

At The Flick of A Switch – Or Maybe Not; Why Power Is Causing Industrial Headaches



1st Topic of the Week: Finding A Power Solution – Power is shaping up to be a much larger headache for industrial companies than many imagined - cheap, useable power is often not close to where it is needed - could we see industrial developments chase sources of cheap power - possibly. The timing of needs is also complicated.



2nd Topic of the Week: Money's Too Tight – Public and private funding of energy transition is shrinking, and this is penalizing small companies where the innovation investment is most needed. We do not see a change in 2024.

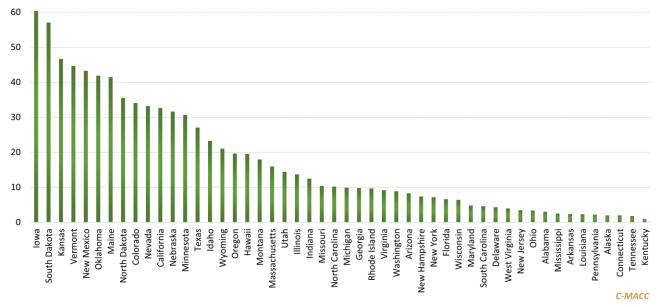


Otherwise - We look at chemical recycling, collapsing European carbon prices, rising costs of shorter-term PPAs, geothermal power, EV stagnation, and LNG.

- Companies Mentioned: Methanex, Nel, Plug Power, Tesla
- Products Mentioned: Methanol, Ammonia, Hydrogen, Lithium, Carbon
- Subjects Covered: Recycling, Renewables, Carbon Capture, Emissions, New Energy, Hydrogen, ESG Investing, Climate Litigation, Clean Fuels

Exhibit 1: The US States with the highest portion of renewable energy do not have high concentrations of industry.





Source: Motley Fool/EIA, C-MACC Analysis, February 2024

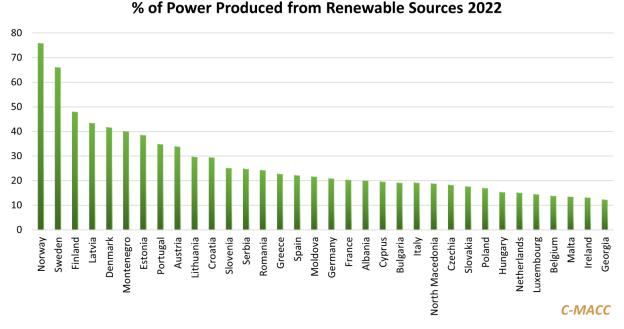
First: Clean Power Needs, Availability and Timing - Not So Straight Forward - May Influence Location Decisions

When the US announced its hydrogen hub ideas and as Europe started rolling out its hydrogen infrastructure plans, we raised a couple of red flags around putting the cart before the horse - hard to have a hydrogen plan without a power plan and suggested that the assumption that the power would just be there was wrong. We believe that we need to raise those red flags a little higher today, as many of those chasing sustainable feedstocks and contemplating carbon

capture are realizing how important low-carbon power is to the story and how challenging getting low-carbon and low-cost power is becoming. Driving through the lower portion of the Texas panhandle last week we were struck by the sheer scale of the wind power generation that has been put in place already, while at the same time noting that it was a long way from any large volume power demand. Many capital-intensive industries have recognized the benefits of brownfield versus greenfield development, especially where industries are well established, as they are in most industrial countries. However, if the power is not where the demand is, demand moves towards supply. This is an evolving issue in the US, and there is a significant current contrast between regulated and unregulated power states. In Texas, for example, you can move the wind power in the North to industrial consumers in the South, but in regulated states such as Louisiana and Mississippi, you cannot. In one of our recent meetings with a company that has assets in both regulated and unregulated states we raised the question of whether the ability to access clean power could drive new investment from regulated states to unregulated states and the answer was a clear yes.

In Exhibit 1, we show the renewable generating capacity as a percentage of use by state for the US; in Exhibit 2, we show the same by country for Europe. There are some very wide differences in both charts but the US wins on the very low levels in some states, the European variability is around a very high average. In the US, not a lot of this power is close to industrial power use, and this is our focus because this is where our clients are grouped. Even in Texas, which boasts by far the largest renewable power capacity – around 140GW (California is second with half of that total) – the power is not that close to the large centers of demand. When we started coverage of energy transition in earnest, roughly three years ago (164 weeks ago to be precise), there was too much optimism around both the likely availability of renewable power and its potential usefulness to industrial consumers. Over the same period, we have followed many of our clients on journeys to move from the early day theories to the practical, and we have yet to find a client who sees the landscape less challenging now than they did then. The more straightforward question of where to find power has been complicated by incentive schemes, all of which look encouraging locally, but come with strings attached and, in some cases, change relative competitiveness between regions and countries. Other complicating factors are regulatory delays and permitting challenges and then we also have the addition of timing.

Exhibit 2: The European average is higher than the US, but the benefits of geography figure in both charts



Source: Eurostat, C-MACC Analysis, February 2024

Timing is not only a challenge with power, but it is also impacting many aspects of energy transition. Companies and industries have different deadlines, some self-imposed, some imposed by industry groups and some by governments. Many of those deadlines and targets involve transitioning to something more expensive than what you are doing today. It could be your cheapest source of high capacity-factor renewable power versus grid power today, it could be buying recycled materials versus virgin, or it could be implementing CCS. Rational business management means that you will likely

not pay more for something until you must. This is proving to be a major challenge for companies that have built capacity well ahead these deadlines as while they have longer term interest from a potentially huge client base, the demand may not be there today, leaving the supplier holding unused capacity and, in many cases, dwindling cash. This is most evident today in the electrolyzer space, although physical limitations around power supply are as large a constraint as willingness to pay. There are plenty of locations with curtailed power today where you could build electrolyzer that would run for a couple of hours a day and there are other locations where you could pay up for the renewable power, but few, if any, would be willing to pay the full cost of making the hydrogen. Those who need clean power, but do not need it yet will have to tread a carful path, especially where they are relying on others to supply the power. They may have to take some higher cost power early enough to ensure that the supplier is there when they really need it.

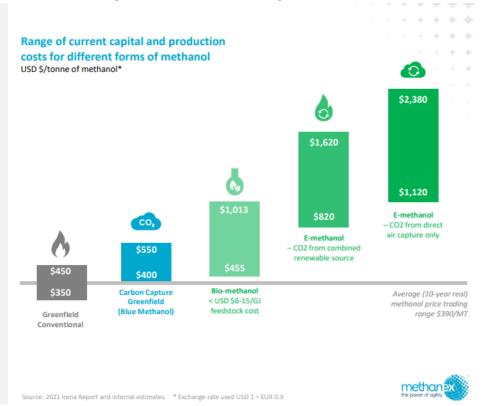
We have the added, and poorly understood challenge for methanol, ammonia, and other renewable fuels, which separating the challenges of sustainable feedstocks from low carbon. We have done a lot of work on alternative fuels, as recently as this week - Grey Ammonia and Methanol Have Futures, But Not Long Ones and last week - Fly Me to The Moon – But Not for Some Time with Renewable Fuel, and one of themes that runs through the work is the challenges of managing carbon. This applies equally to those looking at renewable fuels as it does to those looking at blue ammonia and methanol. To get the low carbon label that the fuels consumers are looking for it is not just about feedstock choice and/or CCS, it is also about how you power all the processes in that mix. Grey power for CCS, especially CO2 compression, meaningfully hurts your "blue" carbon footprint and grey power for direct air capture all but guarantees that you cannot get the lucrative 45Q credit. The Methanex chart below shows some cost comparisons for methanol via different routes. Almost all the higher costs routes today are power based – power for hydrogen and power for CO2 capture. Our waterpower initiative has given us the opportunity to discuss power and its challenges with many industry participants, and we maintain a view that still sits quite distant from consensus, which is that power management may be the largest challenge that decarbonizing industries face. It gives us confidence that we should keep chasing the waterpower idea and drives our views of the likely challenges green hydrogen faces. As we have highlighted before, all the blue hydrogen capacity suggested in the chart below will face clean power availability challenges.

Exhibit 3: Methanex highlights the cost benefits of blue methanol production in a low-carbon economy relative to green, which will require much higher prices to cover its higher costs to maintain margins.

Price response required to incentivize new low-carbon methanol production

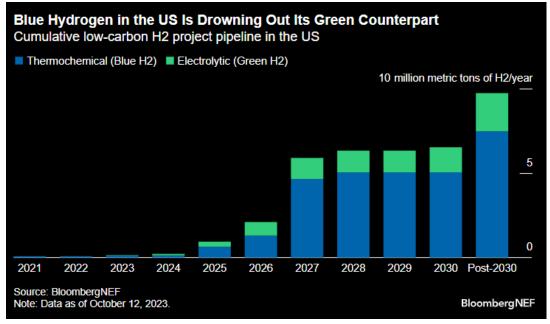
We expect government policies and regulations to lead to increased investment and demand for low and zero carbon methanol. Greater production of lower or zero carbon methanol can be incentivized through various means including customers' willingness to pay a higher price and new technology that reduce production costs.

The cost for lower emission methanol is expected to decrease as technologies mature and become scalable.



Source: Methanex – 4Q23 Earnings Presentation, February 2024

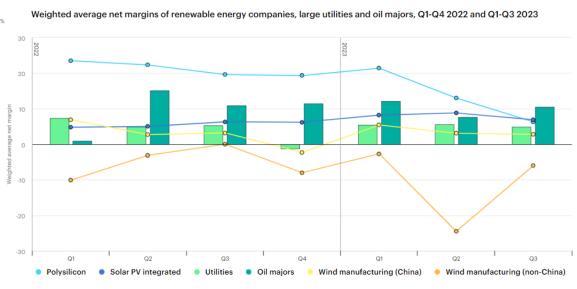
Exhibit 4: US blue hydrogen developments dominate despite larger combined corporate and gov't funding for green.



Source: BloombergNEF, February 2024

IEA estimates suggest COP28 net zero targets face significant risk. According to the International Energy Agency (IEA), global renewable energy capacity is set to increase significantly by 2030, though it falls short of the COP28 goal to triple renewables. Even if, as suggested, onshore wind and solar photovoltaic (PV) remain cheaper than new fossil fuel plants in most areas, there is not expected to be enough development to meet the 2030 targets. A more interesting dynamic will come if we are more successful in building demand for clean energy than we are building supply. This backdrop becomes even harder to model if some of the new demand is subsidy driven, meaning that there could be a bidding war for incremental renewable power. This could be another challenge for green hydrogen, as it would be unlikely that green hydrogen could bid incremental power away from other markets, especially residential, where local utilities are used to paying high marginal prices for top up power. Solar PV is expected to grow substantially due to decreasing costs and fast deployment. At the same time, the wind industry, except in China, faces more significant challenges related to supply chain disruptions and lengthy permitting timelines.

Exhibit 5: Massive global expansion of renewables is coming. But we are still short 20% of our 2030 target, per IEA estimates. This exhibit highlights the shrinking margins of solar and wind component suppliers in 2023.



IEA, Licence: CC BY 4.0

Source: IEA, Energy Post, January 2024

US Wind Power Seen Doubling by 2030 as Obstacles Remain Annual US wind installation forecast and Net Zero Scenario projections ✓ Net Zero Scenario ■ Onshore Wind ■ Offshore Wind 80 gigawatts 60 40 20 0 '23 2022 '24 25 '26 '27 '28 '29 2030 Source: BloombergNEF Note: Net Zero Scenario includes annual onshore and offshore wind additions. BloombergNEF

Exhibit 6: US wind power fleet is estimated to double by 2025 despite obstacles (permitting, transmission, etc.)

Source: BloombergNEF, January 2024

Company Conclusions

We should be supporting investment in the renewable power companies with the discussion above, but the solar industry has shown its ability in the past to compete away every cent of cost savings and the wind industry seems to struggle to handle growth. The equipment and component makers are likely in the best seats, although we have seen lithium overbuilt in the last 24 months and some other materials may also be weak. The installers are probably in good shape, but these tend to be regional and mostly private companies. The industrial companies themselves are likely not interesting investments on this basis as none of what they are looking at is cheap – they may be interesting investments for other reasons.

Second Topic of The Week: Money's Too Tight To Mention

However, the public/private markets have lost confidence in energy transition: The debt chart below shows how little VC and public capital flowed into the sector in 2023 and how dwarfed that has become by corporate and government debt issuance. Many of the industry startups and those pushing newer technology are realizing that not having a large balance sheet is proving to be potentially fatal, and we see a much more aggressive push to chase government debt, especially from the DOE, from companies who had otherwise planned to access public markets for capital. This development presents the industry with several challenges, as many projections around how we might meet steeper emission goals without excessive cost inflation by 2050 call for the reliance on technology advancements yet to be made, requiring substantial development capital. One of the issues we have faced with our water project applies much more broadly here, in that in many cases, technological advancements can only benefit specific corporations if enough other interest exists in the technology to achieve scale. One company alone cannot provide enough waterpower demand to justify the manufacturing scale needed to bring unit costs down; in the same way, one electrolyzer user cannot generate enough demand to bring down electrolyzer costs. But the corporate spending implied in the debt data below is not going into breakthrough technologies, it is going towards less radical technology and process evolution and large lower carbon capital projects. The challenge for our waterpower project will be building a big enough book of real business to justify scale manufacturing. In our view, the electrolyzer producers have moved too early and built the capacity before the demand is there. See the Nel headline below and all our recent work on Plug Power.

Exhibit 7: Debt issuance for energy transition rose by ~4% in 2023, while clean-tech equity finance via public markets decreased~52%. Despite high rates, a still-anemic equity financing market has made debt critical for project funding.

Funding type	Source	2022	2023	Change
Energy transition debt issuance	Corporate	667.9	683.4	+2%
	Government	126.5	140.9	+11%
Climate-tech equity finance	VC/PE	58.6	51.3	-12%
	Public market	68.0	32.7	-52%
Source: Bloomberg, BloombergNEF	Public market	68.0	32.7	-52%

Source: BloombergNEF, February 2024

Recycling and Renewables

Chemical recycling technologies are gaining increased support among US policymakers. Since 2017, 24 states have implemented regulations favoring the establishment of chemical recycling plants by reducing emissions controls. Industry announced capacity addition estimates show that by 2030, the US will have an annual chemical recycling capacity exceeding 1.8 million metric tons, constituting 35% of the global capacity, with New Hope Energy, Freepoint Eco-Systems, Eastman, and Nexus Circular leading the growth. There is a shift in classifying these facilities as manufacturing rather than waste plants, allowing for relaxed emissions regulations and more public subsidies. Opposition from environmental advocates and federal oversight has also shaped the industry's development, while the future adoption of similar policies in other states remains uncertain. We continue to see chemical recycling as a viable solution for those looking to shift the back end of their chemical production processes to more sustainable raw materials.

Exhibit 8: Two dozen US states have shifted policy in favor of chemical recycling In US, 24 States Relax Emissions Regulations for Chemical Recycling Plants Implementation of US laws regulating chemical recycling plants as manufacturing, rather than waste management facilities, by enforcement year ■ 2017 ■ 2018 ■ 2019 ■ 2020 ■ 2021 ■ 2022 ■ 2023 мт ND ID SD ΝE ΝV UΤ CO KS МО NM AF Source: Applied Market Information Ltd, BloombergNEF. **Bloomberg NEF**

Source: BloombergNEF, January 2024

Carbon Capture and Emissions

European Carbon Prices Down Again: This is a bad potential spiral for European and UK energy transition plans, and the respective cap and trade programs may have to be adjusted to help prices rise again. The falling price is more a function of economic, especially industrial, malaise in Europe, and note better carbon management, although carbon management may play a part. If you are faced with slower demand, it would be natural to curtail or shut down any facility with a high carbon cost – in that sense it would be carbon management. But the underlying challenge for Europe is weaker industrial output – less carbon produced versus what was assumed in the cap-and-trade programs and lower prices. Carbon prices are important inputs to investment cases for cleaner projects, although it is interesting that, as published in our hydrogen report earlier, nominal blue hydrogen costs in Europe are falling, because the price of local natural gas is falling more than the carbon credit decline. We suspect that these lower carbon prices in Europe could put some decarbonizing projects on hold, especially as Europe debated whether it makes sense to finance some industries at all.

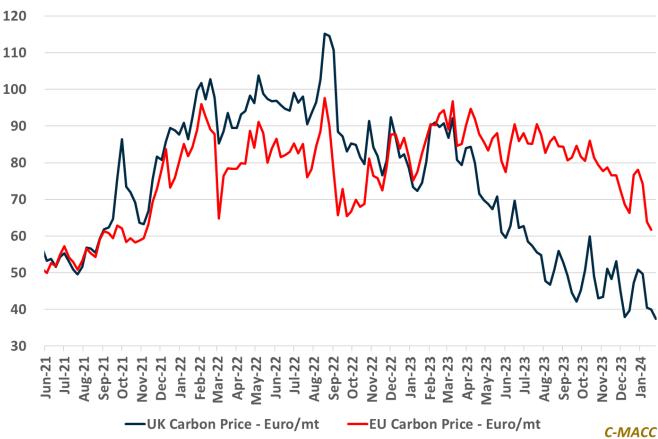


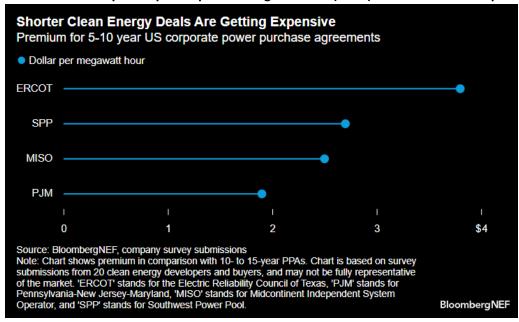
Exhibit 9: UK and EU carbon prices have declined significantly YoY and relative to 2024 YTD highs.

Source: Bloomberg, C-MACC Analysis, January 2024

Renewable Fuels, Power, Hydrogen

Shorter PPAs command a price premium that can significantly differ by region. Per BloombergNEF estimates, companies in the US seeking shorter clean energy power purchase agreements (PPAs) to hedge risk should expect to pay an average premium of \$2.7 per megawatt-hour (MWh), with regional variations ranging from \$1.9/MWh in PJM to \$3.8/MWh in ERCOT during H1 2023, enabling them to shorten typical PPA lengths of 10-15 years. This premium, which can go as high as 10% for wind projects in Texas, and even a 3% increase for solar PPAs in PJM, reflects the challenge of balancing corporations' need for risk mitigation due to market uncertainty with project developers' requirement for long-term revenue certainty, especially in a volatile economic environment with higher interest rates. Weather fluctuations in key power markets, such as ERCOT, may further complicate negotiations and deal-making activities in the clean energy sector.

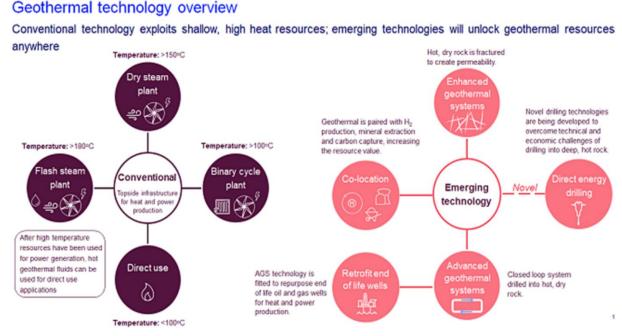
Exhibit 10: US corporate power purchase agreements (PPAs) command a 3-10% premium for shorter length.



Source: BloombergNEF, January 2024

Is next-generation geothermal energy positioning to make an impact on the global energy landscape? We highlight the exhibit below from an article discussing the potential of next-generation geothermal energy as a solution for decarbonizing the energy sector. Geological conditions limit conventional geothermal energy. New technologies like enhanced geothermal systems (EGS) and advanced geothermal systems (AGS) aim to make geothermal energy accessible in a broader range of locations. Oil and gas companies are investing in these technologies, attracted by diversification opportunities and their expertise in subsurface and drilling. While cost challenges exist, scaling up and technological advancements could make geothermal competitive with nuclear and hydrogen, potentially leading to significant global investments in the sector. Big Oil's interest in geothermal is mainly driven by its pursuit of net-zero goals and the need for sustainable disciplines as the oil and gas industry transitions, and it is also fostered by subsurface expertise in this area.

Exhibit 11: Low-carbon tech: is geothermal close to a breakthrough | Wood Mackenzie



Source: Wood Mackenzie, January 2024

ESG Investing

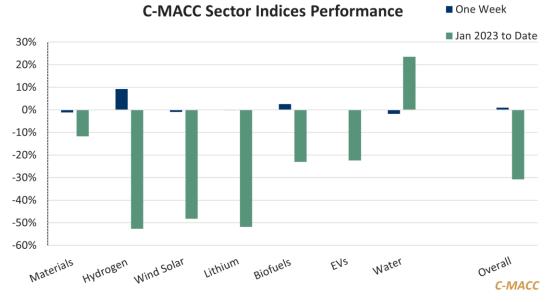
The market share of US electric vehicles continues to rise among light-duty vehicles, but some articles, as shown below, suggest a growth slowdown is likely in 2024. In 2023, hybrid vehicles, plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (BEVs) accounted for 16.3% of total new light-duty vehicle (LDV) sales in the United States, up from 12.9% in 2022, according to data from Wards Intelligence. This increase was driven by a growing number of BEV models, more hybrid options in popular vehicle size classes, and declining BEV prices, aided by manufacturer price reductions and government incentives. Despite a semiconductor chip shortage, these vehicles reached their highest market share at 17.9% in the second half of 2023. The introduction of 20 new BEV models, with half in the crossover segment, contributed to this growth. Tesla's price cuts significantly lowered the average BEV transaction price. Luxury vehicles also saw a surge in BEV sales, with BEVs accounting for a substantial portion of this segment, while non-luxury vehicle sales remained below pre-pandemic levels. With this general 2023 overview in mind, we point to an increasing number of articles discussing EV market growth but a potential slowing of conditions and the missing of EV growth targets.

Annual U.S. light-duty vehicle sales by powertrain (2014–2023) percentage of eia percentage of sales 2023 sales 100% 90% Breakout of EV and hybrid sales non-hybrid internal combustion engine percentage 80% 84% 70% 8% hybrid 60% battery 6% electric 50% 4% 40% 30% 2% plug-in hybrid 16% 20% hybrid, battery electric, 0% and plug-in hybrid 2014 2017 2020 2023 10% 0% 2017 2020 2023 2014

Exhibit 12: Electric vehicles and hybrids surpass 16% of total 2023 U.S. light-duty vehicle sales

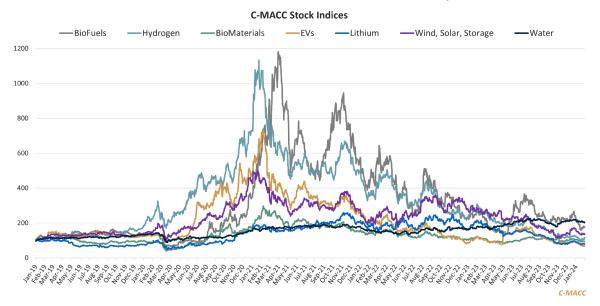
Source: EIA - Today In Energy, January 2024

Exhibit 13: Another Plug move for hydrogen following an analyst upgrade that makes no sense and in any rational market would not have resulted in such a strong stock reaction.



Source: Capital IQ, C-MACC Analysis, February 2024

Exhibit 14: In the second section above we note how disinterested the capital markets are in these sectors.



Source: Capital IQ, C-MACC Analysis, February 2024

Other - LNG

Delays and permitting timelines remain an issue. In the supply chain section above, we highlight the likely limited near-term impact of Biden pausing US LNG permits on the natural gas markets, though medium-to-long-term projects and related upstream capacity additions in the US are likely to see their anxieties surge due to the announcement. But, the issue of permitting has been a major issue during the past few years, and we can cite many examples, such as in US CCS approvals from the EPA, that have stalled progress in an environment where we seem to get an announcement one or twice a week about DOE funding energy transition-related efforts only to find when digging deeper that some of the approvals on this front face many more challenges that this funding effort can cover, further stalling progress. While we stay cognizant of the risk of taking arguments down a slippery slope, we are concerned that permitting delays and excessive studies could further add to risk and halt projects in an election year that already faces a high degree of outcome risk, and as we move to the next paragraph, this adds significant risk to most net zero and clean product transition targets. We also highlight that the upstream LNG supply chain, which includes upstream production, liquefication emissions, shipping emissions, and regasification emissions, only accounts for 25% of the emissions of the LNG supply chain, with the other 75% of emissions coming from downstream emissions, which will likely to be a focus of the DOE review as well.

Biden Administration Has Been Slower to Approve Projects
Duration, in days, of LNG decisions by DOE after FERC order

Slowest decision Average timeframe Fastest decision

600

400

Obama administration Trump administration Biden administration

Sources: DOE, FERC, LNG Allies
Note: Data as of Jan. 5. Biden approvals have been for capacity increases.

Bloomberg

Exhibit 15: Biden Mulls Tougher Climate Test for New LNG Projects

Source: BloombergNEF, January 2024

Carbon intensity of the LNG supply chain Upstream gas production, Downstream emissions processing & transportation emissions Other emissions 50% (excluding downstream Liquefaction emissions combustion) Shipping emissions 25% 75% Regasification emissions 33% Source: Sphera, GHG Intensity of Natural Gas Transport (2017); GIIGNL, LNG carbon offsetting (2020)

Shipping

Regasification

Downstream combustion

Exhibit 16: Decarbonisation of the LNG Supply Chain: challenges and the way forward

Source: BloombergNEF, January 2024

Upstream gas production, processing

& transportation

Headline Appendix

Recycling and Renewable Materials

Sustainable PE will make up larger share of new output - US Dow

Liquefaction

- BASF, Zara collaborate on PA6 made from 100% chemically recycled textile waste
- Chemical Recycling Europe, Zero Waste Europe disagree over pyrolysis
- **Europe R-PET FD NWE C flake rises for second time in January**
- European Bioplastics calls for an industrial policy in new manifesto
- Exports of plastic waste to non-OECD countries on the rise in England
- Mechanical recycling to meet 15% of global PE demand by 2050: Dow CEO
- Dow CEO predicts 15% of PE demand met by mechanical recycling by 2050
- Bioaqualife launches biodegradable shrink wrap tape
- Umincorp, a dutch recycler, declared bankrupt
- **Revolution buys Canadian agricultural film recycler**
- R-PET downward price spiral finally ends
- Singapore's growing bio-bunkers demand to drive surge in regional UCOME consumption
- Braskem and FKUR enter agreement for the distribution of bio-based EVA
- A way to turn red mud into green steel
- Borealis appoints new circular economy vice president
- Antalis has signed a binding agreement to acquire Pakella
- CJ Biomaterials' scPHA Added to FDA's FCS
- Generation Food Rural Partners Acquires DisSolves, Inc.
- Grassroots Recycling elevates plastic waste management capabilities with UNTHA shredder
- Germany introduces new standard for recycled polyamide
- Kumho, Orion to collaborate on sustainable tire development
- Mitsubishi Chemical progresses commercialisation of chemically recycled PC
- Recycled polystyrene wants its place at the table for food-contact applications
- Coca-Cola removes labels from Sprite recycled PET bottles in UK trial

- Germany introduces new standard for recycled polyamide
- Mitsubishi Chemical progresses commercialisation of chemically recycled PC
- Innocycle's Environmental Milestones: Closed-Loop Recycling Service Makes Significant Impact
- Latin America: flexible packaging sector thrives on economic upswing
- PureCycle, Milliken ready to test industry first's 'fully sustainable' PP additive
- Novoloop starts building pilot chemical recycling plant in India
- Recyclable, plant-based glue cuts carbon footprint of Wind Turbines
- TotalEnergies produces circular polymers from plastic waste at Texas plant
- US scientists chemically recycle carbon fibre in wind turbine blades
- Chemical recyclers move to tap overseas potential
- **Overcoming Hurdles In Chemical Recycling For A More Sustainable Future**
- TotalEnergies produces first batch of chemically recycled plastic at Texas plant
- TRP: Chemical recycling must prove its worth
- Dutch recycler Umincorp declares bankruptcy, cites lack of competitiveness to virgin polymers
- 2023 sees growing chemical recycling lawmaking activity
- Polestar Welcomes Geely's Long-Term Commitment to Its Development and Growth as an Independent **Exclusive Performance Brand**
- Replacing expanded polystyrene with compostable trays for protein packaging
- Sidel introduces advanced quality control tech for PET bottle manufacturing

Carbon Capture and Emissions

- Shell to repurpose Wesseling hydrocracker as part of low-carbon conversion of Rheinland complex
- bp Invests in Aviation Decarbonization Solutions Provider CHOOOSE
- Elkem achieves high CO2 capture rates at pilot CCS in smelter China commits €2bn for Serbian renewable energy and hydrogen project
- Farmers: How to actually get paid for carbon (farmprogress.com)
- New Mexico LCFS advances on party-line votes
- EU Commission favours a 90-95pc emissions cut by 2040
- Managing Manufacturing Supply Chains Producing One-Fifth of Global Carbon Emissions
- Modifying blast furnaces can reduce CO2 emissions: SMS CTO
- Policy uncertainty, jurisdictional risks hinder carbon futures introduction in Asian markets
- UK outfit launches £4bn low carbon procurement model
- BASF, IRRI join forces to cut GHG emissions from rice production
- Black & Veatch's IgniteX Carbon Dioxide Removal Accelerator Accepting Applications from Innovators
- Chevron to advance development of Solidec's carbon-capturing electrolyzers
- ArcelorMittal sells first low-CO2 steel
- Climeworks and Syante Collaborate in Development and Supply for Direct Air Capture
- A New Solution for CO2 Emissions: Bury Them at Sea
- Alcoa to supply Nexans with low-carbon aluminum, including metal from ELYSIS™ technology
- Ascend Elements targets 90% carbon footprint reduction by 2030
- **China and Global Cement Agreement on Low Carbon Future**
- Linde starts up supply of captured CO2 to Celanese for methanol production
- Drax signs fibre supply deal with Molpus to fuel US-based BECCS operations

Renewable Fuels, Power

- **Boralex wins 365MW of Canadian wind contracts**
- Capturing SAF Promise in Rural America
- **European Energy Leases Texas Land for E-Methanol Project**
- Jet Zero Australia uses Freedom Pines plant as 'reference' for Project Ulysses

- End of the affair: was Equinor and BP's US offshore wind split 'inevitable'?
- 'Longest on land': monster 131-metre wind turbine blade rolls out of Chinese factory
- Orsted, Eversource make fresh Sunrise solicitation bid
- Equinor Bids Shovel-Ready Empire Wind 1 into New York's Expedited Wind Solicitation
- Equinor, BP split up US offshore partnership
- Avista Signs Fourth Renewable Natural Gas Agreement with Pine Creek
- ACP Statement on Coastal Virginia Offshore Wind Project Moving to Construction Phase
- Cable failure threatens to cripple North Sea wind farm but 'meshed grid saves the day'
- 'Longest on land': monster 131-metre wind turbine blade rolls out of Chinese factory
- Orsted scraps Skipjack deals in latest US offshore wind reset
- Amazon Signs Purchase Agreement for 473 MW of Offshore Wind Energy with Engie
- AlphaReal acquires 40MW UK solar plant
- **Artemis Technologies to Revolutionise Offshore Wind Operations**
- Advent Technologies partners with Airbus to advance fuel cell developments
- ABB breaks ground on Oklahoma-based calibration hall
- China commits €2bn for Serbian renewable energy and hydrogen project
- Consultations underway for 1 GW of solar, storage in UK
- China's wind, solar capacity forecast to overtake coal in 2024
- **Ecuador to begin cutting fuel subsidies in Q2**
- **Eesti Energia unveils Estonian battery project**
- BlackRock unit 'shut out of \$7.5bn flagship Korean wind project': reports
- EDP enters Australia with 1.5GW green power capacity
- **ESB** hits green data project milestone
- Germany needs to speed up offshore wind capacity expansion to hit targets industry
- GE Vernova to supply 1.4GW in onshore wind turbines to Australian billionaire Forrest
- Germany sticks to negative bidding at kick-off of next 2.5GW offshore wind auction
- End of the affair: was Equinor and BP's US offshore wind split 'inevitable'?
- **Electrig Power Sponsors ISNA/ESNA 2024 Solar Games**
- India to set up 100 biogas plants in Uttar Pradesh
- LG Chem and Enilive: a joint venture agreement for the biorefinery in South Korea
- Large-Scale Rooftop Solar Project Unveiled in Northeast San Fernando Valley
- India's interim 2024-25 budget seen incentivizing renewable, clean energy sectors
- Asia power and renewables: what to look for in 2024
- **European power and renewables: what to look for in 2024**
- How to make green incentives pay
- Latin American power and renewables: what to look for in 2024
- POET ethanol facilities to join Summit's CO2 pipeline project
- Largest US offshore wind farm cleared to build as \$10bn Coastal Virginia gets final federal OK
- 'Longest on land': monster 131-metre wind turbine blade rolls out of Chinese factory
- Maersk launches first large methanol-enabled vessel
- Massive floating wind farm to power three million homes tests Mediterranean seabed
- NREL says long-term degradation of 8 GW of US solar 'matches expectations'
- Osage Nation seeks damages from Enel over wind turbines on tribal land
- Ocean Winds, Amazon ink Moray West offtake
- Oil player Sapura hit with \$54m claim over Taiwan offshore wind walkaway
- Offshore wind 'to add €38bn to Irish economy'
- Japan proposes curbing 2024-25 biomass tender capacity
- Q&A: Phillips 66's renewables VP talks RD, SAF
- Qualitas to acquire US solar, storage platform
- 'Risked' project list hits \$353bn as 'oil and even fashion houses' pile into offshore wind: analyst

- RWE profits better than expected thanks to new wind and solar
- Rome must provide green funding to Arcelor Mittal plant, industry chief says
- Sharp unveils 580 W TOPCon solar panel with 22.45% efficiency
- Stability Prevails in Biodiesel Prices Amid Lower Demands and EU China Tensions
- **Suzlon scoops 642MW Indian turbine order**
- 'Those 2030 offshore wind targets are looming it's time to work together'
- **Record number of European PPAs in 2023**
- US secondary market for PV modules offers low-cost buying opportunities
- Vanguard Renewables Welcomes Foremost Farms USA to the Farm Powered Strategic Alliance
- 3S Swiss Solar Solutions completes 250 MW module factory in Switzerland
- **Acelen Renewables Partners with Honeywell for Biofuel Production**
- Avangrid Announces First Onshore Wind Project in Oklahoma, Will Expand its U.S. Footprint to 25 states
- Calif. LCFS update to support RD, SAF growth
- Photovoltaics for unmanned aerial vehicles
- Solitek releases half-cut bifacial 420 W TOPCon solar module
- Thermoelectric generators with PVT energy, nanofluids
- Turkish wind trio enters construction
- Demand for US East Coast offshore wind remains despite gust of disruptions
- **Enerkem to retire its biofuels plant in Alberta, Canada**
- **EnerSys® Launches NexSys® AIR Wireless Charger for AGVs**
- Major Indian Utility Charts Course for \$9.6 Billion Growth in Renewables and Coal
- Marathon Martinez Renewables running at 22,000 b/d
- Offshore wind sector doubled down on tangible opportunities in 2023
- Five years more | BW Ideol gets extension for Floatgen floating wind pioneer
- Greece hit record high green energy output last year
- **Vestas joins TagEnergy to develop Spanish wind farms**
- World's biggest battery maker to build own \$1.8bn offshore wind farm
- US green giant NextEra aims to amass 'more renewable power than all but nine nations'
- Spireon, a Solera Company, Introduces Long-Lasting Flex Battery Tracker for Unpowered Assets
- South Korean refiners step up biofuel business projects
- **Equinor Sees New York's Wind Plan Helping Beleaguered Industry**
- Equinor and BP in offshore wind divorce as oil giants split US projects
- How the Middle East is shaping the global renewable revolution
- Nuclear energy production could reach record high in 2025 IEA report
- **Orsted cancels Skipjack Wind offtake deal**
- Brussels considers support for solar panel makers as Chinese imports flood market
- **Grid link delays could endanger German offshore wind targets**
- Power and renewables: predictions for 2024
- COP28 pledge to expand nuclear capacity is out of touch with reality
- 'Reality check' | Global offshore wind sector has shown resilience in 2023, key industry report suggests
- Altus Power Announces Acquisition of 84MW Portfolio from Vitol, Adding Thousands of Customers in New York, New Jersey, and Maine
- Brenmiller Signs Definitive Agreement to Supply Wolfson Hospital with Clean Electric Heat in \$3.55m Project
- **Enerkem to retire Enerkem biofuels facility**
- **Germany allocates 1.61 GW in latest utility-scale PV tender**
- **GE** Vernova to supply turbines for Japan's Abukuma South wind farm
- Google taps Shell and Mitsubishi in record offshore wind deal
- Linde signs agreements to purchase renewable energy in China
- Mauritania secures \$289.5 million for solar projects, interconnection line
- Offshore wind reinsurance consortium launches

- Tata Power lights up Indian tea estate with bifacial PV system
- US biofuel feedstocks consumption up in Nov
- Oxford PV sets another solar power efficiency world record
- **Siemens Gamesa closes Windar stake deal**
- **Swire Renewable Energy acquires Altitec**
- Ingka Group, OX2 plan wind and hydrogen project off the coast of Sweden
- Lhyfe and SAF+ join forces to decarbonise aviation with e-SAF

EVs

- China EV maker CATL expects weaker earnings growth for 2023
- **Duke Energy Rolls Out EV Charger Rental Program in North Carolina**
- EV production cuts give suppliers more uncertainty and opportunity
- Ford to supply over 1,000 Lightning, Mustang Mach-E EVs to Ecolab
- **How GM Can Keep the Good Times Rolling: No More EV Screwups**
- **GM looks for a road out of Tesla's shadow**
- Tesla Closes in on Toyota in California: The Battle for #1. Total EV Sales +46% in 2023, EV Share Hits 21%
- Two French airports to switch ground vehicles to run on HVO100
- BYD Shares Fall as China's Auto Price War Weighs on Bottom Line
- EVgo Announces Awardees of 2nd Annual National EV Charging Recognition Program
- Ecolab Selects Ford Pro™ to Accelerate North American EV Fleet With Ford F-150 Lightning and Mustang Mach-E, Set to Reach 100% EV in California by 2025
- France is subsidising made-in-EU EVs with low carbon footprints. Europe must follow
- **GM's Bullish Outlook Boosted by Gas-Engine Models, Narrower EV Losses**
- **How GM Can Keep the Good Times Rolling: No More EV Screwups**
- Fisker Welcomes Dealers From Across North America to Its First Open House and Signs First US Dealer Partner
- Profitability worries for world's largest EV battery maker are overdone
- **SK Enmove and Hyundai Motor to develop EV refrigerants**
- Spain: TotalEnergies Acquires 200 Fast and Ultra-fast Charging Sites From Wenea Branded Network
- Yamaha Joins Fuel Cell & Hydrogen Energy Association Supporting Multiple Tech Solutions to Carbon Neutrality
- EV sales start to fall in California, an industry bellwether
- Industry pain abounds as electric car demand hits slowdown
- Speed Bumps Slow EV Progress in 2024 | NACS
- **Tesla Battles to Maintain Market Share in Growing EV Industry**
- Renault cancels planned IPO of EV unit Ampere
- Toyota global EV sales quadruple in 2023, still big gap with goal
- Arkema aims to improve EV battery safety with Foranext gaseous thermal barrier concept
- **Chinese Automakers Eye Opportunity in Central Asia**
- **Could Car Subscriptions Entice Mass EV Adoption?**
- EV battery market to recover from 2H 2024: Samsung SDI
- German dealership Sternauto opens BYD store in Berlin
- Forsee Power to provide battery system for BAE Systems' Class 7 demonstration truck powertrain in North
- Musk seeks Tesla shareholder vote on moving incorporation to Texas
- Only 13 EVs Will Be Eligible for U.S. Tax Credits This Year
- **Volvo Cars to stop funding Polestar electric sports car business**
- Tesla to bring LFP battery supply chain to US
- Slow EV sales are proving problematic for Australia's lithium miners

Hydrogen – See this week's Hydrogen Focused Report

ESG Investing/Activism and Litigation

- EU Elections 2024: the Green Deal can be an emblem of what Europe is for
- **HSBC Tells Clients It Won't Blacklist Major Polluters**
- Biden-Harris Administration Announces \$562 Million for States and Tribes to Strengthen and Modernize **America's Power Grid | Department of Energy**
- Labour faces doubts over 2030 'clean energy' target after delay to UK nuclear plant
- **Haven Energy Raises \$7M Series A Funding Round**
- Sustainable investment can lift Britain out of its slump
- What is the point of ESG ratings?
- Spanish green fund returns to US with swoop for local player
- **European Council adopts new rules to phase down F-gases**
- Is Joe Biden a climate champion?
- EU climate chief rebuts business fears that green policies hit competitiveness
- LGIM commits £25m to boost National Trust renewables push
- For Cop29 to succeed, rich nations must get their parliaments to agree more finance now
- **Business Groups Sue California to Block Climate Disclosures**
- **Danimer Scientific Receives Continued Listing Standard Notice from NYSE**
- **Enviva Receives Continued Listing Standard Notice from the NYSE**
- Climate Activists Cancel Protests, Declare Victory After Biden's LNG Freeze
- Biden halts permits for LNG projects under climate campaign pressure
- Biden stalls natural gas exports that activists call 'climate bombs'
- Trump return 'unlikely' to end key US climate law, says green giant NextEra CEO
- BP faces activist investor pressure to ditch clean energy pledges
- BP unlikely to swing away from renewables despite activist campaign
- India's interim budget for 2024-25 proposes incentives for wind, solar, biofuels growth
- 'Stronger, more focused and more capable' ITM Power posts H1 2024 results
- Taiwan government faces energy, climate policy challenge after elections
- Ecopol Appoints Fabrice Favero as President of Ecopol America to Lead North American Expansion
- ExxonMobil Says Activist Shareholders' 'Extreme Agenda' Designed to Diminish Existing Operations
- Devil in the detail: wind warns EU over key green industries policy
- India focuses on net zero, renewables in interim budget
- SIBUR attains the largest portfolio of climate projects among Russian companies
- Germany: Carbon Prices could phase-out Coal by 2030 without a new law

Other Relevant News

- Delayed EU heat pump plan puts EUR 7 billion at risk, warn 61 industry chiefs
- New 'golden era' for European green power deals as Iberdrola tops sellers' list
- 2024 a tipping point for Sustainable Buildings? Demand now outstrips supply in major cities
- ClimateView & KERAMIDA Partner to Innovate Climate Action Plans in North American Cities, States and
- Electriq Power Announces New Partnership with The Energy Coalition to Form Sustainable Community Networks in Los Angeles County Under the PoweredUp Network Program
- EU shifts spending focus from climate to defence
- 91% of industrial businesses hit by resource scarcity, highlighting circularity needs
- 'Stunning' Bitcoin boom could wipe out world's green power gains, expert fears
- **Surging VC Interest Marks a New Era for Energy Storage**
- Why are nuclear power projects so challenging?

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