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2024 ADI Industry Outlooks

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2024 Upstream Outlook



Maria Eduarda Lopes

Upstream outlook: Opportunities, growth, and industry trends

January 2024

In 2024, the upstream oil and gas industry is expected to experience notable changes influenced by developments in 2023. From the ongoing wave of consolidation and the maturation of the U.S. shale sector to pivotal shifts in Latin America, Africa, and Asia, the industry is adapting to new dynamics. Technological advancements, particularly in digitalization and sustainability, promise to reshape upstream operations.

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1. Consolidation is reshaping the landscape as the pursuit of premium acreage, cost reduction through scale, and sustainable growth will fuel mergers and acquisitions. Exxon's \$64.5 billion acquisition of Pioneer and Chevron's \$60 billion purchase of Hess exemplify this trend. We anticipate that public companies will continue expanding through acquisitions, particularly targeting premium acreage that is in high demand, especially by private equity firms. Such transactions will allow public operators to add to production that is declining actively at a cheaper price than via the drill bit.
2. The U.S. shale industry is maturing, necessitating a greater emphasis on maintaining and increasing production from existing wells. Notably, the percentage of wells producing less than 50 barrels of oil equivalent per day (boepd) in Eagle Ford and Bakken surpasses 50%. Shale continues to pursue capital discipline to achieve sustainable growth, giving precedence to an engineered approach aimed at maximizing recovery. As the industry contends with declining well productivity and a slower pace of new well development, larger E&Ps companies are outperforming private operators by focusing attention on production management.
3. Significant transformations are expected in the Latin American upstream sector, especially in Guyana, Brazil, Colombia, Mexico, and Argentina. Particularly, the Vaca Muerta play in Argentina, identified as the most promising shale prospect outside the U.S., is poised to enhance profitability for Argentina and is expected to generate a substantial surplus of oil for export for the country. Robust licensing initiatives led by Brazil and Mexico have attracted diverse players exploring fresh opportunities. Guyana's oil and gas industry is set for extensive growth marked by new block allocations, progress across existing development efforts, and a pivot towards gas development.
4. African oil and gas is reshaping in multiple ways. The acquisition of African oil and gas assets by Russian companies is set to reshape the continent's oil policies. Angola's withdrawal from OPEC, driven by disagreements over production quotas and domestic policies, presents both challenges and

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opportunities. In alignment with global alliances and geopolitical interests, Angola's departure has implications for OPEC's membership and crude oil production. Regarding natural gas, Africa's substantial potential positions it to capitalize on an undersupplied LNG market and growing European demand. LNG exports, particularly from Nigeria, Algeria, Egypt, Equatorial Guinea, Mozambique, Senegal, and Mauritania, are gaining prominence. Even so, growing renewable power capacity additions globally and energy transition concerns will rely on new investments in Africa.

5. OPEC faces challenges as its membership declines, notably emphasized by Angola's exit. Angola's departure will leave the group with 12 members, reducing its production to below 27 million barrels per day (bpd), accounting for less than 27% of the global supply. The surge in non-OPEC oil production in 2023, coupled with internal challenges and increasing output from non-OPEC countries, poses a threat to OPEC's effectiveness in overseeing oil markets in the upcoming year. We expect increased efforts from OPEC members to deploy various production tactics as they seek to maintain control over global energy markets. The alliance's response to robust non-OPEC+ supply growth and slow oil demand has involved output cuts to support prices.
6. The ongoing conflict between Israel and Hamas, along with the potential involvement of other regional players like Iran, the Houthis in Yemen, and Hezbollah, poses a significant risk to oil prices in the Middle East. Recent events, such as the Houthi Rebels' attacks on merchant ships in the Red Sea, have already contributed to a moderate increase in oil prices. If tensions continue to escalate in the Middle East, there's a genuine possibility of a more substantial and short-term impact on oil prices. Despite the importance of geopolitical dynamics, the immediate direction of oil prices will be influenced by the delicate balance between supply and demand. The U.S. and China are expected to play crucial roles in adjusting supply levels to mitigate potential price fluctuations. Even so, the impact of geopolitical conflicts on oil have waned in their impact with the rise of U.S. shale oil output.
7. Asia is set to play a crucial role in surging global oil demand. Although short-term economic challenges may limit China's growth in the use of fossil fuels, India, driven by urbanization, industrialization, and a wealthier middle-class keen on mobility and tourism, is anticipated to become a key player in shaping future oil demand.
8. The upstream oil and gas sector in 2024 will be characterized by continued investment in digital technology. Advanced software, hardware, and generative AI conceptually hold promise for real-time data collection, innovation, cost reduction, process optimization, and overall operational efficiency improvements. Notably, AI is being utilized for oil drilling, seismic data analysis, and risk assessments. It also contributes to enhancing

predictive maintenance of assets by analyzing data from machines on offshore drilling platforms. Leading industry players, including Chevron, Ecopetrol, Petrobras, Repsol, Rosneft, Saudi Aramco, Shell, and BP, are all actively investing in digitalization. Even so, the current level of interest in digitalization is lower than in the past reflecting its limited commercial impact for various reasons.

9. The recent Oil and Gas Decarbonization Charter (OGDC), endorsed by over 50 major oil and gas companies responsible for more than 40% of global oil production, commits to reducing methane emissions by 2030 and achieving net-zero-methane operations by 2050. Simultaneously, the Biden administration has introduced final regulations aiming for a 30% reduction in methane emissions from the U.S. oil and gas industry by 2030. These regulations include bans on routine flaring, mandatory leak monitoring, and the establishment of a system for third-party companies to detect significant methane releases. Companies are also exploring to implement cogeneration, an innovative solution that utilizes excess heat from oil extraction to spin turbines, generating electricity and reducing emissions.

10. The energy transition is also happening upstream, expertise in Enhanced Oil Recovery (EOR) is propelling upstream companies to actively pursue Carbon Capture, Utilization, and Storage (CCUS) services. ExxonMobil's strategic acquisition of Denbury, leveraging its CO2 capabilities, and subsequent merger with Pioneer Natural Resources underscores the industry's dedication to advancing CCUS initiatives, particularly in the Permian Basin. Another illustration is the joint venture benefiting from California Resources Corporation's early mover advantage, securing access to available storage in California, and leveraging Brookfield's knowledge in global clean energy markets. Such trends exemplify a broader industry shift where companies are enhancing financial flexibility and optimizing portfolio assets while accessing clean-energy markets.

Expected to be a year of dynamic shifts, the upstream oil and gas industry is poised for increased activity. Navigating through geopolitical challenges, market dynamics, and the imperative of decarbonization, it is evident that the industry's landscape is undergoing rapid and transformative changes.

- Maria Eduarda Lopes

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2024 Midstream Outlook



Uday Turaga

Midstream outlook: Business as usual

January 2024

The midstream industry had a favorable year in 2023, witnessing higher investment, M&A, and notable progress in infrastructure development. Looking forward to 2024, we expect a mixed but business as usual outlook for the midstream industry. Key trends to keep an eye on are the following:

1. The Permian takeaway capacity outlook remains a difficult balancing act between surging production and infrastructure development. Rising gas production in the Permian has already led to the build-out of additional takeaway capacity from expansions of existing gas pipelines and WhiteWater Midstream's Matterhorn Express Pipeline which will add new capacity of 2.5 billion cubic feet per day (Bcf/d) by the third quarter of 2024.
2. Permian oil production is expected to reach ~6.5 million barrels per day (bpd) by the end of 2024 with play having a sufficient takeaway capacity of over 7.5 million bpd. However, it is seemingly headed towards a capacity shortage by 2027 with the current pace of oil production growth. To address this, Enbridge is evaluating expansion of Gray Oak pipeline by 200,000 bpd.
3. Lack of sufficient takeaway capacity remains a problem for Appalachian gas producers, resulting in production remaining flat through 2024 averaging ~25 Bcf/d, leading to market volatility. After several hiccups, the Mountain Valley Pipeline project made significant construction progress and is targeted to be completed by the first quarter of 2024 adding new takeaway capacity of 2.0 Bcf/d.
4. New pipelines adding up to over 20 Bcf/d of natural gas capacity are being built in Texas and Louisiana to feed new LNG export terminals. For instance, WhiteWater Midstream is constructing a 39-mile 1.7 Bcf/d pipeline and Cheniere Corpus Christi Pipeline is constructing a 21-mile 1.5 Bcf/d pipeline to deliver natural gas to the Corpus Christi Stage III with LNG export capacity of over 10 million tons per annum (mtpa).
5. Canada's Trans Mountain Pipeline Expansion project is reportedly over 95% complete and expected to come online early this year, nearly tripling the current oil transportation capacity of 300,000 bpd to 890,000 bpd from Alberta to the Pacific coast. Currently, over 95% of Canadian crude oil exports go to the U.S. and expansion will provide Canadian oil producers with additional customer options. This will pose challenges to U.S. Gulf Coast refiners as we discuss in our refining outlook.
6. An increasing amount of natural gas with high nitrogen content is expected in 2024, primarily from certain areas in the Midland Basin. This poses

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challenges for LNG production as it lowers the heating value of the LNG and can disrupt the liquefaction and transportation processes. Freeport LNG has already faced difficulties since the Permian Highway Pipeline went into service. The upcoming Matterhorn Pipeline, set to begin in late 2024, may worsen the issue by bringing in more high-nitrogen gas to Freeport's main supply area.

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7. Growing demand for cleaner marine fuels and the policy push for decarbonization will drive development of LNG bunkering facilities and transportation infrastructure to serve a wide range of ports and ships. For instance, Seapath, a subsidiary of Libra, and Houston-based energy infrastructure company, Pilot LNG, have formed a joint venture to develop, construct, and operate an LNG bunkering facility with 300,000 gallons per day (gpd) of LNG production capacity, in the greater Houston/Galveston area of Texas, with operations set to begin in early 2026. ADI continues to track and publish North American and global assessments of the small-scale LNG market.
8. While natural gas liquid (NGL) pipelines are being underutilized, the utilization rate of fractionation facilities is expected to range between 95% and 100% through 2024, with the U.S. Gulf Coast fractionation volumes currently at ~4.3 million bpd. Companies are thus investing in additional fractionation capacity by expanding current plants or constructing new ones. Several key players including Targa Resources, ONEOK, and Enterprise are making substantial investments in fractionation infrastructure with plans to expand fractionation at Mt. Belvieu by a minimum of 800,000 bpd by the end of 2025.
9. The global demand for renewable energy has surged due to environmental concerns leading to increased opportunities for clean energy transition in the midstream sector. The IRA incentivizes renewable natural gas (RNG) production from organic waste, offering a baseline investment tax credit of 6% of certain costs among other incentives. TC Energy made a \$29 million investment in an RNG facility in Tennessee in 2022 which is expected to come online in 2024. Also, Enbridge recently acquired 7 gas-to-RNG facilities in the U.S. from Morrow Renewables for \$1.2 billion. We expect more midstream companies to follow suit although RNG prices and overall economics will continue to be volatile.
10. The midstream oil and gas industry will continue to face challenges related to ESG integration and decarbonization in 2024 resulting in continued emphasis on methane emissions reduction, renewable energy, technological advancements, and a commitment to social responsibility. To give an example, Cheniere Energy is partnering with Mitsubishi Heavy Industries on a carbon capture and storage project at its liquefaction facility in Corpus Christi, TX, MPLX is investing in digital technologies to optimize pipeline operations and reduce methane emissions, and Kinder Morgan will

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transport biogas produced from landfills and wastewater treatment facilities.

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11. M&A is expected to continue in 2024 driven by a lower growth environment and increasing regulations as companies aim to gain scale, strategically position themselves for growing export markets, and optimize existing assets. Recent activities include Williams acquiring Cureton Midstream and the remaining 50% stake in Rocky Mountain Midstream and Kinder Morgan purchasing South Texas natural gas pipelines from NextEra Energy Partners.

- Bhautik Gajera

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2024 Refining Outlook



Uday Turaga and Edmund Lam

Refining and fuels: A cautious outlook for 2024

January 2024

The global refining industry had an unexpectedly strong year in 2023 with strong demand recovery especially in diesel and jet fuel and high crack spreads not seen in many years leaving many refiners with strong balance sheets and optimism about the future. Against this context, we anticipate a far more mixed outlook for the refining industry in 2024.

1. Global oil demand will continue to grow in 2024 albeit at a slower pace but will underline the world's continued reliance on oil especially for transportation and mobility. ADI is forecasting global refinery runs to increase in 2024 by a little over 1%.
2. Even so, if not quite peak oil, many regions including Europe and the U.S. will have to continue contending with peak gasoline led not as much by the growing sales of electric vehicles (EVs) but more so due to rising fuel efficiency of automobiles in response to fuel economy mandates. ADI's long-term models show that even in the most aggressive EV penetration scenarios, automobile fuel efficiency standards account for two-thirds of gasoline demand destruction.
3. Average U.S. Gulf Coast refining margins were as high as \$17 to \$20 per barrel in 2023 but we anticipate them to fall to \$12 to \$15 this year. While these will still be higher than the average seen over the past few years, refiners will globally have to contend with volatility in crude oil prices and refined product demand. Narrowing price differentials between light and heavy crude oils – only expected to shrink further in 2024 – will compress U.S. Gulf Coast refining margins. The Trans Mountain pipeline expansion cleared a critical regulatory hurdle last week and will be completed in the first half of 2024 tripling crude oil supply from Alberta to the Canadian Pacific Coast. This will further aggravate U.S. Gulf Coast heavy oil costs but will help the West Coast refiners.
4. The global refining capacity has caught up mostly with turnarounds and maintenance deferred during the COVID years. As a result, global refining capacity utilization will also be a few percentage points higher in 2024 in comparison to the past year. This will drive product volumes and widen the supply-demand balances impacting gross refining margins.
5. The risk of a global recession is receding especially as interest rates are expected to fall in 2024 but an economic slowdown could eliminate the modest growth in refining runs we anticipate this year. Geopolitical conflict that constrains shipping routes (e.g., via the Red Sea from the recent attacks) or raise tanker rates could also impact gross refining margins significantly.
6. Refinery divestitures will continue led by the majors such as Shell, BP, and Total as they prepare for the energy transition. In ADI's due diligence projects on

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refining assets, national oil companies in Asia and the Middle East have shown a strong interest in acquiring refineries especially in strategic markets and locations. In 2024, we anticipate this interest to continue but valuations will be challenged and even distressed if the assets lack top-tier operational performance.

7. Going forward, as refining margins tighten, refiners will have to revisit product-market strategies, operational excellence, and technical leadership to deliver expected shareholder returns. This includes developing appropriate market strategies around renewable diesel and now sustainable aviation fuel, lubricants, and asphalt as well as cost optimization, product upgrading, and asset integration.
8. Refiners continue to be highly advantaged in pursuing a broad range of energy transition opportunities with renewable diesel and sustainable aviation fuel being the most likely ones in the near to medium term. Over the next 5-10 years, blue hydrogen and potentially methanol and ammonia projects would also be relevant opportunities for refiners. Within the U.S., ADI's work is showing the refining independents are particularly well-positioned to exploit the incentives proposed by the Inflation Reduction Act.
9. The U.S. Gulf Coast refining infrastructure will continue to be highly advantaged on the global cost curve. This is reflected in the investor activism around leading U.S. refining independents in the past few years. ADI's multi-client study on refined product exports, published annually since 2020, has highlighted that this will require refiners to relentlessly develop relationships to sustain and grow refined product exports to Latin America and other emerging economies.
10. Refiners are not new to regulations, and that pressure will continue and may even intensify both directly and indirectly, e.g., via incentives to EV sales. Governments are implementing stricter regulations on carbon emissions and air pollution, which could increase costs for refiners and potentially force them to close older, less efficient facilities.

The petroleum refining industry is likely to face a complex and dynamic environment in 2024. While there are opportunities for growth, particularly in the short term, the industry needs to adapt to the changing energy landscape and explore new technologies, business models, operational strategies, and product-market plans to ensure its sustained competitiveness.

- Uday Turaga and Edmund Lam

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2024 LNG Outlook



Panuswee Dwivedi

Growing stability yet uncertainty in the global LNG market

January 2024

The ripples in the global LNG markets induced by geopolitical conflict seemed to have died down and greater import and export capacity coupled with continued growth in the share of renewable energy will result in a relatively stable yet uncertain LNG market in 2024. Key trends to look out for include the following:

Global LNG demand amounted to ~402 million tons in 2022 and is expected to have grown by ~8 to 12 million tons in 2023, to reach ~409 to 412 million tons.

Global LNG demand will see similar 2% to 3% growth as 2023 in 2024. While the LNG demand growth in 2022 was mainly driven by Europe substituting Russian pipeline gas with LNG imports, a milder winter in Europe and the economic slowdown in China in 2023 resulted in slower growth for LNG in 2023.

Natural gas and LNG demand in Europe fell by ~7% this year down to ~302 Bcm in 2023 from ~326 Bcm.

Russian gas imports fell ~18% year-on-year in 2023 and some of it was offset by an ~8% year-on-year growth in LNG imports, reaching ~141 Billion cubic meters (Bcm) (101 million tons) in 2023. Not only did industrial gas demand fall in Europe in 2023 but power generation also fell in Europe. At the same time, however, there was a growing contribution from renewables. Collectively, spark spreads fell and were negative suggesting weaker gas demand for power generation in 2024 as well.

Europe enacted policies mandating natural gas storage operators to maximize members' storage during the refill season post Ukraine's invasion by Russia – to 90% before every winter period – resulting in high storage levels.

Gas storage levels by mid-November were the highest the region has seen at over 95% or ~103 Bcm (~74 million tons LNG) with storage being almost full by December. A milder winter may result in lower gas demand and higher storage levels in 2024 beginning January compared to over 50% in 2021 and over 80% in 2022, impacting the LNG outlook for 2024.

China emerged as the top LNG importer in 2023, surpassing Japan, and is increasingly re-selling to other Asian buyers, cashing in on high LNG prices, a trend that may continue through 2024.

After a 19% slump in demand to ~64 million tons in 2022, its LNG imports rose by 11% to ~71 million tons in 2023, yet below 2021 imports of ~79 million tons. However, by September 2023, China had already surpassed its annual LNG exports

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to 617,000 tons, compared to 576,000 tons in 2022 and only 26,000 tons in 2021. South Korea, followed by Thailand, Bangladesh, Japan, and Kuwait are some of the importers of Chinese LNG re-exports. China's newer contracts with U.S. LNG exporters are being written in a way that will limit destination flexibility but allow it to re-export from its shores reflecting its interest in expanding its LNG trading footprint.

Higher natural gas storage levels and muted demand created pressure on LNG prices through 2023 and expectation of a well-supplied market will continue to drive prices down.

East Asia and TTF natural gas futures averaged at ~\$23/MMBtu and ~\$25/MMBtu, respectively, during the 2022-2023 winter season and are expected to average lower at ~\$20/MMBtu and ~\$18/MMBtu, respectively, during the 2023-2024 winter season.

Qatar and Australia are not expected to significantly add to their LNG export capacity in 2024.

The North Field expansion in Qatar is not slated to start production until 2026 and new LNG trains are being constructed. Australia's LNG exports are expected to fall from 82 million tons in 2023 to 79 million tons in 2024 mainly driven by declining production and muted demand from Asia. Darwin LNG production was suspended as its feedgas source, Bayu-Undan field is depleted and its replacement, Santos's Barossa gas and condensate project was still only 60% complete by July 2023 before being suspended lacking necessary environmental approvals. Australia's LNG export outlook remains uncertain.

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The U.S. is the top exporter of LNG globally, exporting ~91 million tons in 2023, a jump of ~13% compared to 2022.

The two main drivers included Freeport LNG returning to full service in early 2022 adding 6 million tons per annum (mtpa) capacity and Venture Global's Calcasieu Pass facility reaching full capacity that added another 3 mtpa. In addition to existing contracts and demand from Europe and China in the spot market, U.S. LNG demand in 2024 will come from Cheniere's deal with Korea Southern Power (KOPSO) to supply 0.4 mtpa from 2027 through 2046, with small quantities starting in 2024.

U.S. LNG exports will continue to grow further through 2024 and may exceed 100 mtpa driven by Plaquemines Parish LNG Phase 1 (10 mtpa) in Louisiana in the later months of 2024.

However, the delay of Golden Pass LNG Trains 1 and 2 (6.5 mtpa) in Texas will create a significant dent in the export outlook and result in uncertainty in the market. Cheniere's 10 mtpa expansion of Corpus Christi LNG terminal in Texas, U.S.

and Shell's 14 mtpa LNG export terminal in Kitimat, British Columbia, Canada may start-up earlier than planned by late 2024 and support LNG supply growth.

U.S. Henry Hub gas prices averaged \$2.53/MMBtu in 2023, a drop of 61%, compared to \$6.45/MMBtu in 2022.

Henry Hub prices are expected to average \$2.79/MMBtu in 2024, an increase of 10% compared to 2023. For the winter season of 2023-2024, gas prices are expected to be higher reaching \$3/MMBtu from January through March.

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The U.S gas production growth is estimated to have grown by 3% (5 billion cubic feet per day or Bcfd) in 2023 and will grow by 2% (1.8 Bcfd) in 2024, mainly driven by the improved well productivity in the Permian region and higher crude oil prices.

The Permian is expected to grow by 11% (2.2 Bcfd) in 2023 and by 6% (1.4 Bcfd) in 2024 mostly as associated gas production from oil wells. Permian pipeline takeaway capacity will be sufficient through mid-2024, when 2.5 Bcfd Matterhorn Express Pipeline is expected to come online. Appalachian gas producers on the other hand will likely keep the production flat averaging ~25 Bcfd during 2024 as they did in 2022 and 2023, with low possibility of new pipeline capacity being built.

- Panuswee Dwivedi

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2024 Energy Transition Outlook



Uday Turaga

Energy transition and climate tech outlook: Measured, steady growth

January 2024

While the broader sentiment around energy transition turned more pessimistic in 2023, investments in clean energy and related technologies still increased by more than 20%. This included renewables, biofuels, and a wide range of low-carbon solutions. Despite this growth, we anticipate a more measured pace of progress in 2024, as reflected in the following themes:

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1. **Publicly Traded Cleantech Companies:** Public cleantech companies took a hit in 2023, and we don't expect the S&P Global Clean Energy Index to reach its 2021 highs again this year or next. However, as interest rates stabilize and the sector recovers, some upturn is likely.
2. **Early-Stage Investment Challenges:** Investments in predominantly early-stage energy transition and climate tech companies totaled just over \$30 billion in 2023, a significant 25% drop from the previous year. High interest rates, renewed energy security concerns, declining cleantech stock performance, permitting hurdles, and the stringent qualification criteria for Inflation Reduction Act (IRA) funds all contributed to this decline. We expect these factors to persist in 2024, leading to similar or even lower levels of investment. Focusing solely on cleantech stock performance or early-stage fundraising paints an incomplete picture of the long-term energy transition trajectory.
3. **Flight to Quality:** Investors in the energy transition space will likely prioritize projects and technologies demonstrably nearing commercial viability. This "flight to quality" could mean fewer funding opportunities for startups and early-stage technologies seeking Series B and C investments, while projects closer to pilots or commercial plants garner greater interest.
4. **Emerging Traction Areas:** We expect carbon capture and storage (CCS), sustainable aviation fuels, and critical minerals recovery and extraction to attract the most fundraising as these technologies and projects gain traction. Solar and wind will continue to see investor interest, and some companies in these areas might be ripe for liquidity events, with oil and gas companies potentially playing an active role as buyers.
5. **U.S. Election Impact:** The upcoming U.S. election could significantly impact climate tech policies. While we consider it highly unlikely for the IRA to be repealed, changes or even pitched battles around its specific details are probable. We saw a preview of this stringency in late December with the U.S. Treasury's definition of "carbon-free electricity" for green hydrogen production, with stringent "three pillar" requirements for IRA tax credits.

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Similar stringency is likely for other IRA incentives under the Biden Administration.

6. **EV Sales Slowdown:** EV sales are expected to continue climbing, but reaching 25% of global new car purchases in 2024 seems unlikely. Shrinking EV incentives in China, Germany, France, and even Norway make them less attractive to buyers. The EU, aiming for all-electric new cars by 2035, is caught in a crossfire with its anti-subsidy probe into China's EV exports potentially leading to import restrictions and jeopardizing its ambitious green goals. The UK, echoing these concerns, has delayed its 2030 ban on new petrol and diesel cars due to affordability worries.
7. **Protectionist Walls:** Western countries are building walls around their car industries in an attempt to ditch China and boost domestic EV production. However, these protectionist policies, like the U.S. Inflation Reduction Act and the EU's Critical Raw Materials Act, could backfire by making EVs more expensive and slowing their adoption. This decoupling push comes at a challenging time, with weak metals demand and high mining costs already squeezing the industry.
8. **Permitting and Regulatory Hurdles:** Energy transition continues to face permitting and regulatory hurdles. Each U.S. state has its own policies and priorities, with California racing ahead with ambitious renewable energy goals while Wyoming remains heavily reliant on coal. While the IRA offers some clean energy incentives, it lacks nationwide emission reduction targets or transition deadlines. Additionally, practical challenges exist, such as the complex interplay between the Federal Energy Regulatory Commission (FERC) overseeing national power lines and state agencies controlling local energy matters. Despite these hurdles, regulatory bottlenecks are being addressed, and grid buildout efforts could ease current constraints.

Overall, 2024 shapes up to be a year of transition and adjustment for the energy transition sector. While the euphoric highs of the past may not return, significant opportunities for measured progress remain. Policy developments and technological advancements will continue to shape the landscape, making it an exciting time for all stakeholders.

- Uday Turaga

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2024 Chemicals Outlook



Piercen Hoekstra

Flat expectations for the chemicals industry

January 2024

The global chemical industry struggled in 2023. The year was marked by rising inflation rates and low demand from major markets. With China still in recovery, the growth the industry was hoping for never came to fruition. In 2024 we expect things to stay the course and see no drastic changes up or down in the coming year. Key trends to look out for in 2024 are as follows:

The global economic slowdown will continue with GDP growth expected to fall to 2.7% year-on-year (yoy) in 2024 down from 3.5% yoy in 2023 significantly impacting the chemical industry.

Inflation and interest rates remain high as we head into 2024. Both the U.S. and Europe are at a high risk of entering recessions this year. As mature markets, this will have significant impact on demand for chemicals.

Lower growth rates than expected in China could result in a muted demand for petrochemicals.

China's petrochemical consumption dominates global demand and influences the trajectory of the market at large. Faced with a declining birthrate and an aging population China's economy is slowing down quicker than expected. Many recent polyolefin capacities were built with the expectation of 6-7% growth in demand from China, but growth rates for 2024 and beyond are only expected to be 3% or less.

After a downturn in 2023 the chemicals industry is expected to bounce back slightly in 2024.

The American Chemistry Council (ACC) estimates a 1.5% increase in U.S. chemical output in 2024 after an estimated 1.0% decrease in 2023. Realized growth will likely be determined by how the industry adapts to energy transition and capitalizes on the growing market. With several projects in clean energy, electric vehicles, biomanufacturing, and semiconductors 2024 represents a chance for the chemical industry to capitalize on energy transition trends.

Oversupply will likely overshadow any rebound in polymer demand we see this year.

Oversupply of PE and PVC is expected due to decreased global demand. New PE and PVC start-ups in the U.S. and China that were originally expected in 2022 have been delayed to early this year and could be delayed even further if demand stays low. China and the U.S. could both be net exporters of PE and PVC in 2024. Operating rates are expected to only be 80% of global capacity. With slight growth

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expected in both automotive and construction, PP will see increased demand in 2024.

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U.S. capex is expected to slow down to 1.1% growth in 2024 from the 4.3% we saw in 2023.

We expect a capital spending of \$25-\$30 billion in the U.S. chemical industry in 2024. The U.S. chemical industry will stay relatively flat in capital spending from 2023 to 2024. Capex is expected to pick back up in 2025 and beyond.

Geopolitical tensions will likely continue to impact supply chains in Europe while U.S. chemicals stay cost advantaged.

Continued strain on supply chains caused by the war in Ukraine may result in price instability for NGLs, naphtha, and other feedstocks. While European naphtha and NGL prices are currently down compared this time last year they still have not cooled down to pre-war levels. U.S. chemicals are expected to stay cost advantaged due to relatively cheap natural gas and ethane feedstocks. As a result, we are seeing a new wave of polyolefins investment in the U.S.

Regulations on packaging and plastic products are tightening in 2024.

Governments are cracking down on plastic waste including post-consumer recycled (PCR) content laws and single-use plastic bans. This will drive demand plastic circularity and plastic alternatives. Italy joins other European nations with its own tax on consumption of single-use plastic products being implemented this year. Many U.S. states including California, Maryland, and Minnesota have implemented bans on intentionally added PFAS in food packaging among other products.

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Look for majors to continue investing in decarbonizing their operations.

A major driver to decarbonizing the chemicals industry is having access to clean hydrogen whether it be blue or green. Progress is expected on several blue and green hydrogen projects this year many of which are also driven by increased demand from the fertilizer industry for low-carbon ammonia. Dow will break ground soon on the company's net-zero steam cracker in Canada that utilizes blue hydrogen. IRA initiatives could drive investment into similar projects in the U.S. BASF, SABIC, and Linde are also hoping to have their joint electric steam cracker furnace ready for commercialization by the end of the year.

Expect a focus on circular economies in key markets including polymers.

Advanced plastics recycling capacity is expected to increase in 2024 as polymer producers aim to reach their recycled content commitments. Several plastic pyrolysis projects are expected to come online this year including plants from Plastic Energy and New Hope Energy. Mura is also expected to start delivering from

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solutions](#)*

their advanced recycling facility this year that utilizes a novel hydrothermal process. Recyclers are looking to cut costs by tailoring their feedstocks and improving efficiency and yields. The largest bottleneck advanced recycling will face in 2024 is feedstock sourcing and availability, particularly in the U.S. Expect recyclers to partner with packaging companies and local waste management services as they look to source feedstock for their expanded capacities.

Mergers and acquisition (M&A) activity was moderate in 2023 but is expected to pick up in 2024.

A favorable valuation environment for sellers will drive deal activity as acquirers get accustomed to higher capital costs. Well-capitalized strategics will make up most of the buyer pool as transaction financing will continue to be difficult in 2024. Some recent M&As to keep an eye on include INEOS acquiring LyondellBasell's ethylene oxide and derivatives business; Borealis is set to acquire Integra Plastics, an advanced mechanical recycler in Bulgaria; and India's Epsilon has acquired a German battery laboratory from Johnson Matthey. We expect to see similar acquisitions throughout 2024 as companies look to shift their focus and invest in sustainability.

- Piercen Hoekstra

ADI will continue to monitor, track, and consult in the chemicals market. You can access our insights by subscribing to the [ADI Newsletter](#) or [contact us](#) to learn more about our [research](#).

Agenda: Oil & Gas Day

7:30 am	Registration and breakfast	8:15 am	Welcome
8:30 am	Keynote address	9:15 am	Energy outlook in 2024
	Tim Adams <i>Hunt Refining, VP, Corporate Strategy, Development & Planning</i>		Uday Turaga <i>ADI Analytics, CEO</i>
10:05 am	Break and networking		
10:35 am	Panel 1: Upstream onshore and unconventionalals		
	Michael Pipkin <i>Rushmore Resource Partners, CEO</i>		Brent Williams <i>Callon Petroleum, Dir., Sustainability</i>
			William Atcheson <i>Jefferies, Energy Sector Strategist</i>
11:25 am	Panel 2: Digital in oil & gas		
	Sheldon Harbinson <i>CMG, VP, Americas</i>		Soudip Chowdhury <i>Eugenie, CEO</i>
			Rohan Irvin <i>ResFrac, Senior Engineer</i>
12:15 pm	Lunch and networking		
1:15 pm	Panel 3: Oilfield services and equipment		
	Austin Harbour <i>Piper Sandler, Managing Director</i>		Sean Ebert <i>Altira Group, Senior Partner</i>
2:05 pm	Panel 4: Natural Gas and LNG		
	James Wang <i>VP Ventures, CFO</i>		Najla Jamoussi <i>Cheniere, Dir., Global LNG</i>
			John Palamara <i>Air Products, General Manager - LNG</i>
2:55 pm	Break and networking		
3:20 pm	Panel 5: Midstream and NGLs		
	Joseph Gentry <i>GTC Vorro, VP, Licensing</i>		Kendall Puig <i>Antero Resources Manager, NGL</i>
			Richard Barber <i>INNIO Waukesha, Key Account Manager</i>
4:10 pm	Panel 6: Fuels and refining		
	Mike Reed <i>Renewable Biofuels, CEO</i>		Chris Efird <i>NXTClean Fuels, CEO</i>
5:00 pm	Adjourn		

Agenda: Energy Transition Day

7:30 am	Registration and breakfast				
8:15 am	Energy transition outlook in 2024	8:55 am Keynote address			
	Uday Turaga <i>ADI Analytics, CEO</i>		Charles McConnell <i>University of Houston, Energy Center Officer, CCME</i>		
9:15 am	Keynote address				
	Lydia Johnson <i>ExxonMobil, VP, Product Development, Low Carbon Solutions</i>				
10:00 am	Break and networking				
10:30 am	Panel 1: Renewable power and energy storage				
	Brandon Schwertner <i>Priority Power Management, CEO</i>		Jane Zhang <i>Breakthrough Energy, Business Fellow</i>		
11:20 am	Panel 2: Biofuels, SAF, and RNG				
	Tamara Siskind <i>Viridi Energy, Dir., Bus. Development</i>		Jesse Blair <i>Synthica Energy, Dir., RNG. Development</i>		Blake Simmons <i>Joint BioEnergy Institute, Chief Science & Technology Officer</i>
12:10 pm	Lunch and networking				
1:10 pm	Panel 3: Hydrogen				
	Markus Digruber <i>Hoerbiger, EVP, Innovation & Business Development</i>		Chendhil Periasamy <i>Air Liquide, VP, Energy Transition</i>		
2:00 pm	Panel 4: CCUS and direct air capture				
	Oliver Tuckerman <i>Blue Sky Infrastructure, Co-President</i>		Jan Sherman <i>Carbonvert, Chief Development Officer</i>		Kal Al-Labadi <i>Sundyne, VP, Product Management</i>
2:50 pm	Break and networking				
3:20 pm	Panel 5: Innovation				
	George Skoptsov <i>H Quest Vanguard, CEO</i>		Brendan Walsh <i>Origina, Sales Director, Americas</i>		Anahita Khanlari <i>AspenTech, Marketing Director</i>
4:10 pm	Panel 6: Energy transition infrastructure				
	Jason Ryan <i>CenterPoint Energy, EVP, Regulatory Svcs & Govt Affairs</i>		Prasenjeet Ghosh <i>ExxonMobil, Hydrogen Venture Exec. – Low Carbon Solutions</i>		
5:00 pm	Adjourn				

Agenda: Chemicals Day

7:30 am	Registration and breakfast	8:15 am	Welcome
8:30 am	Keynote address	9:20 am	Chemicals outlook in 2024
	Kelly Knopp <i>Citroniq Chemicals, CEO and Co-Founder</i>		Uday Turaga <i>ADI Analytics, CEO</i>
10:10 am	Break and networking		
10:40 am	Panel 1: Methanol and ammonia		
	David LaMont <i>SunGas Renewables, SVP, Corporate Dev.</i>		Esben Sorensen <i>Plug Power, Sr. Director, Global Market Dev.</i>
			Hanh Nguyen <i>OCI Global, VP, Sustainability</i>
11:30 pm	Lunch and networking		
12:30 pm	Afternoon Keynote		
	James Simon <i>Braven Environmental, President & CEO</i>		
1:20 pm	Panel 2: Engineered materials		
	Jeffrey Dysard <i>NuMat Technologies, CTO and EVP</i>		Matthew Seabaugh <i>HeatPath Solutions, Founder</i>
2:10 pm	Break and networking		
2:40 pm	Panel 3: Specialty chemicals		
	David Austgen <i>BioVeritas, CEO</i>		Steve Brown <i>Chemstations, President</i>
3:30 pm	Panel 4: Investor		
	Ben Scharff <i>Grace Matthews, Managing Director</i>		Jim Sledzik <i>Aramco Ventures, Managing Director</i>
4:30 pm	Adjourn		

Learn more about our speakers by reviewing their bios at www.adi-forum.com.



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February 11-13, 2025

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