

February 12, 2022

Spectrum of Energy

The Spectrum of Energy aims to consolidate and assess events, data and forecasts that affect the broad 'spectrum' of global energy, considering all sources, technologies, policies, and financial implications as we transition to a lower carbon environment.

HIGHLIGHTS

What We're Watching:

- Biden Extends Trump's Solar Tariffs (p.4)
- US Refiners in the Driving Seat (p.5)
- EU Taxonomy: Green Washing or Reality? (p.7)
- Global Oil: Demand Determines What's Next (p.27)

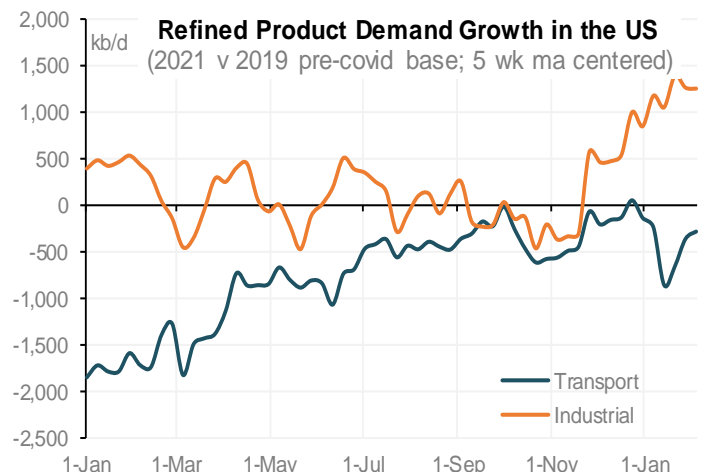
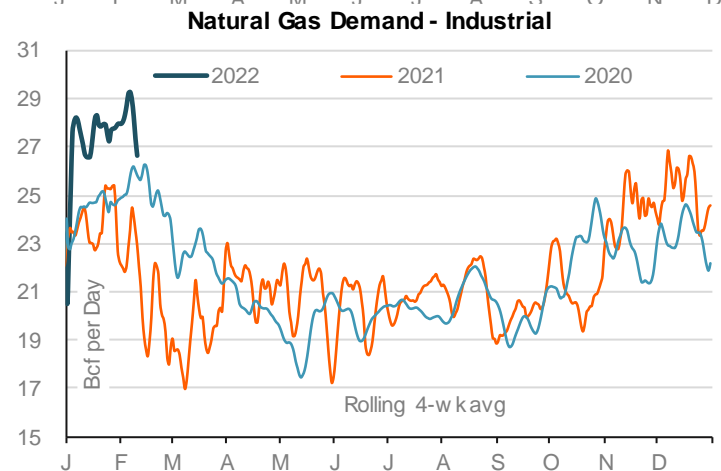
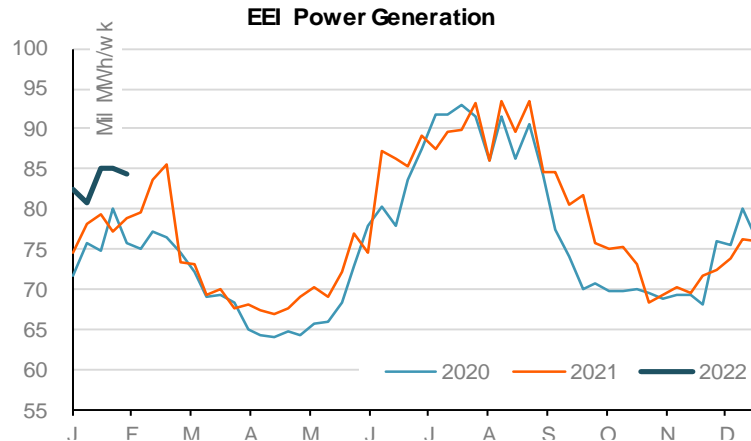
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Cornerstone Macro Energy

Energy Transition Performance Monitor

Sector	MTD	YTD
Solar	-1.0%	-14.2%
Wind	0.3%	-9.9%
Hydrogen	-1.0%	-10.3%
New Energy Vehicles	-3.5%	-12.0%
Battery Storage	-3.4%	-13.9%
Metals & Rare Earths	9.7%	1.1%
Power Generation	-2.0%	-6.1%
Integrated Oils, Ref, Marketing	2.8%	8.6%
Oil & Gas Exploration & Prod	5.5%	22.9%
Infrastructure & MLPs	4.1%	13.5%
Oilfield Services	8.0%	26.6%
Energy Portfolio	0.8%	-3.7%



Thomas Marchetti, CPA

Jan Stuart

James Noonan, CFA

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WHAT'S IN OUR FOCUS

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We are pleased to invite you to the **Piper Sandler 22nd Annual Energy Conference**, March 21-23, 2022. The conference will be held at the Waldorf Astoria, Las Vegas. The conference begins with a welcome reception the evening of Monday, March 21 followed by two days of content concluding on Wednesday, March 23.

This conclave is one of the premier energy conferences each year, bringing together top-tier companies, investors and thought leaders from across the Energy Spectrum. The 2022 conference will highlight the robust operating environment for conventional energy companies, the path to supply/demand normalization, as well as what the unfolding energy transition means for the industry. This year's conference will also feature renewables & clean energy. Join us as we convene leading institutional investors and company executives to discuss investment opportunities, market themes and global perspectives.

APA Corp.	GameChange Solar LP	Plug Power, Inc.
Archrock, Inc.	Halliburton Company	Precision Drilling Corporation
Array Technologies, Inc.	Hannon Armstrong Sustainable Capital, Inc.	Priority Power Management, LLC
Baker Hughes Company	Helmerich & Payne, Inc.	Pro Custom Solar LLC
Black Stone Minerals, LP	HollyFrontier Corporation	ProPetro Holding Corp.
Bloom Energy Corporation	Ittron, Inc.	Qnergy Inc.
BP p.l.c.	Laredo Petroleum, Inc.	Range Energy Resources Inc.
Brigham Minerals, Inc.	Liberty Oilfield Services Inc.	Range Resources Corporation
Cactus, Inc.	Livent Corp.	Renewable Energy Group, Inc.
Catalyze, Inc.	Madison Energy Investments LLC	SilverBow Resources, Inc.
Centennial Resource Development, Inc.	Marathon Oil Corporation	Smart Sand, Inc.
ChampionX Corporation	MRC Global Inc.	Southwestern Energy Company
Chart Industries Inc.	Murphy Oil Corporation	Spartan, Inc.
Chevron Corporation	National Energy Services Reunited Corp.	Stem, Inc.
Comstock Resources, Inc.	NCS Multistage Holdings, Inc.	Sunnova Energy International, Inc.
Core Laboratories NV	NexTier Oilfield Solutions Inc.	SunPower Corporation
Darling Ingredients, Inc.	Northern Oil & Gas, Inc.	SunRun, Inc.
Delek US Holdings Inc.	NOV, Inc.	Tarafert B.V.
Devon Energy Corporation	Novonix Limited	TechnipFMC plc
Diamondback Energy, Inc.	Oasis Petroleum Inc.	Tenaris SA
Enchanted Rock, Ltd.	Oceaneering International, Inc.	TPI Composites, Inc.
Enphase Energy, Inc.	Opal Fuels LLC	Transocean Ltd.
ESS Tech, Inc.	OYA Solar Inc.	Valero Energy Corporation
Expro Group Holdings NV	Patterson-UTI Energy, Inc.	Vertex Energy, Inc.
Falcon Minerals Corporation	Phillips 66	Weatherford International Plc
FTC Solar, Inc.	Pioneer Natural Resources Company	White Deer Management LLC

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Biden Extends Trump's Solar Tariffs

Biden decision to back solar installers puts chips on Build Back Better (BBB) to boost prospects for US solar manufacturing efforts. Despite the best efforts of the Administration to use tariffs to protect the US solar industry, it's failed thus far to produce any meaningful gains for domestic solar manufacturing. The Solar Energy Manufacturing for America Act (SEMA) could provide needed incentives along the entire chain. While there were a number of industry announcements last year to build out manufacturing ahead of the Act to fill the void for US solar manufacturing, their fate is likely tied to the outcome of BBB, which is increasingly unlikely.

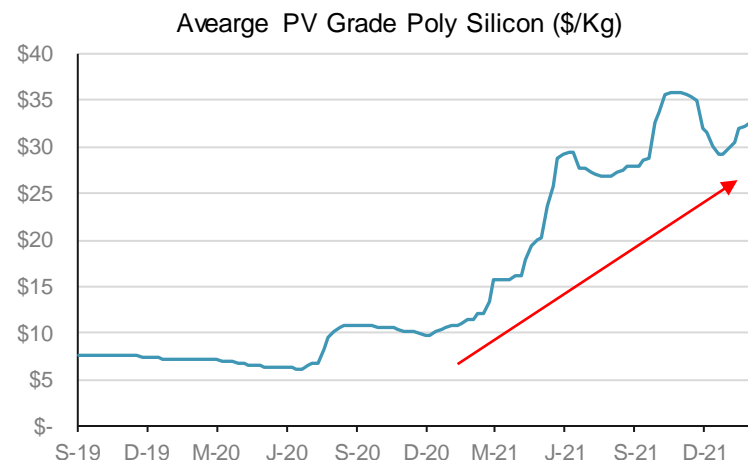
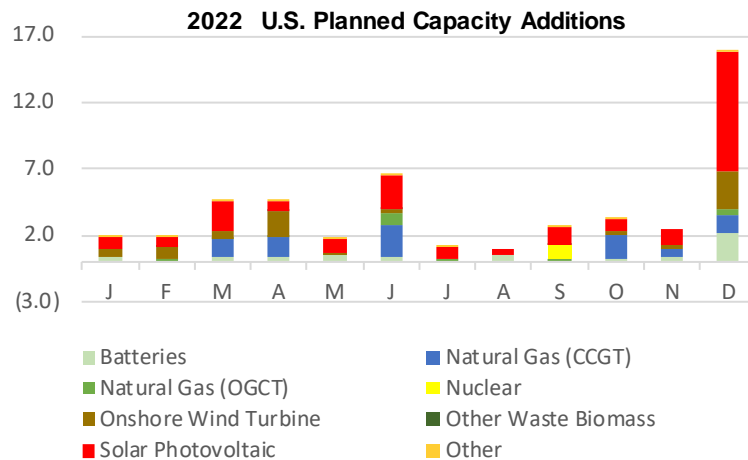
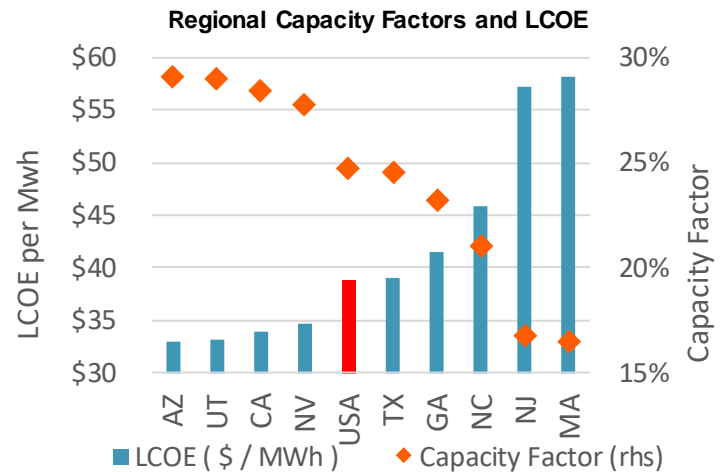
Biden announced that Sec 201 tariffs will be extended for four more years while surprising some by granting an extension for bifacial panels and doubling the quota on imported cells from 2.5GW to 5.0GW. These tariffs became effective February 7, 2022. While Trump originally exempted bifacial cells, he removed their exemption in 2020 given the lack of available domestic supply. Similar to the original tariffs, there will be a phased step-down in the rates thru 2025.

The exemption for bifacial panels remained a point of contention, but the reality is that China remains the main source of bifacial manufacturing and little has been done in the US in terms of building out domestic solar cell manufacturing capabilities (an exception being First Solar's thin-film). In both 2019 and 2020, the US solar panel assemblers imported less than their 2.5GW quota according the US Customs and Boarder Protection. Given the absence of domestic solar cell manufacturing, US demand well exceeded domestic supply for solar panels, module makers will continue to be forced to import crystalline solar cells. In 2022, over 46% of utility scale capacity additions are expected to be solar (22 MW), which obviously excludes residential.

We continue to see risks for the stand-alone solar markets in the US (e.g., installations, manufacturing). Shifts in policies on Net Metering should drive higher storage attachment rates for high-end consumers that benefit players such as Enphase (ENPH) and Solar Edge (SEDG). On our Equities side, Kashy Harrison has the strongest conviction for SEDG within the solar sector to deliver an earnings beat when they report on Tuesday. He notes 3Q21 commentary on strong backlog and clear tailwinds on storage should drive upside to 4Q21 results.

Build Back Better Manufacturing Credits

- Solar Grade Polysilicon (\$3/kg)
- PV Wafers (\$12/Meter sq)
- Thin-film 7 PV Silicon Cells (\$0.04/W DC)
- Thin-firm & PV Silicon modules (\$0.07/W DC)



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US Refiners in the Driving Seat

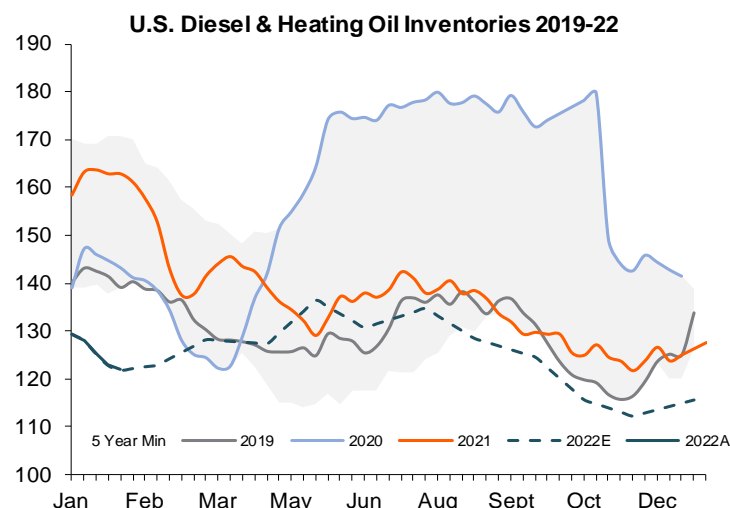
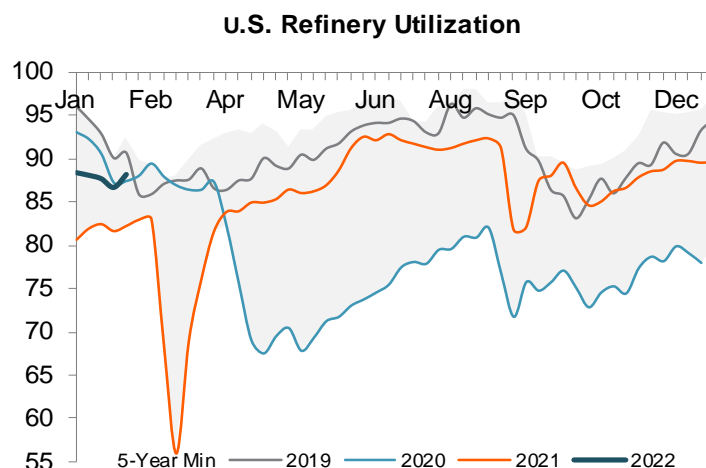
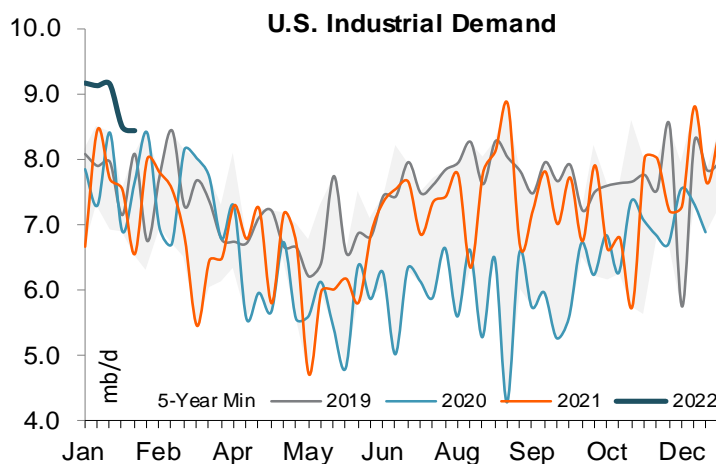
Are Refiners moving from a trading vehicle to a longer-term investment? Similar to other verticals in the energy sector, there have been years of under-investment. Global refining capacity has seen substantial rationalization of capacity over the last several years. We see capacity additions in 2022-23 but slowing. Meanwhile, global demand continues to recover and the remaining global capacity looks to be stretched, which should drive strong margins.

US Refining utilization is picking up to meet exceptionally strong implied product demand (see [upper chart](#)), which is hitting new seasonal highs driven by a recovery in Industrial demand. This is particularly interesting given transportation fuels (e.g., mainly gasoline and jet fuel) have been negatively impacted by Omicron and still have room to continue to recover. As supply chain bottlenecks start to loosen, we are clearly seeing an increase in demand from industrial users not just in refined petroleum products but also for natural gas demand (see [p.35](#)).

Higher natural gas prices and delayed maintenance schedules should keep capacity and product supplied tight thru (at least) 2022. Refiners have foregone maintenance spending over the past few years, but 4Q21 conference calls suggest turnarounds could be high after multi-year deferrals. This should keep a lid on refinery utilization rates to meet demand. In the Atlantic Basin, European refiners are struggling with higher energy costs. Obviously, the *Energy Crisis* has been creating incremental demand for heating oil given the low levels of natural gas in European storage (e.g., fuel switching/substitution). But while natural gas prices have been driving up margins in Padd I, they are also limiting the yields of marginal European refiners for lighter end products (e.g., diesel and heating oil).

For the US Refiners, 4Q21 results have exceeded expectations with tight product balances pushing utilization back to mid-cycle levels “plus.” Piper Sandler’s Ryan Todd noted that margin strength significantly exceeded elevated expectations, which together with commentary indicating elevated levels of industry maintenance this year, suggests increasing market tightness in 2022, likely to drive positive revisions (PSC 1Q22 estimates +49% post earnings) and support his constructive call on the group.

See also ([p.30](#)) for our recap on the US Dept of Energy’s weekly petroleum status report.



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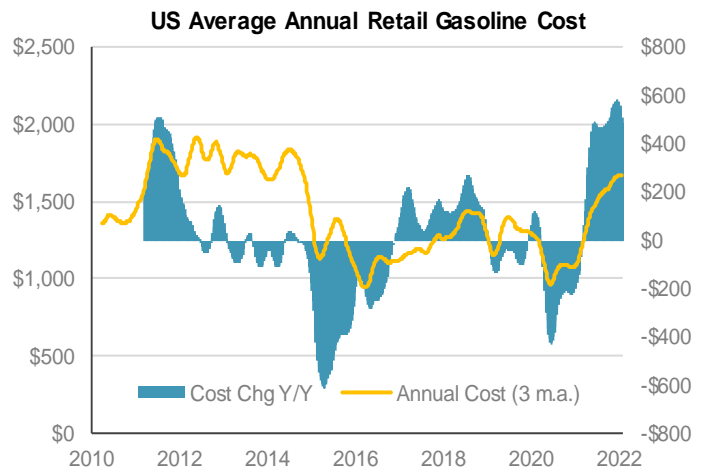
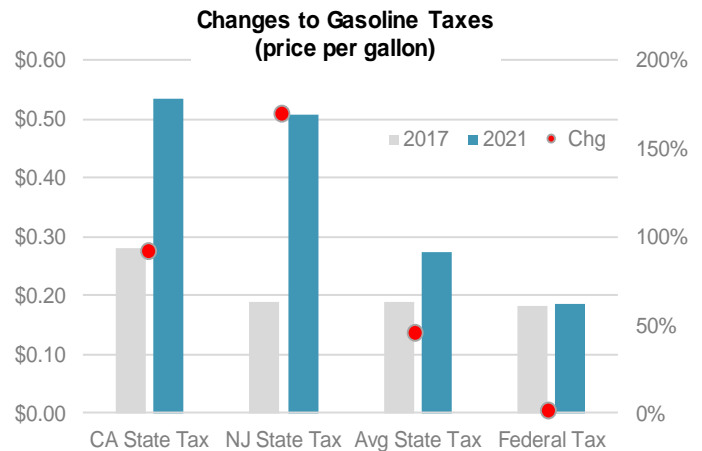
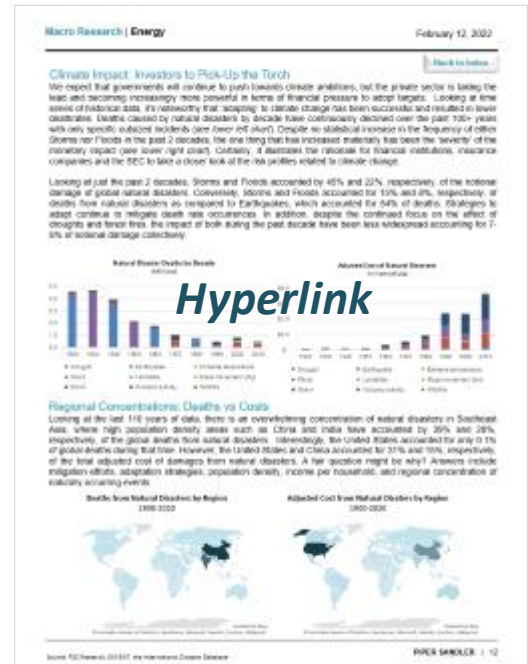
SEC Hits Roadblocks in Climate Disclosure

The Biden Administration and climate progressives could be set for yet another setback as SEC braces for opposition to financial disclosures on climate change and risk management. The disclosure requirements are a key part of the White House's strategy for tackling climate change, but the legality of enforcement is at risk. The Biden Administration is not alone in their efforts. Investors have also been demanding greater disclosure. Difficulties arise on conformity and comparability of data, which have made climate risk assessment challenging for ESG and Sustainability. To complicate matters, the SEC's proposed disclosure requirements follow the ambiguous definition of 'materiality' that the Democrats hopes to extend not only to Scope 1 emissions (e.g., the reporting companies), but to the emissions of those companies suppliers and partners. While Democrats such as Sen Warren and SEC Commissions Lee and Crenshaw are pushing ahead with disclosure demands, SEC Chair Gensler is trying to find a balance. Unfortunately, the tug of war that is ensuing risks either an almost certain indefensible legal opposition or a climate disclosure rule that does not achieve their objectives. The SEC was expected to unveil their rules by the end of 2021, but their release could be dragged out or shelved.

Democrats Propose Suspending Gasoline Tax

The Gas Prices Relief Act would eliminate the 18.4c per gallon federal gas tax for the rest of the year, which would provide \$15 billion in annualized tax relief on gasoline for consumers. Given that gasoline prices are directly correlated with presidential approval ratings, Biden's Administration has noted that they have several tools in their kit to help alleviate inflation.

The impact of higher gasoline prices on consumers has amounted to c.\$500 per year in incremental costs per average consumer compared to 2020. However, the total cost of gasoline to the consumer is still roughly \$1,700 per year (based on 12,000 miles), which is still below the levels seen during 2012 (\$2,000 per year), when higher prices had a 'rationalizing' effect on gasoline consumption. As we had expected, higher gasoline prices have had little impact on gasoline demand, but is likely impacting lower-income consumer's discretionary spending on the margin.



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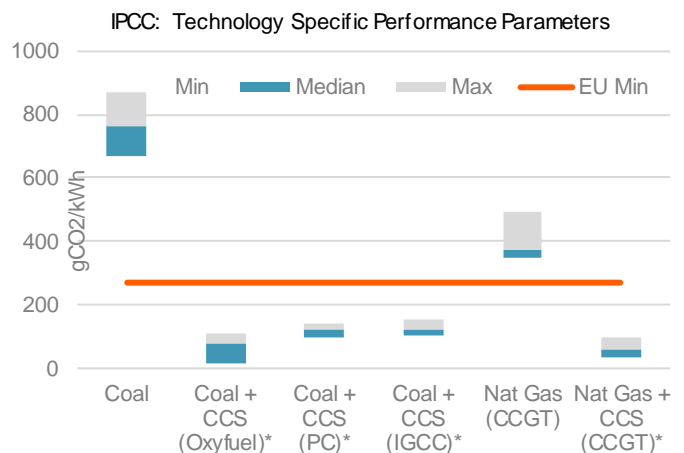
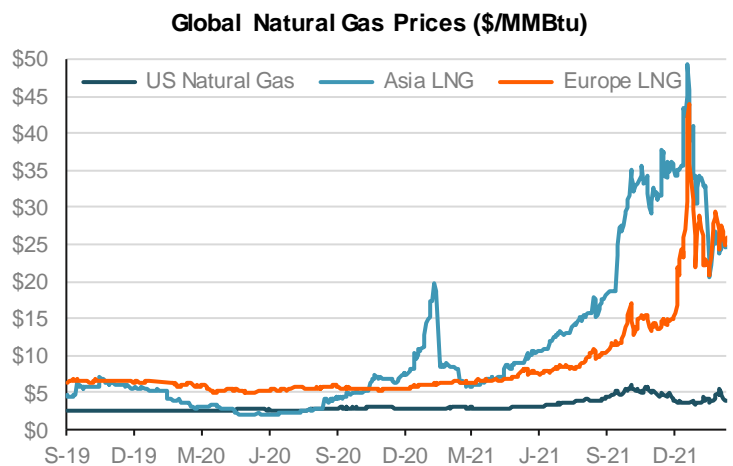
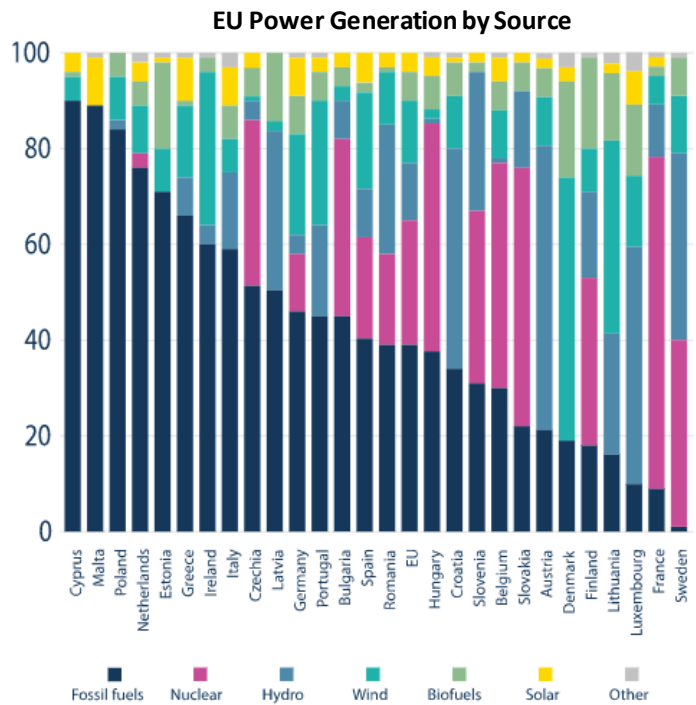
EU Taxonomy: Green Washing or Reality?

The European Commission outraged climate progressives by moving ahead with the inclusion of natural gas and nuclear power as 'green' energy under its sustainable investment taxonomy. Not everyone is content about the new taxonomy (e.g. Germany cares not for nuclear, others prefer less gas) the reality is that the new taxonomy more closely considers 'common sense' to provide reliable, stable and economically viable power generation. However, none of these efforts will provide short-term relief from Europe's energy crisis.

As we've noted repeatedly over the past year, politicians remain "blissfully unaware" of the consequences of accelerating the pace of the energy transition. During 2021, the rapid acceleration of the energy transition left the EU vulnerable as their portfolio of generation mix shifted from fossil fuels (e.g., dispatchable generation) to renewables, which are variable and subject to intermittency that reduces the reliability. In part, Europe's *Energy Crisis* has been a failure of policy makers and stakeholders inability to appreciate the current limitations of technology. To provide for a bridge and act immediately, current technologies that are capable of operating reliably and reduce emissions are required to be included. As the EU finance commissioner said, transitioning to a low carbon environment "may mean accepting imperfect solutions."

Previously, we discussed the challenges that even the adopted EU Taxonomy would pose given the strict limitation on nuclear and gas-fired generation. Nuclear facilities will need to meet stringent safety standards and receive construction permits by 2045. For natural gas-fired generation, plants can only replace coal-fired generation, must emit no more than 270g CO₂/kWh, and must switch to 'low-carbon' gas by 2035, which is seemingly at odds with Nordstream 2.

For gas-fired generation, the current technology deployed in the EU does not meet the limitations of CO₂ emissions. Drawing attention to the IPCC study, despite Combined Cycle Gas Turbines (CCGT) having the lowest emissions (350g CO₂e/kWh), they do not meet the EU Taxonomy's limitations. Furthermore, gas-fired generation will be required to back-up renewables in the absence of significant advancements in utility scale battery storage. Unfortunately, Open Cycle Gas Turbines (OCGT), which are used as 'peakers' to meet short-term generation short-falls, are also significantly less efficient than CCGT resulting in even higher emission levels. Thus, we still do not see even the accommodation made by the EC as something that is currently viable.



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Moving Very Close to 'Normal'

To date, we are tracking 39 countries that have made announcements regarding their intentions for COVID-19 mobility restrictions. These countries represent 75 mb/d of total oil demand or ~75% of global demand. While we believe that individual citizens' decisions will be a factor in mobility, policies by government will be the primary force shaping demand. We are currently modeling 1.25 mb/d impact but expect to be lowering the impact over the coming weeks.

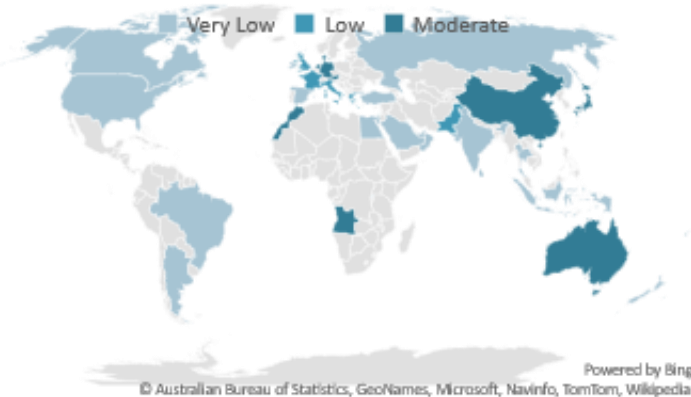
As cases and death rates retreat, policy makers are under pressure to remove Covid policy restrictions. Across Europe, different governments are relaxing measures at different speeds. For instance, the UK and Denmark have removed all Covid related restrictions on work, schools, testing and travel. In other countries, meaningful restrictions and testing requirements remain (e.g. Netherlands). Things are moving fast across select economies in Asia as well (e.g. Thailand, India). And in the United States too even states with fairly severe restrictions and mask mandates began to relax those measures earlier this week. Canada lags – watch the trucker led protest movements which may yet lead to another round of manufacturing bottlenecks.

By the second quarter we expect a full return to normal. By then the only Covid related demand issue remaining would be lower jet fuel use since travel to and from Asia (mostly China & Japan) will likely remain restricted until next year, and corporate travel may take a little longer to normalize as well.

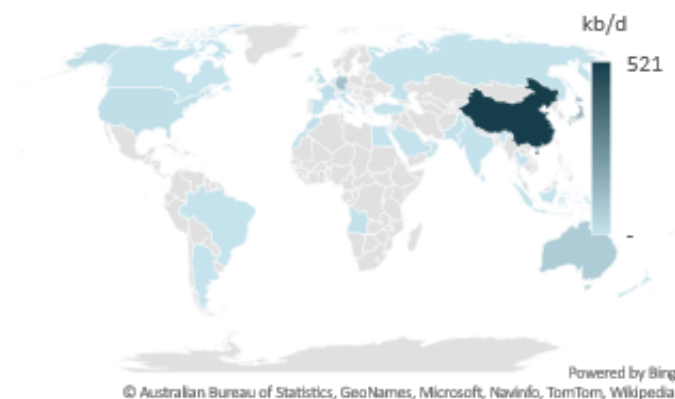
The Worst Behind US, China Risk Remains

In summary: At this stage we see the largest demand impacts (relative to 'normal') as a result of policy positions being attributable to "Moderate" risk regions: China (520 kb/d); Japan (170 kb/d); and Australia (75 kb/d). We moved all European economies one notch down to either 'low' or 'very low'. Others across the Mideast, Africa and LatAm were already there or were moved there as well. Also important, two weeks ago we reduced the potential of a high-risk scenario where Europe and US impose more Moderate restrictions. What risk remains now is still that China may have to impose draconian lockdowns ("High Restrictions"), which could reduce demand by ~3 mb/d.

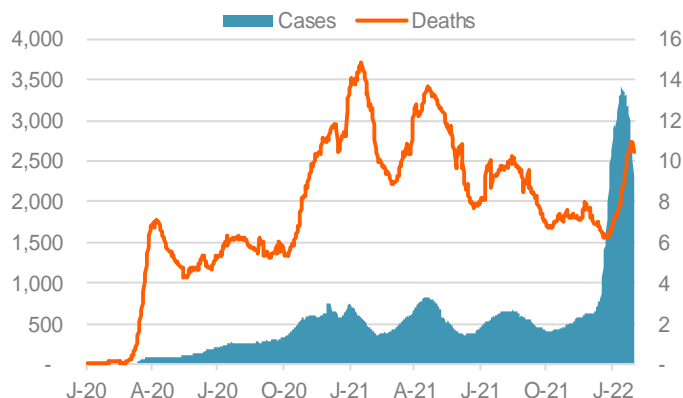
Regional Risk Assessment of Covid Policy



Regional Risk Adjusted COVID Demand Impact



Global COVID-19 Cases & Deaths (thousands 7-day average)



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