



**SASOL GROUP EXECUTIVE,
ANDRÉ DE RUYTER**

**INVESTOR STRATEGY DAY
“NORTH AMERICAN VALUE PROPOSITION
MARKET & CAPABILITY”
AS DELIVERED**

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All right, that's a tough act to follow, with all the enthusiasm, I can't be but excited about what we're about to do.

This is a unique opportunity for Sasol, it is as David said an opportunity to spend three quarters of our market capitalization, significantly grow this business in a very short period of time and build up Sasol to a really higher level of performance both in terms of profitability and volume.

But it also presents challenges. We don't underestimate that spending this amount of money in a responsible way, making sure that we deliver value to shareholders is going to be a challenge. We are very well positioned both in terms of markets as well as our execution capability to meet these challenges in the right way.

Slide 51 – ethane associated with gas leads to global leadership position for US crackers

Let me start by looking at the markets. Here we are in a uniquely advantaged position as well and I'll unpack some of our differentiated ethylene derivatives for you which we believe distinguishes us from other players that are pursuing cracker projects in the US Gulf.

To my mind, the most important curve in the chemical industry is the cost curve. Where are we on the cost curve? Our estimate is that US ethane, based on the abundant supplies of ethane that Lean referred to earlier; we will have a lower third cost curve position on a sustainable basis going forward.

If you obviously include the price of crackers, then the US average is higher but we are going to be playing in that segment of the cost curve. We further think that our position will be enhanced by the fact that we're going to be building a world scale cracker. We're going to be building a 1,55 million ton ethane cracker and this will give us significant economies of scale and thereby improve our cash cost position.

You may have read that there are significant numbers of projects pursuing exactly this opportunity. And you may ask what happens if all of these projects come on line as scheduled? Won't the US be structurally long on ethylene thereby depressing margins and putting us in a margin squeeze? And the answer to that is that if you look at all of these projects and you make the assumption that all of them will in fact happen, we don't think they will. We think there's quite a bit of posturing going on. There's quite a bit of testing the waters to understand exactly what the opportunity is.



Then in 2016, 2017 and 2018, we will see capacity additions to US ethylene production capacity of about between 9% and 11% per annum. And those are substantial capacity additions.

However, if you look at the global ethylene supply-demand balance and taking into account the fact that global ethylene demand grows more or less at a multiple of global GDP. The latest IHS forecast estimates a growth in ethylene demand globally of about 4% per annum. The US capacity additions will add, on average about 2% to global supply.

So in spite of the fact that there are these substantial projects being pursued in the US, we don't think that it will lead to a situation where we will be so long on ethylene that it will have a negative impact on our market position.

I think also, quite importantly is that we were conservative in modelling the cost competitiveness of our project. In order to ensure that we are not dependent entirely on key ethane going forward, we assumed that ethane pricing in the US will be equivalent to propane pricing. Now for those of you familiar with this market, even though ethane today is trading at about \$0,24-\$0,25 per gallon, so in other words, more or less equivalent to natural gas energy value, propane is trading at a premium to that. Typically, it's double to 150% of the price of ethane and if we take that assumption and we put a propane equivalent ethane price into our model, we still meet our required rates of return. Therefore a very conservative assumption and it speaks to the overall robustness of our investment.

Slide 52 – low market risk

Moving on now to the flow scheme and let's unpack some of the derivatives and I think this is again what distinguishes us from the other cracker projects that are being spoken about. A number of the other cracker projects are going to be based primarily on very, very large polyethylene plants. And we don't argue with them, these are experienced companies but we think that we bring something different to the mix that puts us in an advantaged position.

So first of all, let me draw your attention to the cracker as I mentioned. That is 1,55 million tons, truly world scale. I think it is right there at the size limitation. However, we are not taking a scale of risk. What we've done in order to improve the reliability of the cracker in starting up and also to reduce the engineering time, we have taken a design that has already been executed, so essentially, an off-the-shelf



design that we are going to take and implement. It's been done before, so we are not taking undue scale at risk on that.

We are then going to be producing ethylene oxide and MEG. At this point in time, in Lake Charles, we are bringing in ethylene oxide from a remote site and those of you familiar with the ethylene will understand that this is a pretty hazardous chemical and not something that you want to rail around the country. So this is going to be not only a cost advantage to us but also from a safety, health and environmental perspective an improvement.

Furthermore we have unique proprietary technology in the Ziegler Alcohol sphere where we produce a wide range of different alcohols with C numbers ranging from about C6 to C22. In the mid-cuts alcohol range, we compete with earlier chemical base alcohols so that's the commodity stuff. But in terms of the profitability of Ziegler Alcohols, we make our money on the wings of this distribution curve. And this is a unique position that we occupy today and we look to expand on that market opportunity.

We'll also be going to take ethylene and throughout proprietary tetramerization process, we are going to convert that to 1 octene. 1 octene is a co-monomer that is used in the production of polyethylene. Dow, in particular is our biggest customer in this and they have already signed up to take the volume associated with those facilities. So again, very low market risk attached to that.

The ethylene oxide and Ziegler Alcohol will be ethoxylated and we will also be producing Guerbet alcohols. Guerbet alcohol is a highly specialized product. Its total global market size is about 100,000 tons per annum globally, so that's just a bit of premium coffee if you will.

Then we're going to be producing about 900 kilotons per annum of polyethylene. You will have seen recent announcements that we've signed a licensing agreement with Univation as well as with Exxon Mobil. So we're making quite good progress on executing these projects.

There will be a fraction of ethylene that we are going to place in the merchant market. We are today, from our existing 450 000ton per annum cracker in Lake Charles, marketing ethylene into the merchant market. So this is not new for us, it's not an undue risk, it's something that we do today and we're quite comfortable accepting that market risk.



Some background on the capital numbers, this entire complex will cost between \$5 billion and \$7 billion. David referenced the fact that we are going to make a decision on FID on this by the second half of calendar 2014. And we then aim to have this complex up and running by the end of calendar 2016, beginning of calendar 2017.

So overall, quite an aggressive schedule but we think that as Christine said, having placed our order for the crack gas compressor, we are ahead of the curve here and we have captured early mover advantage which is important from two different perspectives. The first one is that the sooner you come online, the longer you will capture the advantage of low priced ethane. And also, you will be able to avoid the overheated labour market which is one of the significant challenges which I'll be addressing a little later on when I talk about execution.

Slide 53 – prudent long term oil price view supported by fundamentals

Now, you've seen this slide before about our relatively conservative oil price assumptions. And one of the questions people always ask us, 'I can go out and buy at North Dakota today a barrel of oil for \$55 a barrel, so how can you assume an oil price north of \$90 a barrel, and will this not impact your profitability on GTL in particular?'. And the answer is that we don't sell oil. Christine used that very phrase. We sell diesel.

Slide 54 – GTL sells diesel, not crude oil

Even though oil prices in the US today are quite appraised, particularly WTI and we know about the cushioning logistics constraint that is causing a depressed price at this point in time, but also in terms of issues relating to refining capacity and over production of volumes in areas that do not have easy access to logistics to place those products in the market. What is happening is that in the US, diesel prices are in lock step with global diesel markets.

And that's purely because this is a commodity that is tangible. You could transport it all over the world. And any refiner in the US that does not make this sort of crack spread on its diesel will just export it. So there is market discipline attached to that. And obviously, with our location, on the Gulf Coast, we have that as an alternative. And initially, we intend to export a fairly substantial portion of the diesel predominantly to Europe. But over time, we intend to penetrate the low-emission diesel market for which one is able to get a premium, particularly in Texas.

Now again, you may ask the question, the US today is a net exporter of diesel. Even though the US consumes about 17% of global middle distillate demand, which is about 4.3 million barrels per day, it exports about a million barrels of diesel and other middle distillates per day. So is that not a disadvantage for us?

Our estimate is that with increasing digitalization of the US economy, more heavy trucks and even more passenger cars moving towards diesel, even though it is a very slow process to wean the American motorists off the big gasoline engines. Understand that we're not banking on it. But we think that by about 2025, you will see the US being a net importer of diesel. So that coincides quite nicely with the time where we will be penetrating the market.

Slide 55 – US GTL product marketing

Moving on to the GTL plant. There's the flow scheme in a bit more detail. Lean already spoke about this. Some numbers attached to this, \$11 to \$14 billion. I may just also stress that this is a pre-optimized capital number. So we are looking at additional opportunities to reduce that capital number.

If we are able to secure the supply of oxygen over the fence and we have received very serious proposals from all four of the major vendors of air separation equipment, we will be able to reduce capital cost on this project by about \$1 billion. We are also pursuing other opportunities to further reduce the burden.

Now it comes to challenges, but doesn't that increase your OpEx? And the beauty of the air separation unit and buying oxygen over the fence is that the air separation unit will make money not so much out of the oxygen, but out of the argon. That is a by-product and as an inert gas commands a significant premium. It's not a business that we understand or know or that we're active in, and therefore, we're quite happy to get the benefit in terms of lower oxygen pricing to our plant by enabling the production of argon by the oxygen vendor.

So FID will be taken on this, about 18 to 24 months after we've taken FID on the cracker. There will be about a 48-month construction period, and that brings us to a start-up date of roundabout the end of 2019, beginning of 2020.



So some brief facts on the process, you can see there that we are going to extract a medium wax fraction. This medium wax fraction will be taken to our wax plant that we have in Hamburg, in Germany. Increasingly, we see that refineries that produce group-one and group-two base oils are being shut down and they are being replaced by group-three and group-four base oils. And this creates a situation where the supply of medium wax is coming under pressure. So this secures feedstock for our wax business in Hamburg.

A similar consideration applies to paraffin extraction. Paraffin is used in the production of LAB, linear alkyl benzene, which is a workhorse-type of commodity chemical used in the detergent industry. And we will be able to produce our own paraffin. So no longer will we have to depend on the supply of kerosene. There's a huge reduction in working capital, instantaneous, of course, one-off.

However, the important thing is that our plants in Augusta and in Lake Charles, the LAB plants, will move from second and third quartile, respectively, to first quartile, based on the cost advantage that cheaper paraffin will provide us. But we're not subsidising the chemicals business. Let me stress that. We are not going to create an artificial advantage for chemicals and, in the process, disadvantage the fuel business.

We are transferring all of these feedstocks into the chemical value-add at fuel alternative value. So it comes at the diesel price, and that imposes a market discipline on what we're doing. And even at that high transfer price, as Lean said, these value-adds are significantly enhancing on the project overall.

And then the last very important one, of course, is base oils. We have the capability and we have already extensively piloted this to extract base oils from our GTL feedstock. And it's a great opportunity again for the very same reason that wax feedstock is coming under pressure. Group-three and group-four base oils are in higher demand and, therefore, this is a great opportunity for us to play into that market.

Again, just the emphasis on the flexibility to allow us to move in and out of fuel and chemical markets as the needs of the market dictate.



Slide 56 – our key markets and products

Right, moving on then to our key markets and how we see our competitiveness. We look at feedstock technology in markets. And you can see that in our current state, we are not all that well positioned. We are in a situation where we're not backward integrated, where we have some dependency particularly on other technology vendors, and in particular on feedstock. That is where we have the biggest exposure.

By building these plants, you will see that on polyethylene, we have first quartile cost competitiveness on a global basis. So from a feedstock supply point of view, we are looking very good. Technology, obviously, we're licensing, so we're not better or worse than anybody else. And from a market perspective, these volumes will be replacing the volumes that we currently place in the market from our plant in Iran.

As for our investment in Iran, I may mention that we are in the final stages of exiting from Iran. We have a signed agreement, we have the regulatory approvals, and we have a drop-dead date by the end of this financial year. So by June of this year, we will be out of Iran and that market position will then be replaced.

On tetramerization, we've got great technology and a great market, but our feedstock position is under threat. We aim to rectify that. The same on alcohols, the same on LAB. I've already elaborated on that. And wax, the same. The important one, though, is GTL diesel. Lean has indicated that we're doing extremely well in ORYX today. So all the lights are green on all three of those metrics in ORYX today, and we aim to grow our volume and to expand our competitive technology in Lake Charles.

Slide 58 – proactive actions to address execution challenges

The question is, how do we build this. And this is not a challenge that we take lightly, because if you look at mega projects irrespective of where you are in the world, they are very challenging. And they typically have a history of cost overruns, of delays, of all sorts of challenges that crop up and eventually depress the IRR that you're able to achieve on such a project.

So we are very aware of these challenges and we've spent a lot of time internally, but also using external resources, external experts, particularly US Gulf experts to come in and advise us and tell us what the pitfalls are, what do we have to watch out for, but more importantly, what do we need to do now in order to prevent all these risks from materialising.

I can't stand here today and give you an absolute guarantee that we will be successful in this. But I can give you the assurance that we have taken extreme care in identifying all of these risks and making sure that we have ways in which we can mitigate them.

So let's move on to some of these risks. We've looked at recent mega projects in the Gulf and what went wrong with them. We've taken a look at the appropriate contracting strategy. It's very often tempting to move into a lump sum EPC contract and put all of the risk on the contractor. Guess what, the contractor is going to impose a significant premium, the risk premium on the price that he requires from you. So there's a balance. And therefore, our contracting strategy needs to be modulated quite carefully in order to make sure that there's an appropriate risk-reward with the right incentives for the contractor to perform on cost and schedule in order to secure optimal execution.

The last risk here is the one that I'm personally most concerned about, and that is the availability of craft labour in the Gulf. Just in our neck of the woods, we are aware of some \$53 billion in projects being pursued in Southwest Louisiana now. That's an enormous number of projects and there's a huge requirement on craft labour to execute these projects. And this is one of the issues that we spent a lot of time on trying to assess and analyse and understand very thoroughly in order for us to mitigate that risk.

Slide 59 – actions to mitigate similar risks and apply best practices

One of the typical engineering-induced risks that we find on projects of this nature is that, engineers tend to be optimists. They say that the technology will work and that it will be much cheaper to build. Experience, however, suggests somewhat otherwise. And therefore, we have been conservative in our capital cost assumptions. I can again tell you that the numbers that we're quoting has a fair degree of conservatism built in there.



One of the key cost mitigation elements that we've built into this project is that we will not go out with bespoke settle specifications into the market. We will be using industry standard specifications. And this enables us to go to an equipment vendor and negotiate with effectively off-the-shelf type of equipment specifications, and this gives us a significant cost advantage.

We know from having interacted with these vendors that some of the others are slightly less flexible in their specification requirements, and that's reflected in the price that they pay. So this is another way in which we manage capital cost.

Reference has been made a couple of times to the stage-gate process, so I'm not going to talk to that again. But then we are going to take our time on engineering. Very often, the approach to these mega projects, particularly when you want to capture a first-mover market advantage is to go with a ready-fire-aim approach. So in other words, you start construction as quickly as you can and you catch up with the engineering afterwards.

We are going to be very careful and very deliberate on when we start construction. We are not going to take risks on engineering catching up with construction later on.

We are not going to be parachuting in a bunch of expats from South Africa to do this project. We understand that this is the US, that it's different here, and we understand that the resources available in the US are highly skilled, highly experienced in local conditions. So we are going to be aiming for a balance of about 38 Sasol expats.

We are going to learn from the local experts. And for that purpose, we have concluded an agreement with an internationally recognised engineering company that has the resources, experience, as well as the systems, very importantly, to measure and manage independently the EPC contractor progress.

Very often, what happens is, if you put the EPC contractor in charge of measuring and managing his own progress, you get very optimistic reports for about 90% of the project schedule, and towards the end, you are taken by surprise with a significantly inflated bill for the completion of the project. And we are going to go into this very stringently measuring and managing our EPC contractors, to make sure that we have a firm control over this project.



We're also in a very fortunate position that we have an existing employee base in Lake Charles. They know how we think, they know how we operate, and there are about 450 of these engineers already working for us today.

So we aim to leverage off this and bring them in as early as possible. We have already identified the team that's going to operate these plants. They are part of the design team, they're making contributions to specifying equipment, to identifying what works well in turnaround situations in order to improve the online availability of the plant. So we are leveraging off our existing resources.

So all in all, I think we've got a project team that is experienced, they're strong, they've got local knowledge, but they also have the appropriate Sasol technology experience in order to have the best of both worlds.

Slide 60 – addressing execution risks

Moving on to executing risks, I've said that we are not going to turn soil until we know what our engineering definition is. And that's one of the easiest ways in which you can enhance the predictability of both cost and schedule.

The scope for FEED is frozen. Sasol is a technology company, so we have a lot of very innovative engineers and they like to improve continuously. But at some point in time, you have to put a full stop behind innovation and you have to start construction. And then, you cannot entertain further technology enhancements.

We are going to be building a plant that is technology proven. We are not going to take significant step-out risks. We are quite comfortable, in leaving some glory for subsequent generations if they are able to come up with greater innovations and debottlenecking, improving efficiencies.

My major aim is to deliver these plants and get them up and running within cost and on schedule. And to do that, you don't want scope changes. Scope changes are the single biggest factor in schedule delays as well as cost overruns. So we are going to be very disciplined on this.

Modularization, this is a key strategy for us. We're going to talk a little bit about that later on. Known technologies, its proven stuff, we do this today. We are not going to be scaling up or experimenting with

technologies. I've made reference to oxygen over the fence, and to our local employees, and again, really understanding fundamentally what can go wrong on these mega projects, and trying to pre-empt and head off those challenges.

Slide 61 – extending the GTL schedule will reduce risk

Moving on then to the GTL schedule, I've given you a flavour of that and you've heard that we've extended or we have phased the GTL schedule by a period of between 18 and 24 months. And while that has benefits in terms of enabling us to keep our gearing under control and meeting our self-imposed gearing targets, it also allows us to further mitigate the predictability risk that is inherent in a mega project, by doing more upfront engineering.

You can achieve about a 10% improvement on estimate accuracy just by doing more upfront engineering. And on a project of this size and scope, predictability is all-important. We are going use the 18 months with a lot of due care and attention to making sure that we know exactly how we're going to head off this challenge.

Slide 62 – modularization mitigates shortage of skills

Now, I referenced the fact that an overheated labour market is the single biggest risk to this project as far as I'm concerned. So what are we doing about it, how are we managing it? And one of the key strategies is through modularization. So what we do is develop packages that we can outsource for fabrication in other US locations or in low-cost countries, for example, Korea, and other locations, which we can then ship into Lake Charles and assemble on-site.

This opportunity is substantially bigger than one would imagine. We have identified more than 325 different modules that we can fabricate, and that totals about 82,000 tons of equipment that we will be able to fabricate offsite and assemble onsite.

As you can see from this manpower loading curve, what it does, if you stick-build it, in other words, do everything onsite instead of having modularized construction approaches, you have a very high labour peak right there. Modularization enables you to reduce that labour peak quite significantly. And that substantially mitigates the risk of having to operate in an overheated labour market.



We estimate that of the 20 million or so man-hours required for the construction of the cracker project and the ethylene derivatives, we can reduce that by about 4,5 million man-hours just by following this modularization strategy, quite an important advantage for us.

However, this is not the only way that we mitigate this risk. You might have seen recent media reports that the government of Louisiana have been extremely supportive on how they've accommodated us. They're going to invest \$20 million in a training facility.

This training facility will initially be entirely dedicated to us to train craft labour. They will also subsequently train operators to work in our facilities, and this will also mitigate the risk of having to bring in craft labour from outside of the Lake Charles area, by training up local people. Obviously, creating local jobs will also give us good local support.

Then, furthermore, early mover advantage is also critical in order to secure the labour required. The sooner you're able to sign your contract, get people on site and start working, the better in terms of securing the available labour.

Slide 63 – favourable location enables modularization

This presentation would not be complete without a picture of what the site will look like. Just to orientate you a little bit. That over there is our existing site. This is a ConocoPhillips refinery, but you can see there that this is right adjacent to our current facility, and this gives a fantastic advantage to us in terms of having people on site who are actually familiar with operating chemical plants in that part of the world.

We have already procured and secured options on a total of 1,925 acres, which is the land requirement that we will need in order to both build the GTL and the cracker, as well as to have lay-down areas and marshalling yards.

I can also draw your attention to the fact that this black line over there, is a shipping channel. It's our intention to use the shipping channel to bring up these offsite fabricated modules, land it right there, and then about a mile and a half from there to the site. So you can see from a logistics point of view, comparing it, for example, to an inland site like in Canada this is pretty easy stuff to execute.



Obviously, we're going to have to work very closely with the local sheriff to get his permission to bring some of these big modules down the road. But there is very active local support. The community of Westlake, which is this part there, they are people very familiar with the petrochemical industry, they're very familiar with Sasol. We are at this point in time the seventh biggest employer in the Westlake area. That will go up to number one or two when we start up these plants. So there's a lot of local support that we can count on as we execute these projects.

Obviously, we need to get environmental permits, we need to get wetland permits, we need to get air emission permits, and we need to get water permits. The wetland permit we will obtain from the US Army Core of Engineers. We're already engaged with them. They are at this point in time under significant pressure. There are new liens offered because of the large number of applications that they've received and we're therefore engaging with them in order to augment their resources and help them to process our application. So that is pretty much in hand. The air emission permit and the water permit, we will obtain it from the DEQ, the Department of Environmental Quality. That is a state of Louisiana department who operates under delegated authority of the Environmental Protection Agency, with whom we have also engaged in Washington.

We are not asking for any waivers. We're not asking for any special treatment. We will comply fully with all environmental legislation or environmental requirements. So we anticipate that provided we were able to keep the support of the local community that the approval process for permitting should be from a technical evaluation point of view relatively uncontroversial. So this is the process that we are following there.

Slide 64 – In summary

Right to my final slide, if I look at a summary, I think hopefully I convinced you that we've got great access to markets. We have signed agreements and letters of intent with our existing customers, large credible customers like Procter & Gamble and Dow, with whom we have existing relationships. We have a portfolio of different products that is differentiated from our competitors and there's a nice spread between commodity products and more specialised products.

From our execution capability point of view, we're bringing on board the necessary experience. We've got independent experts helping us. And for those of you who have been following Sasol for a while, hopefully you'll give us credit for taking notes from our previous mistakes on project execution and by trying to do this in the right way.