Global Manufacturing Prospects 2022

The CEO view: Supply chain resiliency helps achieve a twin transformation

KPMG International

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Foreword

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KPMG International has polled CEOs of large manufacturers to find out what is top of mind as they prepare for the challenges of 2022. The result is a report that covers the opinions of chief executives in 11 countries in Europe,

themselves against and learn from, as they decide where to invest, whom to hire and how to position themselves for the opportunities and difficulties to come.

In the preparation of this report, it became clear that the pandemic, climate change and geopolitics are driving executives to focus even more than before on a twin transformation: smart digitization and a focus on environmental, social and governance (ESG) goals. Faced with skills shortages and growing demands for change from workers, customers and investors, the need to acquire technologies that will transform the entire value chain has become more urgent than ever.

But the acquisition of technologies, such as artificial intelligence and 5G networks, do not happen in a vacuum. If companies are to restructure successfully, the entire executive suite must lead with a clear vision of where they want to go and how to take the company there. This report, we believe, will help provide CEOs with a map — of the future of manufacturing. Read on to see how KPMG International analyzes the opinions of CEOs to provide signposts for a transformative road map.

About the survey

KPMG International polled 146 CEOs of manufacturers in mid-2021. Forty-seven percent are at companies of $1 billion to $10 billion in revenue and 29 percent are at firms with more than $10 billion. Eighteen percent of the companies are headquartered in Germany, 17 percent in the US and 15 percent in China. The rest are located in Asia, Europe, Australia and Canada.

Resilience is a top priority

CEOs at manufacturers have learnt two important and related lessons from the pandemic: the vital importance of a resilient supply chain and the need to invest in new technologies to strengthen resilience, by *both* avoiding business disruptions *and* taking advantage of them. If manufacturers take timely actions to ensure a healthy supply chain, it may enable manufacturers to withstand economic shocks in the future and improve competitiveness.

When asked in the KPMG International survey about the impact of the pandemic on their organizations in 3 years' time, more than two-thirds (68 percent) of CEOs say they aim to ensure their supply chain is resilient in the event of a global lockdown. The focus on resilience is the top answer to this question and reflects a new priority. "The need for resilience is forcing companies to be more agile and make decisions faster. Digitization plays a vital contribution to this," says Grant McDonald, Global Industry Leader, Aerospace and Defence at KPMG International.

What impact do you foresee the COVID-19 pandemic having on your organization in 3 years?

Source: KPMG 2021 CEO Outlook

The pandemic is not the only disruptor of the supply chain; geopolitics is also playing a big role. Near-shoring is one method of reducing supply chain risk. "Manufacturers in Western Europe are achieving financial success building factories in Turkey, Hungary, Poland and Romania with costs that are competitive with those in China," says Kaveh Taghizadeh, Partner, Consulting, Value Chain Transformation at KPMG in Germany.

Another way to mitigate risk is for manufacturers to gain deeper insights into their supply chains. To do this, OEMs will likely have to track their supply chains to at least the level of tier 4, which is very difficult, notes Stéphane Souchet, Global Head of Industrial Manufacturing at KPMG International. To do so entails big changes in the way manufacturers operate. "Companies are moving from just-in-time supply chains to just-in-case and are diversifying their sources of supply. If they plan to re-shore supplies closer to the target market, then supply chains will shorten. For Western Europe, this means shifting procurement to Eastern Europe and North Africa. In Asia, this means focusing on Vietnam, Malaysia and Thailand," he says.

Most definitions of resilience focus on three capabilities: the capacity to decrease vulnerability, the ability to change and adapt, and the facility to recover quickly from disruption.[1] There is no doubt that the events of 2020–21 showed how vulnerable companies were to unexpected dislocation. The pandemic had a particularly dramatic effect on manufacturing supply chains, leading to shortages of key components and rising costs. Managing supply chains certainly presented unique challenges. CEOs were asked to choose which of 12 categories of risk poses the greatest threat to their organization's growth; supply chain risk was the top choice by far.

> "It looks as if the world economy has reached a turning point: The US-dominated trading system appears to be de-coupling from the China dominated one."

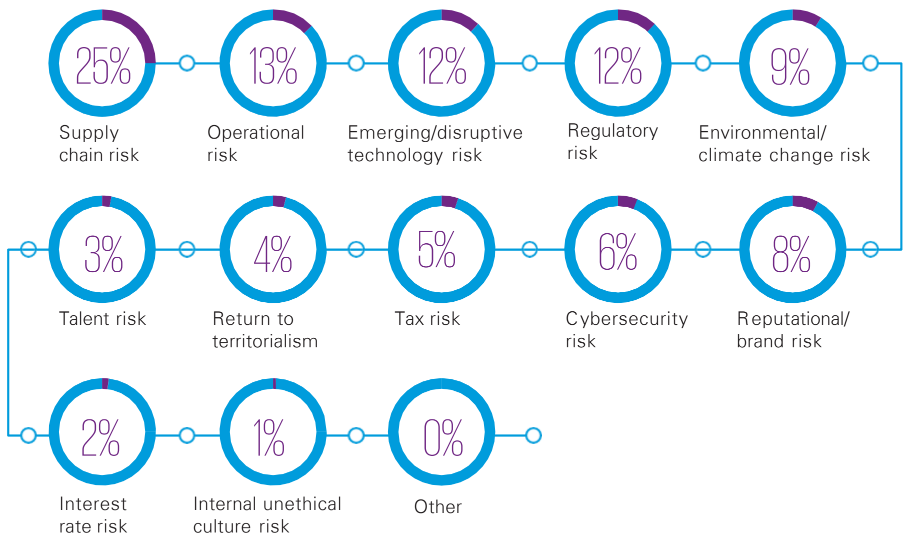
Kaveh Taghizadeh
Partner, Consulting, Value Chain Transformation
KPMG in Germany

[1] https://www.researchgate.net/publication/224144529_Perspectives_on_measuring_enterprise_resilience

"Companies are therefore changing their view of what resilience means and are building in some redundancies. A shift toward, 'just-in-case', systems reflects the importance of resilience," says Grant McDonald. "We have to redefine the security of supply chains. For civilian industries, security is about safety of supplies; for defense companies, it's about national security."

As a result, the supply chain has come to be regarded as a top priority by executives, not just for mitigating risk, but also to maximize opportunities. "The ability to manage supply chain risk gives companies a big competitive advantage. Board directors are taking a much more strategic view of supply chain risk and seeing it on a large scale," says Vinod Ramachandran, Partner and National Leader, Global Head — Industry 4.0, Automobile and Industrial Manufacturing, KPMG in India.

Which of the following risks pose the greatest threat to your organization's growth?



Source: KPMG 2021 CEO Outlook

New technologies' dual role

The renewed preoccupation with the supply chain is connected to the second big lesson of the pandemic — the need to invest in new technologies, both (1) to decrease vulnerability and (2) to accelerate the recovery of business from a massively disruptive event. Take the first part of these twin objectives.

Chief executives say that the top way to mitigate stress on the supply chain is to extend their company's monitoring deeper into the supply chain to anticipate changes before they have a severe impact. To do this requires technology that can track the myriad transactions, not only with their direct suppliers, but also to the fourth tier, or even further, if possible. This is not something most OEMs felt was necessary before the pandemic.

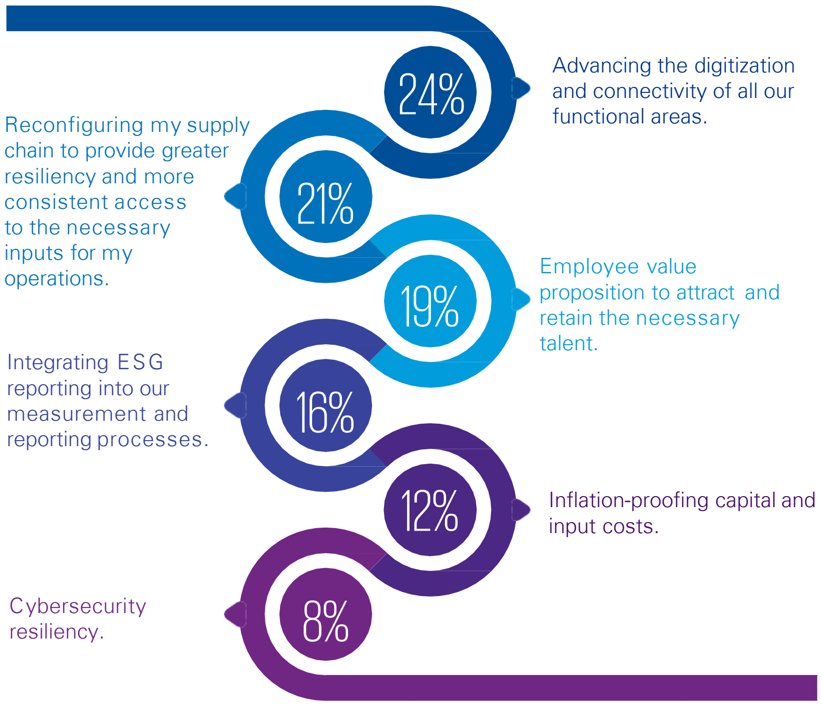
What is the top strategy you are using to mitigate stress on your supply chain in the next 3 years?

35%	Conducting monitoring deeper into our supply chain (i.e. tiers 3 and 4) to better anticipate any potential problems.
31%	Diversifying sources of input by adding new locations of inputs to make my supply chain more resilient.
22%	Onshoring more inputs in my supply chain to enhance our production and/or operational resiliency.
12%	Employing more strategic planning, like hedging program and longer-term contracts, to bring greater stability to our input costs.

Source: KPMG 2021 CEO Outlook

Artificial intelligence (AI) is one answer. "Manufacturers are adopting supply chain solutions which are AI-centered. These enable companies to manufacture, based on demand and supply data they analyze in real-time. The technology helps them to focus on ensuring that, at any vulnerable point in the supply chain, executives develop risk management around it. AI sits on top of ERP systems to help companies gain end-to-end visibility," says Vinod Ramachandran.

Which of the following will be your top operational priorities in order to achieve your growth objectives over the next 3 years?



Source: KPMG 2021 CEO Outlook

Another potentially game-changing technology is blockchain, but this is not always a realistic solution. "More enterprises are considering blockchain technology to improve the way they track the supply chain, but for it to work you need a broad array of suppliers, and many are not capable of using it, especially in tier 3 and 4," says Stéphane Souchet. "An electrical equipment maker may be able to extend the use of blockchain that far, but in metals and mining it is likely to be more difficult to do so."

A further method to improve visibility is to deploy technology to create supplier networks in which connectivity plays a pivotal role. "Digital marketplaces offer a way to connect suppliers and to improve transparency. But changing companies' attitudes is a challenge, because they are reluctant to share more information on volumes and prices," he says.

The second objective of new technology investment revealed by the survey is to use it to expand revenue more rapidly. According to the survey, the top operational priority to achieve growth objectives over the next 3 years is to invest in the digitization and connectivity of all functional areas. If integrated effectively, this type of investment may also improve agility and speed up innovation.

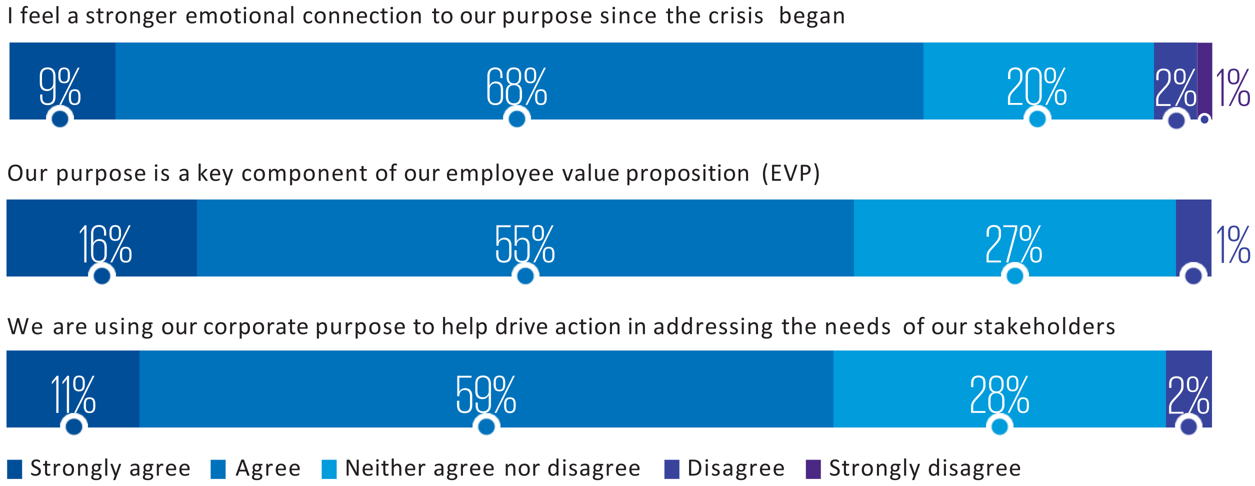
"In Japan, more companies need to take a 'lighthouse' approach to accelerate digital transformation," says Hidenori Sakata, Supply Chain practice, KPMG in Japan. "Choose a pilot factory or process and radically digitize the operations. Once the benefits are realized, roll it out to other factories."

Technology investments are also needed to mitigate the risk of cyber attack; CEOs say their biggest cyber worry is the possible impact on supply chains. Their highest priority in improving digital resilience in the next 3 years is to focus on the security of their supplier ecosystem. They expect this effort to bear fruit: Those who are confident their companies are prepared for future cyber attacks outnumber those who feel under-prepared by a ratio of more than two to one. Furthermore, CEOs of manufacturers understand that creating a cyber-aware culture is as important as technological countermeasures.

Renewed sense of purpose

COVID-19 did not just disrupt supply chains; it also jolted CEOs into pondering deeper questions, such as why they are in business. Some 77 percent of CEOs say they feel a stronger emotional connection to the purpose of their company since the pandemic began. In addition, 67 percent say the overall objective of their organization is the long-term value for stakeholders, almost five times more than the number focused on economic returns to shareholders.

To what extent do you agree or disagree with the following statements about the influence of purpose on decision-making?



Source: KPMG 2021 CEO Outlook

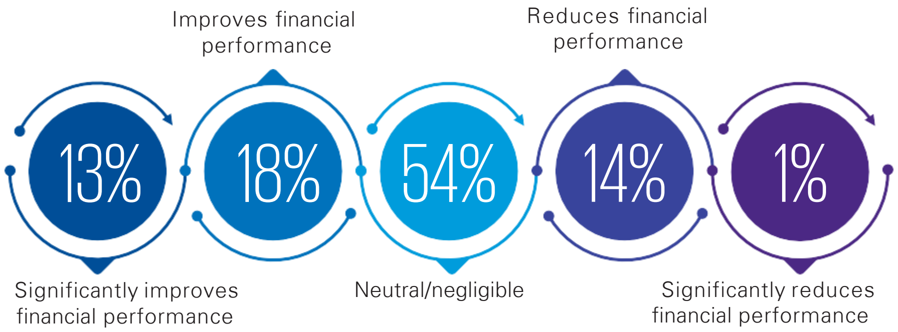
A focus on long-term returns, however, is easier said than done. After all, executives and investors have decried short-run thinking for decades. Now, opinions appear to be muddled. Surveyed CEOs say they want to create a sense of purpose by incentivizing their employees, but when it comes to environmental, social and governance (ESG) issues, they say they do not want their own personal performance to be measured by an ESG yardstick. What is more, CEOs of manufacturers acknowledge that progress on ESG goals is difficult to calibrate, yet 58 percent say they will not rely on external assurance to check the numbers that would show how far they have reached them.

This apparent inconsistency creates a problem for top executives. Almost half (48 percent) say they are under pressure from stakeholders, especially investors, to increase the transparency of their ESG efforts — five times the number who say the opposite. Yet 43 percent of CEOs admit they struggle to articulate a compelling ESG story. This difficulty might be because their approach to ESG appears to be pragmatic rather than visionary.

For CEOs, ESG is seen as a means to an end. This does not mean CEOs fail to see the urgency of the issue; they do, because approximately one-third of CEOs in the survey say that if they fail to meet stakeholder expectations in this area, it will affect recruitment and competitors will gain an edge. "Successful firms understand they need to articulate a compelling ESG strategy to attract talent; showing your commitment to ESG goals is one of the most effective ways of doing this. However, projecting an image has more influence on new hires than existing employees," says Stéphane Souchet.

Despite this admission, ESG is not seen primarily as a tool for growth by the CEOs surveyed. To be sure, a sizeable minority (31 percent) says a focus on ESG improves financial performance, but 54 percent say it has a neutral effect. Above all, 92 percent believe that conveying a sense of purpose will have the greatest impact on customer relationships.

Please rate the impact of your company's ESG programs on your financial performance.



Source: KPMG 2021 CEO Outlook

ESG to the fore

Of the three letters in ESG, CEOs say that they are focusing more on social issues than on environmental and governance matters, in response to the pandemic. For workers, a key component of social objectives is promoting diversity, which CEOs in the survey acknowledge helps with the recruitment of Generation-Z and millennial employees.

"Attracting new employees means leveraging all your efforts on diversity, equality and inclusion, and on training recruits. This includes creating successful, hybrid work processes. To keep skilled people, it's not just about the financial compensation, but also listening more carefully to their aspirations and what they care about, and not taking a top-down approach," says Stéphane Souchet.

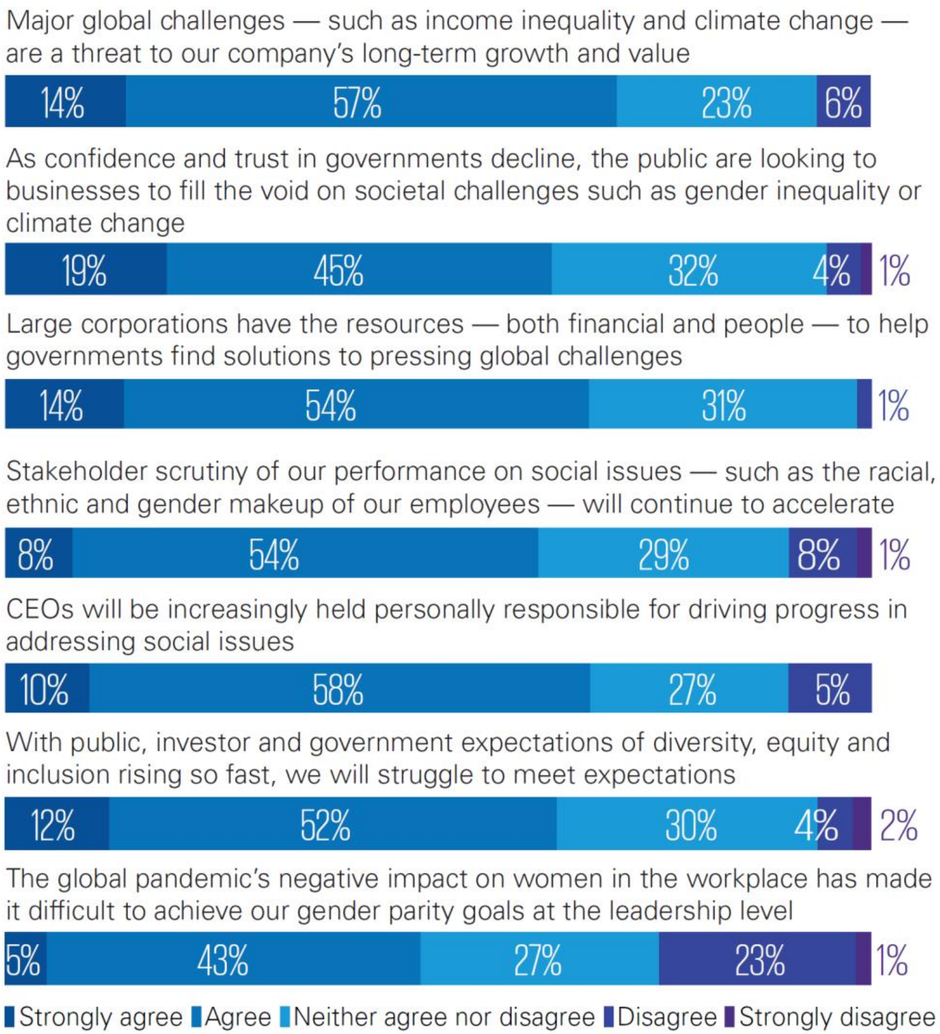
While emphasizing social objectives, CEOs are not ignoring environmental goals; 71 percent do see 'global challenges', such as income inequality and climate change, as the biggest threat to long-term growth. More than half (55 percent) say they will invest between one and five percent of revenue to become more sustainable, but this is not a huge amount, considering the global challenge of climate change.

CEOs do want governments to give them a leg up: 76 percent say it is up to governments to stimulate climate investments by the business community. But there will be a quid pro quo. "Governments won't be providing handouts; officials are saying that if companies do the right thing in terms of ESG goals, then they will receive things like tax concessions and R&D credits," Grant McDonald adds. "There's a new ecosystem of funding in this area, consisting of government, business, academia and foundations. The Canadian government is encouraging industrial partnerships and alliances of large numbers of companies to invest in green technologies."

“Manufacturers are aware they need to invest more in sustainable operations. They will likely have better opportunities for growth and innovation, if they think about it through an ESG lens. Shareholders are urging them to do this. Aero engine manufacturers, for example, are cooperating on the development of new energy systems.”

Grant McDonald
Global Industry Leader, Aerospace and Defence
KPMG International

To what extent do you agree with the following statements about CEOs playing an increasing role in addressing global challenges, from income inequality to climate change?



Source: KPMG 2021 CEO Outlook

A drive to decarbonize

New research by KPMG International in its report on the Net Zero Readiness Index shows that industry (both manufacturing and other industrial sectors, such as energy) is the sector with the highest degree of variability by country in terms of decarbonization progress and government action. The top five countries in terms of readiness for industrial decarbonization are, in descending order, Japan, Norway, the UK, Germany and Denmark.

Top five countries in industrial decarbonization readiness

Score based on a range of economic indicators.

Source: Net Zero Readiness Index 2021

Areas of focus include improving the efficiency of industrial energy consumption and an urgent need to address scope 3 emissions in the supply chain (i.e. all indirect emissions, other than the indirect emissions that come from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company). In the case of equipment such as jet engines, operational emissions far outweigh those required to build them, meaning industry has an even greater impact than its numbers suggest.

"There is an urgent need to address scope 3 emissions, although an increasing number of companies are taking accountability for them in emissions reductions targets, in response to customer and investor pressure," says Wafa Jafri, Director, Energy Lead Advisory, KPMG in the UK.

These findings are borne out by a separate study, published in 2021,[2] of the sustainability of the supply chain — a report co-sponsored by KPMG International. Among the areas of focus that have intensified most for manufacturers between 2020 and 2021 is energy saving and renewables.

[2]https://sscs.mit.edu/

More training and greater skills

A reason for focusing on social issues among ESG objectives is the growing need for skilled workers: 84 percent of CEOs say they plan to increase headcount in the next 3 years. However, since COVID-19 struck, they have had even more difficulty than usual in hiring them. Forty-five percent say they are investing in developing the workforce's skills to meet their growth objectives — and even more, 55 percent, say they are investing in new technology.

"Aerospace and defense companies are always in need of STEM graduates. For those in mid-career, employers need to do something different to ensure nobody is left behind. A lot of aerospace manufacturers have moved some operations to Mexico, creating training colleges and nurturing hubs around them, following the model of Montreal and Toulouse," says Grant McDonald.

Still, CEOs do see training as the most important factor in making a success of hybrid working, and they want to give their workers a strong voice on issues, such as climate change. Workers are likely to continue to work part of the time at home and part at the office. So far, this has been a mixed success. Productivity has not been impaired by hybrid work patterns, but team building and innovation have become harder. Certainly, the large number of resignations during the pandemic has become a big headache for CEOs.

> "Companies should try to ensure their skilled workers meet in person regularly, by making plans to do so and sticking to them. They must not fall into the trap of complacency with the status quo of hybrid working. Employees have to feel they are part of a team and part of a company, by meeting in person; otherwise, there is a risk that employees will drift away and find work elsewhere."

Kaveh Taghizadeh
Partner, Consulting
Value Chain Transformation
KPMG in Germany

What are the key success factors to ensure employees are engaged, motivated and productive in a world where hybrid work isincreasingly common?

38%	Investing in digital training, development and upskilling to ensure employees' skills remain future focused
37%	Having a strong voice on big issues that matter (e.g. climate change, racism or rising inequity)
35%	Focusing on employees' mental health and well–being
32%	Embedding inclusion, diversity and equity so no individual or group feels disadvantaged or disenfranchised
32%	Creating a purpose-led and values-driven culture where leaders 'walk the talk'
32%	Investing in the digital tools employees need in a hybrid work environment (e.g. collaboration tools)
31%	Listening to and acting on employees' ideas, perspectives and needs
30%	Creating a compelling vision of the future of work
18%	Creating flexible working practices
15%	Staying connected with and showing empathy for employees

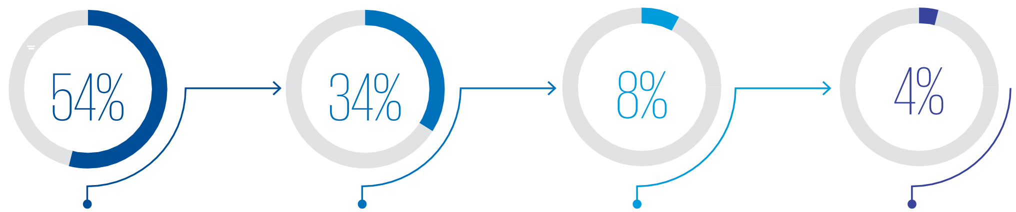
Source: KPMG 2021 CEO Outlook

Profiting in adversity

The economic dislocation of 2020–21 has created massive challenges for CEOs, but there is a positive side to the upheavals. The disruption caused primarily by the pandemic is seen by CEOs as a business opportunity, especially if they decide to take the initiative instead of being borne along by events. Seventy percent of CEOs say their companies are disrupting their industry, rather than waiting to be disrupted, and 70 percent see technological disruption as more of an opportunity than a threat.

One way to seize the opportunity is to do M&A deals, and 54 percent say they have a big appetite for corporate transactions. "In aerospace and defense, those companies that are the disruptors are the ones with the financial resources and an imaginative game plan to do M&A deals. The big prime contractors are lending money to lower-tier suppliers to keep them going. They are also taking stakes in new technologies via such firms as 3D printing firms; if they bought them outright, they would likely smother them," says Grant McDonald.

Over the next 3 years, how would you describe your organization's M&A appetite?



High M&A appetite — Likely to undertake acquisitions, which will have a significant impact on my overall organization.

Moderate M&A appetite — We will make acquisitions but with moderate impact on my overall organization.

Low M&A appetite — Unlikely we will make any acquisitions.

We are seeking to be acquired ourselves — Likely we will be the target of an acquisition or merger.

Source: KPMG 2021 CEO Outlook

Despite the enthusiasm for M&A, it is not seen by CEOs as the main route to faster growth; the top choices are the forming of alliances and organic expansion. "Deals in the future are more likely to be transformative than ones intended to increase market share. This goes for break-up deals, too. It's a sign of intense deal activity", says Stéphane Souchet.

The Malaysia Perspective

Looking ahead, the twin transformations relevant in Malaysia include:

Transformation 1: Smart Digitization

Supply chain resilience drives the need to invest in new technologies.

Original Equipment Manufacturers (OEMs) will likely track their supply chain to at least the level of tier 4 (raw material supplier)[1]. Companies are moving from JIT (Just in Time) to JIC (Just in Case) and diversifying their sources of supply. In this context, with the increasing demand for supply sources, it opens an opportunity for Malaysia as a net exporter for manufacturing industries, particularly serving the Asia Pacific OEMs in adopting near shoring method to reduce supply chain risk.

Companies are building in redundancies in their supply chains to gain competitive advantage. There is a need to extend the manufacturer's monitoring deeper into the supply chain to anticipate changes before they impact the supply sources. This can only be done with technology that is able to track myriad transactions, not only with their direct suppliers, but also to multiple tiers.

With the help of artificial intelligence (AI) in the supply chain management system, manufacturers will be equipped with smart predictions about customer demand, work-in-progress components and the need for raw materials in real time basis. Quick action and appropriate risks mitigation steps can be taken at any vulnerable point in the supply chain.

Some notable examples:

PETRONAS worked with AVEVA[2] and Amazon Web Services[3] in 2021 to deploy solutions to optimize supply and distribution network as well as operations dashboarding to assist in decision making based on the data gathered along the supply chain.

Microsoft Malaysia and **Seeloz Inc. (Seeloz)**, a Silicon Valley based supply chain tech company signed an MoU in August 2021[4] to offer a supply chain planning tool with AI technology to enhance major strategic sectors in Malaysia including, manufacturing, oil & gas, utilities, palm oil and public services. This is in line with the initiatives laid out in Malaysia's IR4.0 Roadmap and MyDigital blueprint. As part of the MoU, Seeloz will collaborate closely with Microsoft to upskill Malaysians through conducting accelerator workshops and hands-on labs.

[1] Supply Chain can be segmented into 4 tiers with Tier 1 being the assembly lines; Tier 1+ being the subcontracted assembly factories; Tier 2 as the component manufacturer or processing facilities; Tier 3 would be parts / equipment supplier and lastly Tier 4 generally refers to raw material suppliers. Supply chain tier can be extended depending on the complexity of the products.
[2] https://www.intelligentcio.com/apac/2021/12/08/petronas-avoids-equipment-failure-with-ai-infused-aveva-predictive-analytics-in-the-cloud/#
[3] https://www.thestar.com.my/business/business-news/2021/05/18/petronas-to-boost-digital-transformation
[4] https://news.microsoft.com/en-my/2021/08/17/bersama-malaysia-microsoft-partners-with-seeloz-to-reimagine-supply-chain-with-ai/

The Malaysia Perspective

> Digital transformation can be executed on a 'lighthouse' phased approach. Choose a pilot plant or production line and digitalize completely. Then a full-scale roll-out to other factories, or the entire plant can be performed once the benefits are proven and realized.

Alvin Gan
Head of Technology Consulting
KPMG in Malaysia

Transformation 1: Smart Digitization (cont')

During a pandemic, manufacturing companies must adjust their operations according to the demand of the moment, and may be forced to "shutdown, retool, resupply, restart" with little notice. This emphasizes the importance of starting the intelligent manufacturing journey by tackling supply chain, unpredictability and inflexibility in order to enhance essential factors such as safety, quality, productivity, cost, delivery, and morale.

This would also require a journey to data visualization, integration with advanced analytics (predictive and prescriptive) as well as symbiotic operations, all of which would improve overall resilience. Investment in digitization and digitalization of all functional areas within a company, if properly integrated, has the potential to boost agility and accelerate innovation.

The Malaysia Perspective

Transformation 2: ESG

Almost half of Global CEOs say that stakeholders, particularly investors, are pressuring them to boost the visibility of their ESG activities. Further observations captured were:

- Majority of the CEOs confess to having trouble telling a convincing ESG story.
- ESG is viewed by CEOs as a means to an end rather than a tool for growth.
- Slightly more than half of the manufacturers say they would not rely on third-party assurance to determine how far they have progressed toward their objectives.

Successful companies recognize that in order to attract talent, they must create a compelling ESG strategy, and one of the most effective ways to do so is to demonstrate your commitment to ESG goals.

Of the three letters in ESG, global CEOs say that they are focusing more on social issues than environmental and governance matters. conundrum.

Malaysia has a carbon neutral goal by 2050 and the 12th Malaysia Plan highlights carbon tax credits, and taxing companies burning fossil fuels by volume or weight of emissions. Manufacturing companies with high energy consumptions are expected to be impacted and should leverage sustainable practices to avoid or minimize these costs.

A promising example is Bursa Malaysia with its goal to be carbon neutral by 2022[6], along with Petronas, Tenaga Nasional Berhad and the Employees Provident Fund. Industrial players in Malaysia have also been actively participating in the Net Energy Metering program by installing solar power systems on factory rooftops to reduce carbon footprint.

Improving the efficiency of industrial energy usage and the urgent need to mitigate scope 3 emissions[5] throughout the supply chain are the top two areas of focus i.e., all indirect emissions, other than indirect emissions that come from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company.

"In Malaysia, forced labor issues have affected local companies particularly in the electronics, rubber glove manufacturing and palm oil plantation sectors. Companies are expected to be more proactive in conducting open discussions and take actions to improve labor welfare following the conundrum."

Phang Oy Cheng
Head of Sustainability Advisory Services
KPMG in Malaysia

[5] Greenhouse gas emissions are categorized into three groups or 'Scopes' by the most widely-used international accounting tool, the Greenhouse Gas (GHG) Protocol. Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company. Scope 3 includes all other indirect emissions that occur in a company's value chain. https://www.carbontrust.com/resources/briefing-what-are-scope-3-emissions

[6] Bursa Malaysia media release, 22 September 2021: "Bursa Malaysia Commits to Become a Carbon Neutral and a Net Zero Emissions Exchange"

Conclusion

Amid a period of transformative industrial change, the main lesson to be drawn from the CEO survey is an evergreen theme that is more urgent than ever: companies shift attention away from their supply chains at their peril. Operational effectiveness cannot be achieved without a resilient supply chain. This report's analysis of top executive opinion strongly supports the view that a healthy supply chain is likely to support a healthy manufacturer. But how can this be achieved?

The combination of a pandemic and climate change is accelerating digital transformation, as companies search for tools to mitigate new risks and maximize new opportunities. The survey suggests that CEOs may not yet have grasped that the goals of digital transformation and ESG are both consistent and work powerfully together. Digitization can mitigate supply chain risk and enhance sustainability, but CEOs need to see ESG as a strategic imperative not simply a means to an end. They won't likely have a healthy supply chain if they don't focus on ESG, and without a healthy supply chain, they will likely struggle to meet their long-term goals.

> "Manufacturers should now focus on a twin transformation: intelligent digitization and ambitious ESG goal-setting. If they are executed effectively, they are likely to reinforce each other to create a more competitive enterprise and a more habitable planet."

Stéphane Souchet
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