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Shell's EBITDA Target for Monaca Facility Under Threat

- *Shell's Pennsylvania petrochemical plant is highly unlikely to meet its financial targets.*
- *Reasons for optimism about the petrochemical industry's outlook will probably be short-lived.*
- *Forecasts suggest the margins for three major products at the Shell Pennsylvania plant will decline through at least 2028.*
- *Slowing demand from China and overcapacity concerns are likely to suppress future margin growth.*

When Shell announced its massive petrochemical plant in western Pennsylvania in 2016, it provided very little transparency about its financial projections.[1] An IHS Markit study estimated earnings before interest, taxes, depreciation, and amortization (EBITDA) of $575 million annually for a plant of similar size.[2]

Even before the COVID-19 pandemic wreaked havoc on the economy, IEEFA and IHS Markit both suggested the markets were not likely to meet the targets.[3] Between Shell's 2016 announcement and the 2022 commencement of operations, Standard and Poor's warned that petrochemical hubs were facing financial trouble globally.[4] Shell also received violations for failing to comply with state air regulations.[5]

A Sasol Louisiana petrochemical project also opened to weak performance, and a shareholder class-action lawsuit based on lack of transparency in light of adverse market conditions was successful.[6] Sasol and complainants settled for $24 million and governance reforms to improve transparency.[7] Sasol subsequently proceeded with greater transparency.

Formosa and Mitsubishi in Louisiana are experiencing delays in their Louisiana projects and CC Polymers has missed deadlines on their Texas PET (polyethylene terephthalate) production plant.

Shell has acknowledged it won't meet its initial target of $1 billion to $1.5 billion of EBITDA from the plant until 2025, at the earliest.[8] CEO Wael Swan estimated that the Monaca facility will more likely reach its financial goals in 2025 or 2026.[9]

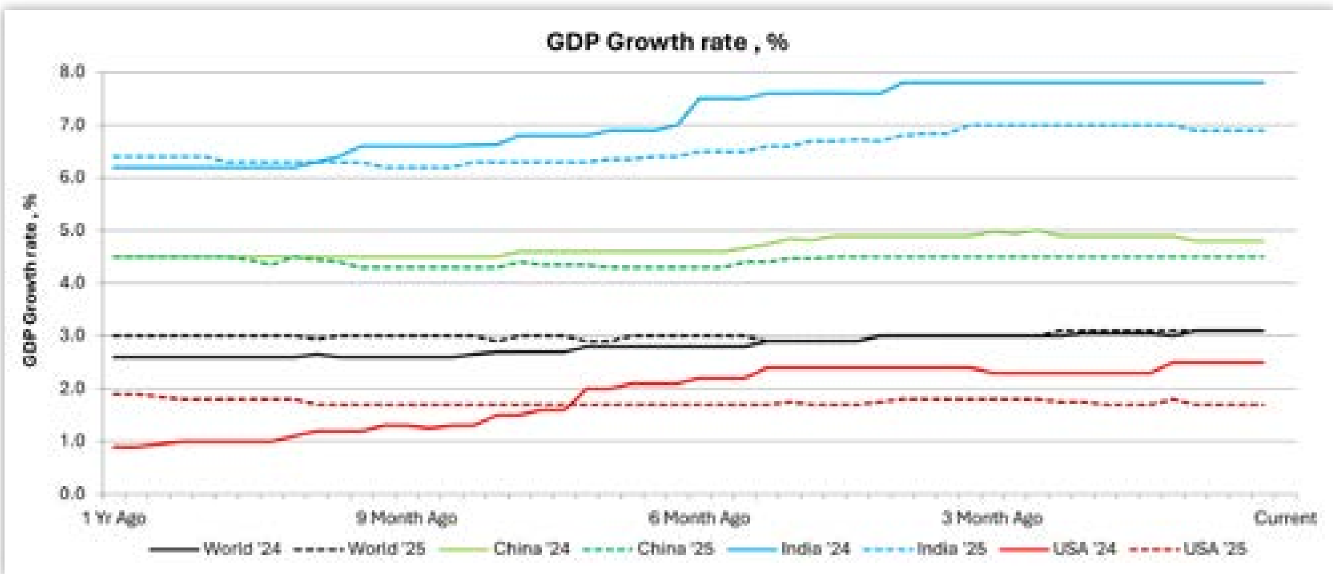
An IEEFA review of the numbers, however, suggests that even reaching its goals in 2026 might not be possible, and the company might be better off taking an impairment, reflecting the ongoing weak position of the project and the industry.

Current Market Conditions for the Petrochemical Industry and Shell's Pennsylvania Petrochemical Complex Do Not Bode Well

At the beginning of 2024, the petrochemical market was experiencing some improvement due to better economic conditions and a decline in energy costs. Margins for ethane-fed crackers had improved for producers, reaching an average of $519/ton in early 2024, a 6% increase from the fourth quarter of 2023.[10] These were some of the highest margins seen this year. Reasons for optimism, however, are likely to be short-lived.

Factors generating an uncertain global economic outlook—particularly slowing demand from China and overcapacity concerns—are likely to suppress future margin growth. Recent revisions in GDP growth forecasts for 2025 suggest a downturn in growth compared to 2024 (Figure 1). If these projections hold, Shell's ability to achieve its EBITDA target from the Monaca cracker plant looks increasingly unlikely. In its update for the third quarter of 2024, Shell reported a chemical utilization rate of 73%-77%, down from 80% in the previous quarter.[11]

Figure 1: GDP Forecasts Indicate That 2025 Growth Rates Would Be Lower Than 2024



Source: Bloomberg, IEEFA

When Shell first evaluated the Monaca facility project back in 2012, ethylene pricing was far more robust, with expectations of sustained growth underpinned by optimistic forecasts for long-term demand and profitability.[12] The long-term outlooks, however, now suggest the demand growth for petrochemicals may be far weaker than initially anticipated, driven by structural changes in the global economy. Such changes include shifts toward more sustainable commodities, overcapacity in the petrochemical sector, and slower industrial growth. These altered conditions imply that the challenges Shell faces are not merely cyclical but secular in nature.[13] The weakening of demand and the softer long-term growth trajectory reflect deeper, more persistent changes in the global economy. As a result, even as the market recovers from short-term fluctuations, the plant's profitability may remain under pressure for the foreseeable future. This secular downturn exacerbates the risk that the Monaca facility will struggle to achieve its original financial goals, making it a less-attractive asset in Shell's portfolio than initially expected.

Figure 2: U.S. Ethylene Price

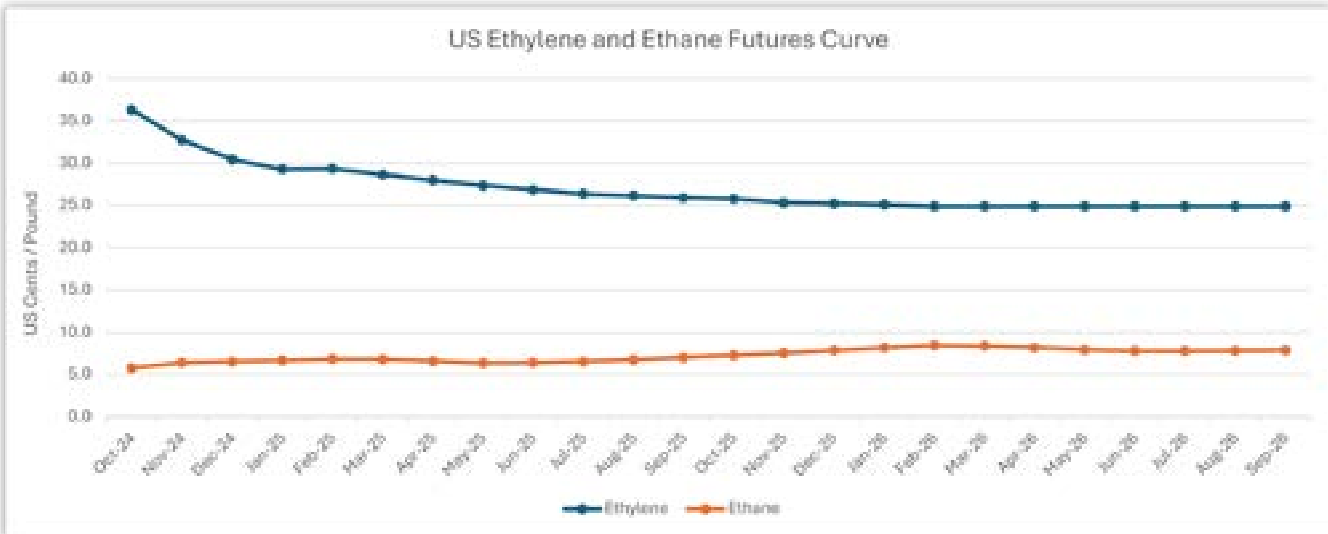
Source: Bloomberg, IEEFA

Futures Paint a Grim Outlook

The initial recovery in olefin margins early in 2024 offered some hope for the industry. The futures curve, however, shows a less promising scenario. Ethylene prices are in backwardation (the current prices are higher than prices trading in the futures market), suggesting lower future prices. In contrast, ethane prices are in contango (the futures prices are higher than the spot prices), indicating rising future costs. This dynamic is expected to put downward pressure on ethylene margins, making it difficult to sustain the positive outlook seen earlier in the year.

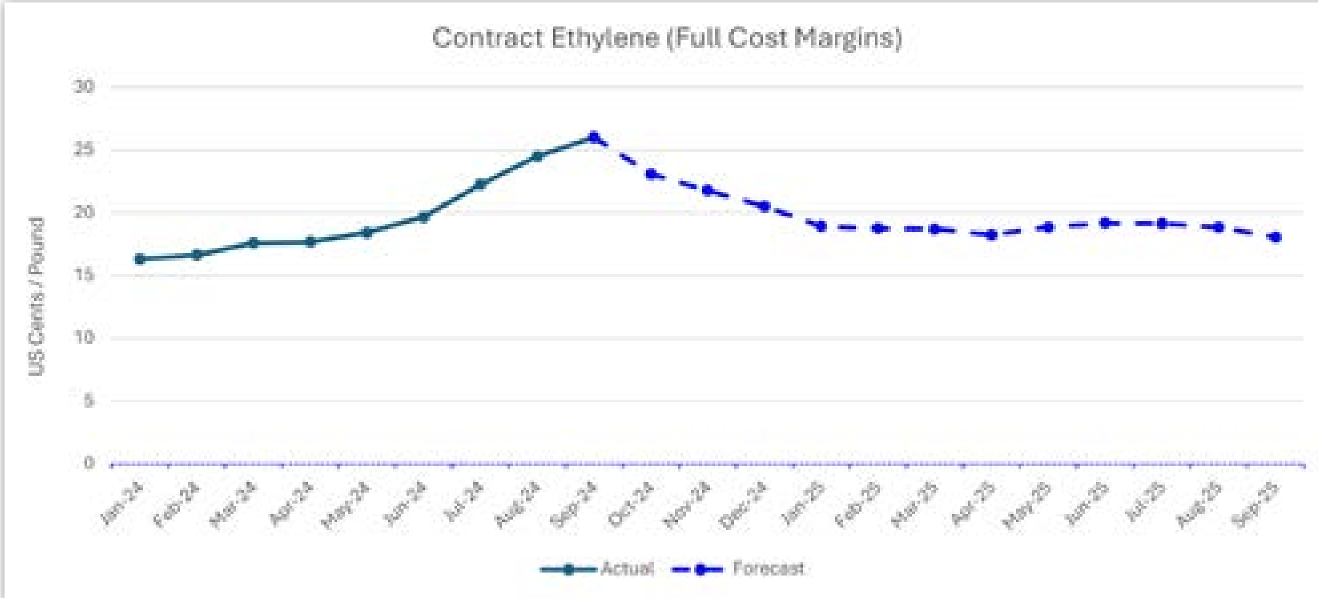
Natural gas price forecasts are also not favorable for Shell's plant. With more LNG demand expected in 2025 and 2026, gas prices are likely to increase. The new Matterhorn Express pipeline—designed to transport up to 2.5 billion cubic feet per day of natural gas from the Permian Basin to the Katy area near Houston, Texas—is expected to strengthen ethane's value over the short term. Rising ethane prices will increase feedstock costs, eroding margins for ethylene production.

Figure 3: Ethylene Prices Are Expected To Go Down but Ethane Prices Are Expected To Rise



Source: Bloomberg, IEEFA

Figure 4: Ethylene Margins Are Expected To Fall



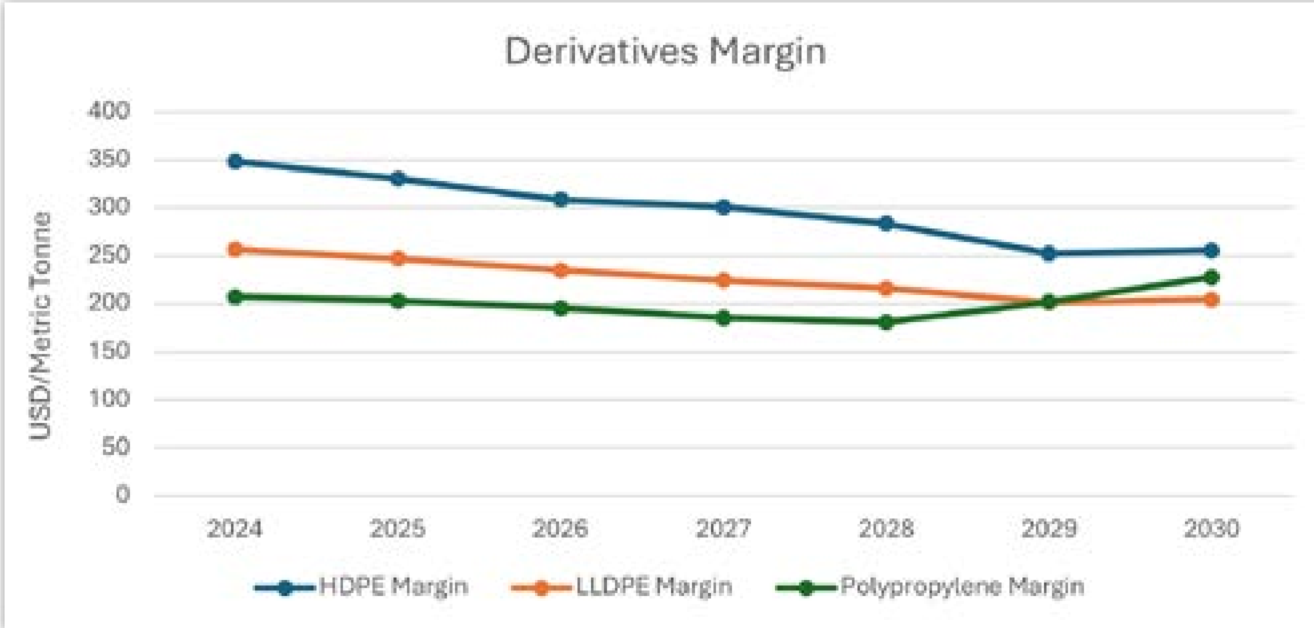
Source: ICIS, IEEFA

Declining Derivative Margins

Shell expects to produce high-density polyethylene (HDPE), linear low-density polyethylene (LLDPE) and polypropylene (PP) as its key derivatives at the Pennsylvania facility. Forecasts suggest, however, the margins for all three products will decline through at least 2028.

Shell may face difficulties optimizing profitability across its derivative products if margins for HDPE, LLDPE, and polypropylene continue to decline.

Figure 5: Ethylene Derivatives Margins Expected To Fall



Source: Bloomberg, IEEFA

EBITDA Forecasts and Return Calculations

It is highly unlikely that Shell will hit the midpoint of its $1 billion to $1.5 billion EBITDA target. We estimate Shell could achieve approximately $415 million in annual EBITDA. This would be a stark contrast to the company's original estimate, and it would fail to meet even more conservative third-party projections offered at the beginning of the project.

IEEFA developed an EBITDA calculation as a sensitivity test based on a more optimistic forecast. We assumed current pricing for HDPE, LLDPE, and polypropylene, while factoring in ethane pricing and operating expenses (opex). Even with this more favorable approach, our high-end estimate for EBITDA remains lower than Shell's low end of the target range, potentially falling short of the guided $1 billion to $1.5 billion EBITDA target.

With $14 billion as the capital cost of the Monaca plant, the project is looking at anywhere from a 4% to a 7% return. The Pennsylvania plant is likely to lag the 10% to 15% return targets for Shell's petrochemical investments.[14] The payback period for the plant could be anywhere from 14 years to 34 years. If the economic environment continues to underperform and the plant consistently fails to meet expected EBITDA levels, the project's overall return could dip well below the company's capital costs, further cementing it as a value-destroying project.

It is not surprising to us that the company has officially announced it is done with developing mega-projects such as its Monaca petrochemical plant.[15] The company is likely assessing the long-term impact of tying up resources in projects where future returns are highly uncertain and could continue to fall below the cost of capital, making them less attractive from a financial perspective.

Figure 6: Estimated EBITDA for Monaca Plant

Monaca Plant Nameplate Capacity (Thousand Tonnes)		
Ethylene	1,500	
HDPE	1,050	
LLDPE	550	
Propylene	45	
Plant Efficiency	90%	
Production (Thousand Tonnes)		
HDPE	945	
LLDPE	495	
Propylene	41	
Margin Assumption ($/Ton)	Low	High
HDPE	309	698
LLDPE	235	615
Propylene	196	563
Estimated EBITDA, $ mm	**416**	**987**
Capex, $ mm	14,000	14,000
Return	3.0%	7.0%
Payback Period, Years	34	14

Source: IEEFA

Conclusion: A Value-Destroying Project in the Making?

Given the unfavorable market dynamics, declining margins, and projected return on investment, Shell's Monaca facility is at risk of becoming a value-destroying project. The facility is unlikely to generate enough returns to justify the capital outlay, and the prolonged payback period further emphasizes the inefficiency of the project. Shell's decision to avoid further mega-projects like Monaca is a reflection of the uncertainties and risks associated with large-scale capital expenditures in an increasingly oversupplied and competitive petrochemical market.

Investors in Shell should expect a more detailed explanation concerning this project. When Sasol experienced very similar problems to Shell it became more—not less—transparent.[16] Shell's finances currently point to at least an impairment. What can investors expect from Shell's market performance going into the future regarding the plant? Residents of Beaver County in Pennsylvania and the state of Pennsylvania have provided incentives to Shell to come to Pennsylvania. They, too, are entitled to a better explanation.

Endnotes

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About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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