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## THE BIG MONEY - REFINERS CUT CAPEX AND SIGNAL SHIFT TOWARD RENEWABLES

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In the spring of 2020, as the COVID-19 crisis started hitting the energy sector hard, many refiners made the tough decision to dramatically cut back capital spending plans and operating costs for the year in order to weather the storm. While these cuts were swift and sizeable, they were not absolute — they couldn't be, given that refining is a capital-intensive industry with complex assets that require seemingly constant maintenance, equipment swap-outs, and upgrades. And then there's the added pressure that refiners also need to invest in keeping their facilities in compliance with changing environmental rules, and to consider the overall impact of investments in new, "greener" fuels, such as renewable diesel, that may help them improve their profitability going forward. Today, we look at refiner capital spending in the context of recent history and highlights some of the growth projects being pursued in the sector.

From a capital spending perspective, refiners are very different animals than exploration and production companies (E&Ps). Sure, both sectors of the energy industry require a lot of capital, but while E&Ps' capex can ramp way up or way down year-to-year, reflecting shifts in hydrocarbon supply, demand, and (mostly) pricing, refiners' spending tends to be more consistent over time. Why? Refiners focus primarily on maintaining existing assets and on making the incremental enhancements needed to refine new grades of crude, to expand refining capacity, and to comply with new environmental regulations.

When discussing refinery capex, we tend to think of the spending in two major categories: **Sustaining Capital** and **Growth/Discretionary** spending.

### **Sustaining Capital**

Sustaining capital is essentially "stay-in-business" capital. Refining involves large, expensive equipment with specialized technology to convert crude oil and intermediate feedstocks into finished products like gasoline, diesel, and jet fuel, as well as specialty products like chemical feedstocks and lubricants. The various units within a refinery must be continuously maintained to ensure they can operate 24/7 in the safest, most efficient, and most productive manner. There are two primary subcategories of sustaining capital:

- *Maintenance/Turnarounds:* These expenditures can range from relatively small, such as a pump replacement, to medium in size, such as cleaning a tank or replacing a large compressor, to very large, such as swapping out an older coke drum or reactor for a new one. While spending can be cut in this category year to year, most of the time this would just translate into a deferral of spending to the near future — sort of like deciding to put off getting new tires on your car for a few months.
- *Environmental/Regulatory Spending:* Environmental spending typically involves improvements that are mandated by policies from the Environmental Protection Administration (EPA), state regulators, local air quality districts, or other governmental organizations such as the Occupational Safety & Health Administration (OSHA). These improvements can include



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emission-control devices, treating units to reduce levels of certain undesirable compounds (such as sulfur), and personnel safety requirements, among other items. This is really a compliance subcategory in that the investment needs to be made, no matter what the return-on-investment (ROI) dynamics might be.

### **Growth/Discretionary Capital**

This category of capital spending is often opportunistic and is designed to enable refiners to boost their profitability. Growth capital can involve such things as adding new units within a refinery to increase crude slate flexibility; improve optimization of “product make” (i.e., make more of one product category such as diesel versus another); increase conversion capabilities for the “bottom of the barrel” (i.e., make more high-value products and less low-value residual fuel oil or resid); or even expand throughput capacity. Some refiners include acquisitions in this category.

In recent history, a substantial portion of growth/discretionary capex in the refining sector has been targeted towards crude slate flexibility, such as allowing increasing amounts of Canadian heavy crude oil to be processed at refineries in the Midwest or enabling a refinery to process more light, sweet crude from U.S. shale plays. The types of units and logistics required to shift crude slates lighter or heavier are quite different, but at the end of the day they potentially (hopefully) provide improved profitability.

Another way to slice-and-dice refiners’ growth/discretionary capital expenditures is to separate them by purpose, namely processing equipment and support infrastructure:

- **Processing Investments:** Examples of investments in processing infrastructure include cokers, which break down resid into valuable products and allow refiners to shift to heavier crude slates; hydrotreaters, which reduce sulfur contaminants that often come with heavier crude slates; topping units, which allow refiners to shift to a lighter crude slate by making the first cuts of very light products; and isomerization units, which increase the value of light crude streams (which come with a higher yield of light naphtha) by increasing the light naphtha’s octane level and thereby its value.
- **Support Infrastructure Investments:** Aside from processing units, most refiner growth capital has been focused on logistics related to either crude oil access or refined product export capabilities. Crude access has been increased through investments in new crude oil pipelines, crude oil storage, and/or rail loading and offloading infrastructure (and even rail cars). Refined product logistics projects, in turn, are generally aimed at increasing access to export markets through storage and marine dock terminal improvements, as well as to some inland terminals and pipelines that provide access to high-growth markets.

In the past few years, as carbon-related policies have ramped up in parts of the U.S. and internationally, the lines between growth capital and environmental spending have been blurred to some degree. For example, consider renewable diesel projects, which have become particularly desirable from a profitability standpoint due to the credit structure supporting the pricing of that fuel.

### **COVID Crushes Capital Budgets**

2020 brought about major changes in refiner capital spending due to the upheaval the sector incurred due to the COVID-19 pandemic — a topic we’ve covered in several blogs, including [Strange Brew](#) and



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Where Are You Going? With refining margins plummeting to below-breakeven economics across most regions, refiners tightened their capital spending to focus on ensuring the long-term longevity of their key assets. To give a sense of what's happening on the refinery capex front, Baker & O'Brien examined the capital spending of seven refiners in the U.S.: Valero, Marathon Petroleum (with Andeavor/Tesoro — stock symbol TSO — broken out pre-merger), Phillips 66, HollyFrontier, PBF Energy, and Delek US. These refiners represented nearly 10 MMb/d of throughput in 2019, which was over half of total U.S. refinery throughput for that year.

### U.S. Refiner Capital Spending Trends, \$MM

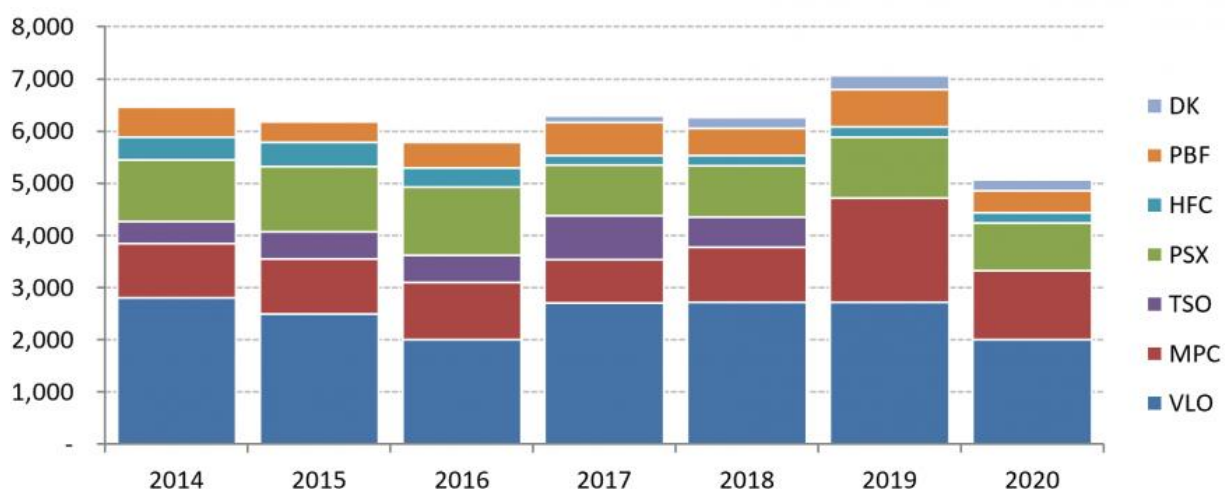


Figure 1. U.S. Refiner Capital Spending Trends. Sources: Company 10-Ks, Investor Presentations, Baker & O'Brien Analysis. Note: Includes "Refining" or "Refining and Marketing" segments for all companies with the exception of Valero. Valero's capex is for the consolidated company due to reporting differences. PBF data has been adjusted for acquisitions, where applicable.

Notably, refiner capex for the sample group generally ranged between \$6 billion and \$7 billion in 2014-19 (see Figure 1 above); 2016 was a low point, with spending of just under \$6 billion, while 2019 represented the high year at \$7 billion. 2020 refiner capex, in contrast, is estimated to come in at around \$5 billion, a 28% decline versus the prior year and a 20% decline from the 6-year average. PBF (orange bar segment) and Marathon (MPC, red bar segments) are estimated to have cut capital the most in 2020 versus 2019, while HollyFrontier (HFC, aqua bar segments) is estimated to have cut capital the least.

To understand how the seven refiners compare to each other, we evaluated their capital spending on a normalized dollars per barrel (\$/bbl) of throughput basis (see Figure 2). (For this analysis, we eliminated Valero since its reporting of capex is on a total company basis rather than a refining segment basis.) Since capacity at most of these refiners has grown over time, either organically or through acquisitions, there has been less variation in this metric despite the change in capex. On a throughput-weighted basis, capital expenditures generally averaged between \$1.50/bbl and \$1.75/bbl between 2014 and 2019 (black line), but varied widely by refiner (colored symbols).



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### Capital Spending Trends, \$/bbl Throughput



Figure 2. Capital Spending Trends on a Throughput Basis, in \$/bbl. Sources: Company Reports, Baker & O'Brien analysis

Some refiners report the percentage of their capital budget that is directed towards sustaining capital versus growth/discretionary capital. For example, Valero targets a split of 60% sustaining and 40% growth/discretionary. Phillips 66 (PSX) has historically been closer to a 70% sustaining and 30% growth/discretionary split, but spent 41% on growth in 2019. Marathon Petroleum (MPC) targeted a 70/30 split of sustaining and growth/discretionary in 2020. In general, the majority of a refiner's capital budget tends to go towards sustaining its operations (i.e., stay-in-business projects), often with little or no economic return on these investments. With 60-70% of new capital geared towards low- or no-return projects, it is little wonder why refiners struggle to achieve high returns on capital — growth/discretionary projects really need to generate high returns to carry the “baggage” of the non-ROI projects. Refiners recognize this and insist on very high “hurdle” rates (or minimum rates-of-return) for the projects that they ultimately approve.

#### Future Growth/Discretionary Capex Puts Low-Carbon Policies in the Spotlight

Assuming that capital expenditures for the sample group of refiners in 2020 are similar in 2021 and that 35% of capex is directed towards growth, we're looking at about \$1.75 billion of capex targeted to growth projects for the coming year. So where are refiners targeting their growth capital in 2021 and the near future?

- Valero** has a number of large growth projects that are expected to be completed between 2021 and 2024. The investments range from a new alkylation unit at the St. Charles, LA, refinery (slated for commissioning in the fourth quarter of 2020); expansion of the Diamond Pipeline (2021; see Oil From the North Country); a cogeneration unit at the Pembroke refinery in the UK (2021); and a new coker at the Port Arthur, TX, refinery (2024). However, a key area of growth is in the renewables space. Valero has noted that 40% of its \$2 billion capital budget will be spent on growth, and 40% of that growth capital is targeted towards renewables, particularly



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renewable diesel. Valero is currently expanding its Diamond Green JV renewable diesel facility in Louisiana, with an expected completion later in 2021. Additionally, the company is evaluating a second renewable diesel plant that would be located adjacent to its Port Arthur refinery, with an expected startup in 2024.

- **Marathon Petroleum** has some large growth projects in the works right now that the company has spoken publicly about. One is the conversion of its Dickinson, ND, refinery to a renewable diesel facility; the new units were scheduled to begin startup in the fourth quarter of 2020 and should be fully operational soon. Another project is the potential conversion of the Martinez, CA, refinery into a renewable diesel plant. This project has not received a final investment decision (FID), but permit applications have been submitted. Additionally, Marathon has an ongoing optimization project at the Galveston Bay refinery in Texas that is expected to be completed in 2022. Marathon remarked on its third-quarter earnings call that, given the current environment, discretionary spending is targeted towards making sure they are very competitive in a low-margin environment and any discretionary capital must meet a very high hurdle rate.
- **Phillips 66**, like Marathon Petroleum, made the decision to permanently close one of its California refineries in the near future and convert the facility into a renewable diesel plant (startup in 2022). The push towards low-carbon investments has also extended towards P66's project at the Humber refinery in the UK to manufacture renewable diesel; solar energy projects at the Rodeo and Ponca City refineries in California and Oklahoma, respectively; installation of "green" hydrogen fueling stations in Europe; and two investments in renewable diesel plants in Nevada. Outside of the refining space, growth capital is focused on completing the projects around the fractionation plants and LPG export terminal at the Sweeny Hub in Texas and other logistics projects.
- **HollyFrontier** is focusing capital on building two renewable diesel facilities at its former Cheyenne, WY, refinery and its Artesia, NM, refinery, as well as a feedstock pretreatment unit at Artesia. Additionally, the company is building a joint-venture crude pipeline with Plains All American between Cushing and HollyFrontier's Tulsa, OK, refinery (2021).
- **PBF Energy** is currently in the process of integrating its Paulsboro, NJ, and Delaware City, DE, refineries; however, this project results in a loss of crude and conversion capacity in PBF's East Coast market. It was scheduled to be completed by the end of the fourth quarter of 2020. In 2019, PBF noted that it was exploring the opportunity for renewable diesel production at two of its facilities, but news has been light on this front lately.
- **Delek US** is making sharp reductions in capex going into 2021: on the order of 40% following the startup of the Wink-to-Webster pipeline and expansion of the Red River crude pipeline, both of which were developed along with others. Similar to other companies, Delek has noted that it will set very high hurdle rates for projects in the discretionary space in refining, on the order of 25% IRR (internal rate of return) for projects greater than \$5 million.

It will be interesting to follow how refiners' current capital expenditure strategies impact their future



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performance. It's no surprise that capex was cut in the wake of the pandemic, but did those investment dollars evaporate (i.e., were they used to cover fixed costs during negative margin environments) or might deferred capital result in a surge in capital spending in the coming years? Will refiners continue to shift growth/discretionary capital expenditures towards renewables and what will that mean for the industry longer-term? There's big money at stake whichever direction refiners ultimately go.

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*Note: The article was authored by Amy Kalt of Baker & O'Brien and published on RBN Energy's Daily Energy Post on January 11, 2021.*

*"The Big Money" was written by Neil Peart, Alex Lifeson, and Geddy Lee. It appears as the first song on Rush's 11th studio album, Power Windows. It was released as a single in September 1985, and went to #4 on the Billboard Mainstream Rock, and #45 on the Billboard Hot 100 Singles charts. Personnel on the record were: Geddy Lee (lead vocals, bass guitar, bass pedals, synthesizers), Alex Lifeson (electric, acoustic guitars), and Neil Peart (drums, percussion, electronic percussion).*

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