

The Italian GDP recovery is on track and the electricity demand almost back to pre-crisis levels gives ground for hope in the real economy resilience. Of the roughly 15 TWh demand recovery in 2021 more than 5 TWh will translate into contestable demand for gas-fired combined cycles, with import not expected to regain pre crisis average levels.

Three Short-term Key Factors to Watch:

- **Coal Switch Price:** year 2020 average CSP was over 10% above the gas-fired production costs for the most efficient coal fired plants and 35% for the average efficiency ones. Year 2021 and 2022 price dynamics make the most efficient coal-fired plants competitive again, but not the average ones, with the CSP remaining around 20% above the gas-fired production costs. This assumes Coal and the CO₂ upward trend continuing and remaining relatively stronger than gas. However, almost 10 €/ton of the recent CO₂ up move were fueled by financial operators net long positioning, which, as any financial position, is subject to be unbuilt. This puts a short-term downward reversal at risk.
- High **hydro contribution** to the Italian mix in year 2021: snowpack is higher than average, but in the event of a dry spring or autumn the renewables weight may decrease, risking the pun to average up to 3 €/MWh higher than expected.
- Gas-fired production higher competitiveness than coal-fired stabilizes the level of net **import** despite demand recovering and the increase in NTC. Lower-than-expected import flows from the northern frontiers would benefit the thermoelectric Italian fleet though, potentially leading to higher baseload CSS (+10%) and PUN (+1%) both in 2021 and 2022.

FRAME OF REFERENCE AND METHODOLOGY

This report is the synthesis of REF-E short-term power, gas, commodities, and macroeconomics scenarios. For more details and in depth analysis we kindly ask you to refer to the specific sections of the **OE Special Outlooks**, issued over the last two months.

The commodities and CO₂ *Reference* scenarios are subject to variations depending on a combination of higher demand and/or lower supply, which are seen as deriving both from an overall weaker/stronger impulse to decarbonization and from specific characteristic of each market (investments in new production capacity, OPEC strategies, weather conditions, geopolitical, regulatory, and economic developments). For each commodity and the CO₂, a *High* and a *Low* scenario is therefore considered. The *High* scenarios for commodities are assumed to materialize in a Thermal Renaissance framework, where the decarbonisation process slows down significantly or fails, while the *Low* commodities scenarios are seen as matching a fast decarbonisation. The CO₂ scenarios mirror commodities, with a *High* scenario attributed to a fast decarbonization picture and a *Low* one to a thermal renaissance development.

Sensitivities for the Power market are characterized by a strengthening or a weakening of coal-to-gas switching dynamics. The latter dynamics derive from two alternative set of hypotheses, which define the very favourable (Green Revolution) and the very unfavourable (Thermal Renaissance) decarbonization framework.

- Green Revolution scenario: stronger CO₂ prices combine with lower fuels prices. Relatively low natural gas quotations compared to coal prices intensify coal-to-gas switching dynamics. Scenario hypotheses also feature a slower electricity demand recovery and a higher wind and photovoltaic output compared to the Reference case.
- Thermal Renaissance scenario: weaker CO₂ prices combine with higher fuels prices. Relatively high natural gas quotations compared to coal prices allow coal-fired production to regain competitiveness. Scenario hypotheses also feature a faster electricity demand recovery and a lower wind and photovoltaic output compared to the Reference case.

Further short-term sensitivities are calculated based on a higher/lower hydro or import contribution to the production mix.

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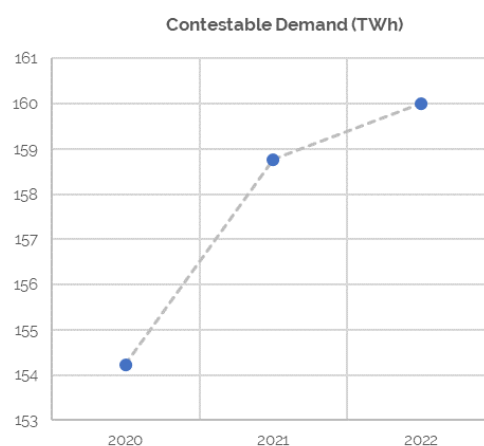
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ITALIAN POWER MARKET

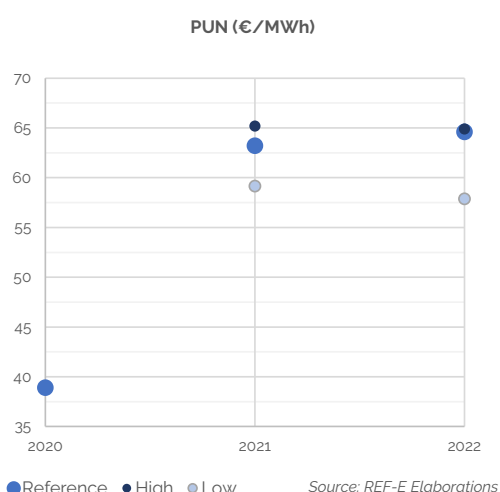
For an in-depth analysis, please refer to the full report: [Italian Power Market Outlook](#)

		PUN €/MWh ¹	GAS Cost €/MWh ²	Coal Cost €/MWh ³	ETS Charge CCGT Plants €/MWh ⁴	ETS Charge Coal Plants €/MWh GCV ^{4,5}	CSS €/MWh	CDS €/MWh	Contestable Demand TWh ⁶
2019	Historical	52.3	38.2	27.5	9.3	23.8	4.7	1.1	168.1
2020	Historical	38.9	26.9	23.0	9.3	23.7	2.7	-7.8	153.7
2021	Thermal	65.2	48.2	27.6	13.2	33.6	5.5	5.6	160.9
2021	Reference	63.5	43.0	26.7	14.4	36.6	6.1	0.2	158.3
2021	Green	59.2	39.0	26.0	15.1	38.5	4.8	-11.9	151.1
2022	Thermal	64.9	50.9	28.9	10.3	26.3	3.6	9.7	165.4
2022	Reference	64.6	44.5	26.9	14.2	36.2	5.9	1.5	159.5
2022	Green	57.9	38.4	24.4	15.6	39.8	3.8	-12.6	147.4

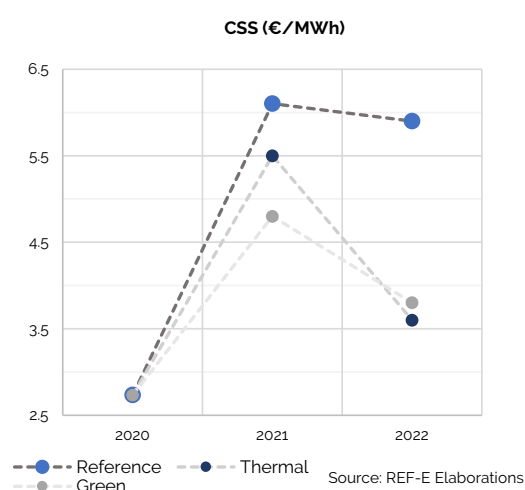
Favorable coal-to-gas switching conditions and import flows in line with the last 5-year historical average potentially increase the gas-fired production in the next two years. In 2022, gas-fired production remaining more competitive than coal-fired stabilizes the level of net import despite the expected recovery of demand and the increase in NTC (following the completion of interconnection developments with France and Austria). Import flows in 2022 grow just by 1 TWh compared to 2021 and total slightly less than 40 TWh – against a previous estimate of 45.9 TWh. PUN and CSS: reference yearly baseload targets for PUN and CSS are 63.5 €/MWh and 6.1 €/MWh respectively for 2021, and of 64.6 €/MWh and 5.9 €/MWh respectively for 2022.



Source: REF-EElaborations



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¹ In all PUN scenarios the RES generation coincides with the Reference generation.

² Logistic costs are included.

³ CCGT plant efficiency of 53%.

⁴ Environmental charge of a coal plant with 35% efficiency.

⁵ Gross calorific value.

⁶ Gross of Industrial Self Production.

Compared to the reference case, residual demand for gas-fired generation is expected to decrease under the alternative scenarios, guided by more competitive market conditions of different nature. With more bearish view on the ETS prices and higher gas prices in the Thermal case combined cycles are expected to lose market share, replaced by more convenient coal generation. Projected CSS is expected to drop to 5.5 €/MWh and 3.6 €/MWh in 2021 and 2022, respectively.

Demand recovery slower than expected and higher share of renewable generation weigh on market room available for gas-fired power plants in the Green case. Average CSS is estimated to reach 4.8 €/MWh in 2021 and decline to 3.8 in 2022.

In the event of hydro generation being lower than assumed in year 2021, this would impact the PUN, rising it by almost 1 €/MWh, while the CSS would near 7 €/MWh.

	Hydro (Twh)	Import (Twh)	CSS (€/MWh)	PUN (€/MWh)
2019 Historical	45.3	38.2	4.8	52.3
2020 Historical	47.6	33.3	2.7	38.9
2021 High Hydro	52.2	38.8	5.8	63.2
2021 Reference	50.8	38.8	6.1	63.5
2021 Low Hydro	47.7	38.8	6.8	64.3
2021 High Import	50.8	36.0	6.7	64.1
2022 Reference	49.0	39.8	5.9	64.6
2022 Low Import	49.0	37.0	6.5	65.2

A lower than assumed import would count for less than 1 €/MWh on the PUN and roughly 0.5 €/MWh on the CSS both in 2021 and 2022.

The impact of the new market zones framework and of New highly efficient and competitive units in the CCGT segment with the Capacity Market also need to be attentively monitored. More details in REF-E latest [Italian Power Market Outlook](#)

NATURAL GAS

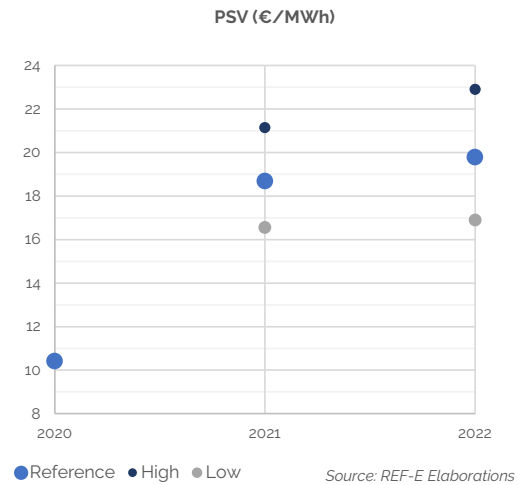
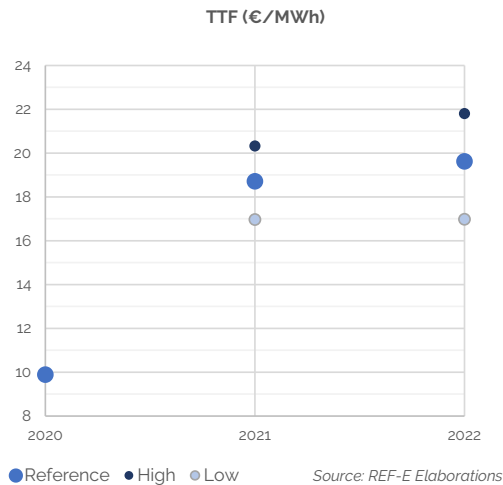
For an in-depth analysis, please refer to: [Natural Gas Market Outlook](#)

	TTF Price (€/MWh)	PSV Price (€/MWh) GCV ⁷	Spread PSV-TTF (€/MWh) GCV	Variable Logistic Costs (€/MWh) GCV
2019 Historical	13.6	16.2	2.6	2.4
2020 Historical	9.4	10.4	1.0	2.7
2021 High	19.7	21.0	1.2	2.0
2021 Reference	18.2	18.7	0.5	2.0
2021 Low	16.5	16.8	0.3	2.0
2022 High	21.3	22.9	1.6	1.7
2022 Reference	19.1	19.8	0.7	1.7
2022 Low	16.5	16.9	0.4	1.7

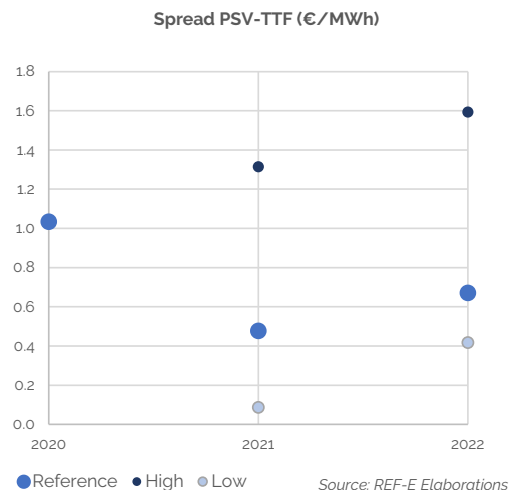
Year 2020 gas market dynamics enshrined Europe's role of balancing market for global LNG trade. On the other hand, the global LNG market definitively took on a key role in determining the European gas prices variations. The US LNG exports to Europe weight, historically averaging around 20%, fell by 65% in January 2021 compared to the previous month and is

⁷ Net of logistic costs from PSV hub to the plant.

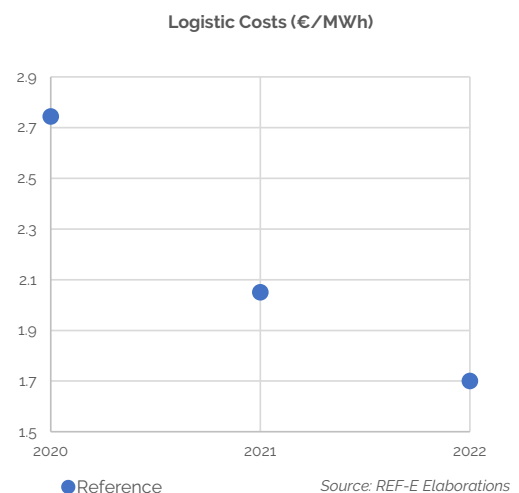
overall lower than the average 2019 and 2020 weight. U.S. producers are meeting the growing demand from emerging markets too, especially Latin America, reducing the margin supply for Europe further over the coming years and supporting a positive outlook for prices.



Spread PSV-TTF: in our Reference scenario, flows arriving from Azerbaijan via Trans Adriatic Pipeline (TAP) will take advantage along with substantially stable LNG arrivals (around 13 Bcm between 2021 and 2022). The change in the import mix with the progressive increase of arrivals from the southern area to Italy confirm our hypothesis of a gradual closure of the PSV-TTF spread, which could average around 0.5 €/MWh by 2022. TAP flows to Italy are so far in line with our estimates, with an average of 10 Mcm/day. Gas flows from North Africa should increase too in 2021, to then leave more space for the Azerbaijani ones.



Variable Logistics Costs: The average variable logistic costs for gas-fired plants in 2020 was just below 2.5 €/MWh@HHV. In our scenario, we assume that all thermoelectric producers apply for the RETTEE refund mechanism in force from Q3-2021, aimed at removing the White Certificates mechanism costs from logistics costs for power plants, reducing the overall figure below 2 €/MWh@HHV for 2021 and close to 1.5 €/MWh@HHV for 2022. The re-introduction of the CRVi component (0.0065 €/Smc) starting from Q4-2021 only partially compensate the reduction of the RETTEE. A reduction in the socialization costs of storage and regasification infrastructures also supports the overall cost decrease.



GLOBAL LNG

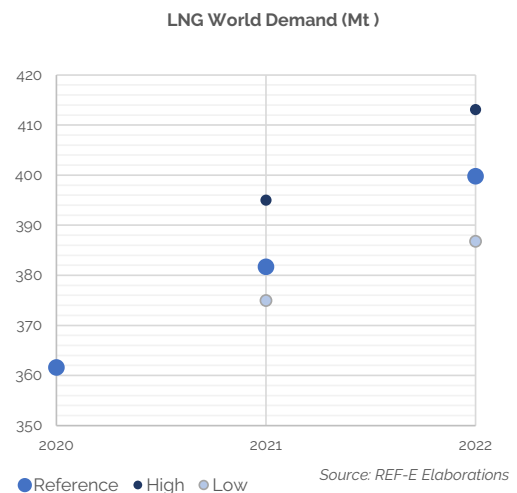
For an in-depth analysis, please refer to: [Global LNG Outlook](#)

The world LNG market dynamics became key in determining the European and the Italian natural gas pricing, with the old continent being a marginal target market compared to Asia.

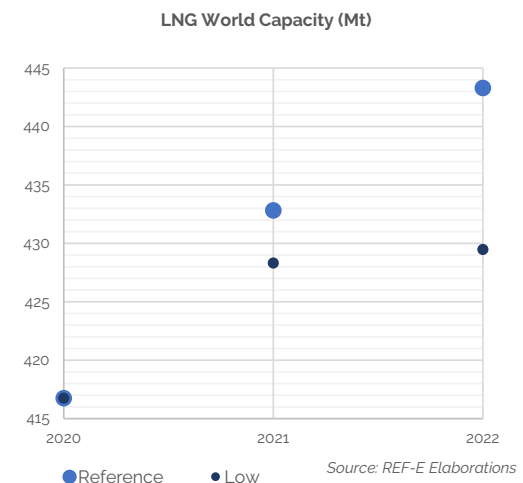
	LNG World Demand (Mt)	LNG World Capacity (Mt)	SW Europe (€/MWh)
2019 Historical	358.2	387.7	14.4
2020 Historical	361.6	416.7	9.5
2021 High	395.0	-	17.6
2021 Reference	381.7	432.8	15.3
2021 Low	375.0	428.3	15.0
2022 High	413.1	-	19.6
2022 Reference	399.8	443.3	16.0
2022 Low	386.8	429.5	15.5

Despite a structural LNG oversupply, in the short-term, new capacity development delays and a faster than expected recovery of the Chinese economic growth rise the risk for the market coming under pressure over the coming years in the event of colder than average winters and/or temporary supply disruptions.

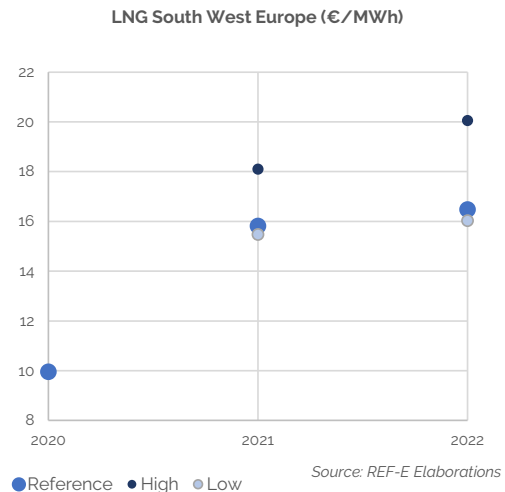
DEMAND: The LNG demand world growth rate fell to 1% in year 2020 from an average growth rate higher than 10% between 2016 and 2019. The European import fell 4%, while the Chinese import grew 11%. The world demand growth is expected to be 6% and 5% in years 2021 and 2022 respectively, with China seen as the main driver. Emerging markets are also growing. Brazil should drive Latin American LNG demand growth over the coming years (Jan-2021 imports have already exceeded those of the entire 2019 overall).



Liquefaction CAPACITY: global LNG liquefaction capacity rose by around 5% in 2020 compared to 2019, when the growth rate was close to 10%. Less than 20 Mtpa of liquefaction capacity was brought on-stream in 2020 (compared to almost 35 Mtpa in 2019, mostly from the US, Russia and Australia. COVID-19 containment measures combined to low gas prices had a negative impact on both under-construction projects and FIDs, with US producers return having been negative between January and September 2020. A growth rate lower than 5% is expected for 2021 and close to 2.5% in 2022.



LNG SOUTH WEST EUROPE: The lower bound of the SW Europe LNG price is estimated based on the assumptions of a global oversupplied market and consequently a large available margin between demand and supply (Low scenario). The upper bound (High scenario) represents instead a low-capacity scenario (only the existing one) that must face the market demand. LNG price in the South West Europe area is now settling just below 20 €/MWh and will end up in around 15 €/MWh in 2021 on average, under the base case hypothesis of a gradual demand recovery and projects under construction that proceed according to the producers' plans.



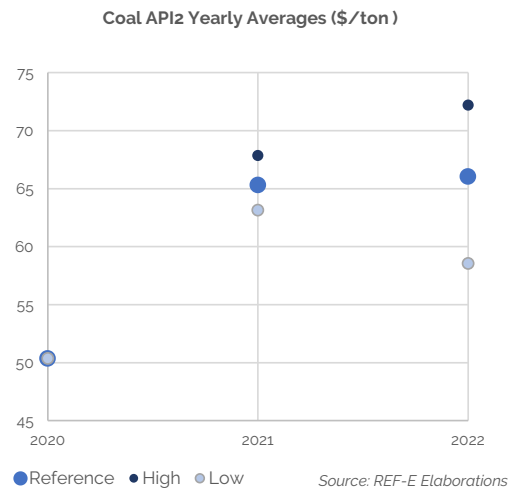
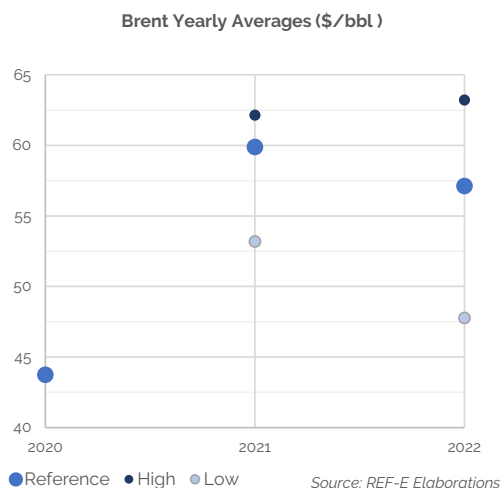
COMMODITIES

For an in-depth analysis, please refer to: [Brent Coal and CO2 Outlook](#)

	Brent (\$/bbl)	Coal API2 (\$/ton)	ETS CO2 (€/ton)
2019 Historical	63.6	61.5	24.8
2020 Historical	43.8	50.4	24.7
2021 High	62.1	67.9	-
2021 Reference	59.9	65.3	38.2
2021 Low	53.2	63.2	35.1
2022 High	63.2	72.2	41.5
2022 Reference	57.1	66.0	37.8
2022 Low	47.8	58.6	27.4

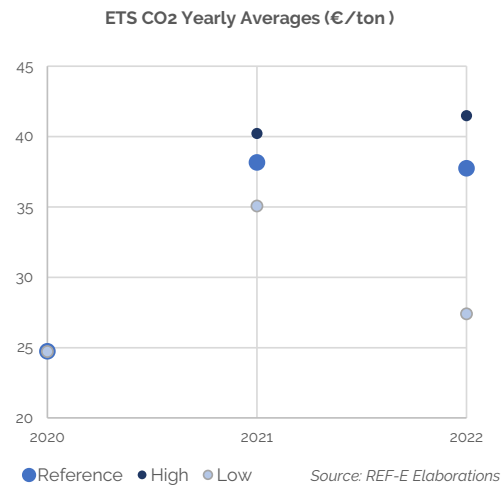
OIL: Saudi Arabia leadership role in the oil market regained strength since last year COVID-19 related demand shock and the oil market consequently becomes short-term supply driven. The OPEC Plus market intervention is not seen as sustainable in the middle term tough. A progressive move towards a structural rebalancing of the market is therefore expected over the coming years, with rising prices also favouring a come-back of the OECD production and record levels of both crude and refined products stocks weighing.

COAL: Global coal demand structurally resumes, following the economic recovery and Prices move higher accordingly. The 2021 2.6% expected rebound in world coal demand is driven



by the Chinese, Indian and overall Asian rebound in electricity demand and industrial output, more than compensating the ongoing decline of the American and European demand. After this year expected rebound the short-term world coal demand for power generation is in fact stable, which limits the API2 European reference price upside potential.

CO₂ ETS: The CO₂ price is moving firmly higher, with the ETS Phase 4 (covering the 2021 to 2030 period) kick off in January having fueled further upside acceleration, following through last September release by the EU Commission Plan for Energy and Climate, including the ambitious revision of the emission reduction target (as of year 1990) to 55%. Despite a clear regulatory commitment by the EU Commission in supporting the CO₂ ETS price, some market adjustment cannot be ruled out and a short-term price stabilization near the current levels may avoid the risk of excessively inflating the electricity prices.



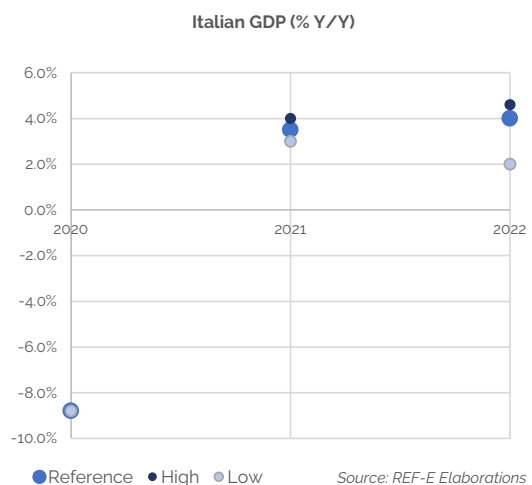
MACROECONOMICS AND ENERGY DEMAND

For an in-depth analysis, please refer to: [Macroeconomic and Energy Demand Outlook](#)

	Italian GDP (% Y/Y)	Italian CPI (% Y/Y)	Electricity Demand (TWh)	(% Y/Y)	Gas Demand (Bcm)	(% Y/Y)	EUR-USD
2019 Historical	0.3%	0.6%	319.6	-0.6%	73.6	2.1%	1.12
2020 Historical	-8.8%	-0.1%	302.8	-5.3%	70.2	-4.7%	1.14
2021 High	4.0%	0.2%	317.4	4.8%	-	-	-
2021 Reference	3.5%	0.1%	316.7	4.6%	72.5	3.2%	1.23
2021 Low	3.0%	0.0%	315.9	4.3%	-	-	-
2022 High	4.6%	0.5%	322.9	1.7%	-	-	-
2022 Reference	4.0%	0.3%	321.2	1.4%	72.7	0.3%	1.24
2022 Low	2.0%	0.0%	316.3	0.1%	-	-	-

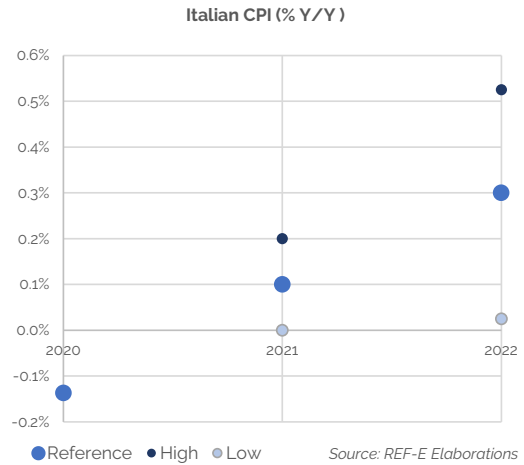
GDP: The Italian GDP recovers pre-crisis levels by 2023, with the government's handling of the over 200 billion of euros of European funds seen as key for achieving the latter target. The increase in households' savings rates keeps weighting on private consumption, in combination with social inequality increase and disposable incomes contraction, which is only partially mitigated by public intervention. This still weigh on domestic demand, limiting a complete resumption of GDP in 2021.

A persistence of COVID-19's restrictions and a failure in investing a large part of the PNRR funds would limit the annual increase of GDP to 3% in 2021 and to 2% in 2022, with GDP remaining below 2019 level after 2023. On the other end, a quicker ending of the pandemic impact and an effective investment of European funds

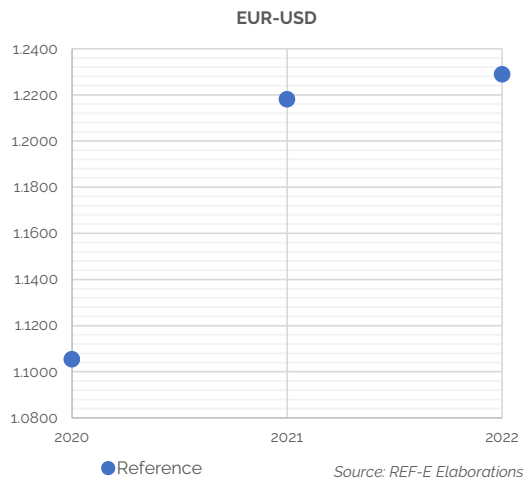


instead would be reflected in a 4% increase of GDP in 2021, followed by an additional 4.6% increase in 2022, and a return to 2019 levels between 2022 and 2023.

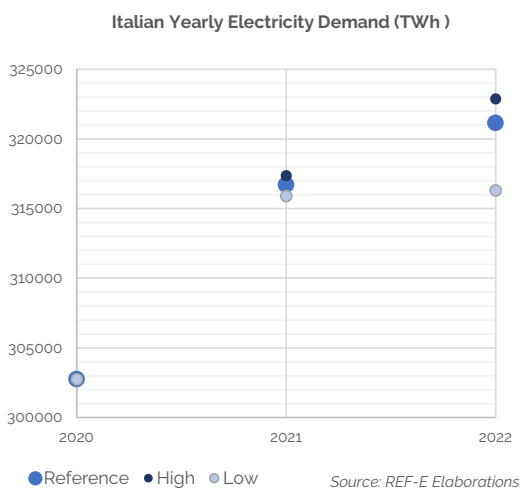
INFLATION: The energy prices recovery and the resumption of demand led to a gradual increase of monthly inflation for the last quarter of the year, leading Jan-21 inflation to above zero (0.2%). Yearly inflation averages are above zero both in 2021 and in 2022, but below 0.5% in both years, with the subdued recovery of private consumption, discussed above, weighing. The impact of COVID-19 on consumption behaviors, by influencing the consumption mix, is reflected in relative prices movements, potentially affecting forecasts for 2021 and 2022 inflation.



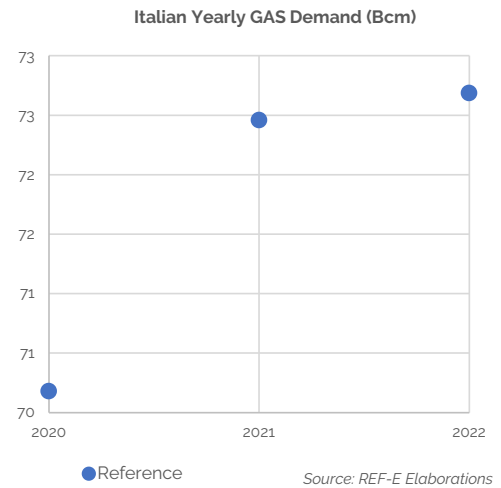
EUR-USD: While the upper bound FED Funds target lies at 0.25%, the EU deposit rates are already in negative territory at -0.5%. The ECB Governing Council can continue to provide liquidity through its targeted longer-term refinancing operations at an interest rate that could be as low as -1%. However, its main weapon to support the economy is now in fact the Pandemic Emergency Purchase Program, Exchange rate wise, a stronger recovery in the United States than in the Euro Zone is compensated by the FED easing potential being perceived as higher than the ECB's. This offers some support to the EUR-USD and favours an overall stable exchange rate over the next couple of years.



Electricity Demand: The more positive evolution of electricity demand compared to GDP is at least partially explained by a heterogeneous response to the pandemic by different economic sectors. The industrial activity contribution to power demand recovery is highlighted by the evolution of Terna's index of monthly consumption of electricity in the industrial sector (IMCEI), whose seasonally adjusted value moved above 2019's level starting from November 2020. Our expectations for 2021 remain in line with the previous update, despite the downward revision of 2021's GDP recovery. This is based on the evidence of a faster recovery of electricity demand compared to GDP and on the positive signals coming from industry sector's electricity consumption (Jan-21 IMCEI index showed industry's electricity consumption to be 3.8% higher compared to Jan-20). In accordance with this evidence, demand forecast for 2022 is set to be equal 321.2 TWh, 0.2% above Nov-20 update.



GAS Demand: The Italian gas demand is expected to grow by nearly 3% y/y in 2021 (slightly exceeding 72 Bcm) and +0.5% y/y in 2022. In 2021, the industrial natural gas consumption recovery forecast is based on GDP growth expectations along with a normalization of thermoelectric and distribution network gas consumption, under the base case assumptions of temperatures remaining in line with seasonal averages. 2021 gas consumption for thermoelectric power plants could decrease slightly amid a growing contribution from renewable sources (settling at 24 Bcm in 2022).





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