



LATIN AMERICA'S HYDROCARBON CHALLENGE

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Latin American crude exporting and product importing countries are all shouting the same thing: "We have no money! We have to cut costs!" Over the last few years, crude exporting countries such as Brazil, Mexico, Colombia, Peru, and Ecuador have seen revenues fall dramatically.

Whether crude exporter, product importer, or refiner, today's challenge is the same: how to increase revenue and reduce cost while operating under mandated spending *reductions*.

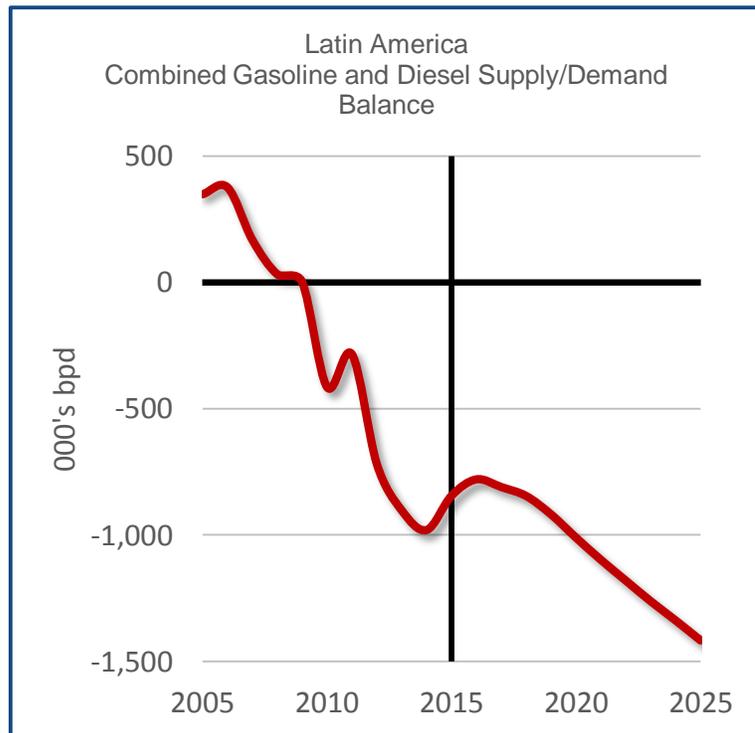
Meanwhile, despite lower energy prices, trade deficits have worsened as costs have continued to rise for steadily increasing quantities of oil product imports.

Near-Term Conditions

Global crude and feedstock supply continues to overrun demand. The economic incentive to convert that supply bounty into usable products is one of the best refining opportunities in the past 40 years. Both National Oil Company (NOC) and Independent Oil Company (IOC) refiners should be seeing some of the best refining margins in living memory—but are they?

Low absolute energy prices have spurred global product demand. Refiners should be operating at high utilisation rates and maximising on-stream operations. Cost containment doesn't mean no cost. But it does mean spending on *revenue generating activities* (See the green elements next page).

For upstream IOCs maximising revenue, or for NOCs supporting a national budget, the focus today is on monetising already discovered oil and gas by generating more sales revenue. And *that* means selling national crude to those that value it the most—even export sales in preference to domestic refineries.

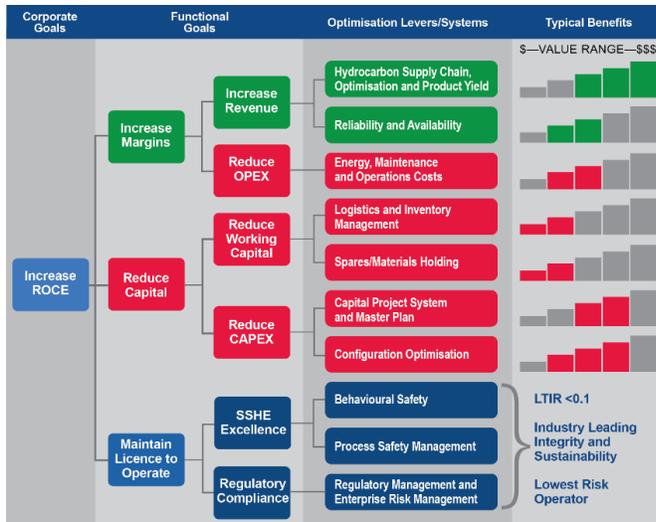




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For refiners, it means optimising feedstocks by even using some non-national crudes—there is nothing wrong with a country simultaneously exporting and importing crude oil.

Whether an IOC or NOC, upstream or downstream, *all* companies should be focused on driving down operational costs and increasing free cash flow. But the drive to cut costs to zero isn't realistic and there is little point in using foreign loans and credit to operate uneconomically. Smart crude sales, feedstock selection, and product slates made from consistently high throughputs are the keys to increased profitability.

Focus On Profit

Enlightened leaders understand the need to set out a vision and inspire others to help them achieve it. Cost control has always been critical to profitability, but by itself is not sufficient. There are smart ways to spend your budget—focusing on revenue generation may actually mean *increased* spending on manpower training and reliability programs designed to get full use of all the operational capacity you have paid for.

Today US refiners are seeing some of the best refining margins in a lifetime. Much of that is because they have led the way in lean and reliable operations. There is no reason Latin American refiners can't participate in that same bounty.

A New Day Is Dawning

Brazil is currently going through a period of national self-reflection. The country's economy is faltering, a significant corruption scandal is unfolding, political instability has increased and an impeachment process is now underway. The energy industry is facing major challenges to generate positive returns for its shareholders. It will take time to repair all the psychological and economic damage, but the day will come when Brazil will have healed.

Elected officials, and those who can influence policy, are already discussing ways to speed the recovery process. It is now universally accepted that Petrobras grew too big, too fast, and lost both focus and control of its many business lines. One remedy actively being discussed is a complete breakup of the national oil company; sales of the upstream and refining downstream assets as separate entities and decontrol of the retail market. But how to sell, to whom, and for how much?

Like Mexico's and Colombia's sickbed recovery, the healing process must include a rollback of regulations that have long guaranteed national oil company supremacy. Ultimately, that means yielding control of product markets and specifically, product prices. Valuing upstream Exploration and Production (E&P) is relatively uncomplicated. Revenue is easily measured—crude produced competes directly in the global market with all other crudes. Brazilian E&P *value* however is set by the cost of finding, producing, complying with local laws,



and finally meeting a tax burden set by the government. But this is an exercise that many sophisticated E&P companies already do in the many countries in which they already operate all over the world.

We All Want To Know

The value of downstream assets however is more opaque. Refining assets are only economically valuable when they produce a positive net margin. Consistency of that positive cash flow is also important. In a free-market, the *cost of production* to make products that are sold at, or below, imports of similar quality, is a critical focus.

To drive down operating costs, the refiner must have freedom to work in the most efficient manner possible. For Brazilian refiners, that means both the permission and urgency to operate their assets in harmony with the marketplace and take advantage of nearby crude production that should be available at a relatively low cost. In order to fully join the international community and attract needed investment, energy policies must change.

Today, through energy policy, the Brazilian government controls refining *revenue* by setting domestic product prices, erecting taxes, duties and tariffs on competing product imports. The result is a loss of focus on costs and thus net refining margin. The consequences are poor cost control, unacceptable reliability and inefficient refining operations. Poor policies forgive poor operations.



Whether one believes government *revenue* support will or will not eventually disappear is not the point. Both seller and buyer of Brazilian refining assets must understand their full technical capability—something not in evidence at the moment. They also need to determine the cost of re-establishing the unseen capability. Beyond the technical aspects, both buyers and sellers must also gauge how much commercial risk a loss of regulatory revenue support would create *and* the implications of a restructured marketplace once it is fully deregulated.

There are different approaches to deregulating energy markets. Mexico has decided to start with the retail market and thus force the national refiner to adjust its *costs* to compete with product imports—strong medicine indeed. Other countries have slowly reduced revenue control by gradually dropping the ‘tariff wall’ over time. That approach guarantees an initial return on refining assets and some time for the patient to recover (i.e. through instituting efficiency and manpower training programs). Both approaches can work, and each have different implications, but the due diligence needed to understand value and price, both for the buyer and the seller, remains the same.

Less Obvious Implications

Let’s consider one of the more important domestic product markets - gasoline. Brazilian gasoline is composed of a relatively large amount of ethanol that is blended with hydrocarbon gasoline components. To make the analysis more complex, sales of virtually pure ethanol also compete as ‘gasoline’ in the domestic fuels market. To simplify this discussion, we will call ‘gasoline’ the total of all these various components.

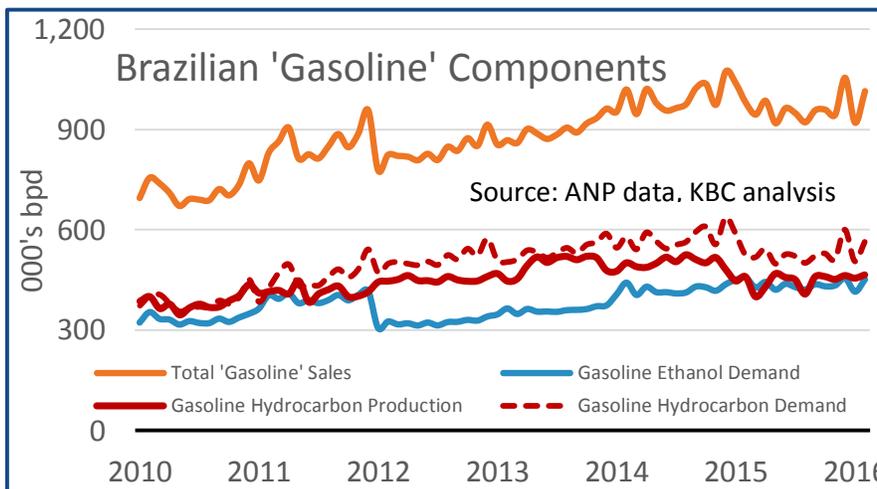
Domestic gasoline demand has grown on average at a strong 0.5% per year since 2010. Only recently, Brazil’s economic growth has slowed, and with it so has gasoline demand growth. Current ‘gasoline’ demand is



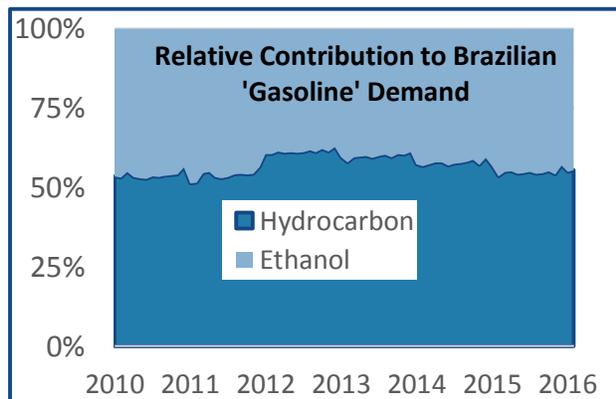
approximately 1 million bpd¹. What is interesting, though, is that the different components of 'gasoline' have been shifting toward increased ethanol content. Like gasoline, the ethanol industry is also regulated by policies designed to support jobs, promote 'green energy' and other considerations that indirectly affect 'gasoline'.

The nearby graphic clearly shows the long-term domestic 'gasoline' demand growth (orange) that paused in early 2015.

The solid red line is the amount of hydrocarbon produced by domestic refineries while demand for those same hydrocarbon components is shown in the red dashed line. The difference between the solid and dashed red lines is the requirement for hydrocarbon gasoline imports.



Ethanol use has grown faster than hydrocarbons and is nearly half of Brazilian 'gasoline' demand.



The next graphic shows the *relative* amount of ethanol sold both as part of a hydrocarbon mixture and as virtually pure ethanol has continued to increase.

Gasoline and diesel are typically the two largest contributors to profitability for a fuels refinery. Therefore, the increasing importance of ethanol in the downstream fuels market has important financial implications for current and future owners of Brazilian refining assets.

Perhaps ethanol policies should also change, but in reality, they are unlikely to do so in the near future.

Gasoline and ethanol policies commercially converge at the point of 'gasoline' supply and demand, import and

¹ Brazilian gasoline typically contains a maximum of ~25% ethanol by volume. That amount changes over time and was recently increased to 27.5%.

Our use of 'gasoline' includes both mixtures of hydrocarbons produced from refining and ~25% ethanol, as well as pure ethanol that also powers vehicles. The total of all ethanol (both mixed and pure) as well as hydrocarbons are included in the 'gasoline' figures in this document.



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export. So even if hydrocarbon policy does change, refining assets valuation is directly affected by (unchanging) ethanol policies.

In Summary

Today we can reasonably say that long-standing hydrocarbon and ethanol policies have inexorably led to a lack of a cost focus and underperforming operations in Brazilian refining. Nevertheless, today it is technically possible to improve those operations and produce more hydrocarbon gasoline components from existing Brazilian refining assets.

Poor operational performance is ultimately the responsibility of refiners, but perhaps the greater fault lies with imperfect energy and even ethanol policies that promote it.

How large is that extra capacity? What would be the cost to recover it both technically and operationally? How much would it be worth in today's and tomorrow's marketplace? Does the shifting composition of the gasoline also pose any technical risk to domestic refiners? What are the financial risks of governmental deregulation of retail 'gasoline' and ethanol pricing and policy? Finally, what are the long-term financial implications for building *new* refining projects?

KBC has the experience and ability to review current crude and feedstock slates, model yield and operational changes. We lead the world in the ability to conduct detailed studies to see what can be done now, at little to no cost. The extension of that is the ability to quickly and efficiently conduct many 'what if' analyses and help you avoid regret investments.

KBC is also a globally trusted advisor to both buyers and sellers in the hydrocarbon value chain. We understand the technical, commercial, regulatory and other risks you face both today and in the future. Latin America's energy markets are a compelling strategic component of a thoughtful energy strategy. While growing and vibrant, they are also affected by local and global forces that we want to help you successfully navigate.

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