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# Maximize refinery profit in a hyper volatile marketplace

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With relentless globalization in place, hyper market volatility seems to be the new normal. The marketplace also adds to increased velocity – with fluctuating feedstock pricing, incessant commodities trading, rapid demand and supply shifts, as well as rampant currency movements. What can refineries do to maximize profits and improve bottom lines?



With this current industry shake up, we see new market entrants moving in to challenge traditional market incumbents. For example, Middle East continues to stake new ground with newly built refineries while the strongest North American shale players defend their market share with great resilience. In the midst of market transitions, refineries are now fairly worried about rising crude oil prices.

However, ConocoPhillips chief executive Ryan Lance gives some hope. According to the Calgary Herald, Lance said, “The volatility is here to stay. Market rebalancing will extend into 2017. The inventory levels are still quite high.” This market perspective buys refineries more time before pricier feedstock gives them a run for their money in terms of profitability levels.

In the macro economy, Channel News Asia reported on global oil majors shedding refineries, as crude oil price takes on a grounded recovery trajectory. Companies, such as Chevron and Royal Dutch Shell, are auctioning small refineries off their portfolio to trim lower margin assets. Fearing that higher crude oil prices might squeeze refining margins, oil majors with refineries are rushing for the exit. This is because refineries can be sold at better prices versus beleaguered exploration and production assets, belonging to these companies.

### **Volatility bites but we have an antidote**

Generally, companies are at the mercy of market trends. However, this does not need to be case, as market volatility can be mitigated. Besides being prepared for sudden market shifts, refineries should also look to maximizing profit and derive

greater business value from their assets by capitalizing on market opportunities. Companies can transform their fortunes by leveraging innovative technologies in a strategic manner.

Asset optimization is an overarching approach that forms the basis of sustainable operational excellence and profitability. In optimizing asset performance, companies make better decisions. A single refinery-wide process simulation model helps users perform rigorous profit margin analysis. This includes comparing the impact of alternative operational improvement plans on refinery profits.

Best practices to reconfigure refineries include leveraging robust refinery wide simulation models that can be developed quickly and economically. Benefits include enhanced performance; better yield; stronger feedstock processing ability; improved operational efficiency and improved profit margin.

### **Turning in increased profitability**

Refineries typically operate with low margins of around 5% or less, their operations are heavily influenced by rapidly changing market conditions. This means that margin analysis is a crucial exercise for refineries. Thus, it is a necessity to consider advanced engineering process simulation software, which enables refinery wide process modeling. This improves and facilitates rigorous profit margin analysis for the refinery. It also helps refineries choose the most profitable course in areas, such as operational improvements, refinery configurations, start up and turnaround planning. The software also offers rigorous analysis on the impact of each alternative course on the refinery's bottom line.

Refineries can further maximize profitability through better collaboration between engineering and planning. This enables rigorous profit margin analysis, as refineries can identify ways to maximize profitability and ensure that planning models are updated in a sustainable manner. Modeling the refining in a single flow sheet helps process engineers evaluate the economic impact of operational improvements and unexpected events. Process engineers can reference rigorous model data to troubleshoot operational problems; recommend the remedial steps to take and predict how such actions impact profitability. Planners can also make more accurate assessment of margins.

### **A well-considered solution**

With dark skies gathering and thunderstorm brewing, refineries can look to industry veteran Aspen Technology for a trusted integrated solution. With the latest technological innovations, process engineers can develop a more robust refinery wide model in a relatively short time to facilitate more accurate decision making and sustained profitability. This model is also scalable across multiple refineries and highly adaptable to new operational scenarios.

A powerful feature of Aspen Technology's aspenONE solution is the shared functionalities between its planning and process simulation solutions. Typically, planning and scheduling software helps planners improve margins, such as making the right manufacturing decisions to achieve an optimal outcome. The shared functionalities ensure that key parameters between planning and process simulation are well synchronized. This enables refiners to maintain their planning tools update and thereby make better operational decisions. With a refinery-wide process model to conduct rigorous profit margin analysis, refineries can predict the impact of capital projects, evaluate economic feasibility of operational improvements and subsequently, determine the best response to unexpected events.

This enhanced capability strengthens the partnership between planners and process engineers to build a collaborative system, where planners conduct rapid economic evaluation of the refinery using planning tools. Their process engineering colleagues can support them by providing a more accurate profit margin assessment on a case-by-case basis. Aspen Technology's business model provides process engineers the additional benefit of being able to access the entire aspenONE suite of products. This includes modeling rigorous heat exchangers, assessing energy consumption, assessing capital and operating expenditure, as well as designing process safety systems – all within one process simulation environment.

### **Two is better than one**

Indeed, the integration of process simulation and planning functionalities right at the heart of the plant is the silver bullet to mitigate hyper market volatility. Similarly, locking in increased profitability is also an essential check list item in a world where new competitors emerge regularly and traditional strongholds get broken down. Refineries do need to adopt operational excellence to derive the benefits of business sustainability and thrive in a world of increasing volatility.