

Conference Summary

Young & Partners 36th Annual Senior Chemical Executive Conference

November 29, 2023

**In Person and Virtual Conference from 11:45 am EST to 5 pm EST
Yale Club of New York City**

- 11:45 am **Luncheon Begins (in person) and Virtual Networking**
- 12:20 pm **Welcoming Comments**

Peter Young, CEO and President, *Young & Partners*
- 12:30 pm **Keynote Fireside Chat:**
Chemical Industry in Europe – Quo Vadis?
Matthias Zachert, Chairman of the Management Board, CEO, *Lanxess AG*

Moderator: Peter Young, CEO and President, *Young & Partners*
- 1:15 pm **Perspectives on the Asian Chemical Industry and Markets**

Kamal Nanavaty, President, Strategy Development, *Reliance Industries Limited*

Moderator: Peter Young, CEO and President, *Young & Partners*
- 2:00 pm **M&A and Financial Developments – Implications for Management**

Peter Young, CEO and President, *Young & Partners*
- 2:30 pm **Virtual and In Person Town Hall and Coffee Break**
- 3:15 pm **The Dramatic Energy Industry Changes and Their Impact on Chemicals**

Dewey Johnson, SVP & Global Lead, Chemical Market Analytics
- 4:00 pm **Speakers Roundtable: What Does the Future Hold?**

Stephen Floyd, Managing Director, *Young & Partners*

Dewey Johnson, SVP & Global Lead, Chemical Market Analytics
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Kamal Nanavaty, President, Strategy Development, *Reliance Industries Limited*

Matthias Zachert, Chairman of the Management Board, CEO, *Lanxess AG*

Moderator: Peter Young, CEO and President, *Young & Partners*

5:00 pm

Conclusion of the Conference

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Keynote Fireside Chat: Chemical Industry in Europe- Quo Vadis?

MATTHIAS ZACHERT, CHAIRMAN OF THE MANAGEMENT BOARD, CEO, LANXESS AG

PETER YOUNG, CEO & PRESIDENT, YOUNG & PARTNERS

Zachert: I am honored to be here at the conference to be here with you. To introduce myself, I have been in the industry for 30 years and have 4 kids. I started my professional career at Hoechst, saw the transformation, and later left to join the chemical industry as the first CFO of Lanxess in 2004. I left Lanxess in 2011 due to differences in strategy, joined Merck as CFO, and came back to Lanxess from 2014 and onwards.



A brief description of Lanxess: we have been spun off since 2004, with a different portfolio focused on polymers. At the time, yes, we did have ABS, styrenics, polymers and were the biggest synthetic rubber producer at the time. We were competing with the giants such as Exxon, SABIC, Sinopec. Today we are a supplier and a solution provider to those companies, we are not competing with them, and we are trying to look for solutions that are win-win situations. The strategy that I embarked on when I joined as CEO in 2014 was exit mass markets and eventually rubber. We saw Reliance and Saudi Aramco focusing on rubber so we sold our rubber businesses to them. The largest markets we that we now focus on are roughly \$1-3 billion in size. These are markets that we like and are markets where we are a big player compared to mid-sized competitors. Sustainability is always one thing that I have at the top of my agenda, not only because I have four children at home who raise the question daily “what am I doing” which I take seriously, but, more importantly, I believe that sustainability can be a real business case. The faster you are versus peers, the sooner you get certificates. If you do not use your certificates to justify your emissions, you can sell them, and that is what we have started doing. Over the last few years we have done a massive transformation, leaving polymers completely, including the polyamide business that we sold to Advent, to create a top three polyamide player in the world. From our sold businesses we took 6.3 billion euros in proceeds and reinvested it, without needing equity or to adjust dividends, to internally create a pure additives division. We also consolidated our flavors & fragrances business and our actives & disinfectants business. The philosophy was to get out of businesses with high volatility and high asset intensity. Those businesses are still good businesses but do not fit with the theme of Lanxess. We used to be known for having 60% of our sales in the automotive space. We have exited the mobility sector massively. We like mobility, but it now represents 10% of our internal portfolio, so it is no longer a core risk.



In the next chapter, you will see why we have done that. We saw 5-6 years ago that there was a tendency towards these trends and we will talk about next how Lanxess sees Europe. We conclude that Europe is in a tough set-up right now. We have two regions that are looking out for high margin markets. Europe is still a high-margin market and the U.S. is really emerging as an industrial power. We see, of course, that China is no longer in a situation where they just import. They have turned to self-sufficiency in many chemicals products and are addressing the exports heavily. We see regionalization, which for some of us is a benefit. Many of our customers that would go to China or India are now coming back to Europe in order to benefit from the regional supply chains in place. But of course, we need to look at building blocks where Europe also loses export markets. Eventually, when you get to the core view, we have a competitive disadvantage as far as input costs are concerned. This relates primarily to energy, but to other cost factors driven by bureaucracy and regulation.

In the 90s, I entered chemicals when it was dominated by companies in Europe and the Americans. Some of these names have vanished. In 2010s, there's a new picture. Asia and the Middle East surfaced. This was a key shocker for many in Europe as we assumed that the Middle East would massively penetrate the European market. Now, look at 2020s it is clear is that both Asia and Middle East dominate more and more. Clearly the list has become more and more diverse. Many of the German and Swiss chemical companies had already realized that many of them do not want to focus on chemicals and that they want to focus on pharmaceuticals. My provocative statement to ignite

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discussion is that in 2035, the Asian and Middle East will dominate at a global scale in the chemicals sector. 2035 will look very different than just 50 years before. United States will play a role, and Europe may have one or two major players.

There are four elements that, from my point of view, will drive this process. One is input cost and energy cost, another is global demand and self-sufficient markets. In China, many of our products that we have massively imported have become self-sufficient. When we look at demand in Europe, it is not soaring, it is sluggish. If we go to geopolitics, Europe was a region that benefited from global trade. We could use the European market but 20% - 30% was always exported. On input costs, energy is costly in Europe. Graphically, this shows energy is at least three times more expensive than the cost in the United States. On demand, Europe was never great at growth. If we look at 2023, Europe, slight growth, 1%, and in Germany it would be -2.2% or -2.3%. If we look at chemicals, we are down, -4.4%, in chemical consumption in Europe. That is the reason why we have seen profit warnings from European chemical companies at a magnitude that I have not seen in my chemical professional life before. Even during the Lehman financial crisis we did not see this, and that shows how severe the chemical downturn and the circumstances are in 2023. I think we have found the bottom and we are seeing green shoots here and there. But it has been a tough, tough time. Even in the severe downturns during Lehman financial crisis, there were four quarters of decline. When you look at the pandemic, four quarters of decline. When you look at 2023, we are already looking at 6 quarters of decline and that is why I call this the severest supply and demand shock that we have seen in the last 20-30 years.

Now let us come to external shocks. In 2016, there was some president, here in the United States, that ensured trade here would be addressed in a different way. None of us will know what will happen in Taiwan, but I think all of us need to deal with volatility and need to be agile. In Europe, they decided to revolutionize Europe within the sustainability world which has led to rising bureaucratic efforts and regulatory costs. As a company with \$8 billion in sales, we have a department that can do that. I would not want to know how of the small to medium sized companies can do this. You guys know the top 20 chemical companies in Europe. You would not know that in Europe, we have 30,000 chemical companies. The others, you do not know, yet most of them have to go through the same kind of work. My feedback to you is that they will not make it. Therefore industry consolidation will happen in Europe. To be outward looking, our answer is cost and energy efficiency. We are closing plants that are too energy inefficient and where we don't think the market will take the cost of the energy. We can see that many of our peers are also doing this. We started with AI three or four years ago, but it was not practical enough for sales or humans. Nowadays we can use them, there is software available that we can introduce in our company. We are focusing on specialties and on the topic of industry consolidation, new players will emerge in difficult times and we will have leaders in specialty camps.

I think that the pressures of today, if we can address them, can be turned into opportunities. My call is that in Europe, there will not be companies that have a majority of their sales in bulk chemicals. This will be taken by the Middle East, Asia, India, and potentially some countries like the United States. I think sustainability will be a core advantage. I think in 10-15 years, Europe will face a different set of companies with different focuses.

Young: Are there advantages, as you look through the geopolitical changes, that have come out of this in Europe?

Zachert: I definitely see that coronavirus left its mark on customers. Many customers of ours spent a lot of time focusing on how they can source in Europe. We saw many companies increasing their regional sourcing, so that was a clear positive. So the regionalization topic is one that strongly emerged after corona and the disruptive supply chains. Opportunistically, companies are still trying to regionalize their business. It all came to a halt when we were confronted with the huge energy crisis.

Young: In fact, the energy side is not necessarily long-term. Factors such as the cost and supply are shifting. Do you see positives as well as the negatives associated with Chinese competition?

Zachert: If we look at China, it is a 1.3 billion to 1.4 billion population country with a huge middle class. The population is currently insecure and not bullish, but this can change. With these changes towards local consumption,

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we will see less Chinese exported products in Europe which is a benefit to the European chemical industry. With the zero-COVID strategy, we can see that one thing the Chinese government does not want is unrest. Therefore my view on China is that this is something that they are more and more trying to settle.

Young: There is a real dilemma in figuring out what is happening in China. We don't wish too many negative things for them because all of us are connected. One dilemma is the control of the population and all these structural problems, such as a declining population with 30% unemployment amongst the youth. They have clamped down on these high-tech companies that were employing the youth and your people don't want to take low labor jobs. If, however, China finds a way to turn things around and prosper they will become a stronger competitor. If they don't do well, they will create havoc for the global economy.

Zachert: Let's not forget, China helped rebuild the global economy after the Lehman crash. They were the first to massively invest and we need to find ways to win together.

Perspectives on the Asian Chemical Industry and Markets

KAMAL NANA VATY, PRESIDENT, STRATEGY DEVELOPMENT, RELIANCE INDUSTRIES LIMITED

PETER YOUNG, CEO & PRESIDENT, YOUNG & PARTNERS

Nanavaty: Peter asked me today to provide a perspective of the Asian chemical industry. I come from a region where a lot of things are happening. Asia contributes 70% of global growth. When the global environment remains highly uncertain, but the outlook is more balanced than it was 6 months ago, we see more stability. There are some headwinds on the demand side, but growth in Asia is expected to be 4.6% in 2023, up from 3.9% in 2022. So let's look at where the growth is really happening. If we look at the IMF forecast, we can see that Asian countries are growing around 4%.

Let me talk now about what is happening in India. India has really become a force to be reckoned with and a hotspot in the foreseeable future. India is at \$3.45 trillion GDP. It is one of the fastest growing major economies and the second largest tubular manufacturer globally. It is also the third largest copper market in the world. When it comes to telephone and communications, there are 1.14 billion devices and the demand growth has been great. CPI inflation in India has fallen to 5% y-o-y compared to 6.8% in August.

India has now come back since COVID. Increases in capital formation indicate progress in the industrial economy and economy. Domestic demand is likely to remain very strong in sectors such as automotive and consumer durables. Consumer inflation has been moderated with wholesale inflation in the negative territory. Consumer inflation is expected to be 5% in 2024 as per RBI projections. Focusing on the economic growth, it will be driven by a combination of domestic consumption, innovation and international investments. Most important thing is the growing middle class and youthful population. This is creating a favorable environment for investment across sectors in manufacturing, technology and services. India is also actively pursuing international partnerships and collaborations. As we can see, everyone is projecting around the same number for Indian growth. Long-term projections are also very optimistic. GDP should touch \$5.5 or \$6 trillion in FY 2028, \$10 trillion in 2036, and \$20 trillion in 2045.

Next we will look at the petrochemical industry in Asia. Asia is already a robust petrochemical industry base. Amazing capacity already has been in the continent and China particularly has massive capacity. What is the outlook? India has very strong growth numbers across all products. But there are some headwinds in the chemical industry. Global economic uncertainty, supply demand imbalance and the tight margin challenges are among headwinds. New capacity is still being built. China is building huge new capacity in 2024 and 2025. This is going to create a supply and demand imbalance. Again, some data on China, the steady capacity buildup in China continues in polymers and fibre intermediates. How will that really change – international trade as we will see. We find that fibres and intermediates imports will decrease as a % of consumption. Because China is building so much new capacity, materials that were supposed to go to China are going to different markets. Is India an alternative market to China? China's imports have gone down while on the other hand India's imports have significantly increased.

Let me look at what is happening back home. In 25 years from now, we believe that the economy will be the second largest, per capital income will increase 10x, manufacturing GDP will grow 15x and services GDP will grow 13x, FDI will grow 12x, exports will grow 12x and the human capital will be the largest and youngest working population with a median age of 29.

Next we will see what is happening in Indian petrochemicals. Petrochemicals demand is growing at 8% CAGR, fastest in the world. Annual GDP growth at 6-8% would require sustained investment in the basic building blocks of commodities, polymers, chemicals, as well as new materials. Every conference that I have been to, I hear that there is a new cracker every year. Polymer consumption will double by 2030 and polyester consumption will double by



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2030. If we break down where the growth is coming, there is consistent growth across multiple application areas. The industry is really running. So, if we see what happens in the daily life in India, 9,800 cars are sold a day today, but by 2030 this will be 19,000. As a result, plastic consumption, very important to those sectors, will grow. We also see massive increases in 2 wheelers, refrigerators, washing machines, televisions, air conditioners which are driving the 2x plastic consumption in 2030. India is also gearing up with new investments. There are 27 new projects with a proposed investment of \$120 billion. We see factors fueling demand growth. These include the expanding middle class, urbanization, food & water security, smart cities, ICEs to EVs, and greater access to healthcare. As a result, the demand for polymers, specialty polymers and elastomers will increase.

Next, there are new dynamics in the Asian Petrochemical industry. One factor that will impact the outlook in the medium term is the energy transition. There is a shift to renewable energy that is impacting demand for traditional petrochemical products. Growth of electric vehicles market is also changing the demand for petrochemicals. With regard to carbon net zero goals, regulatory pressures are always there and are increasingly setting reduction targets and implementing regulations. The most important thing that we have not really discussed is the circular economy. United Nations has been negotiating a treaty in plastics, with the next meeting in Canada and final one in Korea. They are putting a ceiling on plastics consumption. The following slide shows complementary companies in Asia where we can see India is in a deficit compared to Japan, Korea and Thailand, who are in a surplus across multiple products. The next issue is what are the challenges? Global megatrends are crude oil to chemicals. Traditional refineries have 10% yield, integrated refineries 15-20%, 2nd generation refineries 30-50% and 3rd generation refineries >70%. I think we will all need to be ready to see these challenges. India is emerging as a new consumption center where we are looking at 32 million tons in 2030.

Let me just tell you what is happening with Reliance. We call it the new Reliance for a new India. We have the largest and most complex single site refinery. We are also in the communications industry with around 420 million subscribers and the first operator to cross 400 million subscribers in a single country market. We have really grown from a textile company to a chemicals and oil major, a communications major and a retail major. We have seen phenomenal growth and have grown to be a top 100 global company. Reliance is creating a digital ecosystem for data, following an omni-channel retail strategy to maximize reach, operating a world-class O2C platform, transitioning to clean energy, and incubating new platforms in petrochemicals trading, financial services and healthcare & agriculture. Coming to the O2C platform, this was conceived before the industry recognized it as a source of sustainable competitive advantage. Reliance is the only company in the world with integrated value chains from crude to polyester to garments. We will continue our expansion across all value chains, with a focus on India, with over \$20 billion invested in the last decade. Our assets are also future-proof, with a commitment to safety and operational excellence. There is a new energy growth road map and a goal to be net carbon zero by 2035. We use solar PVs, advanced batteries, electrolyzers, fuel cells, and power electronics. In conclusion, Asia's economic outlook is very promising. India is the growth hotspot among major economies, although the petrochemical industry is facing some headwinds. China is moving towards self-sufficiency and trade dynamics in Asia are undergoing fundamental shifts. India is emerging as an alternative to China and the economic outlook and the outlook for the petrochemical industry is very robust for India. Thank you.

Young: I would like to start with a big picture question. One way to look at India and China today is through analogy as when we look at Japan. It started as a low cost manufacturing but they entered the petrochemicals industry with lots of Japanese competitors and tariff and non-tariff barriers against imported chemicals. Japan ended up with a lot of high-cost Japanese producers of petrochemicals. One alternative approach for Japan would have to avoid building such a large Japanese chemical industry and to stay away from chemicals where they didn't have particular competitive advantages. Would they have been better off? South Korea went through the same approach, building up a strong manufacturing sector, but producing a lot of their own petrochemicals. If we then look at China and India in that context, are we looking at the same scenario where there is an artificial creation of a high-cost petrochemical industry? Like South Korea and Japan, India and China do not have a cost advantages in oil, natural gas and refineries.

Nanavaty: I agree but we can only see several years ahead. The import duties that used to be a major sore point are not as significant. We have seen trade shifted and India has an agreement with Japan and is under negotiations with

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other countries. If we see what lessons to be learned, we see challenges such as the significantly aging population, but I think we are very far away from that.

Young: Yes, and that is not necessarily a petrochemical issue. In the U.S., the CEO of Dow said that they were light on petrochemicals and then shale oil was found and a number of assets they failed to sell suddenly made the U.S. a powerhouse. In Japan, Mitsubishi Chemicals was booed by his colleagues when they went to the Middle East and did a joint venture to be where the low-cost producers were. Fundamentally, India is a low-cost manufacturing producer, but that is not necessarily true in petrochemicals. It will be an interesting story in the next 10 years. Do you think that today, this is the right balance?

Nanavaty: We will probably see some consolidation happen. I cannot predict where or what time it will happen, but the major players that will grow in size. Demand will continue to increase and increase.

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M&A and Financial Developments – Implications for Management

PETER YOUNG, CEO & PRESIDENT, YOUNG & PARTNERS

Young: We will start off with the trends and then I will talk about what it means for all of you. The economic situation is very muddled, with areas like Europe trying to revive growth. There are also a number of military conflicts that are affecting the global economy. Chemicals have been under a lot of pressure, but particularly the commodity chemicals producers. Some of this is chemical demand but some of this is also chemical capacities. The specialty chemicals producers are a little better off but have been also affected by demand and pricing pressures.



The stockmarket went through a huge dip last year and has recovered this year, while remaining volatile. Through the third quarter, the S&P 500 increased 12.1% and the S&P Euro 350 by 3.7 %. The chemical industry did not do well and underperformed the market across the board. The good news is that valuations have been pushed up in certain sectors and interestingly enough, whether commodity, diversified or specialty, there are different stories regarding how the valuations have fared. While in general, the multiples chemicals have been higher than the general market, we are now in a period where they have not done as well in terms of relative valuation.

M&A plunged in 2022 and the first quarter of this year. In the second quarter, it did improve significantly however in the third quarter it took an even bigger dive than the first quarter. Today, it is unclear where the direction of the M&A market is heading. In the first three quarters of 2023, \$45.1 billion worth of deals closed. This compares to \$52.4 billion that closed for all of 2022. However, it was \$8.6 billion in the first quarter, \$29.8 billion in the second quarter and only \$6.7 billion in the third quarter. So the dollar volume on an annualized basis has fallen dramatically. While annualizing the number of deals completed may not be the best method analytically, annualized there will be 72 deals in 2023 compared to 86 deals closed in all of 2022, so we are on a pace to see a lower number of deals in 2023 versus 2022.

What is more interesting is looking at the trends underlying the data. First of all, there has been a significant drop in the number of commodity chemical deal. This is not difficult to understand as commodity chemicals are under stress and it is difficult to forecast the earnings and cash flows of these companies. This is suppressing commodity chemical deal multiples.

During the first three quarters of 2023, M&A in Asia surged to 57.4% of deals globally. Interestingly, virtually all of the buyers of those Asian chemical businesses have been Asian and primarily Chinese. Since 12 years ago, Asia's share of deals reached 40% and has been going up since then. The share of U.S. deals in the first three quarters was 22.2% and Europe went up and down but is currently at 20.4%. One of the reason why the volume picked up in the second quarter was the willingness on the part of sellers to accept the lower valuations for commodity chemicals. When prices start to come down, buyers immediately adjust to the price but sellers are reluctant to accept the lower valuations. Eventually, the buyers and seller start to agree on price. This is what happened in commodity chemicals and this is normal in economics.

If you look at non-bank debt financing, \$23.8 billion was issued in the first three quarters, a similar annual pace as the \$31.0 billion issued in 2022. In 2022, interest rates went up and suppressed high yield debt, but high yield has reappeared. On the equity side, equity issuances have been reasonable. It never has been high since chemical companies are blessed with good cash flows and they do not need to use equity very often. \$11.9 billion of issued via 68 offerings in the first three quarter. This was a clear decline in the number of offerings, but not the dollar volume compared to \$17.7 billion and 91 offerings in 2022. Things were different for IPOs. The totals are not terrible, but clearly down. There were 20 IPOs worth \$3.5 billion in the first three quarters compared to 41 IPOs worth \$9.4 billion in 2023. However, 100% of the IPOs were done by Asia and Rest of the World companies. Not as single Western company and most of them were Chinese companies.

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Lastly, what's the outlook? Commodity chemicals will be facing a challenging period with additional regulatory pressures on top of the supply and demand problems. Specialty chemicals will also face a challenging business environment, but much less than those for commodities. There will be a rearrangement of the competitive landscape partly because of the geopolitical environment, but partly due to where the low-cost manufacturers are.

With regard to the stock market, I cannot predict where it will go and it will likely continue to be a mess. The negative is that it seems that chemical is losing ground in relative valuation compared to the general market. In M&A, China will continue to consolidate and dominate the global volume of deals. There are a few Middle East companies such as ADNOC who are pushing to acquire Western chemical companies, essentially the priority of a sovereign country to become less dependent on oil. Valuations came down modestly in specialty chemicals and that will continue. I would not advise you to wait, if you have a specialty chemical business that you want to sell, as the prices are not going up.

The M&A market will continue to be volatile, but certain themes are clear. The M&A market does not always value things properly. For example, right now the market is penalizing diversified chemical companies, regardless of whether those companies' specialties revenues are 30%, 50%, or 70%. The average actually is below what the commodities are trading at and below what the specialties are trading at. You have to understand and engineer your business and financial strategies to take into account these market value anomalies.

Debt issuances will be driven by M&A transactions, and high yield will go up and down depending on the market perception of risk. On the IPO side, there I can predict that there will be very few IPOs, but most or all will be Asian. How many IPOs will really depend on how healthy the Chinese stock market is.

The Dramatic Energy Industry Changes and Their Impact on Chemicals

DEWEY JOHNSON, SVP DOW JONES & GLOBAL LEAD CHEMICAL MARKET ANALYTICS



I'm going to talk today about what is happening in the energy world, how to fix chemicals and the direction they are going. First, we will look at the fundamentals and what is driving those changes.

As a construct on the economy, we use Oxford Economics as a source of data to forecast bottoms-up demand and validate and verify those growth rates. We can see in this view, compared to the past, the normal growth rate has been generally 3%, and we have slowed down to closer to 2%. Looking at energy, we see energy staying at the \$80-\$100 range per barrel of oil into the next year. In terms of the industry, we are in a trough, with operating rates down on ethylene, propylene, chlorine, benzene and paraxylene with ethylene having the highest operating rate at around 80%. No matter how you look at it, we are at the trough now. We want to understand how far and wide the ditch will be and how fast is the recovery. Our view is that we are in the down cycle and we do not see a recovery until 2025 or 2026. We can also see supporting the operating rates that result in cash margins bottoming out. Although the energy industry is transitioning, we do not see a decline in demand in chemicals and believe demand will continue to grow although the multiple on GDP will decline slightly.

Northeast Asia in the last 20 years has grown significantly, but North America interestingly declined before we found shale oil, which drove a recovery. The shift and where the growth is coming from will start to shift to India subcontinent and South Africa. On the issue of elasticity, the multiple on GDP has been volatile, where generally chemicals grew at 1.4x to 1.5x GDP and our long-term view will be about 1.15x GDP. We are in a cycle where margins are under pressure, but we will recover and things will look very different on the other side.

Although trade is declining as a total percent of the chemical market volume, the total chemical volume traded (consumed in another geography) is predicted to increase. This means that the traditional model to build where there is affordable feedstock and export will still be present even with sustainability measures. Geopolitical tensions, sustainability pressures and country policies will increase friction in moving chemicals and materials from one nation to another. The pressures in sustainability are at a consumer level and at a base level. Today in chemicals, prices are mostly separated by freight and duty and these pressures increase arbitrage and decrease transparency in the market.

Energy is a big multidimensional issue for us. Rystad Energy looks at energy transition through the different pathways of global warming. They look at the degrees of warming and its effect with 1.9 degrees being the mean view. The mean view for example, shows that we will have to go from 100 million barrels per day to 62 million barrels. In the optimistic view, we would have to cut 76% of liquid supply and the operating range we see today is somewhere between the 1.9 to 2.2. In the 1.9 degrees view, we look at vehicle fleet and the analysis supports that it will take until 2035 for 30% of the fleet to be electrified and until 2040 for half of the fleet to be electrified. With regard to the chemical industry's Maslow's hierarchy of needs, we see (from bottom to top) operations management, renewable energy and feedstocks, feedstock supply and demand and price volatility, carbon strategy, costs of production, AI processes, and sustainable competitiveness. As we move up the hierarchy we see what the carbon economy is like, and how carbon trading affects strategy. We also see at the top, the disruptors in cost of production and AI processes. Regardless of the pathway we are taking, ADNOC will be active in Europe and we would expect a public offer on the table for Braskem in Latin America. We also see Saudi Arabia taking a significant position in total barrels of fluid in the industry. Regardless of the curve, big oil is investing in chemicals today at scale.

With regard to the plastics dilemma, this is important as half of the market is non-durables. The global demand is 380 million MT per year with the composition being mostly PP and PE. When we view sectors, interestingly enough, about 50% of those sectors are short lifecycle products. Actually, the durable products are much more problematic such as appliances and automotive. Another issue is the curbside waste that is also an opportunity to be

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collected. What we see is that most is mechanical recycling, followed by chemical recycling. The rest is landfill or uncollected. We need to get rid of all the uncollected plastics waste, is that we need to recycle all that we can with mechanical and advanced recycling to get rid of those that cannot be recycled mechanically. There is a large gap in technology for us to advanced recycle to that extent. We have gone a long way in innovating in plastics. We are at a relatively early stage but it will be a large market. Today we recycle about 7% of the plastics produced in non-durable applications. In our base case, this will go to 15% in 2050. Our Green Case where policy supports plastics recycling sees it going to 23%. Global Barrons Group did an article on plastics recycling that I think was pretty well done. It did not sugarcoat the problem or beat the industry up and told the readers that these are the actions being taken.

My last point is on where are we now and what the whole new world will look like. The shape of the trough has deepened and widened but we think we are at the bottom. Demand growth has slowed down, but we see a recovery in the Western market. In global trade, we believe competitiveness by sustainability factors will be dynamic as not all countries will act at the same time. Geopolitics will affect trade structures and increase inefficiencies in trade markets. Big oil is coming and in a more significant way than they have in the past. We are early in the carbon ecosystem development and we see more developments occurring. Plastics waste remains a global challenge. On a positive note, we can't do anything without chemicals and no one is better positioned to fix the problem than the chemicals industry and takeaway for everyone is that the solution sits within the industry.

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Speakers Roundtable: What Does the Future Hold?

DEWEY JOHNSON, SVP DOW JONES, GLOBAL LEAD CHEMICAL MARKET ANALYTICS

KAMAL NANA VATY, PRESIDENT, STRATEGY DEVELOPMENT, RELIANCE INDUSTRIES LIMITED

MATTHIAS ZACHERT, CHAIRMAN OF THE MANAGEMENT BOARD, CEO, LANXESS AG

PETER YOUNG, CEO & PRESIDENT, YOUNG & PARTNERS

Young: We are very privileged to have this group on the panel who are very experienced people in the industry who see things from different angles. This panel will step back and reflect on the big picture and where things followed by questions from the audience.

I will start out with one question: “Describe what you think the chemical industry will look like 10 years from now and in what ways will it be different from now?”

Johnson: Capitalism runs to its extremes. On the commodities side, when you grow to a certain size, there is always a movement to specialties, but there is a different skillset needed. There will always there specialty group that will continue to do what they’re good at.

Nanavaty: The industry will probably find itself in some sort of a new balance. There are a lot of pressures on products, including plastics. There will be some consolidation that will happen and players getting more into downstream. I do not think that the players will look ridiculously different, but there is some readjustment happening with green products.

Zachert: I think I have given my perspectives on chemicals in Europe and to some extent North America. I have been living in the chemical industry for 40 years and this is the time where globalization and digitalization have become the name of the game. This a topic that has been on my desk where we should prepare for a Plan C or Plan D, beyond Plan A and B. The likelihood that we will have these globalization issues is increasing. We should, at least, be prepared for such a scenario.

Young: I believe it is easier to predict things such as GDP growth, etc., but harder to predict disruptive geopolitical changes, the resulting realignments and other things that could dramatically change the global trade environment. An example, Trump becoming president again compared to Biden could have a dramatic effect on tariffs and trade and back up into the chemicals industry.

Johnson: We went from laggard to leader in sustainability initiatives, and that could change.

Zachert: We cannot predict the world. Our industry may be severely confronted with these issues in terms of input costs. When we look at volatility coming from all sides, I don’t expect in the future for the volatility to become less. The learning that I take away is to rethink our organization structures, the DNA of our people, and to have the agility and structures to adjust in a very short period of time. In Germany we are always known for our rigid structure. I do not think this is the philosophy of success. Empowerment of people, intrinsic motivation and an appropriate structure will allow for this agility.



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Young: There are also a number of things that are going to indirectly affect everything. AI will affect everything, in both good and bad ways, but we cannot fully predict its impact on the industry.

Young: Another question: “Where do we think there will be major innovative R&D inventions or other such developments in the next 10 years and what will be the impact on the industry?”

Nanavaty: I’m pretty sure in some lab, somewhere, something is happening. Will it phenomenally change our industry – I doubt it.

Zachert: What I think in our strategy and process, I don’t think that any of us will find new elements. What is interesting is how products will be used. We have a 50 year old product that has surfaced that it can be used for a different application that we are running tests for. A 50 year old product might be entering into a different application to replace a scarce raw material that is constrained. This could be complete innovation on a standard molecule and my sense is that there will be a wave of new applications of existing products. Another example is that we drive the innovation cycle through chemicals. In carbon capture, there are a number of technologies that use chemicals where all of us have products that can lead to energy change, whether it is recycling or new applications.

Young: We owe an obligation to our companies to think ahead and understand those changes.

Johnson: I love the idea of new applications of existing molecules. To cite an example of that, Eastman years ago was in the polyester filament industry and they saw China investing significantly in the polyester industry. They developed a new application for polyester from coal that they invested significantly in.

Audience Question: When you look at sustainability and the case of governments around the world and legislation, and do you think that the pace of legislative drivers will change capital allocation?

Young: I think fundamentally our problem is a game theory problem. To solve this problem requires everyone to work together. The problem is that our current system does not penalize countries in the right way to ensure that they do the right thing. There can be legislation country by country, but if there isn’t global cooperation, change will be hard.

Johnson: We have talked about scarcity and security in Europe and we follow green policy using this scale from aspiration to regulation. Companies have to make sure to not get too far ahead of where regulation is.

Nanavaty: I think cost of capital will always be a factor. New chemical plants will continue to be built with capital available, but the rebalancing of where they are advantaged and built will be changing.

Zachert: Capital allocation is changed by trends in the world all the time. Capital allocation should be done in a way to be put it on a global scale and there are many questions marks in that process. One situation in which I thought the world would learn was the COVID pandemic. My assumption was that the pharmaceutical industry around the globe would interact and, once they found a cure, they would scale up. This has not been the case. China developed their own vaccines, Americans developed their own vaccines. Best making use of capital allocation would have been finding one vaccine that could have been used worldwide. Making sure people don’t bump into each other is relevant in trying to protect this world, getting the three or four leaders in the world to agree on capital allocation is key. Capital allocation in this environment and its flexibility is not going to change.

Young: We need a system in place that incentivizes stakeholders to act in the right way. This is a structural problem.
