 129 TWh (-9.0%), compressed by a disbursement-injections balance at an all-time high of 15.5 TWh, as a result of withdrawals high and lower only than the record of 2020 (119.5 TWh) and injections at their lowest since 2015 (104 TWh, -7%) (from Fig. 2.3.1 to Fig. 2.3.5).

VOLUMES In this context, three important phenomena can be observed on the Gas Spot Market (MP-GAS) in 2021: *i*) the overall increase in volumes on the title markets, *ii*) a redistribution of exchanges between the various spot markets, to the advantage of the day-ahead market, in particular in the continuous trading segment, *iii*) an increase in exchanges between participants other than the Balancing Manager (RdB) in the MI-GAS.

Negotiations in the MP-GAS consolidate the growth recorded in the previous four years and rise to an all-time high of 130 TWh (+15% on 2020), equal to 16% of the demand for natural gas on an annual basis, a share never so high since the start of the new balancing system (+1 p.p. over last year), and with a monthly peak of 26% in April (Fig. 2.3.6).

► **Day-ahead gas market (MGP-GAS).** In a progressively more mature market context, also thanks to the presence of the market making, volumes on the continuous trading MGP-GAS rose to 45.4 TWh (+51%), representing 35% of the total spot traded (+8 p.p. on annual basis), a level never so high, mainly concentrated in the G+1 session.

Furthermore, the appreciation of the participants for the weekend product is confirmed, whose share of the total traded rises to 25% (+4 p.p. on 2020). On a monthly basis, the growth in volumes appears to be widespread and intense, with peaks in the final part of the year, especially in December when trading was close to 6 TWh.

With regard to the AGS segment, the volume traded in the day-ahead segment reached 33.8 TWh (+32%) in the second year of operation, equal to 26% of the total spot traded and attributable almost exclusively to purchase transactions by the TSO (90% of volumes).

► **Intra-day Gas Market (MI-GAS).** Conversely, trend reversal for continuous trading on MI-GAS which, after six consecutive increases, while remaining at high levels, dropped to 44.1 TWh (-5%), equal to 34% of the total spot traded (it was 41% in 2020),

dynamics concentrated in the period between May and November and interrupted in December, when the exchanges hit their all-time high (5.7 TWh).

The overall decline originates from a significant contraction in RdB operations (13.1 TWh, -23%), characterised by purchases at lower levels since the start-up of the new balancing system (9.4 TWh, -24%) and sales at the lows of the last three years (3.7 TWh, -20%), contrasted by the consolidation of trade between participants other than the RdB, which rose to an all-time high of 31.0 TWh (+4% up on last year), equal to 70% of the total traded in the sector (+6 p.p. on 2020).

With regard to the AGS sector, the intra-day segment is confirmed to be less liquid than the counterpart day-ahead sector, with volumes equal to 1.6 TWh (they were 4.4 TWh in 2020), of which 63% relating to TSO purchases.

- **Marketing for the trading of gas stored (MGS).** The quantities traded on the MGS, again only for the Stogit company, reinforced the downward trend of the last two years, updating the historical low to 5.1 TWh (-21%), with a share of the total traded at 4% (it was 6% in 2020). In this case, the contraction reflects the decline in trading by third party participants (2.8 TWh, -36%), while the volumes handled by SRG for all purposes (2.3 TWh, +37%), especially for sales (1.8 TWh, +1.0 TWh).
- **The Locational Product Market (MPL).** Also in 2021 no session was activated by Snam Rete Gas S.p.A. (henceforth: Snam).

PRICES. In a national and international context characterised by strong tensions in the balance between supply and demand, the prices of natural gas showed strong upward pressures and increased volatility on all trading markets.

In particular, on the spot gas markets managed by GME, prices rose everywhere to historical highs, ranging between 45.66 €/MWh of MGS and 46.70 €/MWh of the continuous trading sector of MI-GAS, still confirming themselves as being strictly correlated to the price of the PSV (47.2 €/MWh), also in their monthly trend (see Section 2.1).

As also observed in recent years, the greater separation of MGS was concentrated in the last few months of the year, reaching its maximum in December (-9 €/MWh), due to the lesser reactivity to punctual spikes inherent in its nature as a storage market.

In light of its increased liquidity, the weight of the continuous trading MGP-GAS increased in the determination of the System Average Price (SAP)¹⁸, the value of which rose to 47.77 €/MWh, expanding the spread with the PSV to 0.56 €/MWh (+0.40 €/MWh). Instead, the volatility index of the two prices was realigned, with the value of the PSV at the highest levels of the last four years (5.8%, +1 p.p.) and that of the SAP down (5.4%, -1 p.p.) precisely due to the effect of the greater weight assumed by the MGP-GAS in determining its value: the volatility of the MGP-GAS price is in fact confirmed as being lower than that recorded on MI-GAS (7.0%, -1.2 p.p.), structurally impacted by the effects deriving from the interventions of the RdB. The volatility indices were higher in the months of January and February and, above all, in the last quarter, when they reach their highest levels for over three years (12-14%). The infra-annual trend of the volatility indicator of the MGS price is different, basically in line with 2020 for almost the entire year, except in October and December, when it stood at 25% and 21% respectively (Fig. 2.3.7, Fig. 2.3.8).

SNAM OPERATIONS AS RDB. In 2021, Snam's participation as RdB was reduced, both in terms of volumes and matchings, and, as in previous years, mainly on the purchase side. The overall volumes handled by the RdB on the title markets in continuous trading

¹⁸ The SAP is the average of the prices recorded on the MGP-GAS and on the MI-GAS in continuous trading weighted for the respective matchings. Its differential with the PSV is only calculated on the days in which the prices of the latter are available.

amounted to 13.1 TWh (-3.9 TWh), almost all on MI-GAS (99.8%) and mainly referring to purchases (72%).

The analysis of the movements carried out as RdB on the MI-GAS, in line with historical operations, showed a greater intervention by Snam, both in terms of volumes and frequency, in short system situations (284 against 149 matchings). In conditions of negative residual unbalance, Snam's purchases totalled 9.1 TWh (70% of the total handled), made mainly in relation to a system unbalance included in the classes [31,400-60,000 MWh] for 3.2 TWh and [60,000-100,000 MWh] for 3.5 TWh. The RdB interventions in long system conditions were less intense and less frequent, when the Snam's sales totalled 3.5 TWh (27% of its total turnover), concentrated in the medium-high unbalance classes. Finally, the volumes traded by the RdB were residual and halved compared to 2020 and inconsistent with the sign of the unbalance, a circumstance which occurred in both short and long system conditions (respectively in 11 and 12 cases, for a total of 0.4 TWh) (Tab. 2.3.1).

MARKET CONCENTRATION. The title markets in continuous trading were confirmed to be more competitive than the other sectors, also by virtue of the growing liquidity recorded on the MGP-GAS and the greater share of exchanges between participants other than the RdB on the MI-GAS: in these markets the shares of the leading participants (CR5) increased on the purchase side (36%/55%; +3/+4 p.p.) and were stable or decreasing on the sales side (34%/38%; -3 p.p.). Opposite dynamics for the remaining segments, among which the reduction in CR5 for MGP-AGS in purchase (-12%, calculated net of TSO exchanges) and worsening of the same indicator for MGS in sale (+12%) (Fig. 2.3.9).

2.3.2. Other gas markets

MT-GAS. In 2021, in the context of general uncertainty and growing volatility, the exchanges recorded on the Forward Market for Natural Gas (MT-GAS) intensified the decrease already recorded the previous year and reached 22.3 GWh (they were 478.3 GWh in 2020), negotiated in a total of 10 matchings (compared to 122 last year), all relating to monthly products (Tab. 2.3.2).

P-GAS. Exchanges were back in the Royalties sector, where 2.2 TWh were negotiated, of which 1.4 TWh will be delivered in the period October-December 2021, at an average price of 66.53 €/MWh. No exchange, however, in the Import sector.

PAR. A total of 11 slots were assigned in the Regasification Capacity Allocation Platform, amounting to 1.2 million m³ liquefied (they were 22.0 million m³ liquefied in 2020), at an average price of around 4.2 €/m³ liquefied.



Fig. 2.3.1 Natural gas consumption trend

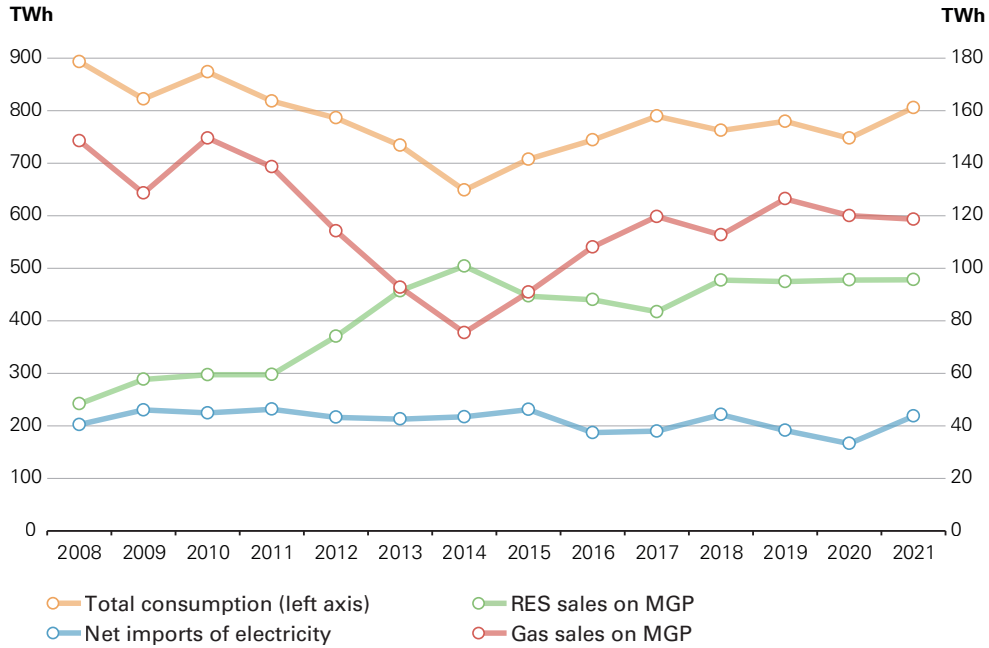


Fig. 2.3.2 Natural gas demand in Italy

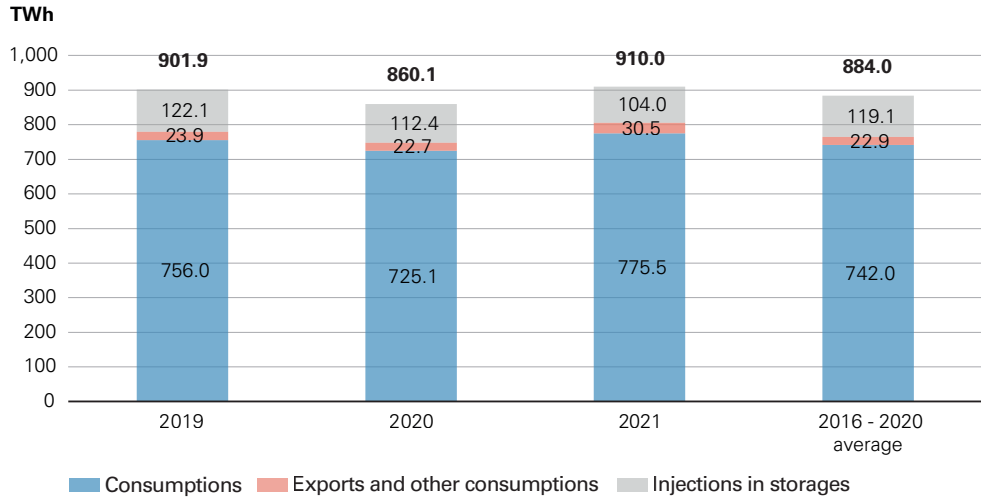


Fig. 2.3.3 Trend of natural gas demand in Italy

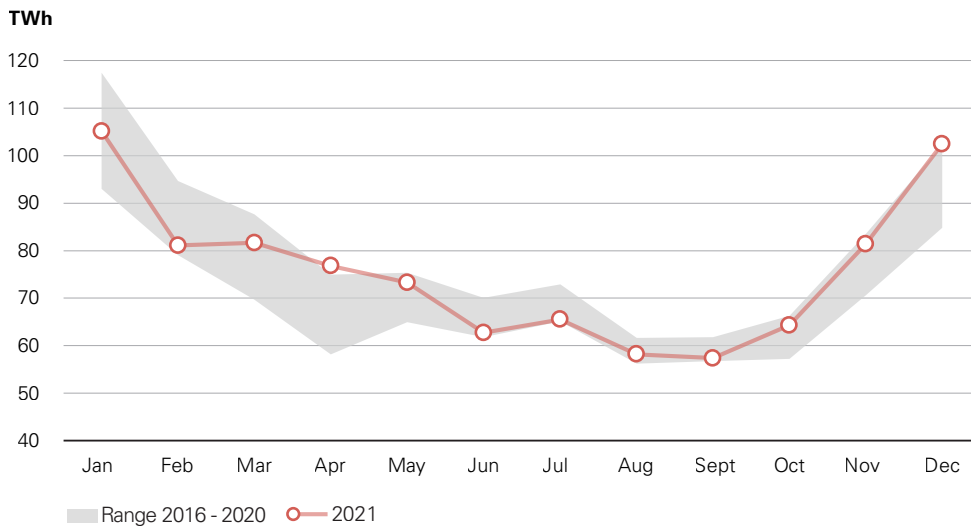


Fig. 2.3.4 Gas import trend

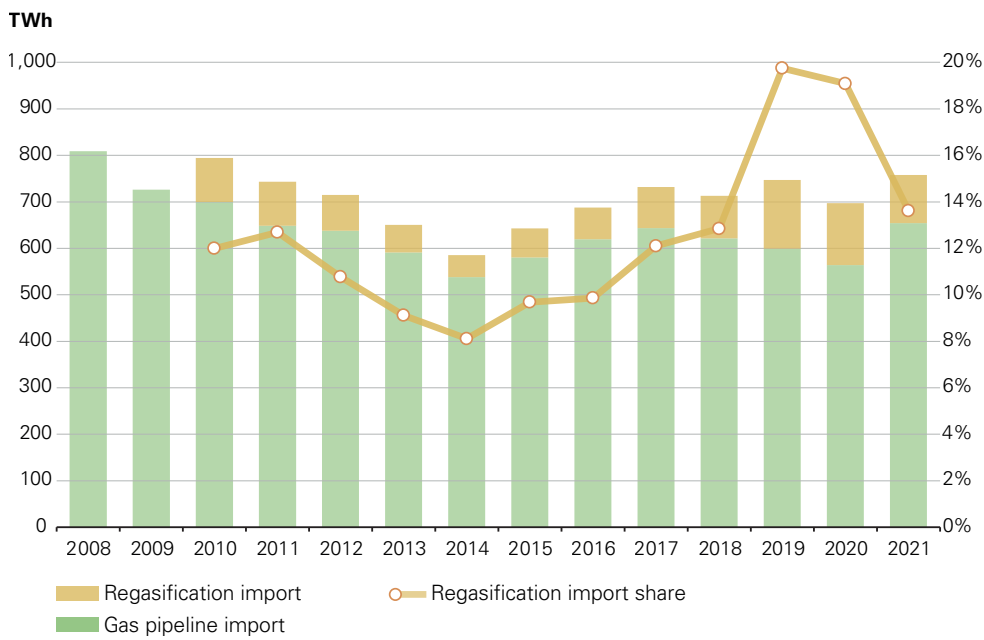


Fig. 2.3.5 Level of stock in storage at the end of the year

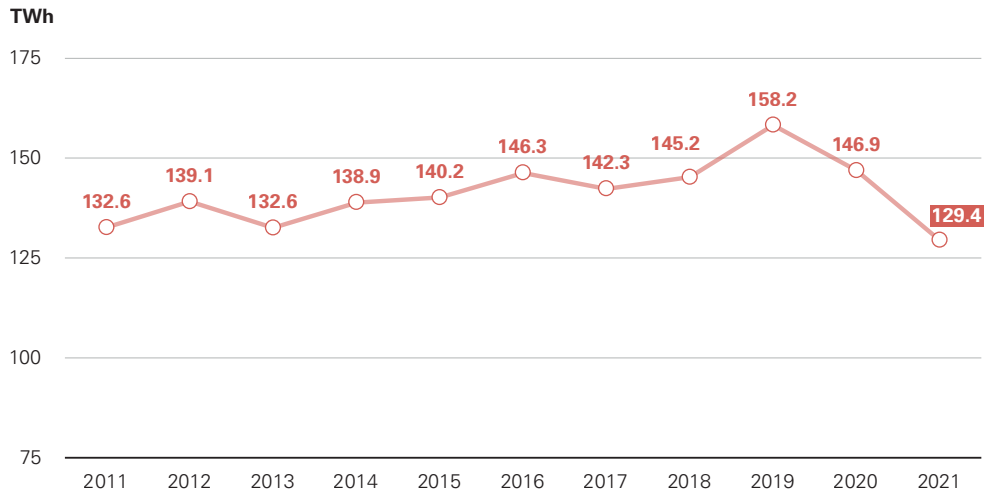


Fig. 2.3.6 Volumes trend

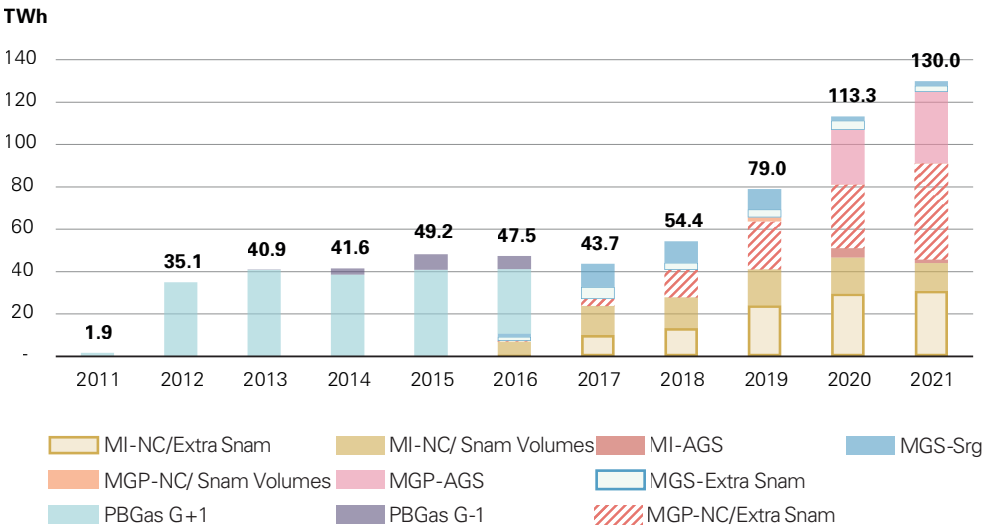
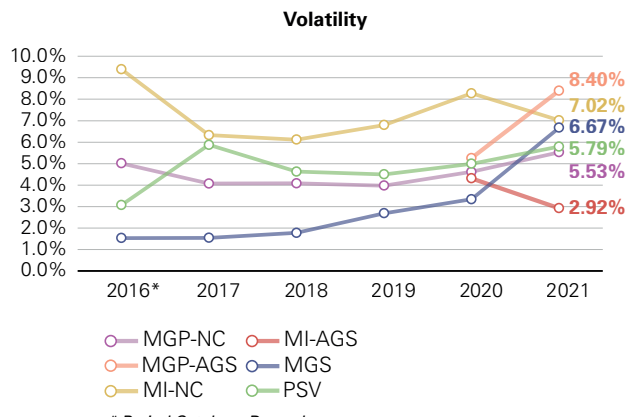
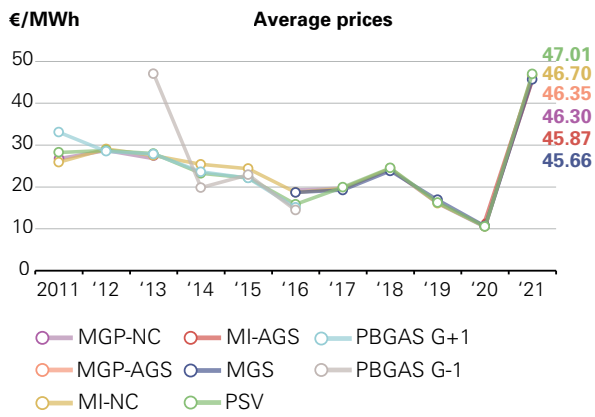


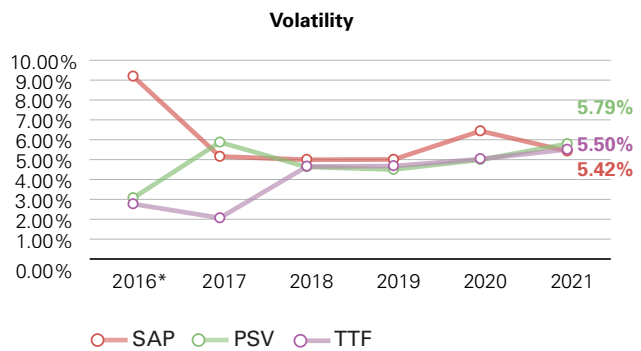
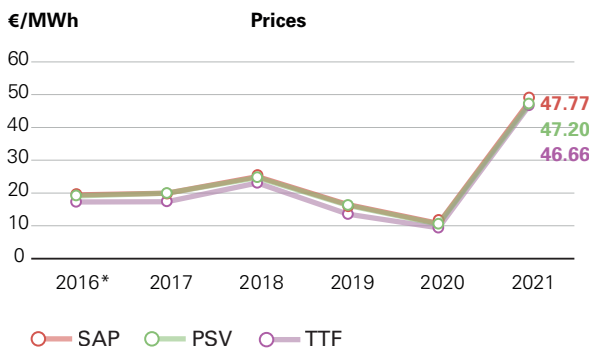
Fig. 2.3.7 MPGAS average prices and volatility



* Period October - December

Note: The volatility is calculated considering the session date and only the gas days in which the price on the PSV is available

Fig. 2.3.8 Average prices and volatility. SAP comparison with PSV and TTF



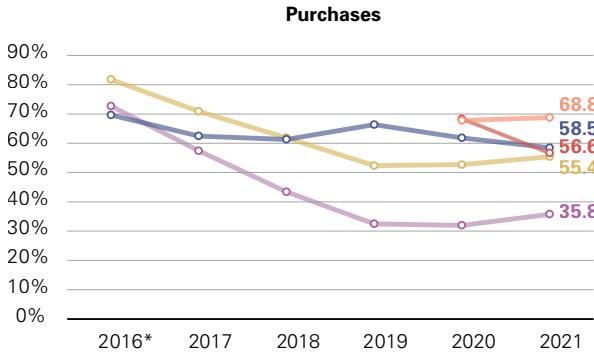
* Period October - December

Note: The average price is calculated considering the session date and only the gas days in which the price on the PSV is available

* Period October - December

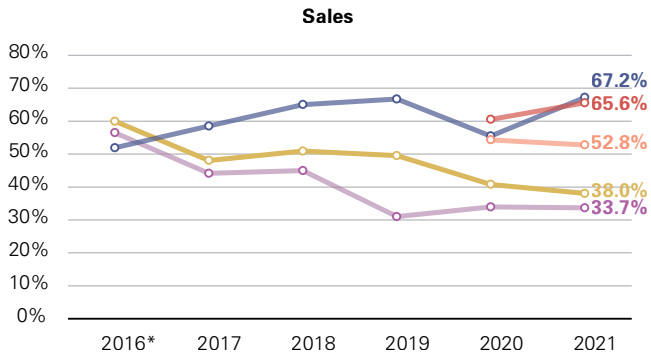
Note: The volatility is calculated considering the session date and only the gas days in which the price on the PSV is available

Fig. 2.3.9 Market shares



○ MGP-NC ○ MI-NC ○ MGS
○ MGP-AGS ○ MI-AGS

* Period October - December
Note: For the AGS sub-funds the indicator is calculated net of TSO exchanges



○ MGP-NC ○ MI-NC ○ MGS
○ MGP-AGS ○ MI-AGS

* Period October - December
Note: For the AGS sub-funds the indicator is calculated net of TSO exchanges

Tab. 2.3.1 Snam's operations in the MI-Gas. Year 2021

SHORT SYSTEM (Negative residual unbalancing)								
Unbalancing Classes MWh	Unbalancing MWh		Purchases MWh			Sales MWh		
	Average	N° cases	Average	% on unbalanc.	N° matchings	Average	% on unbalanc.	N° matchings
(0-15,000]	7,676	821	19,536	223%	7	3,798	46%	4
(15,000-31,400]	23,572	1,015	22,349	93%	25	15,468	90%	2
(31,400-60,000]	44,590	1,480	30,570	66%	106	19,766	50%	5
(60,000-100,000]	76,941	865	36,430	47%	95			
(100,000-200,000]	129,326	371	37,562	29%	34			
>200,000	270,018	70	64,116	23%	6			
Total	49,687	4,622	33,182	48%	273	13,178	55%	11

LONG SYSTEM (Positive residual unbalance)								
Unbalancing Classes MWh	Unbalancing MWh		Purchases MWh			Sales MWh		
	Average	N° cases	Average	% on unbalanc.	N° matchings	Average	% on unbalanc.	N° matchings
(0-15,000]	7,593	690	7,200	1110%	1	7,200	55%	1
(15,000-31,400]	23,284	689	22,709	94%	5	27,927	117%	8
(31,400-60,000]	45,043	1,056	40,392	92%	4	24,272	51%	47
(60,000-100,000]	76,488	667	8,724	13%	2	26,131	33%	49
(100,000-200,000]	130,963	383				26,874	21%	27
>200,000	252,533	73				29,486	11%	5
Total	52,968	3,558	24,980	69%	12	25,729	32%	137

Tab. 2.3.2 Trading structure on the MT-GAS. Year 2021

Products	Matching		Volumes		
	N.	MW	%	MWh	%
BoM	(19)	(3,096)		(49,944)	
Monthly	10	(85)	744	(10,464)	100.0%
Quarterly	(18)	(1,224)		(112,248)	
Semi-annual					
Annual					
Total	10	(122)	744	(14,784)	100.0%

() The values of the previous year are shown in brackets

2.4. ENVIRONMENTAL MARKETS

2.4.1. Energy Efficiency Certificates Market (TEE)

THE CONTEXT. In 2021, the energy efficiency incentive mechanism was affected by further regulatory changes, which helped to support participants in fulfilling the obligation and, in the context of a shortage of certificates in circulation, to ease the tensions observed on prices in the first part of the year.

In particular, with Italian Ministerial Decree of 21 May 2021, the MITE defined, inter alia, the national energy saving targets for the period 2021-2024, providing for a reduction in the number of TEEs to be achieved for the compulsory year 2020 and simultaneous postponement of the deadline to comply with the same (i.e. 16 July 2021).

Furthermore, again with reference to the compulsory year 2020, with resolution no. 547/2021/R/EFR, ARERA determined the “exceptional” tariff contribution to be paid to distributors subject to the obligation to such an extent as to reflect the upward trend in the prices of white certificates found on the organised market in the first quarter of 2021. In the current regulatory framework and on the basis of the estimates published by the GSE¹⁹, the gap between the demand for certificates necessary for the fulfilment of the obligation and the available supply seems to be cancelled for the compulsory year 2021, with the guarantee of coverage of the minimum required obligation (Tab. 2.4.1, Fig. 2.4.1).

VOLUMES AND LIQUIDITY. In light of the afore-mentioned dynamics, the reduced ability to issue energy efficiency certificates shown by the incentive mechanism over the last few years is directly reflected in the overall trading trend which, for the fourth consecutive decline, has fallen to its lowest level since 2011.

Negotiations recorded bilaterally fell to the lowest value since 2010, equal to 1.4 million toe (-24%), and, for the second consecutive year, they are also lower than exchanges on the organised market (1.9 million toe, -18%). As a result of these trends, the liquidity of the market rose to 58% (+2 p.p. on an annual basis and the second highest value ever), highlighting a greater propensity of participants to obtain supplies from the market. The intra-annual analysis of the volumes showed a concentration of overall trading in the May-July quarter (45%), corresponding to a high quantity of certificates issued (51% of the total issued in the whole of 2021) and close to maturity for the compulsory year 2020, extended to mid-July. This trend is more accentuated in the context of trading on the bilateral platform (55% against 37% of the market) (Fig. 2.4.2).

PRICES. The average price on the organised market was confirmed to be in slight growth on an annual basis (+2%), reaching 267.40 €/toe, a value only lower than the maximum reached in 2018 (-36 €/toe). Similar to what has been observed over the past years, the trend in prices recorded on the MTEE in 2021 must be read in the context of the regulatory interventions reported above which, in a scenario of severe scarcity, allowed them to be contained. At the beginning of the year, in fact, in a context of uncertainty caused by the significant unbalance between supply and demand of certificates and the difficulties in finding the certificates necessary to achieve the obligations, market prices rose to reach a monthly peak of 290 €/toe in March, only to reverse the trend and stabilise around 260 €/toe, in the presence of the measures they, inter alia, reduced the obligations for the current year, extending the latter to the middle of July.

¹⁹ GSE, White Certificates Annual Report 2020, p. 48.

The average price recorded on the bilateral platform also slightly increased (243 €/toe, +1%), which widened the annual spread with the corresponding market level at 24 €/toe, with a peak of 54 €/toe in January, when the bilateral price fell close to 210 €/toe. However, this differential was reduced to only 5 €/toe considering only the bilateral transactions recorded at a price higher than 1 €/toe, representing a share equal to 92% of the total recorded on the platform, one of the highest ever. Regarding volatility, the index remained very low and equal to 1% on the MTEE, while confirming itself high and equal to 20% for registrations made at strictly positive prices on the bilateral platform (Fig. 2.4.3, Fig. 2.4.4, Fig. 2.4.5).

MARKET CONCENTRATION. The structure underlying the incentive mechanism, characterised by few obliged buyers compared to the number of sellers, including ESCo²⁰, was reflected in the analysis of the market competitiveness indicators, which were confirmed as being higher in purchase and lower in sale. In 2021, in parallel with the significant contraction in trade and a reduced presence on the market of participants, there was substantial stability of the competitive buying rates and a slight improvement on the sales side, where they fell to historical lows for the CR10 (28.4%) (Fig. 2.4.6).

2.4.2. Guarantees of Origin Market (GO)

VOLUMES AND LIQUIDITY. In a year characterised by the recovery of electricity demand (+5.6%) and by renewable production almost in line with last year (+1%)²¹, with potential bullish effects on the demand for guarantees and bearish effects on the supply, the Guarantees of Origin (GO) mechanism returned to show signs of growth on a trend basis, both in terms of prices and volumes, the latter totalling 93.2 TWh (including intra-group contracts, +9% on 2020).

The increase appears to be driven by exchanges on the Bilateral Platform of Guarantees of Origin (PBGO), which was confirmed as the most widely used trading method, consolidating the multi-year uptrend and rising to record levels of 67.1 TWh (+11%), equal to 76% of the total procured (net of intra-group exchanges). Instead, there was a decrease in trading both on the Guarantees of Origin Market (MGO), where volumes fell to 1.3 TWh (-35% on 2020), minimum of the last four years, and on GSE auctions, whose allocations fell to 20.3 TWh (-1%), equal to 22% of the total contracted (-3 p.p. compared to 2020). In 2021, the structure of trade by year of production²² showed a predominant share of volumes traded relating to the previous production year, concentrated in the January - March quarter, according to a trend that is now well established on the PBGO (74% of registrations), but which included the MGO for the first time (53% of contracted volumes).

The composition of exchanges by type of renewable source for the certificates referring to the year of production 2021 showed greater liquidity on the PBGO for the certificates referring to hydroelectric production (44%), followed by wind (28%), while on MGO the position of the Other type was consolidated (59%, +1 p.p.) and the weight of the Solar category increased (12%, +8 p.p. compared to the previous production period). Finally, in the GSE assignment auctions, the distribution by type is aligned with that of the last two years, with the Solar category which is confirmed as the most relevant one (41%) (Fig. 2.4.7, Fig. 2.4.8, Fig. 2.4.11).

²⁰ Energy Service Company (ESCO) means a company capable of providing technical, commercial and financial services necessary for the implementation of energy efficiency interventions.

²¹ TERNA, Monthly Report on the Electricity System - December 2021.

²² Year of production means the one which runs from April to March of the following year. For the production year 2021 the data were calculated up to 31/12/2021.



PRICES. Opposite dynamics can be found on the prices observed on the three trading methods both on an annual and monthly basis. With reference to the year 2021, the average price fell on the bilateral platform (0.51 €/MWh, -23%), while increasing both on the MGO, where it reversed the downward trend of the last two years (0.34 €/MWh, +22%), and on the GSE auctions, returning to mark the highest level (0.64 €/MWh, +14%). Regarding, however, the infra-annual trend, higher prices were highlighted in the January-March quarter on the PBGO (0.58 €/MWh) and in the following months on the MGO (0.62 €/MWh), with the start of the new bargaining period, with a maximum of 1.20 €/MWh in September (Fig. 2.4.9, Fig. 2.4.10).

Tab. 2.4.1 Certificates needed to comply with the obligation

Year of obligation	Actual Obligations Total Distributors	Actual Obligations Electricity Distributors	Actual Obligations Gas Distributors	Cumulative total for fulfilment	Certificates issued since the launch of the mechanism	Delta Certificates issued-Obligation	Certificates issued January-May**	Certificates available at the end of the year (GSE net account)
	(Mtep/a)	(Mtep/a)	(Mtep/a)	(Mtep)	(Mtep)	(Mtep)	(Mtep)	(Mtep)
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	67.80*	-4.78	1.04*	2.38

* The data is calculated on the basis of the estimate of the number of available certificates published by the GSE in the White Certificates Annual Report 2021.

**Number of certificates issued between January and May of each year of obligation.

Fig. 2.4.1 Available certificates and obligations

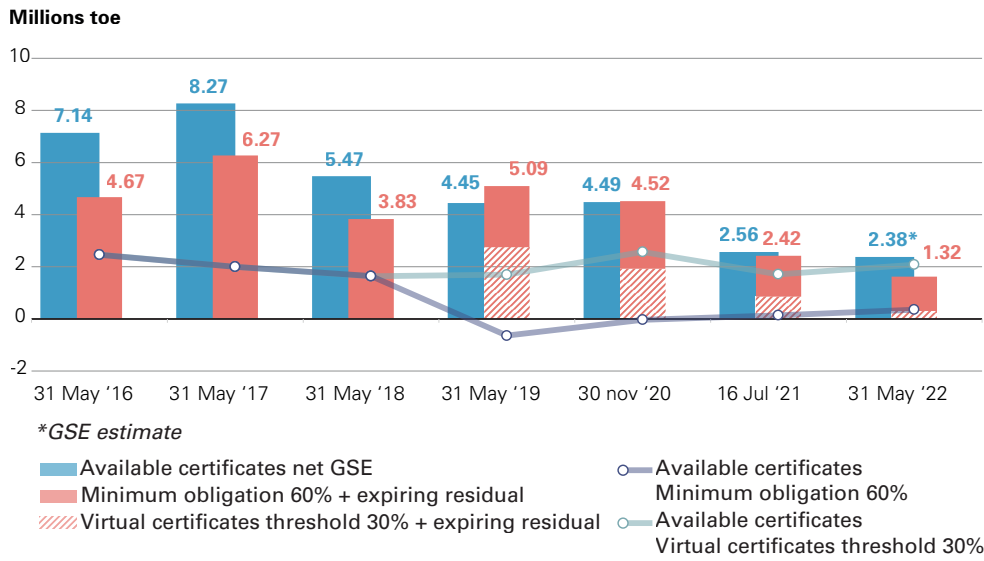


Fig. 2.4.2 Volumes traded - TEE

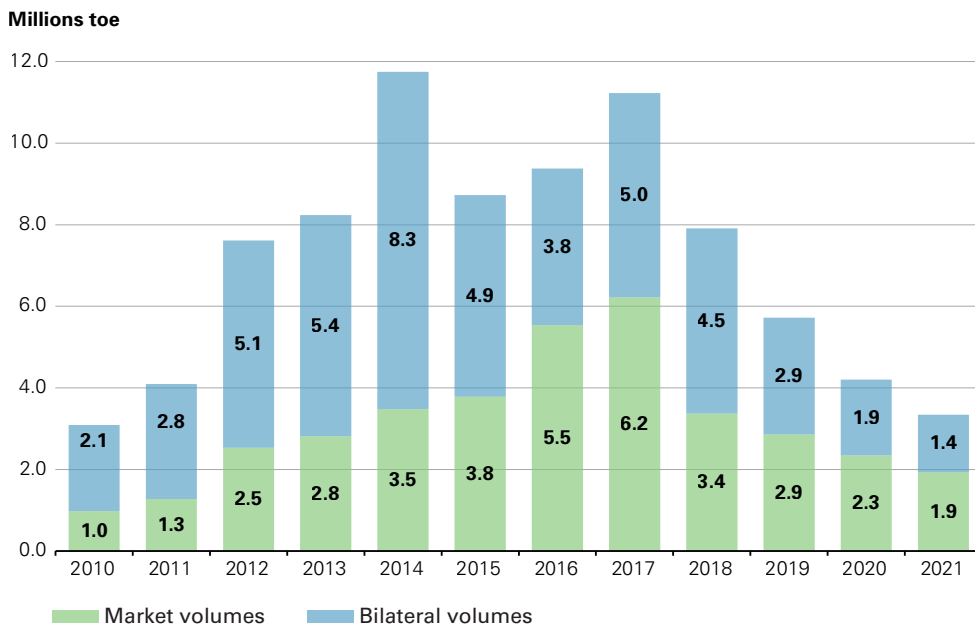


Fig. 2.4.3 TEE prices. Annual average

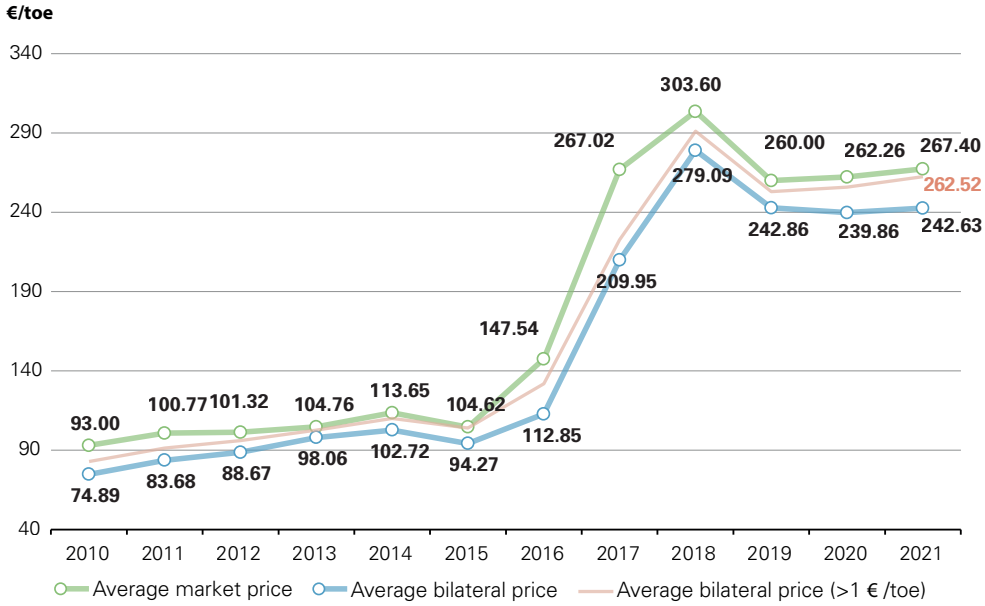


Fig. 2.4.4 MTEE price session trend. Year 2021

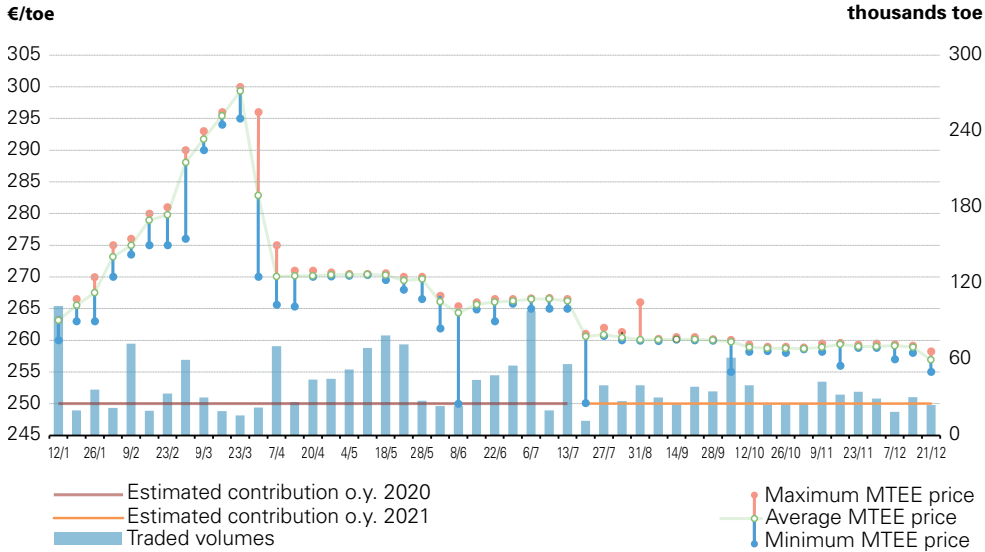


Fig. 2.4.5 Price volatility - TEE

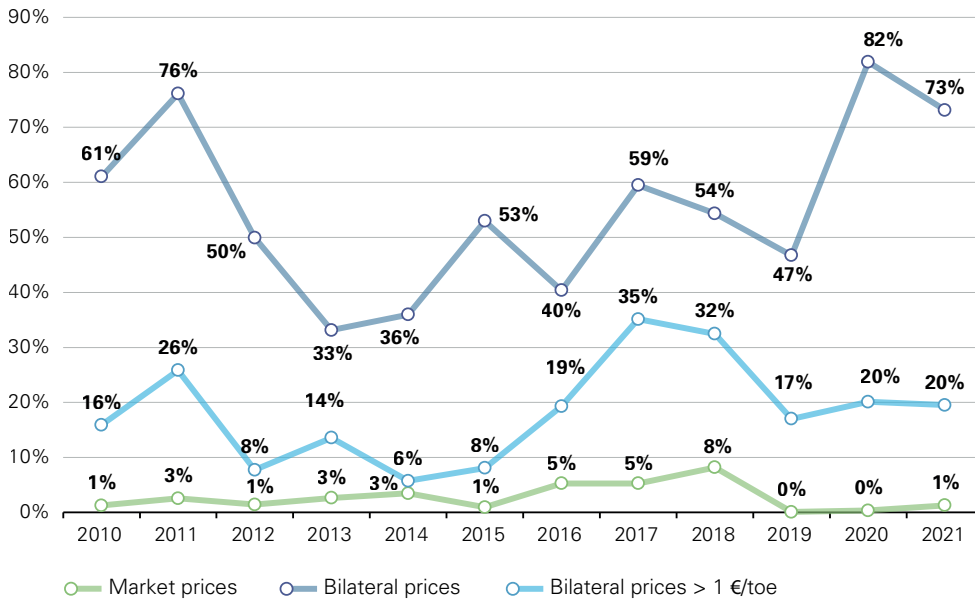


Fig. 2.4.6 Market concentration

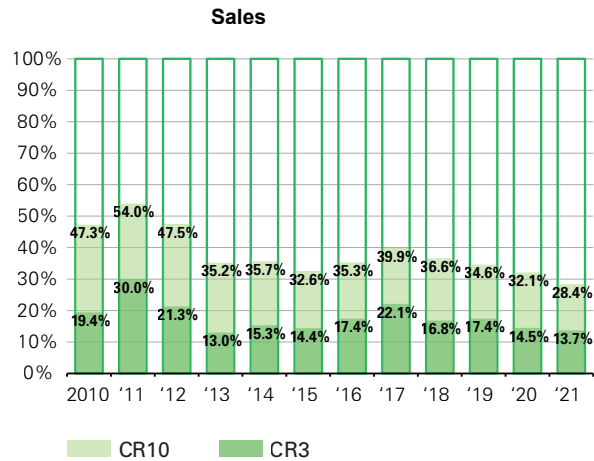
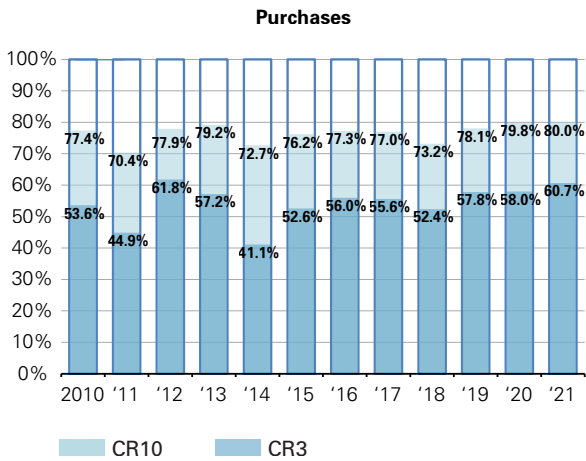


Fig. 2.4.7 GO - Volumes traded

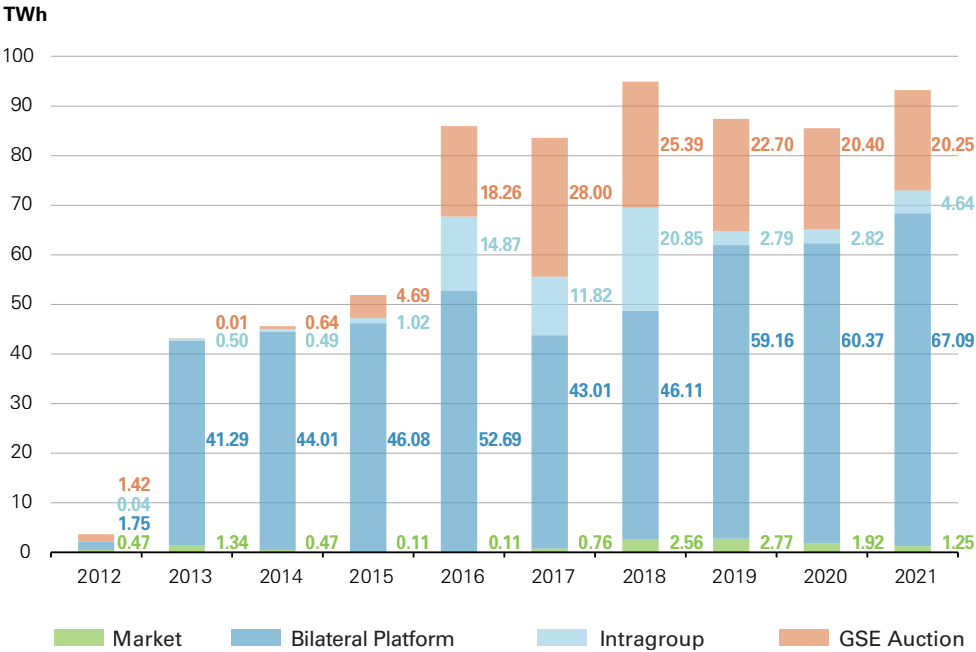


Fig. 2.4.8 Structure of volumes traded by year of production

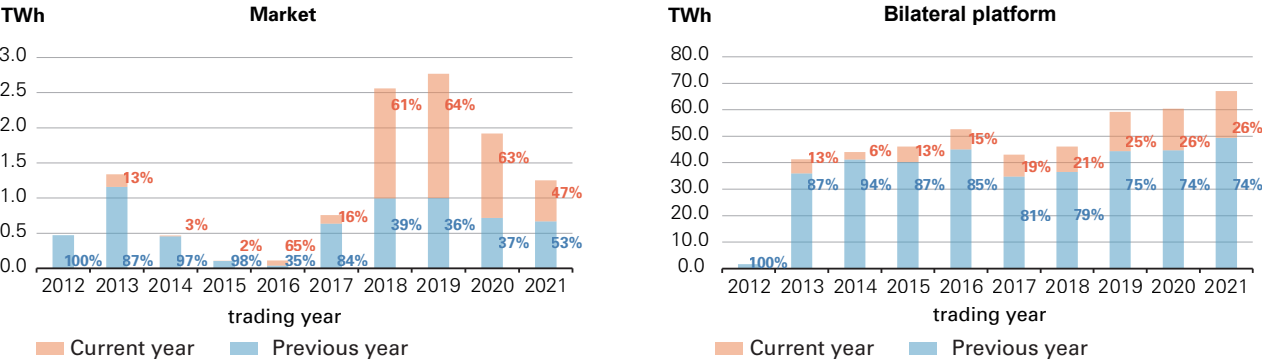


Fig. 2.4.9 GO prices. Annual average

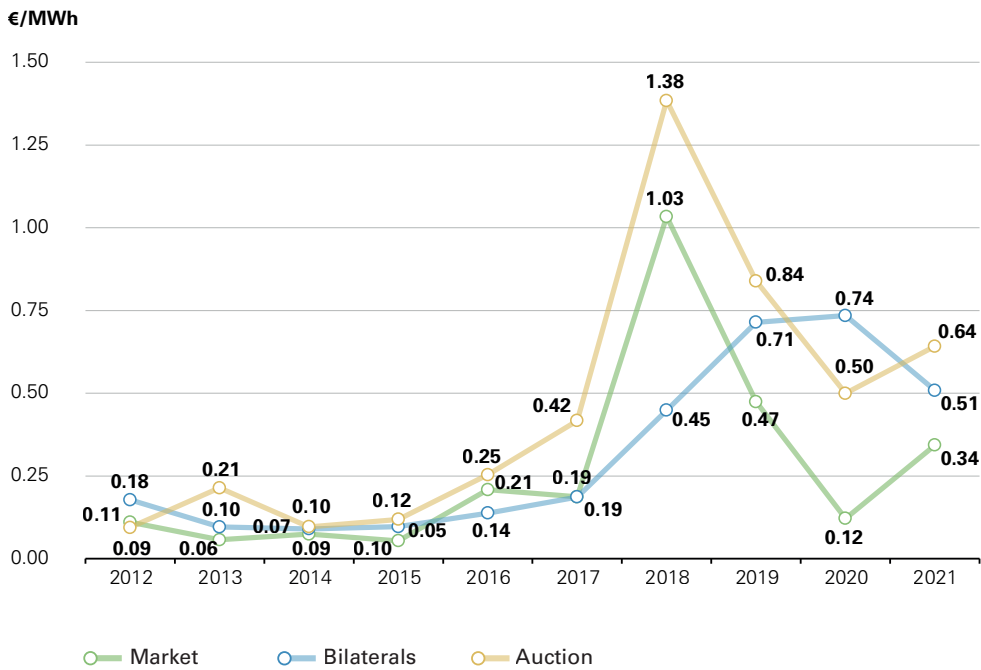
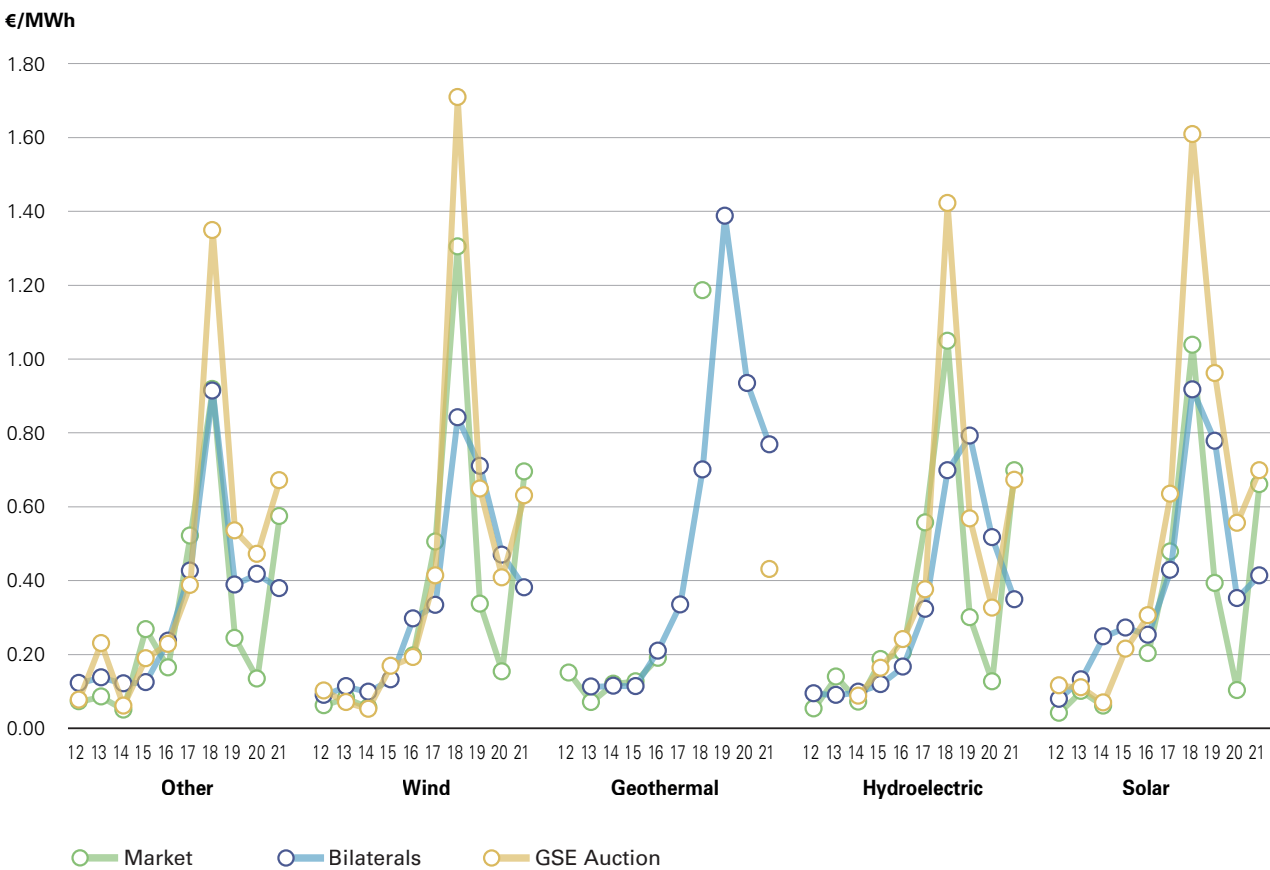
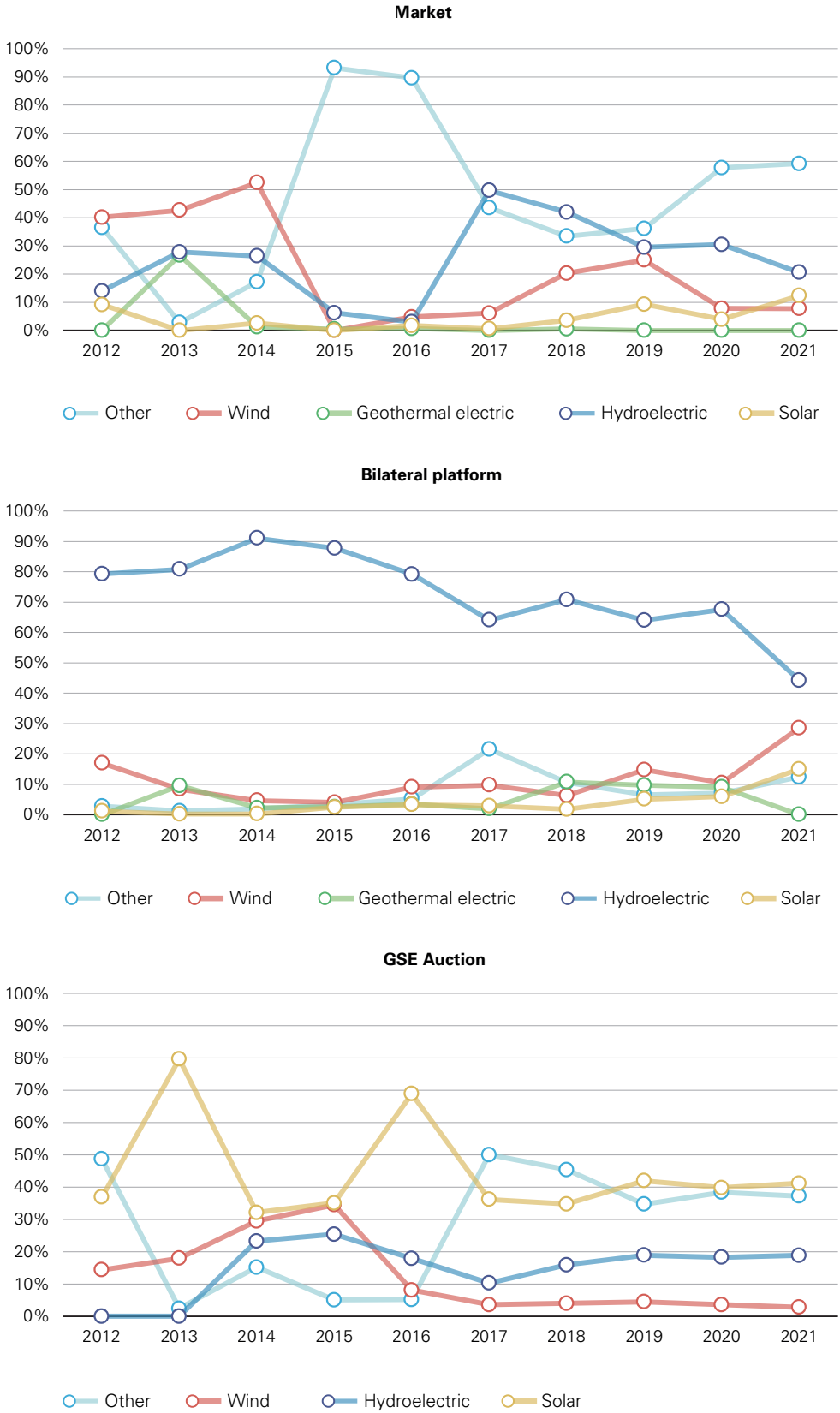


Fig. 2.4.10 GO prices by type and year of production²³



²³ The data relating to the year of production 2021 are calculated as of 31/12/2021

Fig. 2.4.11 Structure of volumes traded. Year of production²⁴

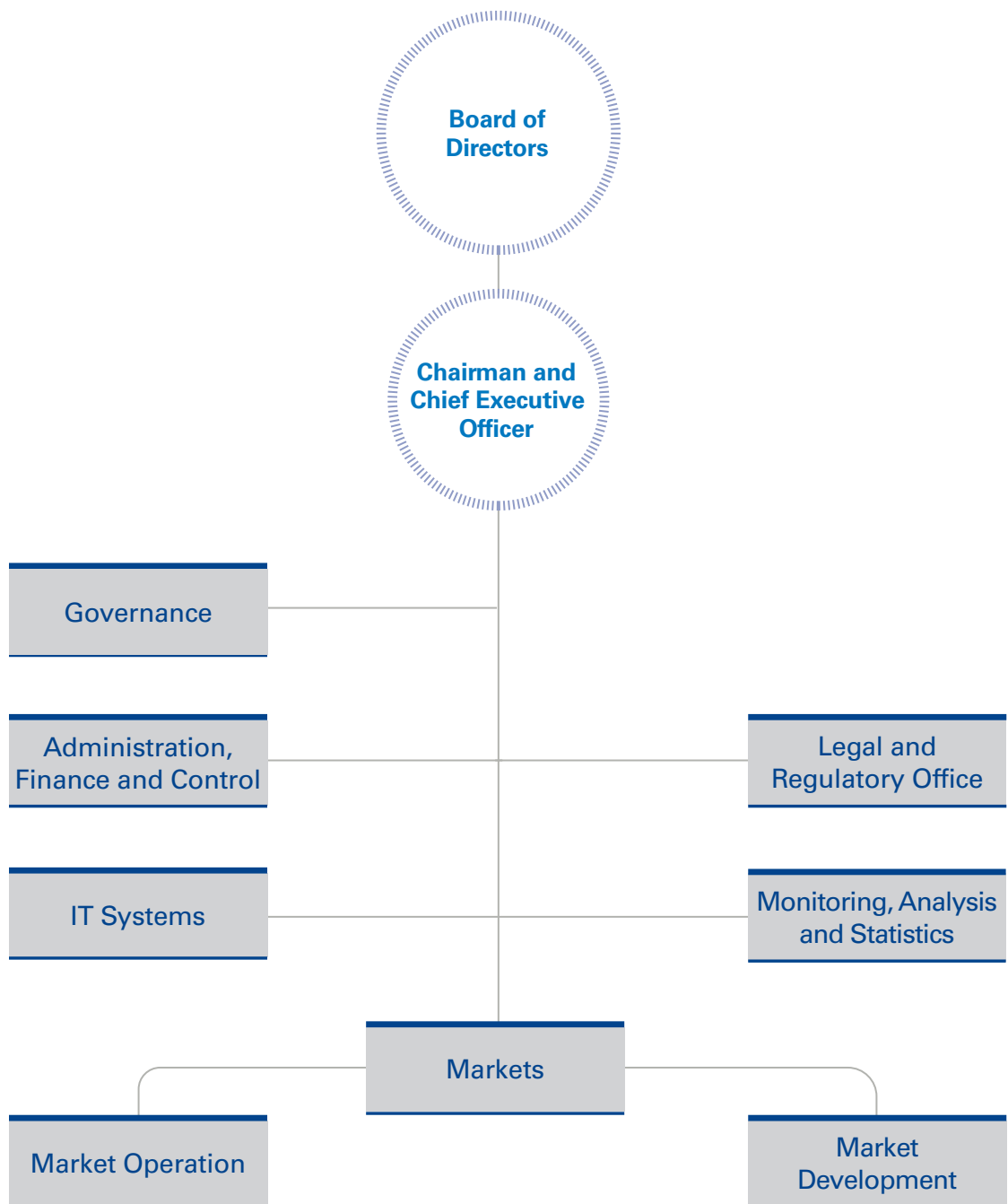


²⁴ The data are calculated as of 31/12/2021.

Appendix 1

GME
organisational
structure





Appendix 2

Market rules



Market rules

	ELECTRICITY MARKET			GAS MARKET			
	MPE	MTE	PCE	MGP-GAS MI-GAS	MGS	MPL	MT-GAS
Participation	Voluntary on the MGP, MI and MPEG Mandatory on the MSD	Voluntary	Voluntary	Voluntary	Voluntary	Voluntary	Voluntary
Requirements for admission to markets and for participation in tradings (*)	Ownership of an energy account to deliver a net position required	Ownership of an energy account to operate	Only dispatching users and persons authorised by them	Need to be a PSV user to operate	Need to be a PSV and storage services user to operate	Need to be a PSV user and to be entitled to submit offers at point of offers of the transport network to operate	Need to be a PSV user to operate
Traded product	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 profile)	Annual, Quarterly, Monthly (with baseload profile and peakload)	OTC Contracts	Daily	Daily	Daily	BoM, Monthly, Quarterly, Half-yearly, Annuals (both thermal and calendar)
Trading methods	Auction on MGP, MI and MSD Continuous trading on XBID, MPEG	Continuous trading	Bilateral trading	Continuous trading/Auct (AGS)	Auction	Auction	Continuous trading
Price rule	Zonal marginal price on the MGP and MI Pay as bid on XBID, MPEG and MSD	Pay as bid	N/A	Pay as bid/ Marginal price (AGS)	Marginal price	Marginal price	Pay as bid
Guarantees	Bank guarantee and/or cash deposit		Bank guarantee. Cash deposit only necessary and urgent cases	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit	Bank guarantee and/or cash deposit
Central counterparty	GME on MGP, MI and MPEG Terna on the MSD	GME	GME (only for CCT)	GME	GME (from 1st April 2017)	GME (from 1st April 2017)	GME
Payments	W+1 (from 1st December 2016) for MGP and MI M+2 per MPEG	M+2	W+1 (from 1st 2016)	W+1 for the transactions (1st September 2016) M+3 for the closure of the non-delivered positions	W+1 for the transactions M+3 for the closure of non-delivered positions	W+1 for the transactions M+3 for the closure of non-delivered positions	W+1 for the transactions (from the 1st September 2016) M+3 for the closure of non-delivered positions

(*) The requirements for participation in the markets are indicated in the rules and regulations of the each market.

(**) Valid from September 2021.

PGAS			MTEE	MGO	MCIC	PAR
Import	Virtual Storage	Royalties				
Mandatory (sales side)	Mandatory (sales side)	Mandatory (sales side)	Voluntary	Voluntary	Voluntary	Voluntary
PSV users subject to the obligation to bid for import shares	PSV users participating in the virtual storage service	PSV users subject to the obligation to bid for royalties	Need to register an account in the TEE Register for trading on the MTEE	Need to register an account in the GOs Register for trading on the MGO	Need to register an account in the CIC Register	Users authorised at the regasification terminal
Monthly, Yearly Thermal	Monthly, Half-yearly	Monthly	Single trading book for unified type (1 toe)	Certificate for source type (1MWh)	Certificate for source type (1 CIC)	Yearly and multi-year capacity Capacity during thermal year; Thermal year residual capacity; Regasification capacity that can no longer be assigned to auction
Continuous Trading	Continuous Trading	Auction	Continuous Trading	Continuous Trading	Continuous Trading	Auction/FCFS
Pay as bid	Pay as bid	Marginal Price	Pay as bid	Pay as bid	Pay as bid	Pay as bid/Marginal Price
Defined by each selling participant	Defined by each selling participant	Defined by each selling participant	Cash deposit to cover total purchases	Cash deposit to cover total purchases	Cash deposit to cover total purchases	NA
N/A Invoicing and payments between participants	N/A Invoicing and payments between participants	N/A Invoicing and payments between participants	GME	GME	GME	Regasification terminal
Deadline defined by each selling participant	Deadline defined by each selling participant	Deadline defined by each selling participant	D+3	D+3	D+3	Regasification terminal

Appendix 3

Statistical Data



Table 1 – Traded volumes

TWh	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Var. 21/20
ELECTRICITY MARKETS												
MGP	311.49	298.67	289.15	281.98	287.13	289.70	292.20	295.56	295.83	280.18	290.40	+3.9%
Exchange	180.35	178.66	206.90	185.85	194.59	202.82	210.92	212.93	213.26	209.83	221.28	+5.7%
Bilateral	131.15	120.00	82.25	96.13	92.54	86.88	81.28	82.63	82.56	70.35	69.12	-1.5%
MI	21.87	25.13	23.34	22.79	24.92	28.01	25.35	25.38	26.37	24.91	26.04	+4.8%
MI-A1											4,01	-
MI-A2											1,47	-
MI-A3											0,67	-
XBID											0,73	-
MI1	14.47	15.99	12.80	12.23	12.91	15.04	13.81	13.35	12.73	11.39	9.19	-
MI2	5.38	6.21	6.07	6.47	6.15	6.97	5.45	4.53	4.44	4.58	3.10	-
MI3	1.22	1.72	2.00	2.01	2.39	2.50	2.38	3.34	4.19	3.65	2.72	-
MI4	0.80	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	-
MTE	33.44	54.96	41.10	32.27	5.09	1.07	1.36	1.19	1.64	0.77	0.02	-97.1%
Exchange	31.67	30.36	8.00	18.40	5.09	1.07	1.36	1.19	1.64	0.77	0.02	-97.1%
OTC clearing	1.77	24.60	33.10	13.87	-	-	-	-	-	-	-	-
MPEG						0.00	3.93	3.16	0.70	0.72	0.29	-59.7%
PCE*	290.82	307.61	325.50	345.72	354.47	342.14	302.83	311.57	291.74	265.14	232.22	-12.4%
Registrations	290.82	307.61	325.50	345.72	354.47	342.14	302.83	0.00				
GAS MARKETS												
MGAS	0.16	0.17	0.02	0.10	1.01	10.69	43.92	55.16	82.17	113.79	129.99	+14.6%
MGP-CT	0.15	0.14	0.01	0.00	0.00	0.33	3.28	13.01	24.56	30.08	45.40	+51.3%
MGP-AGS										25.72	33.79	+31.8%
MI-CT	0.01	0.04	0.00	0.10	1.01	7.09	23.83	27.86	41.05	46.70	44.09	-5.3%
MI-AGS										4.36	1.61	-63.1%
MGS						3.27	16.63	13.50	13.37	6.45	5.08	-21.0%
MPL							-	-	-	-	-	-
MTGAS							0.19	0.79	3.19	0.48	0.02	-95.3%
PB-GAS	1.71	34.93	40.88	41.52	48.19	36.79						
G+1 Segment	1.71	34.93	40.83	38.58	40.86	30.57						
G-1 Segment			0.05	2.94	7.33	6.22						
P-GAS	2.91	2.87	0.62				1.95	2.43	0.44		2.22	-
Import	-	-	-	-	-	-	-	-	-	-	-	-
Ex Leg. Dec. 130/10												
Royalties	2.91	2.87	0.62	-	-	-	1.95	2.43	0.44	-	2.22	-
ENVIRONMENTAL MARKETS												
CV	31.09	32.33	44.81	43.05	36.78	9.23						
Exchange	4.13	3.81	7.57	8.20	6.95	1.26						
Bilateral	26.97	28.52	37.25	34.85	29.84	7.98						
TEE	21.91	40.73	44.04	62.88	46.67	50.15	60.04	42.30	30.60	22.48	17.87	-20.5%
Exchange	6.83	13.56	15.06	18.66	20.21	29.64	33.26	18.03	15.27	12.55	10.32	-17.7%
Bilateral	15.08	27.17	28.98	44.22	26.45	20.52	26.78	24.27	15.33	9.93	7.55	-24.0%
GO		2.22	42.63	44.48	46.18	52.80	43.77	48.67	61.93	62.29	68.35	+9.7%
Exchange		0.47	1.34	0.47	0.11	0.11	0.76	2.56	2.77	1.92	1.25	-34.7%
Bilateral		1.75	41.29	44.01	46.08	52.69	43.01	46.11	59.16	60.37	67.09	+11.1%
MCIC**										421	-	-

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

**The data is expressed in number of CICs.

Table 2 - Registered participants

No. of registered participants *	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Var. 21/20
ELECTRICITY												
IPEX	192	200	223	254	264	245	258	269	282	280	278	-2
PCE	208	259	287	317	321	321	331	332	350	345	352	+7
GAS MARKETS												
MGAS	33	42	66	71	88	158	179	186	201	207	227	+20
PB-GAS	60	65	74	86	96	107						
P-GAS	61	72	77	78	80	86	85	85	80	80	81	+1
ENVIRONMENTAL MARKETS												
MCV**	675	745	852	901	908	911						
PBCV**	1,082	1,177	1,381	1,466	1,509	1,509						
MTEE	379	447	588	838	1,055	1,281	1,499	1,558	1,623	1,673	1,730	+57
TEE Register	513	635	866	1,196	1,469	1,775	2,155	2,307	2,409	2,529	2,643	+114
MGO		180	262	291	299	325	396	469	651	709	739	+30
PBGO		219	324	359	374	405	509	713	1,022	1,225	1,400	+175
MCIC										19	26	+7

* The number of registered participants refers to the figure calculated as at 31/12 of each year.

** The number of registered participants for 2016 refers to the figure calculated as at 30/06.

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