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PRESENTATION

Operator

Good day, and welcome to Dow's Fourth Quarter 2021 Earnings Call. (Operator Instructions) Also, today's call is being recorded.

I would now like to hand the call over to Pankaj Gupta. Please go ahead, sir.

Pankaj Gupta ***Dow Inc. - VP of IR***

Good morning. Thank you for joining Dow's fourth quarter earnings call. This call is available via webcast, and we have prepared slides to supplement our comments today. They are posted on the Investor Relations section of Dow's website and through the link to our webcast.

I'm Pankaj Gupta, Dow Investor Relations Vice President, and joining me today on the call are Jim Fitterling, Dow's Chairman and Chief Executive Officer; and Howard Ungerleider, President and Chief Financial Officer. Please read the forward-looking statement disclaimer contained in the earnings news release and slides.

During our call, we will make forward-looking statements regarding our expectations or predictions about the future. Because these statements are based on current assumptions and factors that involve risks and uncertainties, our actual performance and results may differ materially from our forward-looking statements. Dow's Forms 10-Q and 10-K include detailed discussions of principal risks and uncertainties which may cause such differences. Unless otherwise specified, all financials, where applicable, exclude significant items. We will also refer to non-GAAP measures. A reconciliation of the most directly comparable GAAP financial measure and other associated disclosures is contained in the Dow earnings release, in the slides that supplement our comments today as well as on the Dow website.

On Slide 2, you will see our agenda for the call. Jim will begin by reviewing our fourth quarter and full year highlights and operating segment performance; Howard will then share our outlook and modeling guidance; and then Jim will discuss how we will continue to execute on our priorities to deliver value growth. Following that, we will take your questions.

Now let me turn the call over to Jim.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Thank you, Pankaj. Beginning with Slide 3, in the fourth quarter, Dow once again delivered top and bottom line growth year-over-year with sales growth and margin expansion in every operating segment. Our results reflect the strength and resilience of our advantaged portfolio and the incredible efforts of the Dow team as we continued to ensure well-being and safety of our team and our communities.

We delivered year-over-year sales growth of 34%, with gains in every operating segment, business and region. While volume declined 4% year-over-year due to supply constraints from several factors, including our own maintenance, lingering effects of weather-related outages and global logistics challenges, we continued to see robust underlying demand across our end markets particularly for higher-margin downstream and sustainability-led applications. Prices were up 39% year-over-year, reflecting gains in all operating segments, businesses and regions.

Our discipline and agility enabled us to navigate the supply constraints and logistics challenges I just mentioned, dual-control actions in China and rising energy costs. We delivered operating EBIT growth of $1.2 billion year-over-year, with margin expansion in every operating segment. Equity earnings were also up year-over-year with margin expansion at our joint ventures in Saudi Arabia, Thailand and Kuwait. These results translated into significant cash generation for the quarter, with cash flow from operations of $2.6 billion, up $901 million year-over-year and cash flow conversion of 88%. And we returned $912 million to shareholders in the quarter, including $512 million through our industry-leading dividend and $400 million in share repurchases.

Our performance in the fourth quarter capped a record year for Dow, which you will see highlighted on Slide 4. In 2021, Team Dow capitalized on the economic recovery, achieving record sales and earnings performance despite pandemic-driven uncertainty and industry-wide weather-related challenges. Our focus on cash flow and disciplined capital allocation enabled us to continue to deliver on our financial priorities.

We achieved $7.1 billion of cash flow from operations, bringing our total cash flow from operations since spin to $18 billion. We enhanced our balance sheet by reducing gross debt by another $2.4 billion in the year, bringing down gross debt by more than $5 billion since spin.

We have also no substantive debt maturities until 2026. We proactively funded our U.S. pension plans, and successfully executed Sadara's debt reprofiling, lowering Dow's guarantees by more than $2 billion. Dow has returned a total of $7.3 billion to shareholders since spin through our dividend and share repurchases, including $3.1 billion in 2021. And we kept CapEx well within D&A as we continued to invest in our higher return and faster payback growth investments. In 2021, we achieved a return on invested capital of greater than 22% on strong earnings growth.

As we turn the corner on the pandemic, we do so with a strong balance sheet and a deliberate and disciplined strategy to decarbonize and grow. We achieved this record financial performance in 2021 while advancing our ESG leadership. Importantly, we announced our disciplined strategy to decarbonize our assets, while improving underlying EBITDA by more than $3 billion as we capitalize on our participation in attractive, high-growth end markets and sustainability-driven solutions.

Our ESG efforts continue to be recognized externally as we were recently recognized by JUST Capital for the third year. Dow earned a top spot in the chemicals sector overall as well as the #1 position in the workers and stakeholders and governance categories in the industry. I'm extremely proud of Team Dow's dedication to deliver for our customers and drive value for all of our stakeholders. We will build on these achievements in 2022 as we advance our ambition.

Moving to our operating segment performance for the fourth quarter on Slide 5, in the Packaging & Specialty Plastics segment, operating EBIT was $1.4 billion, up $662 million year-over-year, primarily due to margin improvement and partly offset by lower supply volumes. Sequentially, operating EBIT was down $512 million and operating EBIT margins declined by 520 basis points on lower olefin and co-product pricing combined with higher raw material costs and energy costs.

The Packaging & Specialty Plastics business reported higher net sales year-over-year driven by price gains in all regions as well as in key applications such as flexible food, industrial and consumer packaging. Volume declined year-over-year, primarily in Asia Pacific due to supply constraints.

Moving to the Industrial Intermediates & Infrastructure segment, operating EBIT was $595 million, up $299 million year-over-year, primarily due to continued price strength. Sequentially, operating EBIT was down $118 million and operating EBIT margins declined 280 basis points, primarily driven by higher energy costs in Europe and our planned maintenance turnaround activity.

The Polyurethanes & Construction Chemicals business increased net sales compared to the year-ago period on broad-based price gains in all regions. Volume declines were primarily due to a planned transition away from a low-margin co-producer contract and our planned maintenance turnaround activity.

The Industrial Solutions business delivered a net sales improvement compared to the year ago period with local price gains in all regions. Volume was flat year-over-year as higher volume from a renewable energy contract was offset by fewer licensing and catalyst sales.

And finally, the Performance Materials & Coatings segment reported operating EBIT of $295 million compared to $50 million in the year ago period, as margins increased 900 basis points due to strong price momentum for silicones and coatings offerings. Sequentially, operating EBIT improved $11 million as price gains were partly offset by our planned maintenance turnaround activity.

The Consumer Solutions business achieved higher net sales year-over-year with local price gains in all regions and across end market applications. Volume declined as strong demand, particularly for industrial, electronics and personal care applications, was offset by lower supply availability due to our own decision to pull forward maintenance activity to coincide with dual-control actions in China.

The Coatings & Performance Monomers business achieved increased net sales year-over-year as higher raw material costs and strong industry demand led to price gains in all regions. Volume declined as stronger demand for architectural coatings and industrial coatings, primarily in the U.S. and Canada was more than offset by lower merchant sales of acrylic monomers partly due to Dow's own higher captive use.

I'll now turn it over to Howard to review our outlook and modeling guidance.

Howard I. Ungerleider ***Dow Inc. - President & CFO***

Thank you, Jim, and good morning, everyone. Turning to Slide 6. Our diversified portfolio continues to enable us to capitalize on attractive end market trends with higher-margin downstream products. Our 4 primary market verticals are each growing at rates of 1.3x to 1.5x GDP and benefiting from sustainability macro trends. We are meeting this demand with higher-margin solutions such as functional polymers, alkoxylates, surfactants, polyurethane systems, sustainable coatings, and performance silicones.

In the packaging vertical, demand for lower-carbon emissions, recyclable and circular materials are driving demand for Dow's industry-leading plastics portfolio and in-house application design capabilities. Dow's broad suite of products and hybrid innovations targeting infrastructure will continue to benefit from government investments and incentives, with particular demand resiliency in the Americas, Europe as well as in the Middle East, Africa and India.

We see global demand across the diverse consumer market vertical remaining at elevated levels, particularly for applications like electronics, 5G, appliances, pharma and home care, where several of Dow's growth investments are targeted. And in mobility, Dow's portfolio of specialty silicones, polyurethanes and elastomers is uniquely positioned to benefit from growing electric and autonomous vehicle trends. Importantly, these attractive market verticals are supported by favorable balances across our key value chains with continued strength across consumer and industrial end markets, which we'll see on Slide 7.

We expect the economic recovery to continue as forecasts call for above historical average global GDP growth in 2022. While the Omicron variant has resulted in some near-term disruption, we do not expect it to materially change the current recovery path, particularly as global immunization levels and treatment options continue to increase.

Several factors support continued strength across our end markets. Consumer balance sheets remain healthy, with significant pent-up demand driven by more than $5 trillion in additional savings accumulated through the pandemic. Manufacturing growth is expected to remain robust, supported by increasing investments in infrastructure and accelerated adoption for 5G, EV and sustainability trends.

And with retail inventories remaining low and backlogs elevated, easing supply chain issues should unleash additional volume growth in 2022 as manufacturing activity increases to meet strong consumer demand. This will certainly be a focus for Dow as we work closely with our customers to fill order backlogs and replenish inventories to meet the robust demand and increase service levels.

Turning to Slide 8, in the first quarter, we expect these demand trends to drive growth, particularly following the Chinese Lunar New Year. Demand remains resilient in Packaging & Specialty Plastics. Although domestic polyethylene supply improved through the fourth quarter, comonomer supply remains constrained and trade sources are predicting another year of higher-than-average turnaround activity. These factors, coupled with improvements in shipping logistics that will help meet demand in the export market, are leading to more constructive supply and demand balances domestically.

Equity earnings are expected to be lower sequentially due to rising feedstock costs impacting Asian olefin margins, and we anticipate higher raw material and energy costs, particularly in Europe and Asia. Altogether, we anticipate an approximately $200 million impact versus the prior quarter for this segment. Utilizing our best-in-class feedstock flexibility and our differentiated portfolio, Dow will continue to be agile to mitigate potential volatility and meet demand.

In Industrial Intermediates & Infrastructure, strong demand for our high-value materials in appliances, construction, pharma, home care and energy applications, combined with tight supply and increased global infrastructure investment are supporting a constructive demand outlook. We anticipate approximately a $100 million benefit in this segment from completed turnarounds in the fourth quarter, including Sadara's isocyanate facility and several in our core polyurethane business. And we expect the elevated energy costs in Europe will be a $75 million impact versus the prior quarter for this segment.

In Performance Materials & Coatings, increasing industrial activity and consumer demand for electronics and construction continues to outpace supply for our differentiated silicone products. The industry also anticipates resilient demand for architectural coatings as rebuilding from low inventory levels in preparation for the Northern Hemisphere spring and summer months.

The completion of our turnaround in the fourth quarter at our siloxane facility in China will allow us to take advantage of tight global market conditions as silicon metal supplies improve and energy curtailments in China continue to ease. We will also be executing a turnaround at our methacrylates facility in Deer Park. All in, we expect a $25 million net tailwind versus the prior quarter from turnarounds for this segment.

Turning to the full year. We're continuing to provide our best estimates of several income statement and cash flow drivers. Notably, we expect lower equity earnings sequentially due to margin compression versus the tighter conditions in 2021, particularly in Asia as oil remains constructive, putting upward pressure on the naphtha-based feedstock costs in the region.

Total turnaround spending for the year will be up approximately $100 million versus 2021 as we have another heavy turnaround year with 3 crackers slated for maintenance activity and increased inflationary pressure on materials and labor. Net interest expense is expected to be approximately $600 million, benefiting from our proactive deleveraging actions since spin.

For cash flow, we anticipate higher joint venture dividends from increased earnings in 2021 and a $1 billion tailwind toward pension-related items following our actions last year. Continued investment in our digital initiatives will drive efficiency and enable us to achieve our $300 million EBITDA run rate on the program by 2025. We will also complete the spending portion of our restructuring program which is now delivering the full $300 million EBITDA run rate as we enter 2022.

And finally, as we highlighted at our Investor Day, we anticipate increasing our capital expenditures to $2.2 billion, well within our D&A target as we continue to advance our higher return, faster payback projects and execute on our decarbonized and growth strategy. Overall, the macroeconomic backdrop remains favorable in 2022, and Dow is well positioned due to our global footprint, feedstock flexibility, productivity programs and sustainable solutions for our customers.

We will continue to leverage these advantages as we navigate higher oil prices and continue to deal with inflation and logistics challenges. And as the year progresses, we intend to drive operating rates and service levels higher and do expect widening oil-to-gas spreads.

With that, I'll turn it back to Jim.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Thank you, Howard. Turning to Slide 10, at our Investor Day in October, we laid out our disciplined strategy to decarbonize and grow the company, supported by a series of in-flight earnings growth programs that will drive over $3 billion in underlying EBITDA growth. In 2022, our capital and operating investments are on track to deliver $200 million to $300 million in run rate EBITDA and will serve higher-margin, differentiated applications where demand is accelerating as customers work to reduce their own carbon footprint.

In Packaging & Specialty Plastics, our Fort Saskatchewan expansion completed last year will deliver a full year of earnings growth to support increasing polyethylene demand. And our FCDh pilot plant in Louisiana will start up this year to produce propylene for coatings, electronics and durables end markets. Notably, the technology enables lower CapEx, OpEx and CO2 emissions compared to conventional PDH technologies.

These projects serve faster growing, more sustainable market segments such as renewables to drive lower carbon emissions for our customers. For example, our ENDURANCE compounds for cable systems support next-generation, longer life and lower carbon emissions infrastructure, including on and offshore wind farms by reducing the cable manufacturing carbon emissions footprint by 80%. And our ENGAGE elastomers deliver 35% improved performance and efficiency for solar photovoltaic applications.

In Industrial Intermediates & Infrastructure, our alkoxylates and PU systems expansion projects are closely linked with brand-owner demand for higher value, differentiated downstream applications across home and consumer care, agricultural and infrastructure end markets. For example, our surfactants offer an improved environmental profile for leading brand-owner laundry and home care products. And our polyurethane system PASCAL technology enables up to 10% greater energy efficiency in appliances without raising manufacturing costs.

In Performance Materials & Coatings, we're expanding capacity in formulated solutions for coatings and silicones through incremental debottlenecking projects. Our products enable higher-performing, more sustainable solutions, targeting mobility, consumer and infrastructure end markets.

For example, FASTRACK coatings enable autonomous mobility infrastructure and have approximately 45% lower greenhouse gas emissions. And our DOWSIL technology enables higher-density, lower-cost battery packs for the fast-growing electric vehicle market. Finally, as Howard mentioned, our restructuring program and digital investment will continue to support our low-cost operating model and top quartile cost structure.

Turning to Slide 11, the increasing demand for sustainable products represents a significant growth opportunity for Dow with attractive pricing that will support longer-term, higher-quality earnings. Our customers are looking for opportunities to enhance their sustainability, and we are meeting those needs with lower carbon emissions solutions beginning with our own operations.

Our Alberta project will decarbonize approximately 20% of Dow's global ethylene capacity while growing our global polyethylene supply by about 15%. We are also working with our suppliers to reduce our Scope 3 carbon emissions. To date, we have more than 150 supplier [collaborations] (corrected by company after the call) in place and have adopted third-party frameworks like CDP, Together for Sustainability and Ecovadis to drive tangible improvements in environmental performance along the value chain.

We continue to advance a circular economy for plastics and see a consistent trend across our brand-owner customer base, toward redesigning packages to be recyclable and incorporating 30% post-consumer recycled content in their packaging by 2030. Six of our largest sites have now received international sustainability and carbon certification plus recognition for tracking the use of sustainable feedstocks.

We're advancing our partnership with Mura Technology to scale advanced recycling solutions and secure circular product supply. Mura broke ground on the new plant with an expected startup around the end of the year.

Earlier this month, we announced an investment in Mr. Green Africa, the first recycling company in Africa to be a Certified B Corporation, which includes socially responsible waste collection and plans to codevelop new flexible plastic packaging that will enable more sustainable packaging solutions. A first-of-its-kind investment for Dow in Africa, this business model will be scaled to other developing regions around the world.

We continue to grow our recyclable offerings, recently doubling sales with Chinese laundry brand, Liby, and increasing our addressable market opportunities. And like the partnerships Dow recently announced to source pyrolysis oil from Gunvor and New Hope Energy, these investments in circularity are examples of our progress and solid foundation as we grow and scale circular solutions.

To close on Slide 12, 2021 was an outstanding year for Team Dow. We delivered record financial performance and continued our disciplined execution of our strategic priorities. Building on this foundation, we're focused on advancing our plan to decarbonize our assets and grow earnings. Our competitive advantage enables us to meet the increasing needs of our customers and consumers who are demanding more circular and sustainable products while we work to achieve zero-carbon emissions in our own operations.

And as we look ahead, our priorities remain consistent. Our focus on profitable growth, while maintaining a low-cost position and best owner mindset, will enable us to deliver on our earnings growth levers. We'll continue to maintain our balanced and disciplined approach to capital allocation, driving higher returns for the company and our shareholders while retaining the financial flexibility that has served us well. And we'll continue to advance our leadership in ESG with a clear path to achieve our zero-carbon circularity and sustainability targets.

The world and our customers are demanding a more sustainable future. As we execute our ambition, I am confident that we will create significant long-term value for all of our stakeholders.

With that, I'll turn it over to Pankaj to open up the Q&A.

Pankaj Gupta ***Dow Inc. - VP of IR***

Thank you, Jim. Now let's move on to your questions. I would like to remind you that our forward-looking statements apply to both our prepared remarks and the following Q&A.

Operator, please provide the Q&A instructions.

QUESTIONS AND ANSWERS

Operator

(Operator Instructions) We'll take our first question from David Begleiter of Deutsche Bank.

David L. Begleiter ***Deutsche Bank AG, Research Division - MD and Senior Research Analyst***

Jim and Howard, it looks like there's some recent stability or even strength in polyethylene. What are your assumptions for polyethylene prices over the next couple of months? Could we actually see a price increase maybe in February given some higher oil prices and better demand and balances here?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Our view, as we go into the quarter, we had 2 increases out in the market, plus 4, plus 4. And I think those will look like they're going to line up for February and for March. As we ended the year, we were a little bit constrained on volume really due to some unplanned events of our own, both the hurricane as well as the situation we had in Terneuzen.

Otherwise, December was the best marine pack cargo month for exports that we've had since last March. Still not back to where we'd like it to be but I think we see signs of gradual improvement, and the team is working hard to stay on top of that. And I think that's why you see the Asia volume number down in the fourth quarter, was we just backed off of those exports in the fourth quarter.

Operator

We will move on to our next question from Hassan Ahmed of Alembic Global.

Hassan Ijaz Ahmed ***Alembic Global Advisors - Partner & Head of Research***

Jim and Howard, just wanted to sort of get your views on the Q1 guidance that you guys have given. If I'm running my numbers correctly, it seems you guys, with some of the tailwinds and headwinds that you talk about, you're guiding to around $2.8 billion in EBITDA for Q1 '22. And correct me if I'm wrong, it seems to me that, that does not factor in the sort of polyethylene price hikes that you talked about, the 4 plus 4. Is that a fair assumption?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Let me have Howard -- Hassan, welcome. And let me have Howard walk through the guidance and then we can comment a little bit more on the market outlook for Q1.

Howard I. Ungerleider ***Dow Inc. - President & CFO***

Sure. Hassan, look, I think your number or your estimate is reasonable when you look at all the moving parts. And the way I would think about it is, look, we're going to see about $275 million likely of margin moderation sequentially from Q4 to Q1. And then the net turnaround is actually a tailwind from Q4 to Q1 of about $125 million. So those are the big moving parts.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

And I'd say, Hassan, it's possible that margins could open up. Obviously, our view on oil is very constructive because as you look at the market, demand has been better than anybody anticipated for oil. And because of the investments being so low in oil and gas production in the last 3 years, it takes supply time to catch up. So when you look at the spare available capacity for oil, that number is relatively low. And as this demand grows, that shrinking spare available capacity number means the market moves up pretty dramatically, and that opens up the spreads.

Meanwhile, LNG is obviously driving natural gas production. I think in the United States, as we get through winter, we're going to see prices come down to like the $275 million Btu range. That will mean a pretty good oil-to-gas spread here and plenty of available ethane for the market.

Operator

We will now move on to our next question from Vincent Andrews of Morgan Stanley.

Vincent Stephen Andrews ***Morgan Stanley, Research Division - MD***

Wondering if you could talk about the Asian polyethylene market, just where we continue to see negative margins. And I assume some of that is just that the raw material costs have moved faster than pricing. But is your anticipation that we'll see those margins neutralize at least through higher prices? Or should we anticipate that we'll see some reduction in production there? And I guess I asked that in particular because you're referencing increased export capability coming out of the U.S. I'm just trying to put all of that together.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, Asia has been underwater because of the rise, obviously, in naphtha prices and the narrow margins there. I'd also say a slow start to the year. We've got Chinese New Year ahead of us here, the 1st of February. And I think we're watching closely as we come out.

We've seen some rate reductions at some Asian producers that are higher cost. That's what we would expect to see. And obviously, when coal ramped up and LNG ramped up, CTO/MTO down. So as we come out of Chinese New Year, we're watching closely on both polyethylene as well as ethylene glycol and what happens to the market.

EG has come off a little bit from the fourth quarter, not terribly dramatic, but it's down more than $100 a ton. And the demand coming out of Chinese New Year will be something we keep an eye on.

Now that's good for us. Obviously, with our footprint and our advantaged cost positions here, we just have to continue to improve on these marine pack cargo shipments and get those numbers moving up to take advantage of that arbitrage with Asia.

Operator

We will now move on to our next question from Jeff Zekauskas of JPMorgan.

Jeffrey John Zekauskas ***JPMorgan Chase & Co, Research Division - Senior Analyst***

In your modeling guidance for '22, you say that your share count is 745 million. Isn't your share count today, I don't know, 743, and aren't you buying back shares at 6 or 7 million a quarter? Shouldn't your share count be, I don't know, 735 or 730 for modeling purposes for 2022? And secondly, how are your VAM operations in the United States? Are they back to normal running at full capacity? Or are there still issues?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Jeff, let me ask Howard to walk through the share count and the modeling guidance data.

Howard I. Ungerleider ***Dow Inc. - President & CFO***

Yes, sure. Jeff, I would say, look, our guidance is for flat because we're focused on making sure we cover dilution. With that said, we're going to continue to be opportunistic. We bought $400 million worth in the fourth quarter. Our expectation is that we will do that same rough amount in the first quarter.

Don't forget the way -- as you're doing your math, you've got to think about where the stock price is because that will obviously impact the number of shares that we can buy, increased exercise of options as the share price hopefully continues to move up. And then also the averaging effect, right, because that will impact the number as well. So that's why we say, look, 745 is a good number. Could it be slightly lower than that by the end of the quarter? It could be.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

And on -- back to your question, Jeff, on asset utilization, we've seen -- obviously, we saw some impact in the fourth quarter from weather-related outages and constraints. But as we start the first quarter, I think everything's come back to normal on operating rates. So we've been running pretty strong in the Gulf Coast, strong as we have for a long time, and that's a nice sign going into the first quarter.

Operator

We will now move on to our next question from Frank Mitsch of Fermium Research.

Frank Joseph Mitsch ***Fermium Research, LLC - President***

Nice end to the year. You referenced the Terneuzen outage. I was wondering if you could talk about your operating rates overall in the P&SP segment in the quarter and then also versus the year. And I believe, Howard, during your comments, you also mentioned that you anticipate higher operating rates in 2022. If you could expand upon that, that would be great.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, Frank, P&SP in the segment, obviously, was down a bit in the fourth quarter from what we had been running throughout the year. It was down about 5%. And so that really hit us. And if you think about fourth quarter, fourth quarter could have probably been about $150 million better had we not had those outages. So we're running at much better rates right now.

The Gulf -- our outlook for rates for the year on ethylene and all the ethylene derivatives is north of 87%. We kind of see that as the low watermark, and that's the way things are running right now, really strong. And then Terneuzen's back -- one of the crackers has been back since the beginning of the year. The other one is in the startup phase right now. And so we'll be back out of that situation. Any other comments on operating rate, Howard?

Howard I. Ungerleider ***Dow Inc. - President & CFO***

The only other thing maybe to add, Frank, is remember, when you think about year-on-year for full year '22 versus '21, last year, we had the winter storm. That's knocked out the Gulf -- that knocked out all of Texas basically for the industry for about 30 days, and then we also had the 2 hurricanes. So we obviously can't predict what weather events or what unplanned events are going to happen. But certainly, it feels like last year was above normal.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Normal amount of capacity offline for the year. So typically planned downtime year-to-year will be about the same. We have 3 cracker turnarounds, the 3 crackers that are there means about the same amount of outage time. Our expectations on growth, global GDP, 4% to 4.5%; U.S. 4; China, 5 to 6, translates really for us at 1.5x GDP and about 6% year-over-year volume growth. That's what we're targeting for and that's what we're running for. We want to try to obviously also get some inventories back up and service levels back for our customers, trying to get back to a -- kind of a normal cadence that they can expect and better availability and reliability for them.

Operator

We will now move on to our next question from John Roberts of UBS.

John Ezekiel E. Roberts ***UBS Investment Bank, Research Division - Executive Director and Equity Research Analyst, Chemicals***

The downstream coating customers are obviously struggling with raw materials, and it looks like you made some changes to your acrylic mix as well. When do you think the supply chains and coatings sort of get back to a steady state where things aren't shuffling around?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

They are gradually improving. I would say the one thing in coatings that's a little bit different than some of our other chains, there are quite a few small ingredients that go into that coatings chain. So third-party suppliers, even that supply through us from day to day, we still see some disruptions on third-party supply and materials.

We've got a turnaround right now in the first quarter for Deer Park, but that's planned and then we'll be running hard. We ran really hard in fourth quarter. I think we picked up some ground in fourth quarter, and we're able to help some things out. We've been using more of our own acrylate monomers in our captive business.

So that's kind of constrained monomers a bit. But my expectation is with the strong contractor demand for housing architecture, do-it-yourself is still holding up really well. And housing starts, I mean you saw the December housing starts number was up 11.9% in North America, which was well above what people expected with rents increasing and the ability to buy or build being there and some of the materials cost coming off, I think we're going to see a good housing season in North America and that's going to drive some good business for us.

Operator

We'll move on to our next question from Mike Sison of Wells Fargo.

Michael Joseph Sison ***Wells Fargo Securities, LLC, Research Division - MD & Senior Equity Analyst***

Nice end of the year. Just curious, the industry consultants still look for a lot of capacity coming on in -- globally this year, 8 million plus. And you guys tend to have a better view on what realistically could come on. So just any thoughts on sort of the outlook for new capacity, and how much of that could be absorbed this year, given -- it seems like the outlook demand for polyethylene remains really strong.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, the demand is very strong. For every 1% of GDP growth in the marketplace, you need 2 to 3 world-scale polyethylene plants to come online and our expectation is that is not going to change. We see strong demand across all the sectors for plastics products. And so that's what's driving it. I would say we have very good line of sight to the projects and the timing of the projects. And most of them are going to start coming on second quarter midyear impact. And so I think the market growth is going to help moderate some of that. I think our expectations on operating rates are 2 to 3 percentage points higher than what the industry is expecting on polyethylene, and plastics is typically running a bit heavier than that.

So my outlook is you've got 4 million tons that are coming in North America. About half of that is destined for the export market. So that's why we're trying to keep an eye on marine pack cargo and the export shipments. About 50% of the global PE capacity adds between now and 2025 are coming on in high-cost regions. Naphtha, which is the most of that and a little bit of CTO and MTO capacity. About 60% of all global polyethylene capacity adds through 2025 are in Northeast Asia. So I think with the advantage being in Canada, U.S., Argentina, Middle East to places that have really good structural low-cost ethane positions, we're going to be in a good space and operating rates are going to be very high.

Operator

We'll now move on to our next question from Bob Koort of Goldman Sachs.

Robert Andrew Koort ***Goldman Sachs Group, Inc., Research Division - MD***

Maybe along the same lines, Jim, I was curious. It looked like maybe polyethylene exports were down 15% or 20% in total in '21 from the U.S. as a result of those production issues. And I guess by our reckoning, production might be up as much as 15% in '22. You mentioned the Asian crackers are maybe curtailing a bit. Where is all the extra polyethylene going to get sent relative to what you saw in the export arena in '21, do you think?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, Bob, I do think we're going to see a rebound from all that off-line capacity. As Howard said, it's unpredictable, right? I mean, a weather event can take some off-line. But the amount off-line due to unplanned events, weather-related events last year was probably double what we would normally see. And that Texas freeze had a lot of knock-on impacts that are hurting.

I think, yes, we're seeing movement into all the markets. We've seen India come back relatively strong, which has been a good positive. And I think after the Chinese New Year, we'll watch China coming back. We're seeing good steady improvements in marine pack cargo. We need to keep ramping those rates up. And I think as we navigate through Omicron and we'd start to see less of an impact on the labor force, we'll see those numbers loosen up. And so that's why we're looking for the higher operating rates and the 6% volume growth coming out of the machine this year.

I think global -- I'm not pessimistic about inflation killing demand. Honestly, inflation has always been a positive for our business, and over the last 30 years, when the Fed raises interest rates, that typically tends to drive outperformance in our sector versus the other sectors. And so I think the commodities pull is very strong right now, whether it's in petrochemicals or whether it's in minerals and mining for all of the things that we need for EVs and alternative energy.

Operator

We will now move on to our next question from Steve Byrne of Bank of America.

Stephen V. Byrne ***BofA Securities, Research Division - MD in Americas Equity Research & Research Analyst***

Jim, you have some pretty ambitious sustainability goals on your Slide 11. And when you look across all your businesses across the 3 segments, what would you estimate the fraction of those customers that are asking you for a more sustainable product? And then if you drill into that, do they want your product to have been derived from some recycled material? Or do they just simply want their product to be recyclable? Or does it go even further in that, they want your product to be derived from a renewable feedstock or a low-carbon feedstock?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, no, it's a great question, Steve. And this is an area that's rapidly changing. I would say on the brand-owner segment, the brand owners pull a lot through the packaging. So brand owners can be brands that you buy for food or for personal care items, could be medical care and other types of applications as well. All the brand owners are asking us for more post-consumer recycled content. And obviously, the quality needs to be good. And that's why the discussion around advanced recycling is so strong, and we're making progress getting more and more acceptance of advanced recycling.

I think our view is, as we go into high-value applications, that is going to be the way that we tackle this. Mechanical recycling will still be there but in those cases, I think you're going to see more mechanical recycling into more durable type applications, different end markets.

We see the same trend in silicones, silicones especially in Personal Care. We see the trend in automotive, all the automotive OEMs and manufacturers are looking for -- to be able to make claims on sustainability on their products. That even goes into polyurethanes for seating and cushioning. And so the project we announced last year in France for full recycle of polyurethane foams, strong demand for those in the automotive sector.

Now, the supply is not there yet. And they all want more supply faster and supply challenges, making sure that that's all cost competitive. And they just don't have a blank check to write for these materials. It is going to be more expensive than virgin materials. And I think they're all getting their hands -- heads wrapped around that. Just like the whole discussion we're having now about a focus too much towards renewable energy really drives up the energy cost for the whole complex. And so that's a big debate right now, and that's why we're very disciplined about our approach and making bets that we think will be low cost in that future and also will be the quality that customers need for their end product.

Operator

We will now move on to our next question from Kevin McCarthy of Vertical Research Partners.

Kevin William McCarthy ***Vertical Research Partners, LLC - Partner***

Jim, I was wondering if you could expand on your outlook for volume growth. I think you indicated a target or projection of 6% growth, which is quite a bit above the minus 4% that we saw in the fourth quarter. You touched on supply constraints, maintenance turnarounds and dual control actions in China. Is it the case that fourth quarter was unduly depressed by these sort of fleeting or temporary effects such that it will come back quickly to 6%? And if so, might that happen as soon as the first quarter? Or do you think that takes longer or more patience as the year progresses?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes. Kevin, it's a very good question, and we will ramp into this as we go through the year. Think about it this way. It was this time last year, I think it was February last year that we had the freeze in Texas. It took pretty much the whole state of Texas down. A lot of capacity came out -- and we -- by March, we were back and we ran hard through the month of March. What happened during that time was inventories got depleted pretty much through the chain. And then we had a very strong second and third quarter.

So there wasn't a chance to really rebuild any inventories. We had an October hurricane, again, pressure on inventories, and then we had logistics constraints all through the year. In fact, March was our best marine pack cargo exports after the freeze. And December was the best month we've had since March. So it took that long to really kind of scale back out of it. So gradually, we're seeing improvement month by month on marine pack cargo exports. We were constrained by the fact that there if you had inventory, it might not have been in the right grade for a customer. We were constrained a little bit by comonomers. Comonomer is very tight for the higher alpha olefins sector. And we're constrained by logistics. And so that's -- and the Terneuzen situation then in Europe, obviously put a curtailment on taking orders in the fourth quarter. So I think that's a bit of an anomaly that was specific to those issues. But I think the underlying demand growth is still there, and the order book is still strong.

Operator

We will now move on to our next question from John McNulty of BMO Capital Markets.

John Patrick McNulty ***BMO Capital Markets Equity Research - Analyst***

So I guess maybe 2 related things. On the supply chain impact that you guys had in terms of the hit to volumes in the quarter, can you help us to understand what that was? And then maybe a little bit more broadly, when you think about the really tight freight and logistics markets right now and the impact that they're having on some of these very wide arbs, I guess, how are you thinking about how that plays out as we look through the rest of 2022?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

I think a good proxy for the supply chain impact would be to look at the Asia volumes year-over-year, and that will give you a good -- because we had a strong fourth quarter last year. And so that would give you a good indication on the age of volumes. So if you look at our fourth quarter sales volumes, they decreased in Asia, and that's mostly obviously China.

And so I think you can look at that and see that opening back up, and that will drive some of that 6% growth. And then obviously, we have other markets that we serve out of the Gulf that will come back. And some of that outage time was in Europe. And Europe is really sized for the domestic market there. And the business in Europe Q1 has been strong. There hasn't been an issue with demand in Europe. So I think we'll work through that.

Team is working hard on the reliability and availability of schedule. That's been the biggest challenge, is you've got something scheduled and then worker shortages, because somebody has tested positive for Omicron means they're not able to pick it up. That's the hand-to-hand that the team is dealing with right now.

Operator

We'll move on to our next question from Duffy Fischer of Barclays.

Patrick Duffy Fischer ***Barclays Bank PLC, Research Division - Director & Senior Chemical Analyst***

Two questions. The first one, on your JVs, EBITDA is down a couple of hundred million dollars, but cash equity dividends to you are up. Can you walk through the puts and takes on that? And then how should we think about those 2 moving together going forward?

And then maybe more broadly, just on dual control, now that you and the government there have had the opportunity to kind of go back and forth on some stuff, what do you think the impact in '22 is going to be on your business from dual control? And what do you think it's going to do to your end markets?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Howard, you've got a good line of sight on the JV. So you want to take a shot at that?

Howard I. Ungerleider ***Dow Inc. - President & CFO***

Yes, sure. Duffy, yes, equity earnings were up year-on-year. They were up 224 -- well, they were $224 million, up $118 million, really, gains in Kuwait, Thailand and JV primarily in P&SP in our Industrial Solutions business. And you're right about cash. So our dividends are -- they come a year in arrears. So if you think about it, the reason why the cash was down this year is because earnings last year were lower in 2020 versus 2019. Obviously, the equity earnings were up in 2021. And so that's why this year in 2022, we're guiding that the dividends will be up about $250 million. So you should model in about $500 million to $600 million. We targeted the midpoint of $550 million of higher cash from our JV dividends in 2022.

James R. Fitterling ***Dow Inc. - Chairman & CEO***

In China on dual control, Duffy, the biggest thing that we had our eye on was, obviously, silica metal for silicones is an energy-intensive process. And early on, there was some concern that China was going to curtail some of that manufacturing. We were able to move some silicon metal from Brazil because we have production there as well to kind of offset. But that's why in the fourth quarter, we pulled some turnaround time into the fourth quarter for Zhangjiagang, for silicones, and that's done now.

And over the course of the fourth quarter, both our industry and the solar industry made sure it was obvious to the Chinese government that the impact that, that would have on solar PV market and on our market as well. So right now, those assets are not under the dual control curtailments. We keep a close eye on that.

We are not in some of the other locations that have been more impacted by dual control. And I think it could be positive for imports, for polyethylene, although I haven't seen that yet. So we just keep a close eye on it. But I think for silicones, we're in a good track. We're going to -- we're up and going to have a strong first quarter there. And the market demand and the volumes are good.

Operator

We will now move on to our next question from Alex Yefremov of KeyBanc.

Aleksey V. Yefremov ***KeyBanc Capital Markets Inc., Research Division - Research Analyst***

Howard, I wanted to follow up on your comment about $275 million of sequential margin pressure in the first quarter. If you get any of the $0.08 of polyethylene price increases that you nominate, does this number become better or does it include the $0.08?

Howard I. Ungerleider ***Dow Inc. - President & CFO***

Yes. I think you -- I think you've really -- you've got 2 moving parts, so really 3. You've got how much volume we can get, which will be the total margin dollars, you've got the price and then you've got the cost structure. I mean clearly, what we're seeing is elevated natural gas prices in the U.S. and also significantly higher Brent pricing, which will impact naphtha. So certainly, in Europe, our cost structure is going to be higher.

But I think the points that Jim mentioned earlier, demand is very strong. And so you are likely going to see higher prices around the world. It is too soon to tell about Asia to the point that Jim made about Chinese New Year. We'll see what happens. But you've got good global GDP, you've got good manufacturing output. You've got good consumer spending. That will drive demand growth. And with the higher feedstock cost, whether it's on a natural gas basis, in the Americas or oil, Brent, naphtha, in the rest of the world, that will put pressure on price. So the best that we can do is -- our view is that minus $275 a margin, offset by $125 million of favorable net positive sequential turnaround. And that's how you get to that 2 8 plus or minus number.

Operator

We'll now move on to our next question from Arun Viswanathan from RBC Capital Markets.

Arun Shankar Viswanathan ***RBC Capital Markets, Research Division - Senior Equity Analyst***

Congratulations on a strong year there. I guess we've talked a lot about the polyethylene market. So maybe I could also just get you to guys to elaborate on your outlook for polyurethanes, as well as silicones. Could you just comment on those 2 markets as well?

James R. Fitterling ***Dow Inc. - Chairman & CEO***

Yes, Arun, thank you. Polyurethane market strength and furniture and bedding, appliances, construction, everything related to housing is very good. In that segment, II&I segment also Industrial Solutions, market strength, pharma, home cleaning, food, we have some feed additives in there, crop defense, intermediates for crop defense and electronics are all very strong. And what you see is that the supply/demand is very constructive to the middle of this decade, whether you're looking at MDI, polyethylene -- propylene glycol or ethylene oxide and ethylene oxide derivatives. So all very strong through mid-decade.

We think that even though automotive is a little bit constrained right now because of semiconductor chip shortages, we expect that's going to ease throughout the year and especially in the second half, it's going to be better. Light vehicle production estimates for this year, about 85 million units around the world, that will be up from last year so that's positive. Electric vehicle trends are good for us. There's more content on an EV for us than there is on internal combustion engine vehicle, but both of them continue to look good. So I think that's good.

A little bit slower, our operating rates on propylene oxide because the new capacity has come on. But net-net, so the systems business, which is a strong driver of the profitability is going to be good. Just to give you an example, on building and construction, we're looking at kind of 4% market growth rate similar to last year; electronics, 6. And so I think we've got a good trend in front of us.

Pankaj Gupta ***Dow Inc. - VP of IR***

I think that's all the time we have today. So thanks, everyone, for joining our call. We appreciate your interest in Dow. For your reference, a copy of our transcript will be posted on Dow's website within about 24 hours or so.

This concludes our call. Thank you very much.

Operator

Ladies and gentlemen, this concludes today's conference call. Thank you for your participation. You may now disconnect.