ENERGY OUTLOOK

Year VI n. 17 – July 2021

Italian Power Market Outlook

Osservatorio energia

REF E

Both this and next year expected average PUN have been revised higher, following the recent sharp gains. Prices should mark a short-term peak in 2021 though, in line with commodities.

The gas price sharp recovery was not fully reflected in the electricity price and a compression of the CSS is consequently expected.

High commodities prices also drive options' strike price level higher for 2022, the first delivery year of the Italian Capacity Market.

Coal-fired production low levels are seen as becoming structural, with the CO_2 up-trend favoring the gas fired capacity, while imports from southern borders are seen on the rise

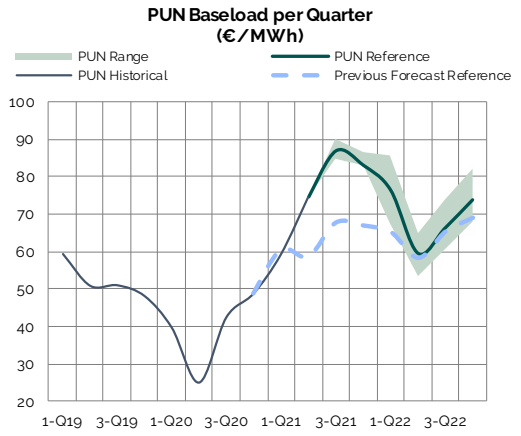
FRAME OF REFERENCE AND METHODOLOGY

The REF-E energy outlook and the special focuses are elaborated by REF-E experts on the base of proprietary suites and market knowledge. Econometric and structural models, as well as our expert sensitiveness and detailed knowledge of regulation, accurate monitoring of market outcomes underlie our elaborations.

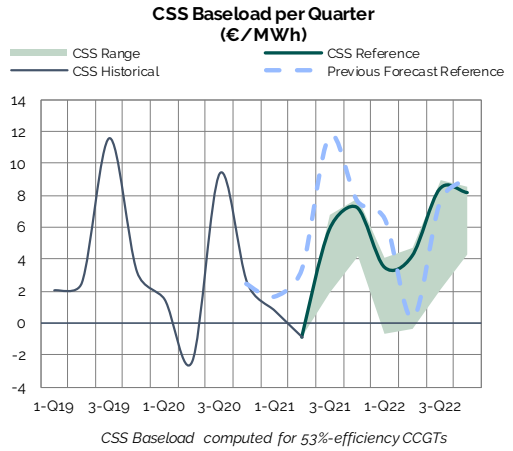
A **Reference** scenario is built to represent the highest probability market equilibrium given the BAU conditions and the most likely evolution of the underlying assumptions (such as known market developments or approved regulatory improvements).
A **Thermal Renaissance** framework refers instead to a scenario where the decarbonisation process slows down significantly or fails in respect to BAU targets while a **Green Revolution** scenario assumes a very favourable decarbonization framework. The differences between the two alternative scenarios entail also different levels of power demand, commodities prices, and renewable production, that become more and more evident into the mid to long-term horizon. For instance, in the Green Revolution scenario a lower electricity demand and a higher wind and photovoltaic output reduce the market space for thermoelectric generation, and stronger CO_2 prices, combining with lower fuels prices, strongly intensify coal-to-gas switching dynamics. Opposite conditions hold in the Thermal Renaissance scenario.

In a short-term perspective, our **High** and **Low Scenarios** are respectively characterized by tight and loose market conditions (temperatures and climate, market congestions, etc), expected to drive the commodity prices higher or lower compared to the Reference view.

POWER PRICES PEAKING IN 2021 FOLLOWING COMMODITIES



Source: REF-E elaborations



CSS Baseload computed for 53%-efficiency CCGTs

Source: REF-E elaborations

Our *Reference* 2021 CSS and PUN have been revised (46% lower and 20% higher respectively compared to our previous forecast to above 3 €/MWh and above 75 €/MWh, following the recent commodities sharp gains. The PUN should average just below 70 €/MWh in 2022, with a 7% upward revision compared to our previous forecast, amid higher than previously expected commodities and CO2 prices. Year 2022 average baseload CSS lies at 6 €/MWh (in line with the previous forecast), with the Q1-22 compression and Q2-22 recovery determined by commodities seasonality and switching dynamics.

Different levels of demand and commodities prices lead to diverging competitive dynamics and market results compared to the Reference case.

According to our alternative assumptions, year 2021 PUN variations are contained[1] (-1% in the Green Revolution case and +2% in the Thermal Renaissance case), while CSS differentials are more significant (+5% in the Green Revolution case and -50% in the Thermal Renaissance case).

Relevant divergencies between the Green and the Thermal Renaissance scenario are in evidence in year 2022:

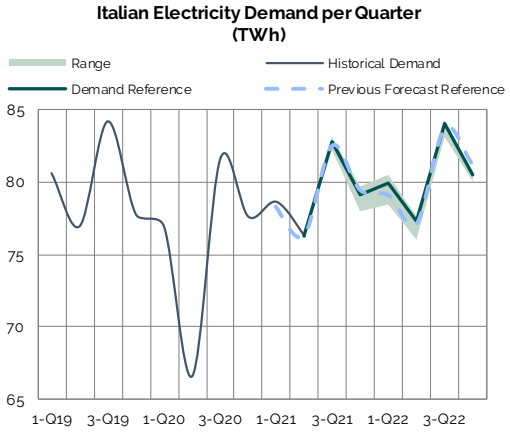
- In the Green Revolution case, strong switching conditions are counterbalanced by low demand and commodities costs, which lead to low PUN and CSS values (about +10% and -35% respectively compared to the 2022 Reference levels).
- in the Thermal Renaissance scenario, relatively unfavourable coal-to-gas switching conditions erode the marginality of gas-fired plants, leading to lower CSS values (about -80% compared to the Reference case 2022), despite higher market prices (about +10% compared to the Reference case 2022) amid high fuels prices.

In both the alternative scenarios net import is assumed equal to the Reference case, reflecting the most probable view given expected market conditions according to REF-E estimates. The impact of possible net import variations is discussed through sensitivity analyses on the Reference case.

Power Demand Ahead of Economic Recovery

Over the first months of this year, winter temperatures fostered electricity and gas consumption. The economic activities recovery, led by the industrial sector and favoured by the loosening of restrictions (Macroeconomic and Commodities Outlook, May-21), kept the trend on course together with prolonged below-average temperatures in spring. Indeed, colder-than-usual temperatures in April and May and an extraordinary heat wave in in early June supported electricity consumption.

[1] 2021 projections show a contained degree of variation compared to 2022 as actual price figures have been incorporated until June 30.



Source: REF-E elaborations

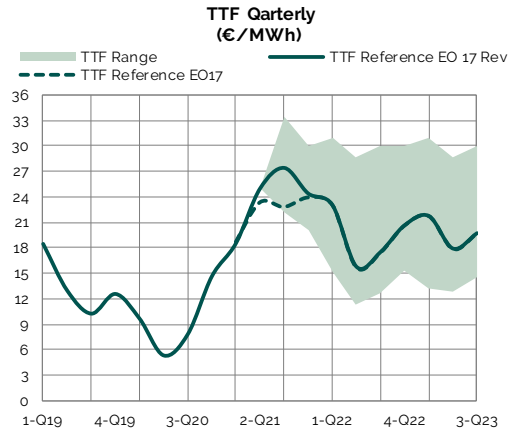
Our updated Reference case forecast for the short-term Italian power demand is unchanged compared to our previous estimate, with the reference values seen at 316 TWh for 2021 and almost 322 TWh in 2022. Demand is assumed to gradually move back to pre-pandemic levels in 2022, initially led by the industrial sector, followed by the progressive recovery of the tertiary sector and of non-energy-intensive activities. The low-high demand range lies between 314 and 317 TWh for 2021, and between 318 and 323 TWh in 2022.

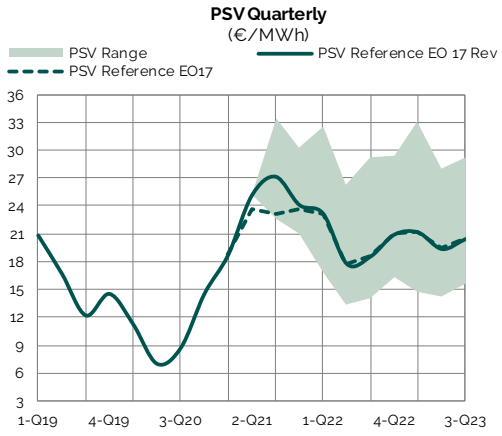
The low demand case may depend on a slower-than-expected recovery compared to the Reference case. This may derive from the impact of COVID-19 variants on activities next fall but could also result from a higher-than-expected concentration of investments in energy efficiency applications. The high demand case may instead follow a faster economic recovery path, supposing a lower contribution of energy efficiency developments.

Commodities Markets Tightness Seen as Short-Term Shot

Prices of wide range of assets, commodities on the forefront, rose sharply over the last two months, supported by a firm recovery of global economic activity, decreasing global COVID-19 cases and very accommodative monetary policies. Brent, Coal, LNG, Natural Gas and CO2 upward moves exceeded our expectations, with the above bullish factors having combined with physical markets constraints, supply limitations, above average demand, and regulation variations.

June Brent average was above 70 $/bbl, for the first time since May 2019. A significant decline in global oil inventories fuelled expectations for further market tightness amid personal travel and mobility resumption, production restraint from OPEC+, a subdued recovery of exploration activity and flat crude oil output in the US. The Oil market up-move accelerated the gas short-term bullish trend, with the world LNG market tightness having pushed the European LNG reference and the TTF above the Oil-indexed price for the first time in spring-summer months. Strong demand amid an early heat wave in June and lower than average stocks added to the above bullish drivers (see also our most recent Weekly Reports).





Source: REF-E elaborations

The very short-term price targets for commodities have been revised higher, incorporating June strong price settlements, July persisting strong fundamentals and the risk for at least some of the above-described market tightness factors (such as below average EU storage and strong Asian LNG demand) to keep supporting in August and possibly September.

Both the TTF and the PSV reference target near 24 €/MWh for 2021, compared to about 22 €/MWh in the previous forecast. However, we assume a progressive move of the commodities markets back to normal conditions (average seasonal temperatures and related demand, scheduled maintenances and supplies) and our latest LNG and Natural Gas Market Outlook price targets for next year remain coherently unchanged (TTF reaching about 19 €/MWh, PSV reaching about 20 €/MWh).

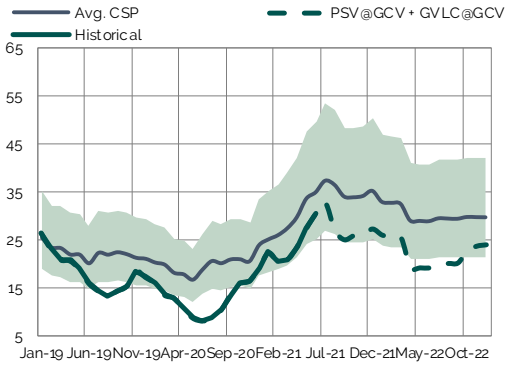
The ETS CO2 price moved higher than expected too, driven by the overall commodities bullish sentiment and by expectations for a regulatory revision of the system, having attracted significant buying interest from financial operators. The very short-term targets were revised higher coherently with the TTF upward revision, and this year average price may lie just above 50 €/ton. Until a regulatory reform is approved and implemented by the European Commission, the expected normalization of the gas market should maintain the average price for 2022 in line with June's ETS CO2 Outlook target, near 45 €/MWh.

ETS CO2 Takes the Lead Towards Decarbonization

Over the first half of 2021 CO2 prices supported coal-to-gas switching dynamics even during intense bullish conditions on the commodities market. Indeed, despite the strong rise in gas prices, the parallel upward trend of coal quotations and the endurance of CO2 prices maintained the gas-fired power generation competitiveness compared to the coal-fired one.

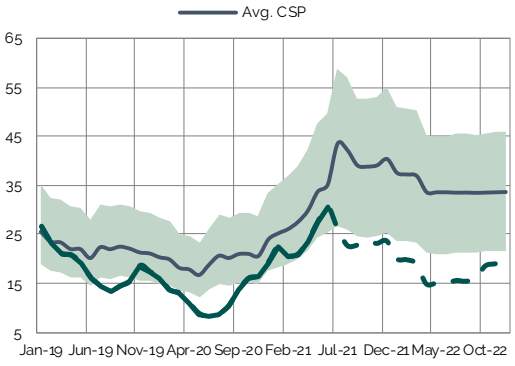
In our Reference case[2], a CO2 price progressive growth fosters switching conditions even beyond the standard-efficiency level under previously described hypothesis of gas, CO2 and coal prices (see also our Macroeconomic and Commodities Outlook, May-21).

Monthly CSP - Reference Case (€/MWh)



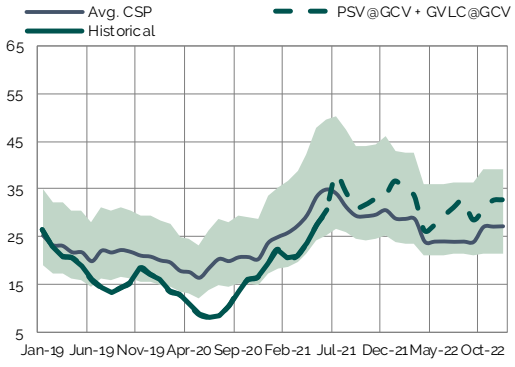
Source: REF-E elaborations

Monthly CSP - Green Revolution Case (€/MWh)



Source: REF-E elaborations

Monthly CSP - Thermal Renaissance Case (€/MWh)

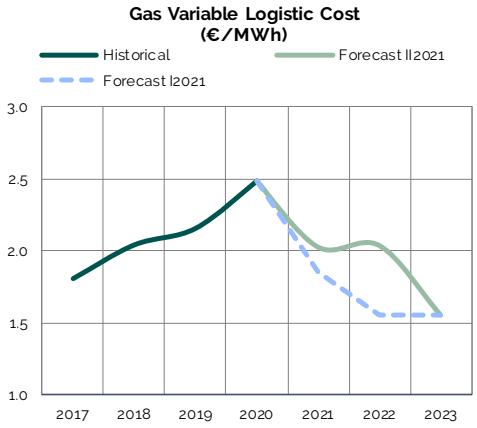


Source: REF-E elaborations

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

Variable Logistic Costs for Gas-fired Italian Power Plants

The average variable logistic costs for gas-fired plants in 2020 was just below 2.5 €/MWh@GCV. **Our expectations for year 2021 and 2022 is for a reduction to around 2 €/MWh@GCV on average.** A conservative hypothesis of **an average logistic cost close to 1.5 €/MWh@HHV is applied for the medium and long-term**, since there is a possibility of some variable cost components decreasing further, such as the RE_T component.



Source: REF-E elaborations

In fact, since Q3-2021 the **RET_{TEE} refund mechanism** is in force. This is designed to call off the White Certificates (TEE) mechanism costs from power plants logistics costs. With the Resolution 278/2021/R/com of the 30th of June 2021, the Italian Energy Regulation Authority (ARERA) set the RET_{TEE} component at 67.75% of the overall RE_T (which is now 2.29 €c/Scm until the end of 2021). We assume that all thermoelectric producers will apply for the RET_{TEE} discount, which is therefore equal to 1.55 €c/Scm in Q3-2021.

Starting from January 2022, the overall RE_T will be lowered to 1.14 €c/Scm. The new TEE Decree of the 21st of May 2021 determines the national energy saving objectives up to 2024 and drastically reduces the TEE obligations for electricity and gas distributors from 2020 to 2024 compared to the previous four years (albeit implicit in the provisions of the Italian National Energy and Climate Plan, PNIEC). The provisions of the new Decree are expected to reduce the TEE mechanism public expenditures over the coming years and, consequently, a future reduction of the percentage relating to the RE_{TEE} component is conceivable. **According to our hypothesis, the RET_{TEE} component could near 0.4 €c/Scm in Q1-2022.**

Nevertheless, an upward revision of the variable logistic costs compared to our previous forecast was necessary, due to the increase established by the Authority of other variable components.

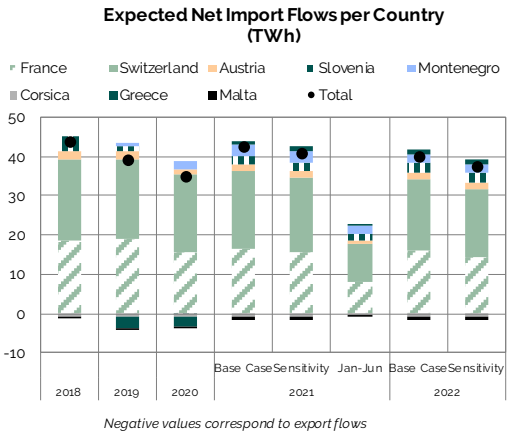
The re-introduction of the **CRV_i component equal to 0.065 €c/Smc** (Resolution 41/2021/R/gas of 9th February 2021) starting from Q4-2021 (after almost four years at zero) to cover interruptible service costs, and the increase of other energy efficiency costs, only partially compensates the overall reduction implied by the RET_{TEE} discount.

The **CRV_{OS}** component, which covers the charges arising from the application of the revenue guarantee factor for the storage service, **rose from 0.55 €c/Smc to 1.20 €c/Smc in Q4-2021 and Q1-2022** (Resolution 133/2021/R/gas of 1st June 2021). The storage operators, by the 31st of May of each year, must submit to the Authority the revenues achieved in the previous year and the estimated revenues for the following year. The Authority's decision to increase the CRV_{OS} component starting from Q4-2021 derives from estimated revenues of companies for year 2021 (Resolution 275/2020/R/gas of 21st July 2020) lower than those of 2020 (Resolution 535/2019/R/gas of 17th December 2019) requiring a higher tariff coverage.

Another important variation depends on the increase of the **CV_{FC}** component (which is the variable complementary fee for the revenues recovery of natural gas transmission companies). This **rises from a negative value of -0.06 €c/Smc in 2021 to 0.13 €c/Smc in 2022** (Resolution 230/2021/R/gas of 1st June 2021). Transport companies have the possibility to make a flexible use of the transport capacity booked for multi-year periods at the interconnection points with foreign gas pipelines (Resolution 666/2017/R/gas of 28th September 2017). They can also postpone the use of residual capacity in one of the next thermal years if this is not used during the assignment year (the so-called *reshuffling*

mechanism). The charges deriving from the *reshuffling* mechanism feed into the "Transport Charges Account" year by year. According to the Resolution 180/2020/R/gas of 26th May 2020, in year 2021 this Account was to return 49.5 million € to the system (deriving from a previous surplus of approximately 148 million €) and the CV_{FC} component turned negative consequently. For year 2022, the aforementioned Account requires a financing of approximately 105 million € instead, pushing back the **CV_{FC}** component back into positive territory.

IMPORTS FROM SOUTHERN BORDERS ON THE RISE



Negative values correspond to export flows

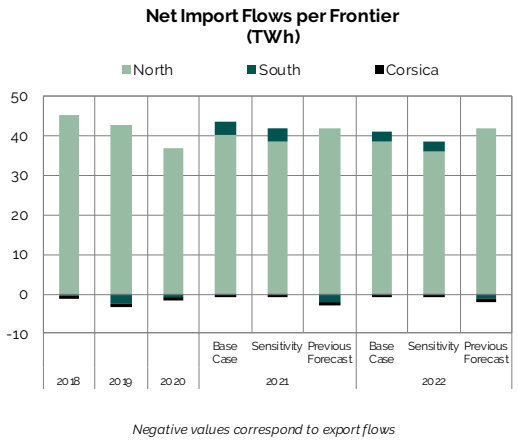
Source: REF-E elaborations

Net import flows are expected to total 42.5 TWh in 2021 and 40.3 TWh in 2022 (versus 33 TWh in 2020). Compared to our previous Reference case scenario, projections have been revised higher (+3.7 TWh in 2021, +0.5 TWh in 2022) considering the impact of updated dynamics influencing flows from the southern frontiers.
A sensitivity considering greater-than-expected unavailability of the French nuclear fleet (see also our most recent Weekly Reports) shows that net import flows could reduce by 1.5 TWh in 2021 and 2.5 TWh in 2022, with however contained effects on the PUN.

Favourable switching conditions sustain the competitiveness of the Italian gas-fired fleet with respect to power production coming from beyond the Alps. Our new net import forecast incorporates this trend and reviews downward northern import flows from the previous level of about 42 TWh in both 2021 and 2022 to 40 TWh in 2021 and 38.5 TWh in 2022.

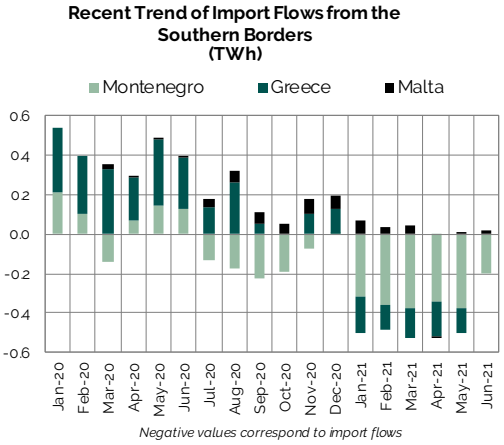
However, forecasted values for import flows from the southern borders have been revised higher. The 2021 forecast incorporates H1-2021's dynamics, that saw high hydro-generated power imported from both Montenegro and Greece (especially in Q1-2021) and an increased competitiveness of Greek gas-fired production compared to the Italian one in correspondence of hub prices bullish trends. Indeed, in Greece there is no natural gas hub and natural gas supplies are essentially based on long-term contracts. This means that eventual short-term market turmoil affecting hub quotations at European level would have little effects on Greek gas prices. The expectation of similar Greece-Italy exchange dynamics (Greek Electricity Market Scenario) holding true also in 2022 translated into an upward review of the overall southern net import forecast for next year as well. Thus, our updated forecast envisages a southern net import of about 3 TWh compared to a net export of about 2 TWh in the previous one for 2021[3], and a net import above 2.5 TWh compared to a net export of about 1 TWh for 2022.

[3] The updated forecast incorporates the out-of-service period in the month of June on the Italy-Greece submarine interconnection followed after a fault occurred in late May anticipated and prolonged the maintenance period to the infrastructure.



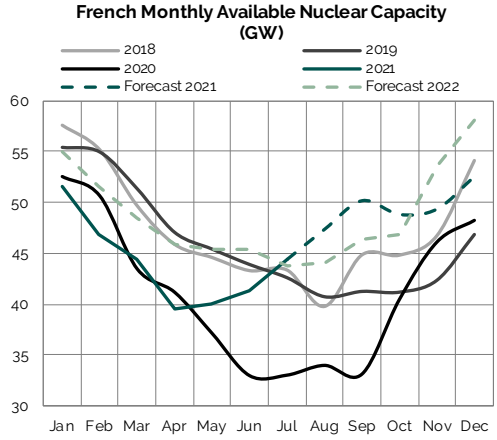
Negative values correspond to export flows

Source: REF-E elaborations



Negative values correspond to import flows

Source: REF-E elaborations



Source: REF-E elaborations

Import flows from the northern borders can be influenced by the degree of availability of the French nuclear capacity. Thus, a sensitivity case considering a slower-than-expected recovery in capacity availability for the second part of 2021, and a greater-than-expected unavailability in 2022 of the French nuclear fleet has been performed.

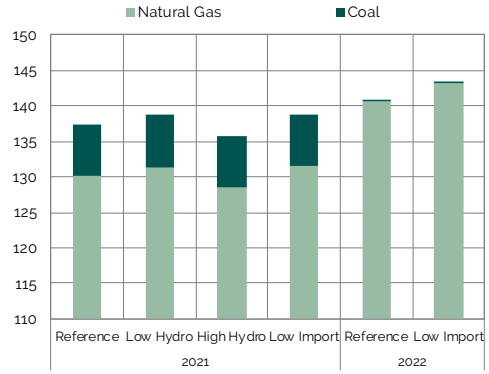
This greater unavailability level may translate into -1.5 TWh flowing from France and Switzerland for 2021 and -2.5 TWh for 2022, assuming 338 TWh of total French nuclear output for 2021 and 330 TWh for 2022 against an estimated 345 TWh target for both years[4] Lower import flows from the northern frontiers in the 2021-2022 period would benefit the thermoelectric Italian fleet and especially gas-fired units, potentially leading to higher baseload CSS (+9%) compared to the base case. The effect on the baseload PUN remains however limited (about +1%), with forecasted values substantially aligned with the Reference case. Results are in line with recent historical patterns based on the relation between the residual demand for Italian combined cycles and their baseload marginality.

COAL-FIRED PRODUCTION RECORD LOW LEVEL BECOMING STRUCTURAL

Gas-fired production and renewables are dominating the internal energy production mix pushing coal-fired output to minimum levels to date. Despite the upward revision of net import flows, favorable coal-to-gas switching conditions and the recovery of power demand foster gas-fired production on the Day-Ahead Market in the next two years. The impact on prices could be amplified should import flows or hydroelectric production be lower than assumed in the Reference case.

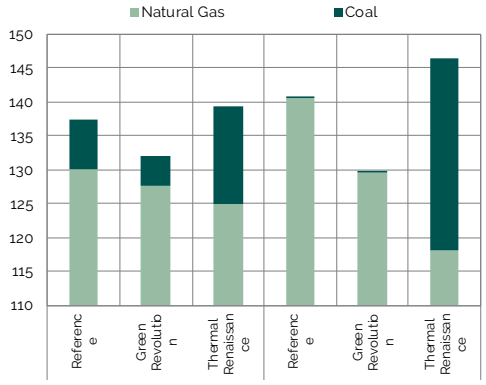
4 Assumptions based on publicly available information.

Italian Gas- & Coal-Fired Output, Reference Case & Sensitivities (TWh)



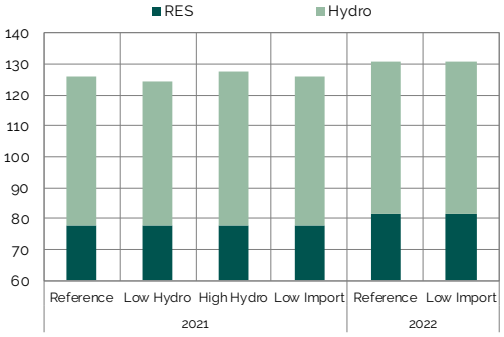
Source: REF-E elaborations

Italian Gas- & Coal-Fired Output, Reference & Alternative Cases (TWh)



Source: REF-E elaborations

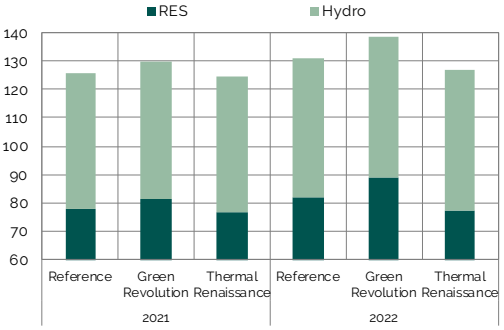
Italian Hydro & RES Output, Reference Case & Sensitivities (TWh)



Net of pumped hydro production and consumption

Source: REF-E elaborations

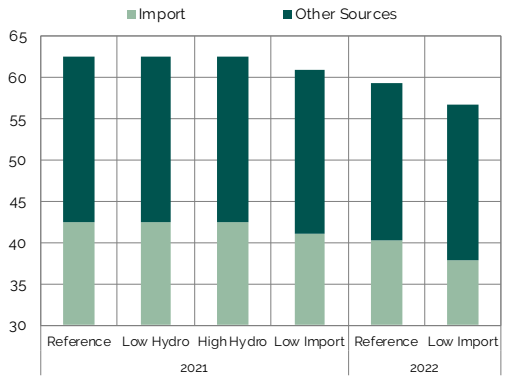
Italian Hydro & RES Output, Reference & Alternative Cases (TWh)



Net of pumped hydro production and consumption

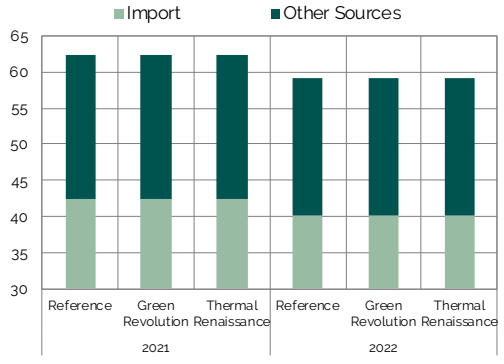
Source: REF-E elaborations

Italian Other Sources Output & Net Import, Reference Case & Sensitivities (TWh)



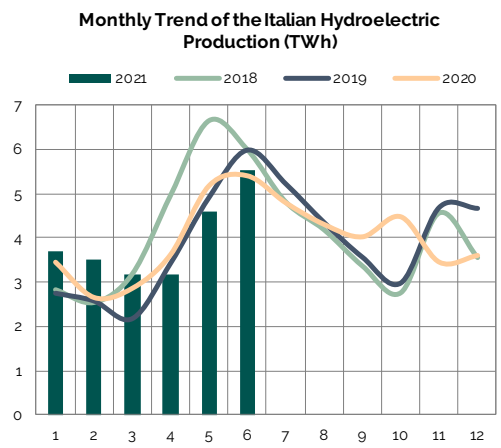
Source: REF-E elaborations

Italian Other Sources Output & Net Import, Reference & Alternative Cases (TWh)

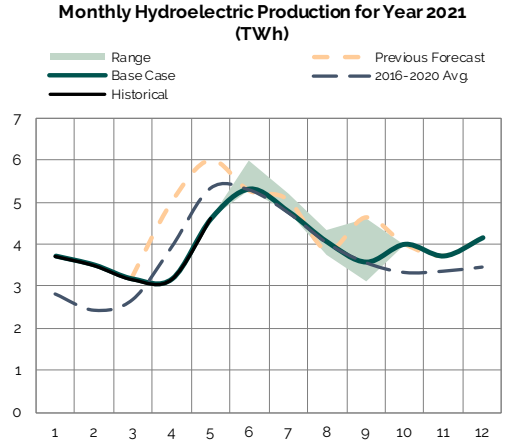


Source: REF-E elaborations

Hydroelectric variability can have an impact on the final energy mix composition and influence market prices. In early 2021, the so-called stored energy value of Italian hydro reservoirs and the snowpack level in mountain regions were sensibly higher than the previous years (Italian Power Market Outlook, Mar-21). However, spring colder-than-average temperatures limited the snow melting, leading to poor refurbishment of reservoirs and limited water supply for power generation, disregarding previously expected production figures. Our previous base case yearly estimate of hydroelectric output was revised from 51 TWh to about 47 TWh consequently – the last 5-year historical average accounts for roughly 45 TWh. With respect to the base case, two sensitivities on the hydroelectric production for the second half of the year have been performed: in the first sensitivity a lower hydroelectric output (about -0.7 TWh) is assumed in case of little rainfall over summer months; in the second, a higher hydroelectric output (+1.6 TWh) is assumed in the event of very rainy conditions in the same period. In both sensitivities, hydroelectric production in Q4-2021 is assumed equal to the last 10-year historical average.



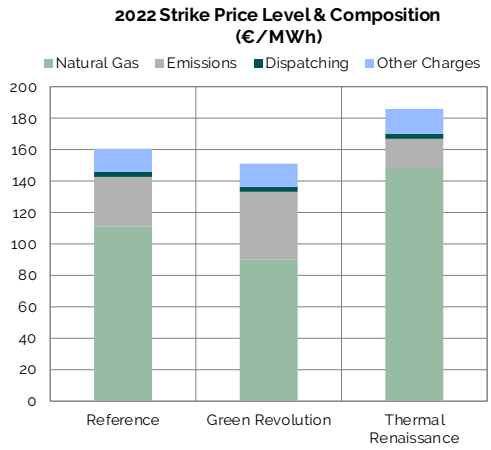
Source: REF-E elaborations



Source: REF-E elaborations

Variations of hydroelectric output in the second half of 2021 (assuming the contribution of all other renewable sources equal) could influence the available market space for gas-fired power plants compared to the base case affecting the baseload CSS (+7% in the 'Low Hydro' sensitivity, -8% in the 'High Hydro' sensitivity). However, both sensitivities show little effect on the baseload PUN, which remains aligned to the Reference case figure.

In the Reference case, output from solar and wind sources is expected above 25 TWh and 19 TWh in 2021 and above 27 TWh and 21 TWh in 2022, respectively, considering historical 2021 data until June 30. In the alternative scenarios, solar and wind production is seen at higher/lower levels assuming an accelerated/decelerated development of installations and more favorable/unfavorable climatical conditions. In particular, solar and wind production is estimated to reach above 28 TWh and 21 TWh in 2021 and above 32 TWh and 23 TWh in 2022, respectively, in the Green Revolution case. In the Thermal Renaissance case, instead, solar and wind production is expected at about 25 TWh and below 19 TWh in 2021 and below 25 TWh and 20 TWh in 2022, respectively. Hypotheses concerning forecasted production values (from Jul-21 to Dec-22) are unchanged compared to our previous assumptions.



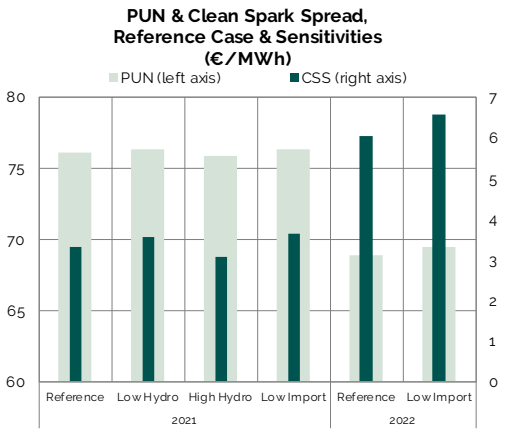
Source: REF-E elaborations and estimates

Capacity Market Strike Price Follows Commodities and CO2 Up-Move

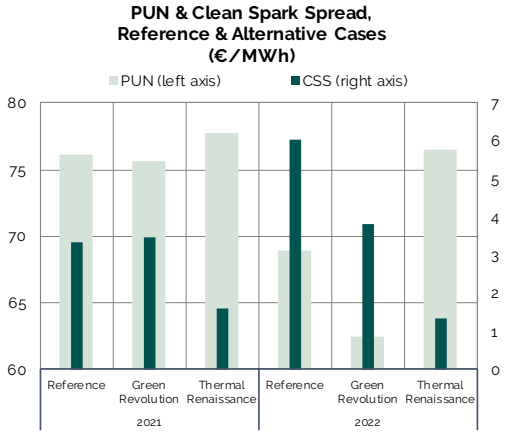
On January the 1st, 2022, the first delivery period of the Italian Capacity Market will begin. In view of the 2019 auction results, about 2.1 GW of new gas-fired capacity are expected to enter the market in 2022. Among these, 0.8 GW originate from the repowering of existing CCGT units, while 0.6 GW and 0.7 GW from new peaker and CCGT units, respectively. According to publicly available information, all the projects having taken part to the auction as non-authorized received the final authorization and are undergoing the realization phase.

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-fired peaker plant and thus is influenced by commodities trends. According to our updated hypotheses about future CO2 and natural gas prices, the Reference strike price is estimated at about 160 €/MWh, 6% higher than our earlier forecast (Italian Power Market Outlook, Mar-21).

CONCLUSIONS



Source: REF-E elaborations



Source: REF-E elaborations

Commodities and import dynamics are confirmed as the key determinants of our scenario results. Reference yearly baseload targets for PUN and CSS are 76.1 €/MWh and 3.3 €/MWh respectively for 2021, and of 68.9 €/MWh and 6 €/MWh respectively for 2022. Possible variations in the key factors and in the renewable production may determine prices variations compared to the *Reference* view, as synthetically shown in the table below.

Summary of Main Assumptions and Results			Main Assumptions							Main Results	
			CO2 (€/tCO2)	PSV@HHV (€/MWh)	GVLC@HHV (€/MWh)	Coal API2 ($/t)	Demand (TWh)	RES output (TWh)	Hydro Output (TWh)	Net Import (TWh)	CSS (€/MWh)	PUN (€/MWh)
Reference		2021	50.3	23.8	2.0	79.8	316.2	69.1	48.0	42.5	3.3	76.1
		2022	44.4	20.1	2.0	79.2	321.7	72.8	49.1	40.3	6.0	68.9
Sensitivities to the Reference case	Low Hydro	2021	50.3	23.8	2.0	79.8	316.2	69.1	46.7	42.5	3.6	76.3
	High Hydro	2021	50.3	23.8	2.0	79.8	316.2	69.1	49.6	42.5	3.1	75.8
	Low Import	2021	50.3	23.8	2.0	79.8	316.2	69.1	48.0	41.0	3.6	76.4
		2022	44.4	20.1	2.0	79.2	321.7	72.8	49.1	37.8	6.6	69.5
Green Revolution		2021	59.2	21.9	2.0	78.7	314.4	72.7	48.1	42.5	3.5	75.6
		2022	60.5	15.2	2.0	74.1	317.6	80.0	49.4	40.3	3.8	62.4
Thermal Renaissance		2021	42.1	26.9	2.0	81.5	317.1	68.1	47.9	42.5	1.6	77.7
		2022	26.1	29.3	2.0	87.5	323.1	68.7	49.2	40.3	1.3	76.5

Source: REF-E elaborations

2021's baseload CSS is influenced by a delay of power prices reactiveness to significant short-term commodities upward movements. Indeed, the commodities bullish trend recorded in the first half of the year was not followed by a proportional Italian power price increase. This contributes to erode the target Day-Ahead Market marginality for 53%-efficiency CCGT in 2021 compared to the previous forecast.

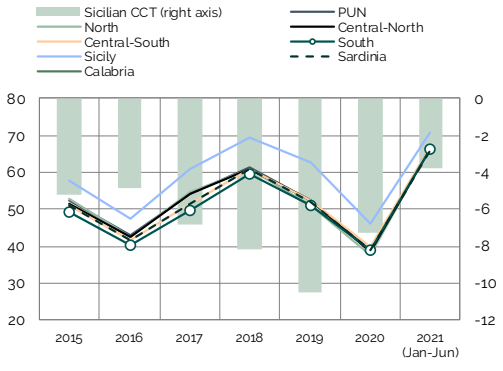
Coal-fired production in 2022 reduces to almost null from about 7 TWh in 2021 due to strong switching conditions. The 2022 CSS increases consequently, assuming a greater market space for the marginal technology fostered by the stabilization of commodities prices.

Sicilian Price Dynamics

With the new zonal configuration, the Italian TSO updated the exchange limits between some market zones. The most significant change concerned the increase of the maximum import limit for Sicily from new the new Calabria zone from 1100 MW to 1500 MW. Based on zonal prices dynamics observed in the first part of 2021, the new limit is expected to reduce the Sicilian price premium over the PUN, but it is not expected to completely solve congestion problems between Sicily and the continent especially during the hours of high residual demand (i.e. evening hours when demand is high and solar production decreases).

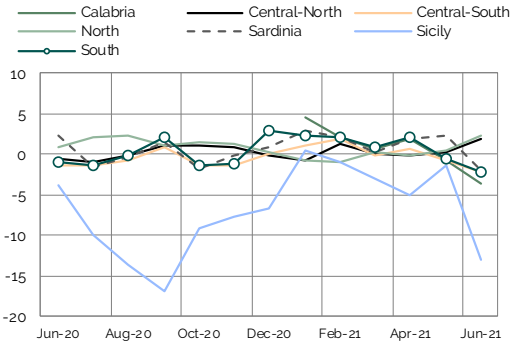
Our updated zonal prices forecast incorporates the most recent zonal dynamics and envisages Sicilian baseload prices to maintain a 4 €/MWh premium over the PUN in both 2021 and 2022, compared to about 6 €/MWh in 2019 and 2020, and to an historical average of about 7-8 €/MWh from the entry into force of the Sorgente-Rizziconi cable in 2016.

Zonal Prices & Sicilian CCT, 2015-2020 (€/MWh)



Source: REF-E elaborations

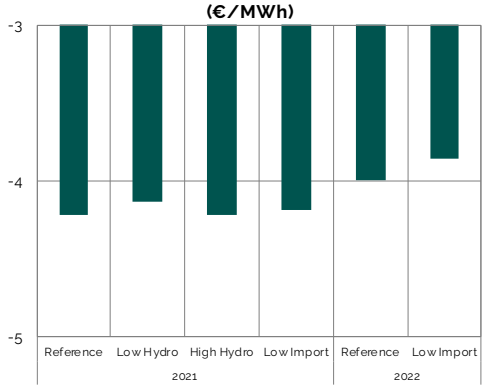
Recent Monthly Trend of Zonal CCT (€/MWh)



CCT is the difference between the PUN and the zonal price

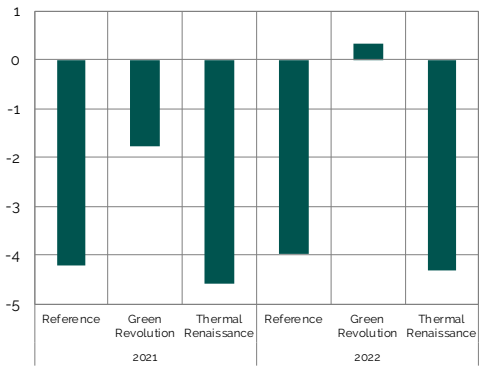
Source: REF-E elaborations

Expected Sicilian CCT, Reference Case & Sensitivities (€/MWh)



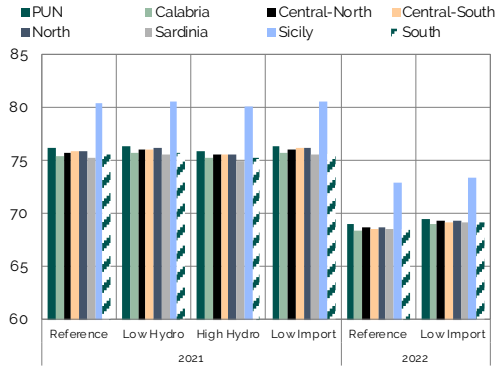
Source: REF-E elaborations and estimates

Expected Sicilian CCT, Reference & Alternative Cases (€/MWh)



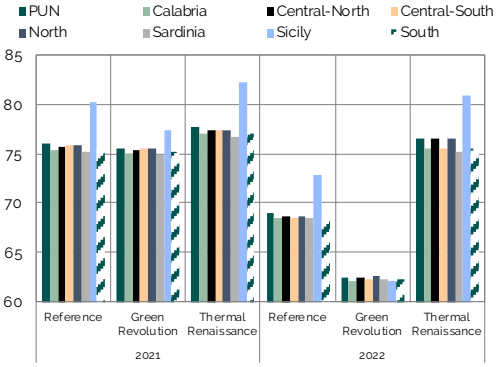
Source: REF-E elaborations and estimates

Expected Zonal Prices, Reference Case & Sensitivities (€/MWh)



Source: REF-E elaborations

Expected Zonal Prices, Reference & Alternative Cases (€/MWh)



Source: REF-E elaborations

SCNARIOS SUMMARY	2019	2020	2021			2022		
			Reference	*High*	*Low*	*Reference*	*High*	*Low*
Oil Markets and Macroeconomic Scenario								
GDP (y/y variation %)	0.3%	-9.0%	4.5%	5.7%	3.7%	4.6%	5.0%	3.0%
Oil Price ($/bbl)	63.6	43.8	69.0	70.2	66.5	69.2	76.4	59.9
Exchange Rate (€/$)	1.12	1.14	1.22	1.22	1.22	1.24	1.24	1.24
Natural Gas Market								
PSV Price (€/MWh GCV) [1]	16.2	10.4	23.8	26.9	21.9	20.1	29.3	15.2
Spread PSV-TTF (€/MWh GCV)	2.6	1.0	0.0	0.2	0.5	0.9	-0.6	1.6
Variable Logistic Costs (€/MWh LCV)	2.4	2.7	2.0	2.0	2.0	2.0	2.0	2.0
Coal Market and Emission Permits								
Coal Price ($/t) [2]	61.5	50.3	79.8	81.5	78.7	79.2	87.5	74.1
CO2 Price (€/tCO2eq)	24.8	24.7	50.3	42.1	59.2	44.4	26.1	60.5
PUN and Cost Components								
PUN (€/MWh) [3]	52.3	38.9	76.1	77.7	75.6	68.9	76.5	62.4
Gas Cost (€/MWh) [4]	38.2	26.9	53.8	60.3	49.8	46.2	65.4	35.8
Coal Cost (€/MWh) [4]	27.5	23.0	26.9	27.5	26.5	26.3	29.1	24.6
ETS Charge - CCGT Plants (€/MWh)[5]	9.3	9.3	18.9	15.8	22.3	16.7	9.8	22.8
ETS Charge - Coal Plants (€/MWh)[6]	23.8	23.7	48.2	40.3	56.7	42.5	25.0	58.0
CSS (€/MWh)	4.8	2.7	3.3	3.5	1.6	6.0	3.8	1.3
CDS (€/MWh)	1.1	-7.8	1.0	10.0	-7.6	0.1	22.4	-20.2
Demand								
Electricity Demand (TWh)	319.6	302.8	316.2	317.1	314.4	321.7	323.1	317.6
Electricity Demand (y/y variation %)	-0.6%	-5.3%	4.4%	4.8%	3.9%	1.7%	1.9%	1.0%
Natural Gas Demand (Bcm)	73.6	70.2	73.5	75.1	72.1	73.8	77.1	70.9
Natural Gas Demand (y/y variation %)	2.1%	-4.7%	4.7%	7.0%	2.8%	0.5%	2.7%	-1.7%
Net Production From Renewable Sources (TWh)	114.0	115.7	116.8	115.7	120.5	121.8	117.7	129.1
Hydro	*45.3*	*47.6*	*47.7*	*47.6*	*47.8*	*49.0*	*49.0*	*49.1*
Wind	*20.1*	*18.5*	*19.4*	*18.9*	*20.2*	*21.4*	*19.8*	*23.5*
PV	*24.6*	*26.2*	*25.4*	*25.0*	*28.2*	*27.1*	*24.6*	*32.2*
Geothermal	*5.7*	*5.6*	*5.8*	*5.8*	*5.8*	*5.8*	*5.8*	*5.8*
Biomass and USW	*18.4*	*17.8*	*18.4*	*18.4*	*18.4*	*18.4*	*18.4*	*18.4*
Import	37.4	33.3	42.5	42.5	42.5	40.3	40.3	40.3
Contestable Demand for Other Sources	168.1	153.7	157.0	158.9	151.5	159.7	165.1	148.2

* Historical data up to February 2020

[1] Net of logistic costs from PSV hub to the plant

[2] Net of logistic costs

[3] In all PUN scenarios the RES generation coincides with the Reference generation

[4] Logistic costs are included

[5] CCGT plant efficiency of 53%

[6] Environmental charge of a coal plant with 35% efficiency

Source: REF-E Elaborations

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