ENERGY OUTLOOK

Year VII n°21 - November 2022

Italian Power Market and CO2 Outlook

The gas market dynamics are expected to remain the key driver for the power market in the last months of 2022 and in 2023, with the Italian electricity prices seen as remaining under upward pressure till the beginning of 2024.

European regulatory measures to stabilize the electricity market and the Italian coal maximization initiative are expected to help stabilizing the market over the next winter season. Nevertheless, with more than 35% of demand reliant on gas-fired generation, Italy remains heavily exposed to gas supply emergencies and the introduction of further demand reductions measures cannot be ruled out yet. The persistent scarcity of hydro generation and limited availability of French nuclear fleet add to the short-term picture, increasing the Italian system vulnerability in the event of any further reduction in supplies both of gas and generation sources, or import.

Since the beginning of the year, the EUA demand expectations reduced on the back of a weakening economy and lower fossil fuels consumption. The CO2 price forecast have been consequently revised lower. However, since the implementation of the “Fit for 55” reforms to the ETS is now set to proceed as scheduled, the underlying trend is in fact assumed to remain positive both in the Reference and in the High Scenario.

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FRAME OF REFERENCE AND METHODOLOGY

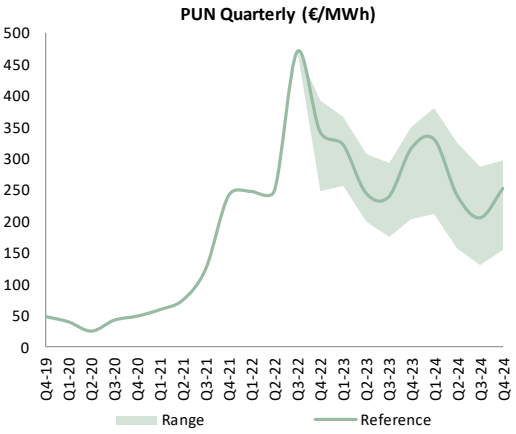
REF-E Energy Outlooks are elaborated by MBS Consulting experts on the base of proprietary suites and market knowledge. Econometric and structural models, as well as our expert sensitiveness, detailed knowledge of regulation, and accurate monitoring of market outcomes underlie our elaborations.

Gas and electricity forecasts take into account the diverse geopolitical and economic hypothesis deriving from the potential war duration and outcome. The European Union and each single nation reaction to the disruption generated from the deterioration of both diplomatic and commercial relations with Russia are seen as key determinants of the future equilibrium of the energy markets.

In this perspective, we defined three scenarios. The **Worst Case** is characterized by permanently high prices amid a long lasting conflict which would lead to import-export bans and economic retaliation, trade flows interruption, commodities supply sharp reduction, negative o zero economic growth and the energy transition process failure. In the **Reference scenario**, prices will remain high in the short-term amid diplomatic and commercial tensions, while the energy transition process will continue and dependence on Russian commodities will be reduced. Gas and other fossil fuels supplies from alternative routes will increase initially limiting prices upward potential and successively leading to a normalization path. The economic growth suffers a contraction over the next two years, followed by recovery. The **Best Case** scenario would materialize in the event of favorable weather conditions and a fast energy transition, supported by low inflation and a strong economic recovery. In this case demand would keep decreasing, initially limiting prices upside potential and then fuelling a downward acceleration.

ITALIAN POWER MARKET OUTLOOK

In our Reference scenario the gas markets dynamics are expected to maintain power prices under pressure until 2024, forcing the PUN near the 329 €/MWh threshold in 2022 and above the 250 €/MWh threshold over the subsequent year. In the Worst Case Scenario, permanently high prices, a long-lasting conflict, and logistic blocks, would stabilize the PUN above 300 €/MWh in years 2022 and 2023, with a slow downward movement just beginning in year 2024, despite economic contraction and high inflation seen as weighing on consumptions in 2023.



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Winter Cuts to Enhance the Slowdown of Italian Demand

A net deceleration of electricity consumption was registered in August 2022 (3% lower than the previous year in August). September 2022 figures consolidated further the downward path with a year-on-year reduction of demand reaching 4%. A weak GDP outlook (see Macroeconomic Outlook) and demand curtailment measures appointed by the latest European provision to address high energy prices[1] are expected to weigh on electricity demand patterns over the upcoming winter months.

While the overall consumption in 2022 is expected to remain close to 317 TWh, a significant drop should occur in 2023, when electricity withdrawals are projected to decline in all scenarios. The degree of reduction will depend on climate and economic conditions: in the Worst Case scenario a negative GDP growth leads to a sharp reduction of demand down to 305 TWh, while in the Best Case scenario favourable macroeconomic trends would partially compensate for the winter demand curtailment effect and power consumption would stabilize at 310 TWh; in the Reference Case the expected GDP stall (nearly 0% growth rate) leads 2023 demand to just slightly above 308 TWh. In 2024 despite high energy prices still weighing on consumptions, the Reference and Best Case scenarios demand would be back above 2021 levels, reaching 320 TWh. Only in the Worst Case scenario a persistently weak macroeconomic outlook would reverberate on 2024 consumptions, which would grow slower than in the other two scenarios, reaching just above 310 TWh.

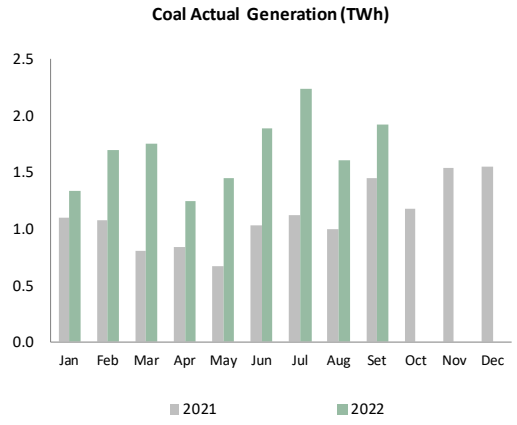
Coal Power Generation Partially Compensates the Russian Gas Supplies Reduction

The national program for the maximization of the coal-fired generation production[2] entered into force last September. The relevant units (maximum power higher than 300 MW) involved in the program include Fusina, Monfalcone, Fiumesanto, Sulcis, Torrevaldaliga Nord, Brindisi Sud and San Filippo del Mela units. Those plants are qualified as ordinary essential units with the possibility to require fixed cost integration according to a computation methodology set by the ARERA.

The maximization program is expected to cover the coming winter months, and it is unlikely to be extend beyond 2023. Owners of some production sites, such as Monfalcone and Fusina, are starting their upgrading projects, having committed under the Capacity Market program to procure gas fired capacity from the next two years. Coal-fired power plant owners are requested to phase-out within 2025 by the Integrated National Energy and Climate Plan (PNIEC). In view of the above obligation, qualified personnel is already reduced and some logistic and procurement channels dismissed. As a consequence, running these plants at maximum capacities for long periods would impose extra costs or a review of the phase

[1] EU Regulation for High Energy Prices (2022/1854).
[2] *Delibera 13 settembre 2022 430/2022/R/eel.*

out programmes. An additional constraint is represented by the emission limits values reported in the Integrated Environmental Authorisation (IEA), according to the European legislation on integrated pollution prevention and reduction, which were not reviewed following the maximisation programme.



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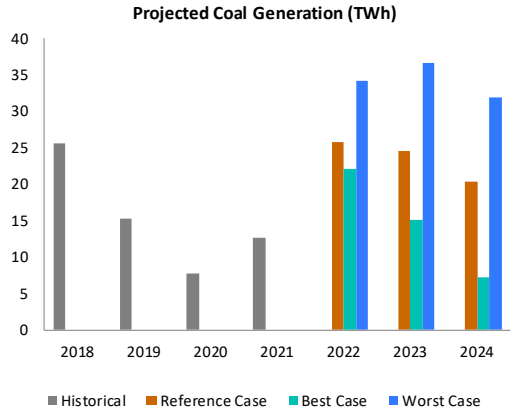

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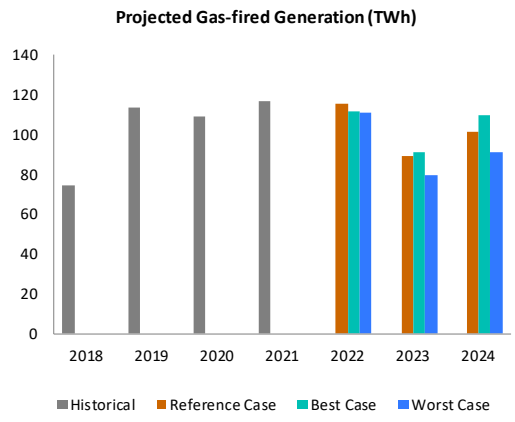
Favourable market conditions boosted the coal fleet production over the past nine months and supported a year on year 67% increase in coal production, which reached 15 TWh.

Coal-fired generation is expected to remain competitive and yearly production to stay above the 2021 levels (13 TWh) over the 2022-2023 period, ranging between 15 and 35 TWh in the different scenarios. In 2024 switching conditions are assumed to improve with the CO2 moving on an upward path and coal power plants should reduce their power generation progressively.

In the Worst Case Scenario, the gas prices stabilize above 100 €/MWh, **this would improve the economic conditions for the Italian coal-fired generation further,** bringing it in the 30-35 TWh range through the next triennium, corresponding to a 50-60% average load factor. Under this circumstances, fuels-led high inflationary pressure would also weigh on the on investments, **compromising** the **renewables growth**: between 2022 and 2024, the sum of solar and wind capacity increase could be limited to 1.6 GW, while the overall renewable production (hydropower not included) would remain aligned to year 2021 levels at around 70 TWh.

Only in the event of very mild winter temperatures keeping gas demand below average and pushing prices lower the **Best Case Scenario** would take shape. In this event, as renewable production gains ground, gas share totals 111 TWh in year 2022 and reduce further to 90-110 TWh range in 2023 and 2024. The energy transition would in fact be favoured by the economic recovery and regulation, with focus on the need to promptly reduce the level of energy dependence at European level. Solar and wind capacity may increase by 5.7 GW and 3 GW respectively by year 2024 end, while renewable production (hydropower not included) hit 90 TWh. Coal-fired production phase out would be favoured by gas-fired generation returning competitive and would stall below 15 TWh after 2023.

Switching conditions affect net import levels too, with energy flows from the Northern frontiers expected to remain at highest levels this year and in the next future as the Italian thermoelectric fleet is challenged by the continental Europe nuclear and coal-fired generation. Thus, net import levels are expected to stabilize around 40 TWh in each of the next three years both in the Reference and Worst Case scenarios.



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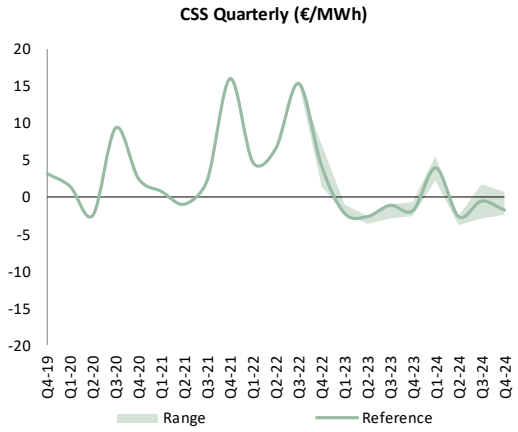
Gas-fired Generation Tightens as Demand Squeezes



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Despite the ongoing gas supply crisis, the low hydro availability keeps the overall 2022 gas-fired fleet production above 115 TWh. In the Reference case, gas demand for power production is expected to reduce sharply in 2023 and 2024 though: final demand contraction and hydro production recovery to average levels are only partially compensated by new - high efficiency - capacity joining the market (4 GW). The Clean Spark Spread (CSS) of 53%-efficient CCGTs worsen consequently. After the positive trend witnessed over the last six quarters, baseload margins should decrease and remain negative, made exception for the Q1 2024 high seasonal gas market prices and demand recovery will support the combined cycles' generation. The limited market share will lead the baseload CSS values to fluctuate between -3 and 4 €/MWh in our *Reference* scenario. Only favourable coal-to-gas switching conditions, led by a fast normalization of the gas market and a contextual upward move of the CO2 price, would support gas-fired generation, leading the baseload CSS of 53%-efficiency CCGTs to swing between -3 and 6 €/MWh over the different quarters in the *Best Case* scenario. Natural gas scarcity and high prices would translate into coal-fired generation regaining market shares instead, with the baseload CSS of 53%-efficiency CCGTs stabilizing in the lower end with values between -4 and 3 €/MWh level in the *Worst Case* scenario.

Winter 22-23: a Subtle Equilibrium Between Demand Savings and Security of Supply

Concerns on the electricity system adequacy in Europe arise ahead of the winter season, with hydro scarcity, Germany and Poland being affected by coal and lignite supplies constraints, reduced nuclear availability across Europe, and the switching to direct electric heating adding to the overall gas supply shortage risks.

The preliminary insights of the ENTSO-E Winter Outlook[3] point to tight adequacy conditions in Europe. Same areas in France, Ireland and Southern Norway are seen as exposed to the greatest risks, as Loss of Load Expectation (LOLE) are higher than last winter.

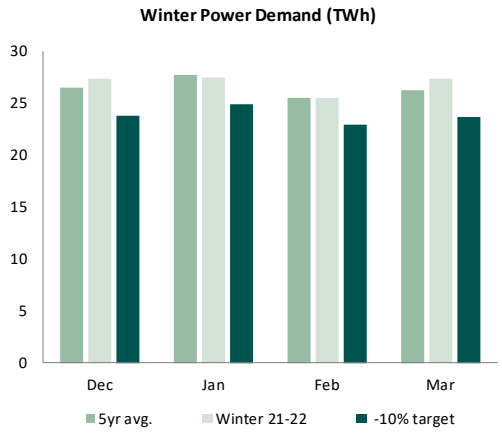
Still, according to the study, stress situations in many countries should be manageable through the timely preparation and application of adequate measures. The 10% electricity demand reduction required by the EU Regulation should in fact relieve the main criticalities and mitigate the risks.

Despite Italy being one of the most gas-dependent systems in Europe (with more than 30% of demand covered by gas-fuelled power plants), no criticalities emerged from the ENTSO analysis, with LOLE indicators estimated to stay within the safe value interval even before the 10% required curtailment.

[3] Insights and key observations on the European electricity system criticalities for winter 2022-2023 were shared by ENTSO-E in the late October 2022 (Early insights of Winter Outlook Report 2022-2023) but the full report with deeper details of the study is expected in the beginning of December 2022.

According to MBS analysis, an implementation of the 10% demand reduction requirement would have a significant impact on the adequacy of the Italian system and gas demand over the winter season.

All our alternative scenario cases (Reference, Best and Worst) incorporate the actual implementation of the Regulation 2022/1854 provisions for electricity consumption reduction. This establishes a target path for electricity consumption, that must lead to a 10% reduction between Dec-22 and Mar-23 compared to the last 5 years average consumption in the same period. Demand between Dec-22 and Mar-23 must be consequently close to 95 TWh, 12% lower than the same period last year.



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Other-than-gas Thermal Generation Incremental Use and Electricity Demand Curtailments Impact on Gas Consumption

According to MBS estimates, other conditions being equal, the demand curtailments imposed by regulation and the incremental use of alternative thermal generation sources lead to nearly 3.4 Gmc of gas demand savings through the winter season compared to a year ago.

Power demand curtailments and alternative thermal generation sources use benefits in terms of gas savings would be partially thwarted in the event of low temperatures or import reductions though. Temperatures elasticity of the Italian power demand is in fact relatively low, but a cold winter could nevertheless bring gas demand 0.2 Gmc higher, according to MBS estimates. The Italian reliance on net import represents a more significant criticality, which must be monitored carefully, especially nuclear availability in France, since up to 0.8 Gmc of additional gas would be needed in case of null power flows from France.

The Italian Price Cap on Renewables: Uncertainties and Risks

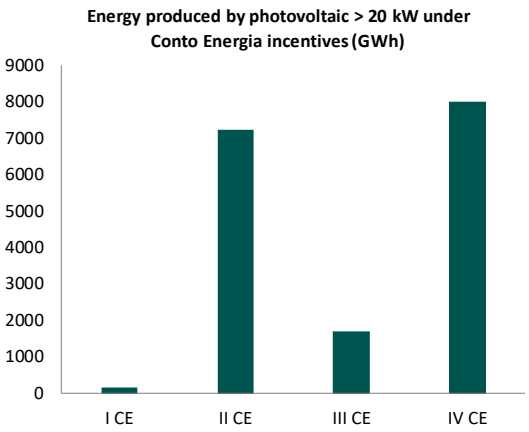
In response to persistently above average electricity prices the Italian Government introduced a *Price Cap Mechanism* (Italian CAP approved by Law Decree 4/2022), consisting in the request for a pay-back of a share of inframarginal technologies revenues to a defined group of power plants with the average energy selling price higher than a reference value between Feb-22 and Jun-23 (see Newsletter 262).

North (€/MWh)	Centre North (€/MWh)	Centre South (€/MWh)	South (€/MWh)	Sicily (€/MWh)	Sardinia (€/MWh)
58	58	57	56	75	61

The power plants included in the cap price mechanism are the following:

- photovoltaic plants, with installed capacity greater than 20 kW with access to the *Conto Energia* mechanism (I-IV *Conto Energia*)
- other renewable plants without incentives and commissioned before 2010 (mainly large hydro and geothermal plants)
- renewable plants, with installed capacity greater than 20 kW, not incentivized, having variable price sale contracts or a fixed price 10% higher than the reference price (see the table above)

Estimations based on the publicly available information indicate that almost 70% of the energy produced by photovoltaic could be affected by the



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extra profit mechanism, most of which (approximately 17 TWh) under *Conto Energia* incentives[4].

The *Conto Energia* was an important incentive mechanism in force between 2005 and 2012, whcih provided remuneration with a fixed tariff for each MWh produced at a premium with respect to the market price. Fixed rates progressively declined based on estimated decreasing costs. However, this mechanism, was particularly generous, especially for the plants that came into operation between 2010 and 2012. By 2020, the GSE surveyed almost 15 GW of plants in this category, approximately 30% of the total capacity, absorbing more than 50% of the incentives paid.

Most of the non-incentivized renewable power plant entered into operation before 2010 are hydroelectric power plants. According to MBS estimations the energy produced by the hydroelectric power plants (excluding pumped hydro power plants) included in the extra-profit mechanism could be almost 18 TWh in 2022[5] and 16 TWh in 2023[6].

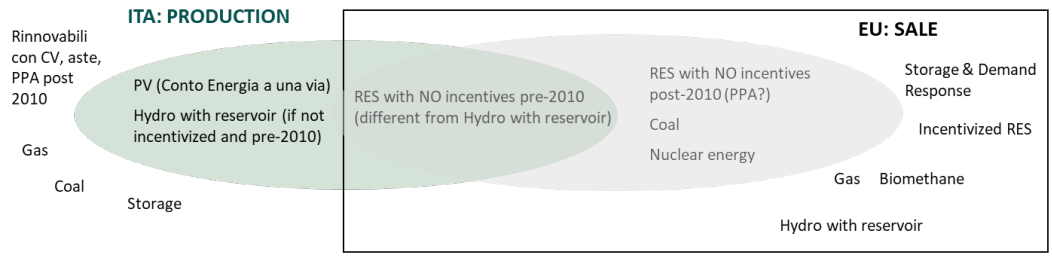
New photovoltaic and wind power plants, PPA model financed, add to the latter, but it is difficult, if not impossible, to estimate how many of these sell electricity at a fixed price 10% below the average market price (thus not falling within the mechanism) and how many at a variable price, with contracts signed before the decree came into force.

A common cap on inframarginal technologies revenues was broadly discussed at European level and with the Regulation on emergency intervention (Regulation 2022/1854) the European Commission established a cap at 180 €/MWh the Dec-22 to Mar-23 period. The power plants included in the European Mechanism are:

- non-incentivized renewable plants which came into operation after 2010,
- coal and nuclear power plants
- non-incentivized renewables prior to 2010 other than hydroelectric plants with reservoirs.

Storage, biomethane and incentivized renewables are also excluded. This mechanism overlaps to the extra-profit Italian CAP, and the Member States would have full freedom to decide how to implement the obligations. The Commission's proposal has similarities with the Italian CAP, but the two mechanisms differ in their application: the contribution proposed by the Commission would apply to the 2022 profits of companies operating in the fossil fuel sector (oil, gas, coal and refining) which exceed the average taxable profits of the previous three years by 20%.

Italian and EU CAP mechanism



Despite the European Commission and the Italian legislator having remarked the exceptional nature of those measures and their conditioning to extreme energy prices volatility conditions, potential extensions of the mechanisms beyond the Jun-23 deadline could not be excluded with the next two years projections for power prices being higher than 150 €/MWh. A prolonged and potentially extended to all types of renewable production application of price caps in the near future may significantly affect the economics of newly built initiatives and weigh on the near-term investors' confidence.

The **Italian Energy Release**, one of the measures adopted by the Italian legislator[7] in order ensure green energy to large consumer at controlled prices received the green light and between 9 and 21-Nov the

[4] The *Conto Energia* considered are from I to IV which are not based on the market price (feed in tariff)
[5] Considering the period from February to December 2022.
[6] Considering January - June 2023 period and assuming progressive recovery of natural inflows towards the historical average.
[7] *Decreto Ministeriale 341 del 2022*

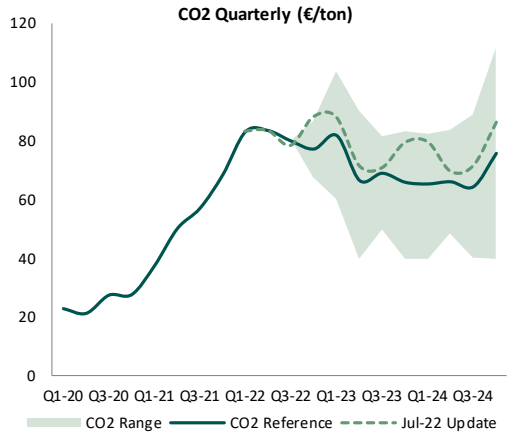
eligible customers can submit an application for the tender. The Italian Energy Services Manager (GSE) will release a part of the electricity from renewable sources under its control (renewable energy with feed-in tariffs, net-metering and simplified purchase and resell arrangements) through a long-term contract. The overall volume announced as available by GSE amounts to 16 TWh/year so far.

The first tender will be dedicated to a specific category of customers defined as *Priority Final Consumers*, allowed as aggregates as well, and include the industrial consumers, small and medium-size enterprises, customers in Sardinia and Sicily who provide interruptible and instant island reduction services. Any residual volumes will be allocated through a second tender procedure open to all consumers.

Awarded energy will be arranged through Contract For Difference of 3-years duration (from 1/1/2023 to 31/12/2025) and exchanged at reference price equal to 210 €/MWh[8]. The minimum bid threshold is 1 GWh/y, while the maximum bid allowed should not exceed 3% of GSE total volumes and in any case, it remain below 30% of the average consumption of the last 3 years.

Little Progress on the ETS Reforms Leaves the Market Uncertain in the Short-Term

Since the beginning of the year, EUA demand perspectives worsened on the back of the energy crises led economic activities slow down, despite the increase of coal fired generation. Our CO2 price forecasts have been consequently revised lower.



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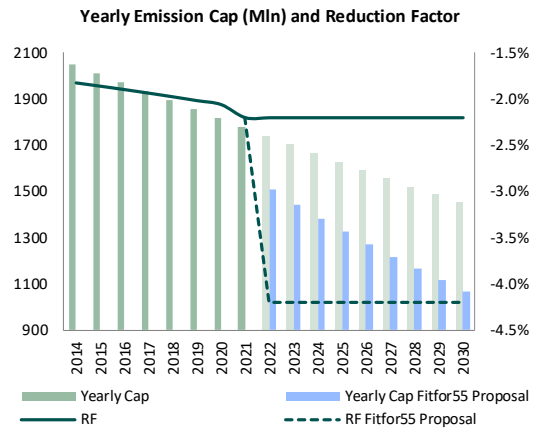
In our Reference scenario the CO2 price is expected to stabilize and average below 75 €/ton until 2025. In the Best Case scenario (realizing in the event of a fast normalization of commodities prices supporting a healthy economic growth)**, the CO2 price is expected to average close to 90 €/ton both in 2023 and 2024, supported by the regulatory framework and by the economic recovery**. In view of the recent European Commission activity, the Worst Case scenario, contemplating the possibility of the ETS system itself being put on hold as a consequence of fuels scarcity and permanently high prices, is now seen as the less likely option instead.

Our three CO2 short-term price forecasts scenarios (Reference, Best and Worst Case) are still based on the coal to gas switching modelling as long as seasonal patterns are concerned, but regulatory interventions are still assumed to support an upward price trend in the medium to long-term.

On 14 July, as part of the *Fit for 55* package, the Commission published a legislative proposal for a revision of the EU Emissions Trading System (ETS), to align it with the target of a 55 % reduction of EU net greenhouse gas (GHG) emissions by 2030, compared to 1990 levels. During the COP27 meeting in Sharm el-Sheikh, Egypt, the European Commission, along with the EU Parliament and the Council, reached an agreement on increasing the cut emission target from 30% to 40% compared to 2005 levels by 2030 in sectors not currently included in the EU ETS, such as construction, small industry, road transport, agriculture and waste management, paving the way for an acceleration of the decarbonization process towards the *Fit for 55* targets.



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The *Fit for 55* ETS reform proposal provides for a 63% reduction in ETS allowances by 2030, the elimination of the free allocations between 2027 and 2032 and the Carbon Border Adjustment Mechanism (CBAM) adoption from 2033 to prevent the risk of carbon leakage. The reform proposal also includes an increase

[8] The Legislator could further adjust the reference price to the changing market conditions if deemed necessary.

of the Linear Reduction Factor for emission allowances from the current 2.2% to 4.2% until 2030 and the strengthening of the Market Stability Reserve (MSR) mechanism, both of which would add support to CO2 prices, and the extension of the mechanism to cover CO2 emissions from maritime transport and possibly buildings, not currently included.

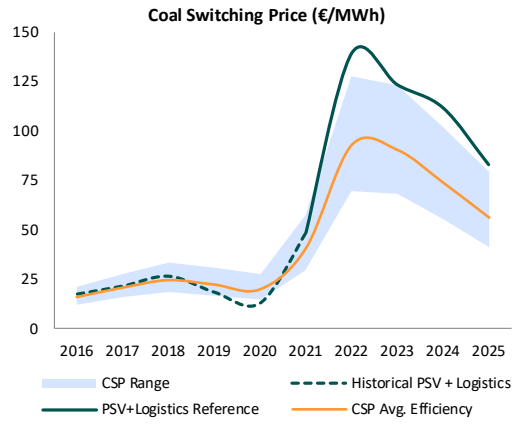
The first two ETS trilogue, held between July and October, ended with little success. The 9-10 November European Parliament on REPowerEU Regulation and the third ETS trilogue (10-Nov) led to an agreement on some important elements, which are seen as supporting the hypothesis of a short-term stabilization of prices and a continuation of the medium to long-term upward trend. The trilogue agreed in fact on:

- **a strong mechanism against price hikes**. The Commission decided to trigger the automatic release of 75 million allowances in the ETS market if the allowance price is more than 2.4 times the average price of allowances during the two preceding year (Article 29 of the EU ETS Directive stated that if for more than six consecutive months, the allowance price is more than three times the average price of allowances during the two preceding years, the Commission shall convene a meeting of the Climate Change Committee, while the initial proposed threshold to activate the allowances release was 3 times the average price of allowances during the two preceding year);
- the CCU and negative emissions through air capture in the EU climate policy, with an opening on their inclusion in the ETS, which given this issue complexity, is subject to the Commission assessment of all the options before though.

The proposal to restrict access to the carbon market for the financial operators to tackle speculation was dropped instead and there was no significant progress on key themes such as the ETS2, free allowances and the timetable of the CBAM.

Coal to Gas Switching Seen as Temporarily on Hold

Should the PSV price average above 100 €/MWh over the next winter season and until 2024 (see our LNG and Natural Gas Market Outlook for an in-depth analysis), this would favour coal-fired thermoelectric generation compared to gas, if average-efficiency plants (53%) are taken into account.



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In 2023, coal to gas switching conditions would materialize only for low-efficiency coal plants (30%) to high-efficiency gas plants (60%), as the PSV curve should near the top end of the fuel switching band and the CO2 reference price for 2023 averages near 70 €/ton. However, switching conditions may not be granted in 2024, as the CO2 price is expected to stay below 70 €/ton in our Reference scenario while PSV gas price is still expected to remain high over the same year.

Gas-fired generation would return the most competitive thermoelectric source only after 2025, under the assumption of gas prices following a gradual path towards normalization. The eventual normalization of commodities markets and the acceleration of the ETS mechanism reform are in fact seen as guaranteeing favourable switching conditions between high-efficiency coal-fired units and low-efficiency gas-fired plants in the long-term, supported by the combination of rising CO2 prices and PSV quotations moving towards the 25 €/MWh long-term target.

POWER AND CO2 YEARLY PROJECTION SUMMARY

Scenario		Power demand (TWh)	PUN (€/MWh)	CSS (€/MWh)	CO2 (€/ton)
Reference	2022	317	323	2.3	81
	2023	308	281	-2.7	71
	2024	320	256	-2.1	68
Worst	2022	317	335	1.1	79
	2023	305	329	-3.5	48
	2024	313	321	-3.0	42
Best	2022	317	298	1.2	83
	2023	310	208	-2.6	90
	2024	323	161	-1.0	92

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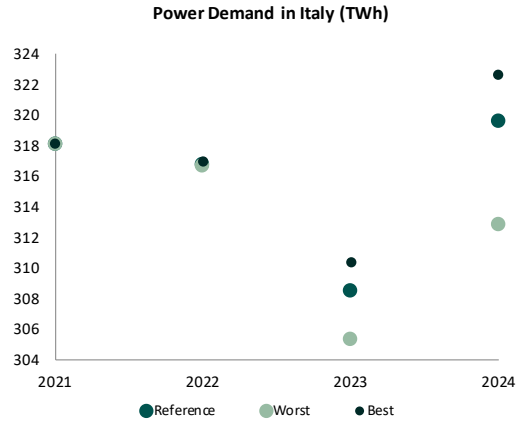

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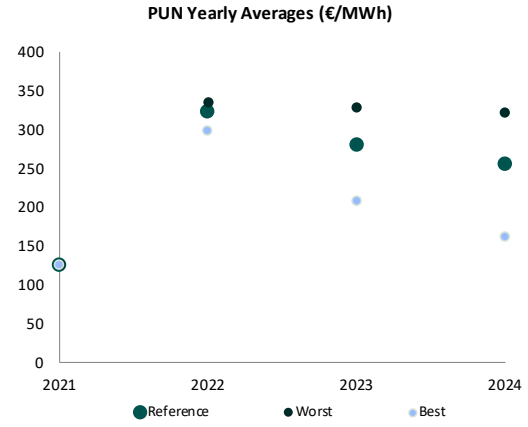

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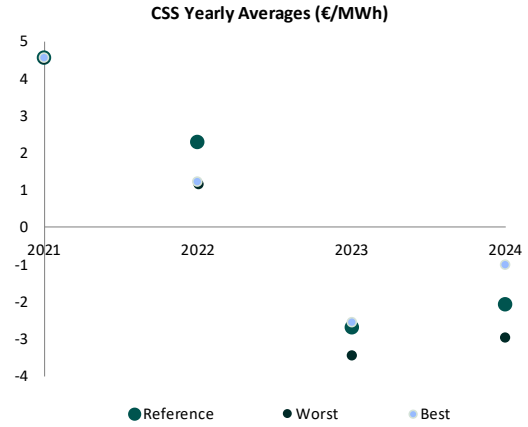

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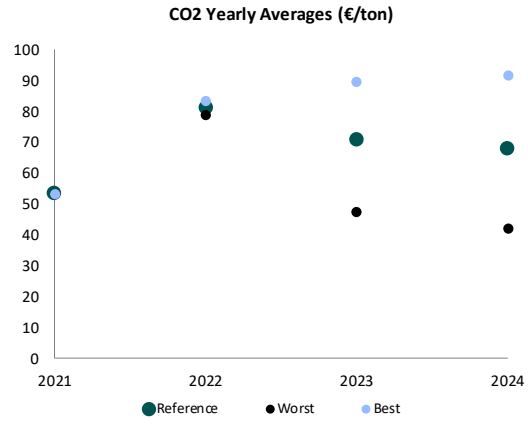

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EDITOR-IN-CHIEF
Virginia Canazza

DIRECTOR OF ENERGY OBSERVATORY
Claudia Checchi

EDITOR
Simona Soci

TEAM
MBS Consulting Practice Energy

PUBLISHER
MBS Consulting S.p.A.

EDITORIAL OFFICE, EDITING
Dalia Imperatori
Phone +39 02 89096061
E-mail: d.imperatori@mbsconsulting.it

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MBS Consulting S.p.A.
Società diretta e coordinata da Cerved Group S.p.A.

via degli Olivetani 10/12
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