



Year VI n. 18 – October 2021 Italian Power Market Outlook

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The expected average PUN has been revised higher in the period 2021-2023, following the bullish trend of underlying commodities. Prices are expected to peak in 2022 though.

As the gas price sharp up-move are normally not fully transferred to electricity prices, a compression of the CSS is expected for 2021 and 2022.

High commodities prices also support the Capacity Market strike price level over the first delivery years of the mechanism (2022 and 2023).

Coal-fired output recovers in 2021 and early 2022 amid weaker coal-to-gas switching conditions compared to our previous estimates. **However, low coal-fired production levels are seen to become structural from H2-22 onwards**, with CO₂ prices supporting gas-fired production.

2021 commodity dynamics favored imports from the southern frontiers other than from continental Europe, but net cross border flows are expected to decrease over the next years, as market conditions gradually normalize.

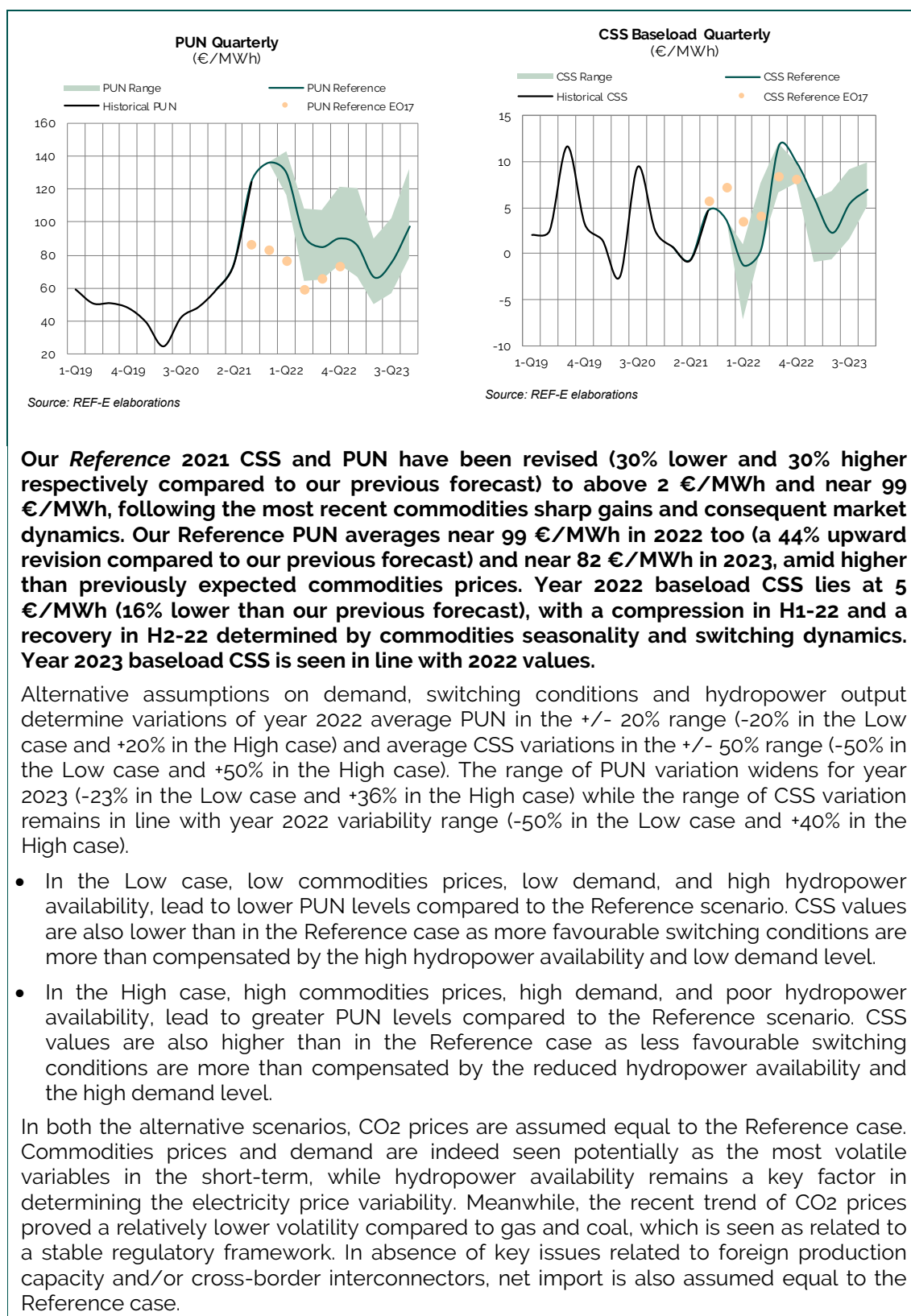
FRAME OF REFERENCE AND METHODOLOGY

The REF-E Energy Outlook and the special focuses are elaborated by REF-E experts on the base of validated econometric and accurate structural models, as well as our expert sensitiveness, detailed knowledge of regulation, and continuous monitoring of market outcomes.

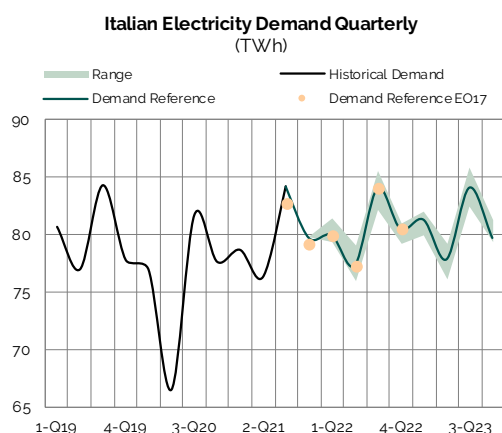
A **Reference** scenario is built to represent the highest probability market equilibrium given BAU (Business-As-Usual) regulatory conditions and the most likely evolution of the fundamentals' assumptions.

In a short-term perspective, the **High** and **Low** scenarios are respectively characterized by tight and loose market conditions that entail differences in terms of power demand (sensitivity to extreme/milder temperatures), fuels prices (higher/lower natural gas and coal prices) and hydropower output (poor/large availability of natural intakes) compared to the Reference view.

COMMODITIES KEEP SUPPORTING POWER PRICES



Power Demand Possibly Nearing Pre-Pandemic Levels by the End of 2021



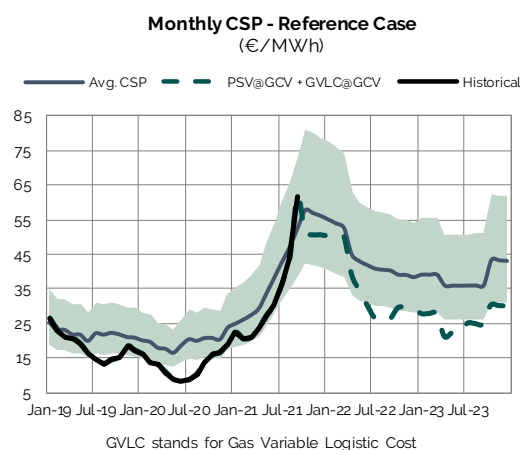
Source: REF-E elaborations

Last spring below-average temperatures, followed by summer above-average temperatures supported electricity consumption in 2021, adding to the firm recovery of the economic activities led by the industrial sector ([Macroeconomic and Commodities Outlook – October 2021](#)). Our Reference forecast for the short-term Italian power demand is unchanged compared to our previous estimate. Year 2021 incorporates the historical recovery trend and is seen at 318 TWh, while year 2022 and 2023 near 322 TWh and 323 TWh respectively. Temperatures and industrial activities are hence expected to drive demand almost to pre-pandemic levels by the end of 2021, while the recovery of the tertiary sector and of non-energy-intensive activities are seen as the key drivers for year 2022 and 2023 demand growth. The low-high demand range lies between 317 TWh and 327 TWh for 2022, and between 318 TWh and 328 TWh for 2023. The low demand case assumes milder-than-average winter months and below-average summer temperatures. The high demand case is based on the opposite assumptions. GDP growth variability was not considered in defining low and high demand levels.

Switching Conditions Momentarily Challenged by Commodities Dynamics

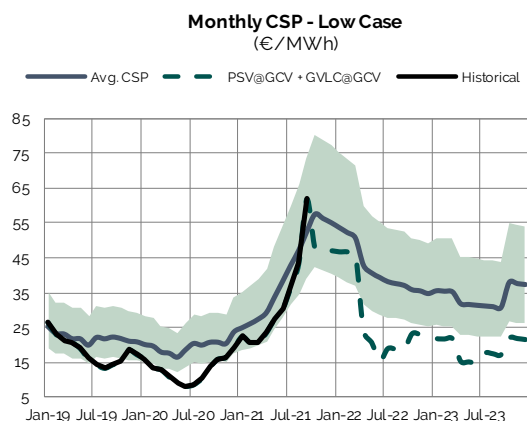
Over the first half of 2021 CO₂ prices supported coal-to-gas switching dynamics despite the general commodities market upward trend. However, the latter up-trend acceleration, especially of natural gas quotations, combined with a substantial stability of CO₂ prices in the second part of the year, leading to a progressive weakening of the coal-to-gas switching conditions¹. In our Reference scenario, the combination of decreasing gas prices and still rising coal quotations in year 2022 reprints favorable switching conditions for gas-fired units beyond the standard-efficiency level. The CO₂ staying on a stable upward path maintains the switching over the years ahead ([LNG and Natural Gas Market Outlook – October 2021](#), [Macroeconomic and Commodities Outlook – October 2021](#)).

The Coal Switching Price range in the Low and High cases is determined by the relative movements of natural gas and coal prices, which lead to stronger or weaker switching conditions.

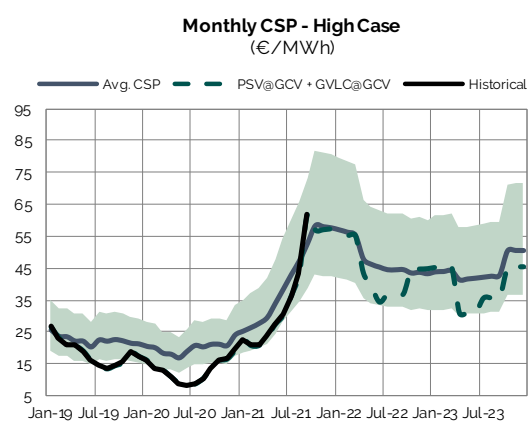


Source: REF-E elaborations

¹ The Coal Switching Price is the level of gas price (raw material plus variable logistic costs) that makes gas-fired production more convenient than coal-fired production. The light green range in the CSP graph is obtained considering different levels of efficiency between coal- and gas-fired power plants: the upper bound defines the switch between high-efficiency gas units and low-efficiency coal-fueled units; the lower bound defines the switch between low-efficiency gas units and high-efficiency coal-fired units.



Source: REF-E elaborations



Source: REF-E elaborations

Variable Logistic Costs for Gas-fired Italian Power Plants

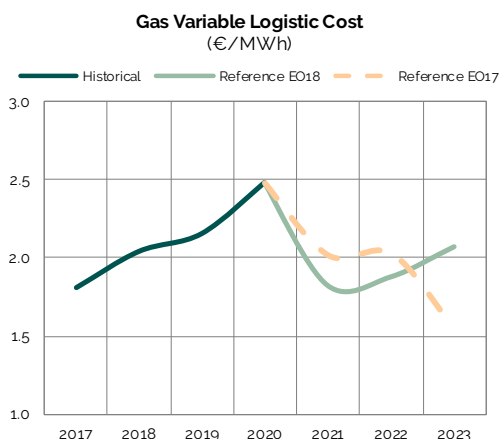
The recent extremely high commodities prices and their impact on the electricity prices, led the Italian authorities to act and mitigate fall backs on final consumers bills. The variable transport charges for the next few months have therefore been revised as follows:

The Italian Energy Regulation Authority ARERA, through Resolution 396/2021/R/com and Resolution 401/2021/R/gas, canceled the following components for Q4-2021:

- GS_T , covering charges for economically week customers,
- the overall RE_T component and the related refund mechanism designed to call off the White Certificates (TEE) mechanism costs from power plants logistic costs,
- UG_{3T} , covering temporary suppliers' charges.

In 2021 the average variable logistic costs for gas-fired plants are therefore just above 1.8 €/MWh@GCV², 10% lower than our previous forecast amid those temporary reductions.

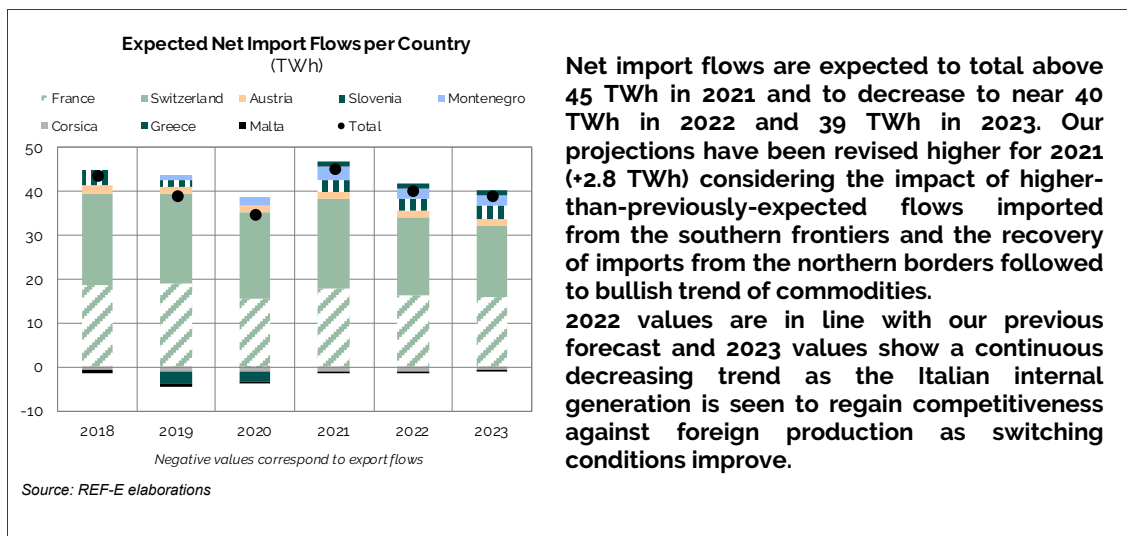
The RET_{TEE} refund mechanism should resume starting from January 2022. With the Resolution 278/2021/R/com of the 30th of June 2021, ARERA set the RET_{TEE} component at 67.75% of the overall RE_T (which will be 1.14 €/c/Scm in Q1-2022). We assume that all thermoelectric producers will apply for the RET_{TEE} discount, which is therefore equal to 0.78 €/c/Scm over the same period. Furthermore, starting from Q2-2022 the CRV_{BL} component, which covers the charges connected with the gas balancing system, will be increased to 0.33 €/c/Scm (from the current 0.02 €/c/Scm), in line with the recent months sharp increase in the wholesale gas price. Our expectations for year 2022 and 2023 are for a gradual re-stabilization around 2 €/MWh@GCV on average.



Source: REF-E elaborations

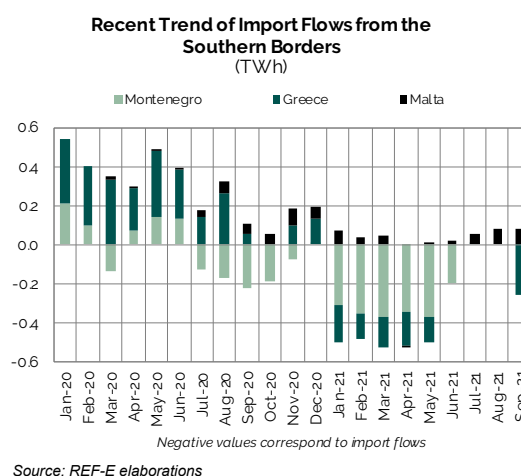
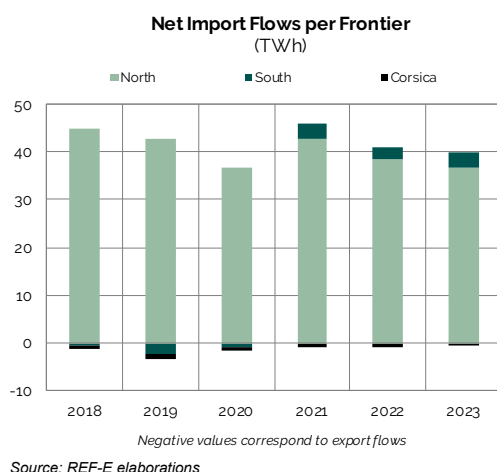
² Gross Calorific Value.

ITALIAN IMPORTS SEEN AS PEAKING IN 2021



Weak switching conditions partially undermined the competitiveness of the Italian gas-fired fleet in comparison to coal-fired production – both domestic and central European. Our new net import forecast incorporates this trend and reviews upward the northern import flows for 2021 from the previous level of 40 TWh to about 43 TWh. 2022 and 2023 values are seen decreasing, in line with the expected improvement of the switching conditions and the phase-out of a part of the coal-fired German fleet. Year 2022 forecast remained in fact unchanged compared to the previous view, totalling 38.5 TWh, while year 2023 is seen slightly lower to about 37 TWh.

Moreover, year 2021 import levels reflect an increase in energy flows coming from the southern frontiers, despite the failure-led three-month stop of the Italy-Greece interconnection. Indeed, imports from Montenegro and Greece continued, supported by the high competitiveness of the Balkan power production, where coal and renewables prevail, and gas prices are currently lower than in Europe ([Italian Power Market Outlook – July 2021](#)). Our updated forecast for 2021 envisages thus a southern net import totalling 3.5 TWh, compared to 3 TWh in the previous release. The estimate for 2022 is unchanged at roughly 2.5 TWh, while for 2023 increasing imports from Greece are expected to bring total volumes coming from the south near 3 TWh.

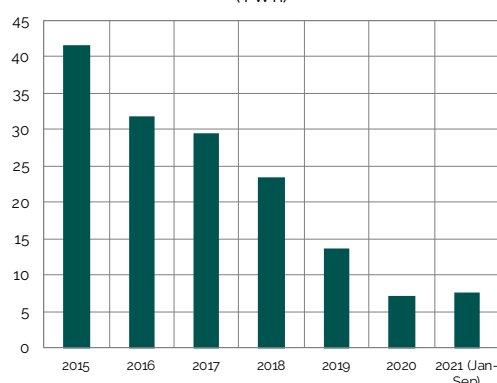


COAL-FIRED PRODUCTION REGAINS MARGINS BUT ECONOMIC PHASE-OUT IS LOOMING

Coal-fired output on the Day-Ahead Market (DAM) – especially in Sardinia and in the Centre-South – recovered in the last months after years of decreasing production and year 2020 record lows. This is in line with the recent weakening of the coal-to-gas switching conditions described above and coal-fired generation may remain competitive through the entire winter 2021-2022. However, starting from Q2-22, coal-to-gas switching conditions are expected to improve, favoring gas-fired production. Production from coal-fired units is expected to total slightly less than 10 TWh this year (about 3 TWh more than our previous forecast), to stay below 5 TWh in 2022 and to be economically phased out on the DAM by 2023. Only in the event of natural gas and coal prices trend being significantly negative for the switching, this would leave coal-fired production in the range 7-10 TWh.

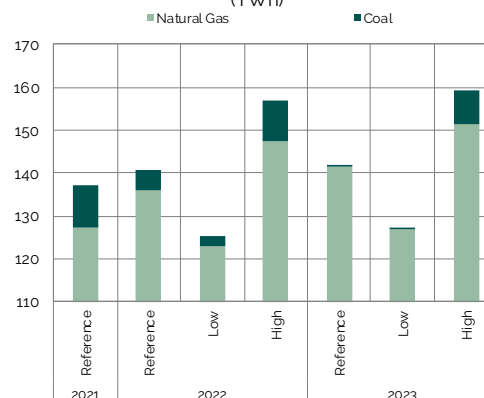
Solar and wind output is expected above 25 TWh and 19.5 TWh respectively in 2021. This incorporates historical data until September and should not be subject to significant variations. Solar production for years 2022 and 2023 is estimated above 27 TWh and above 28 TWh, respectively, while wind generation for the same period is estimated above 21 TWh and above 22 TWh, respectively. Hypotheses concerning forecasted production values (Oct-21 to Dec-23) are unchanged compared to our previous assumptions. In terms of installed capacity, the overall production increase to 2023 corresponds to a +1.5 GW (ca.) for solar power and to a +800 MW (ca.) for wind power, compared to current levels – about 22 GW of solar and 11 GW of wind.

Historical DAM Accepted Volumes, Coal Units
(TWh)



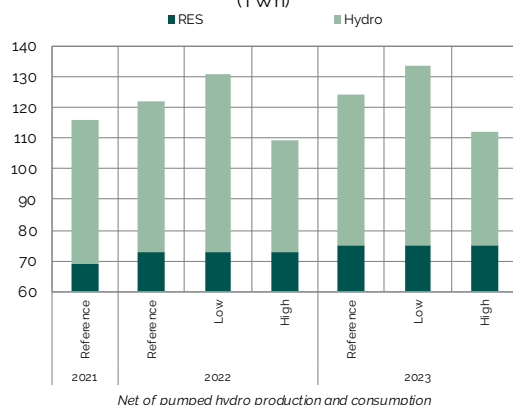
Source: REF-E elaborations

Italian Gas- & Coal-Fired Output
(TWh)



Source: REF-E elaborations

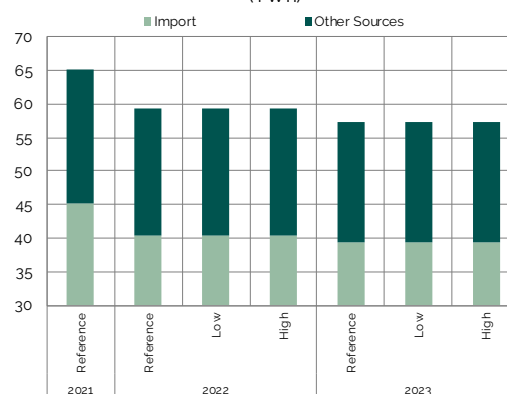
Italian Hydro & RES Output
(TWh)



Net of pumped hydro production and consumption

Source: REF-E elaborations

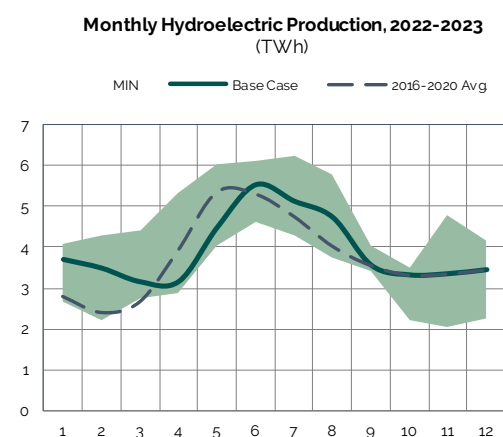
Italian Other Sources Output & Net Import
(TWh)



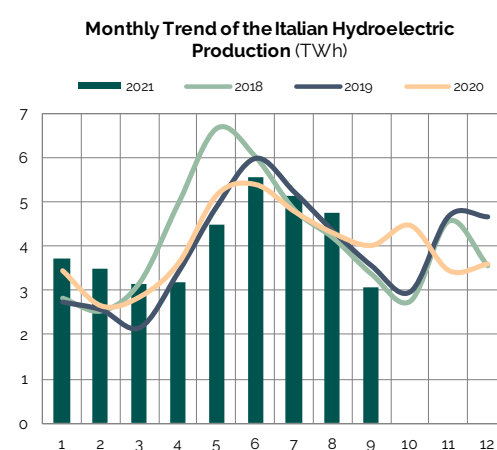
Source: REF-E elaborations

Hydroelectric variability can have an impact on the final energy mix composition and influence market prices. Our 2021 forecast has been revised to consider the effective trend of summer production, which led to a -1 TWh change and to an overall yearly estimate nearing 46 TWh³. For years 2022 and 2023, the Reference scenario assumes standard natural intakes⁴ conditions and envisages a hydroelectric production totaling about 49 TWh.

The Low and High scenarios incorporate a different level of water intake availability, based on recent historical extreme situations. The Low case reproduces the extraordinary output level recorded in 2014 (about 58 TWh in the year, upper bound of the range), while the High case reproduces the hydropower scarcity conditions recorded in 2017 (about 37 TWh in the year, lower bound in the range).

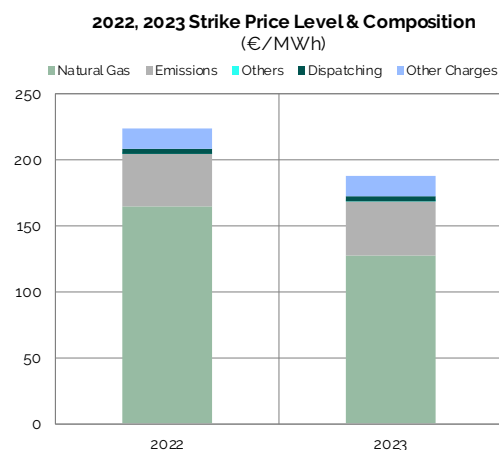


Source: REF-E elaborations



Source: REF-E elaborations

The Capacity Market Strike Price Follows Natural Gas Prices



Source: REF-E elaborations

On January the 1st, 2022, the first delivery period of the Italian Capacity Market will begin. According to the 2019 auctions results, about 2.2 GW of new gas-fired capacity are expected to enter the market in 2022 and further 4.2 GW in 2023. Among these, 0.8 GW originate from the repowering of existing CCGT units, while 1.7 GW and 3.8 GW come from new OCGT/peakers and high-efficiency CCGTs, respectively.

According to publicly available information, all the projects that took part to the auction targeting year 2022 as non-authorized, received the final authorization and are finalizing the realization phase. On the

other hand, some projects that should come online by 2023 experienced strong opposition and have not completed the authorization process yet - despite the deadline to present the authorizations having been postponed two times (now to October 31st). It is thus considered unlikely for such projects to enter the market before year 2024.

Power plants adhering to the mechanism will be subject to the upward price limit imposed by the strike price, valid both on the Day-Ahead Market and on the Ancillary Services Market. The strike price reflects the production cost of a 30%-efficiency gas-

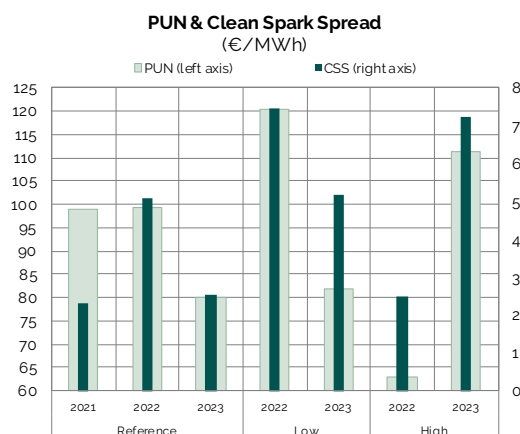
³ Hydroelectric production in Q4-21 is assumed equal to the last 10-year historical average.

⁴ Based on the last 10-years monthly historical average.

fired peaker plant and thus is highly influenced by commodities trends. According to our updated hypotheses about future CO₂ and natural gas prices, the Reference strike price is estimated near 220 €/MWh in 2022 (40% higher than our earlier forecast) and near 185 €/MWh in year 2023. For both years, our simulations show that hourly DAM prices should peak below the strike price threshold.

CONCLUSIONS

Commodities, demand, and hydropower availability are the key determinants of our scenario outputs. Reference yearly baseload targets for PUN and CSS are, respectively, 98.9 €/MWh and 2.3 €/MWh for 2021, 99.2 €/MWh and 5.1 €/MWh for 2022, and 81.7 €/MWh and 5.2 €/MWh for 2023. Variations of the key drivers (demand, hydropower output, commodity prices) would determine price variations compared to the Reference view, as synthetically shown in the table below.



Source: REF-E elaborations

Scenario		CO ₂ (€/tCO ₂)	PSV@GCV (€/MWh)	GVLC@GCV (€/MWh)	Coal API2 (\$/t)	Demand (TWh)	RES Output (TWh)	Hydro Output (TWh)	Coal Output (TWh)	Net Import (TWh)	CSS (€/MWh)	PUN (€/MWh)
Reference	2021	53.6	34.8	1.8	120.3	318.6	69.2	46.8	9.8	45.3	2.3	98.9
	2022	55.3	33.3	1.9	134.4	321.7	72.8	49.0	4.7	40.3	5.1	99.2
	2023	58.3	24.1	2.1	99.9	322.9	75.0	49.3	0.1	39.3	5.2	81.7
High	2022	55.3	42.3	1.9	152.6	327.0	72.8	36.7	9.6	40.3	7.4	120.2
	2023	58.3	37.3	2.1	132.4	328.3	75.0	36.9	7.6	39.3	7.2	111.3
Low	2022	55.3	25.3	1.9	119.9	316.6	72.8	58.1	2.3	40.3	2.5	80.0
	2023	58.3	17.1	2.1	74.0	317.7	75.0	58.4	0.2	39.3	2.5	63.2

Source: REF-E elaborations

In 2021, the baseload CSS was penalized by the delayed and less than proportional reaction of power prices to the recent sharp commodities' upward movements. The target Day-Ahead Market marginality for 53%-efficiency CCGTs in 2021 is lower than our previous forecast, consequently. Unfavorable switching conditions may continue to penalize gas-fired units also in Q1-22, limiting the CSS upside potential. However, switching conditions are expected to become progressively stronger into summer and fall, sustaining a consequent CSS recovery and leading to a just minor downward revision of the 2022 yearly average compared to our previous forecast. In 2023, the CSS remains stable as more favorable switching conditions (translating also in decreasing net imports) and growing demand are counterbalanced by the presence of the first high-efficiency CCGTs supported by the Capacity Market⁵.

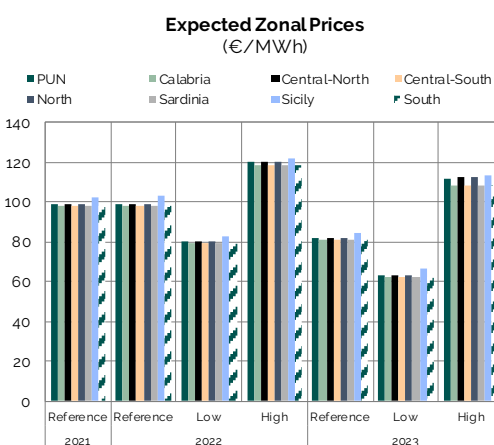
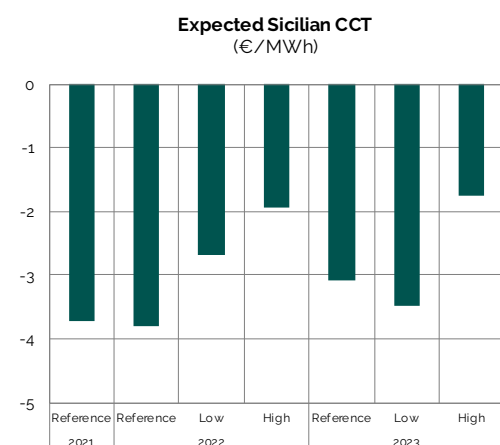
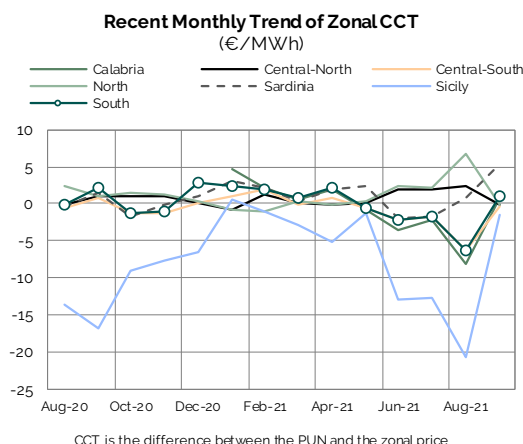
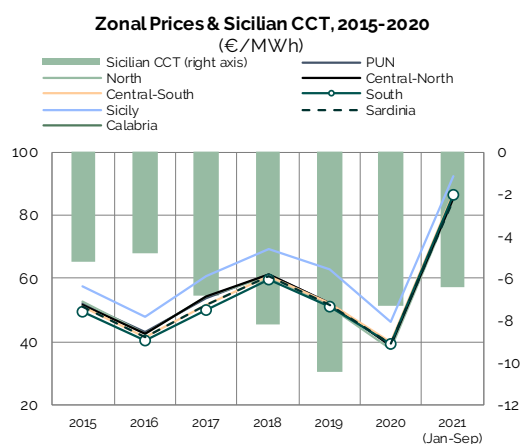
⁵ In 2022, only one new high-efficiency CCGT is due to come online, with no relevant effects expected in terms of competitive dynamics.

Sicilian Price Dynamics

With the zonal configuration in force since January 2021, the Italian TSO introduced the new market zone Calabria (previously incorporated in the South market zone) and updated the exchange limits between some market zones. In particular, the maximum import limit towards Sicily from the continent has been increased from 1100 MW to 1500 MW.

The zonal prices dynamics observed in the first part of 2021 suggest the new limit can reduce the Sicilian price premium over the PUN. However, this is not expected to fully eliminate congestion problems between Sicily and the continent, especially over high residual demand hours (i.e., evening hours, when demand is usually high and solar production decreases).

Our updated zonal prices forecast incorporates the most recent zonal dynamics and envisages Sicilian baseload prices to maintain a 4 €/MWh premium over the PUN in both 2021 and 2022, which should be reduced to 3 €/MWh in 2023 - compared to roughly 6 €/MWh in 2019 and 2020, and to an historical average of 7-8 €/MWh from the entry of the Sorgente-Rizziconi cable⁶ in 2016.



⁶ Our simulations consider a historical monthly availability of the infrastructure.

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