Predicts 2022: Supply Chain Strategy

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By Analyst(s): Simon Bailey, Marco Sandrone, Jennifer Loveland, Dana Stiffler, Heather Wheatley, Pierfrancesco Manenti, Sarah Watt, John Blake, Laura Rainier

Initiatives: CSCO Strategic Leadership; Supply Chain Head of Strategy Realization

Even as CSCOs steer supply chains through today’s short-term shortages and disruptions, our 2022 predictions will guide long-term focus. Use them to spur preparation for the rise of ecosystems, modular business redesign, augmented decision making and close gaps in ESG and DEI strategies.

Overview

Key Findings

- Unfamiliar risk events have reinforced customer and business expectations for more fluidity in supply chains. Ninety-two percent of supply chain leaders expect to adopt new business models within five years but they are struggling to mitigate risk because they lack visibility, collaboration and resource sharing with their trading partners.

- Regulatory pressure is likely to increase in the coming years as nation states respond to the findings of the latest IPCC report. Respondents in Gartner's 2020 Sustainability Survey report pressure to invest in the sustainability strategy is coming from customers (63%), investors (48%) and regulators (46%) in areas including GHG emissions reduction and packaging waste.

- Gartner's 2021 Supply Chain Diversity, Equity and Inclusion Survey finds only 23% of global companies have DEI objectives and report DEI metrics in their scorecards compared to 83% of leading organizations in Gartner's Top 25.

- Across many functions of the end-to-end supply chain, there is an extensive and expensive set of business processes that require humans to perform manual tasks and decisions. Customers are less and less willing to pay for these manual touchpoints and human interference.
Recommendations

CSCOs seeking to develop their strategic leadership vision should:

- Build the foundations of ecosystem success by working with IT to create the digital platform and find novel partners in value-aligned ecosystems.

- Address shortfalls in action versus commitments on sustainable packaging by engaging with cross-functional stakeholders across supply chain, R&D and commercial teams to fully vet existing and in-process sustainable packaging goals.

- Build composability to meet shifting supply chain requirements by adopting modular operating model designs that provide smart flexibility to rapidly reconfigure capabilities to tailor outcomes.

- Define how the supply chain can contribute to the realization of the corporate DEI commitments by defining metrics that allow the executive team to track DEI performance and drive desired outcomes.

- Prepare your supply chain to benefit from the use of machine learning to augment decision-making capability by developing an integrated, end-to-end digital roadmap.

- Create a more robust investment strategy to address stakeholder sustainability pressure around GHG emissions by working with finance to account for a steadily rising cost of carbon as low-hanging opportunities are exhausted.

Strategic Planning Assumptions

By 2026, more than 50% of large organizations will compete as collaborative digital ecosystems rather than discrete firms, sharing inputs, assets and innovations.

By 2025, 90% of public sustainable packaging commitments won't be met due to reliance on plastics and single use packaging.

By 2024, supply chains redesigned for modularity will operationalize business model innovations in half the time of competitors.

By 2024, 70% of global organizations will report metrics to track realization in supply chain against corporate diversity, equity and inclusion objectives.

By 2026, more than 50% of supply chain organizations will use machine learning to augment decision-making capability.
Analysis
What You Need to Know

In 2022 and beyond, chief supply chain officers (CSCOs) must update their vision to account for ongoing and as-yet-unimagined disruption to global networks, operating models and stakeholder demands. Some of these disruptions are externally driven — such as material shortages, climate-driven disruption, labor scarcity and fatigue. ¹ Others are driven by the organization’s own transformation plans. According to the 2021 Gartner View From the Board of Directors Survey, nearly five-in-ten boards of directors (BoDs) in manufacturing companies have accelerated their digital business initiatives in the wake of COVID-19 disruption. ²

Companies have developed the know-how to deliver traditional network operating outcomes, such as reliable, cost-optimized product supply and effective service delivery, during times of normal operating conditions. Many are struggling to adapt to today’s disruptions and have added a focus on risk-optimized growth events. The disruptions ahead require a broader focus. For CSCOs and supply chain leaders, this means an increased focus on areas of growing stakeholder concern, including sustainability and DEI.

Words and commitments are not enough on their own — the “say/do” gap must be closed with action. Our predictions also signpost ways that supply chains will address these and other emerging challenges by competing in new ways with value-aligned ecosystem partnerships, modular design practices and augmented decision-making processes that support a more autonomous supply chain (see Figure 1).
Figure 1: Five Critical Supply Chain Strategy Predictions for 2022

In line with this focus, we have chosen five new predictions that address the priorities of CSCOs and their board of directors. And we take a look back at two predictions to see whether they were hit or missed.
Strategic Planning Assumptions

Strategic Planning Assumption: By 2026, more than 50% of large organizations will compete as collaborative digital ecosystems rather than discrete firms, sharing inputs, assets and innovations.

Analysis by: Pier Manenti and Simon Bailey

Key Findings:

- As of 2021, 68% of supply chain executives report that they have been constantly responding to high-impact disruptions over the last three years. And 67% report they have not had sufficient time to recover from a disruption before another high-impact event has disrupted their supply chains again. The need to mitigate supply risk and increase the level of supply chain agility emerged as the most frequent reason why CSCOs want to create (or participate in) a partner ecosystem.

- Our 2020 Future of Supply Chain Survey found that by 2023, over half of supply chain organizations plan to share data across the partner ecosystem, establish common processes to operate it and have a technology platform in place to integrate with ecosystem partners.

- Gartner’s 2020 Digital Supply Chain Decisions Survey found that by 2025, 52% of supply chain organizations are planning to digitally orchestrate the end-to-end value chain from the customer upstream to suppliers by creating a digital ecosystem.

Market Implications:

The ability to leverage the capabilities of all the partners is the key to the ecosystems becoming the dominant competitive entity in the future. For example, the ability to share data that individual partners have sensed enables the entire ecosystem to respond to inputs that would otherwise be missed. Shared sensing of unanticipated changes in demand or notification of supply disruption across the entire ecosystem contributes to its resilience and adaptability.

As well as sharing data, ecosystems can pool other resources. Shared assets such as warehouse capacity, shared innovation and pooled investment can be joint action levers that mitigate risk or enable opportunities. The opportunity is to multiply the effect of value exchanges through an ecosystem. As the saying goes: “The whole is greater than the sum of its parts.”
Sharing of data creates a more transparent supply chain that provides the opportunity to dynamically connect upstream supplier capacities and operational status with a deeper understanding of customer demand. Ecosystems that share end-to-end supply chain information in real time will be able to support better and faster response to unexpected changes in supply or demand. CSCOs will want to leverage the data shared by the digital ecosystem to unleash predictive and autonomous planning that can anticipate unexpected changes in supply or demand.

Ecosystem partners can also share risk information that might include suppliers’ risk scores, disruption predictions or market intelligence. Traditional organizations tend to be particularly protective of this intelligence, considering it to be a source of competitive differentiation, whereas, in a value-aligned ecosystem intelligence is shared for the mutual benefit of all participants.

Here are specific examples we are seeing:

- **Arrow Electronics** is developing an ecosystem platform to drive innovation in its business model as the digital layer of its Supply-Chain-as-a-Service offering. The environment is where multiple partners connect into a multi-tenant digital platform and gain access to more information from which they can better run their supply chain. The more trading partners connect into the platform, the richer the ecosystem becomes in terms of the ability to leverage partnerships to innovate for value.

- **General Mills** employs a partner ecosystem, enabling regenerative agriculture, in its efforts to advance the purpose of the organization. This ecosystem allows the company to leverage its influence and extend benefits to its partners. General Mills is using its scale and influence to accelerate farmer adoption of regenerative agriculture, including investments in education, mentorship and peer networking, to advance the science and measure outcomes.

**Recommendations:**

- Prepare the organization to participate in extended ecosystems (not just suppliers but many novel partners) by building stakeholder consensus on the benefits of being part of a mutually beneficial ecosystem and overcoming internal resistance to sharing assets and intelligence for the benefit of the ecosystem.
Build your ecosystem partnering capabilities by being clear on how you determine value exchange, develop your ability to identify novel partners that bring complementary capabilities, fostering shared capabilities and measure, monitor and refine against clear principles of engagement.

Develop your ecosystem technology platform and connectivity by prioritizing investments in digitalization to increase the level and intensity of connections with trading partners. Work with IT leaders to adopt technology capable of real-time and secure data exchange such as APIs and blockchain.

Related Research:

Supply Chain Executive Report: Fostering a Digital Supply Chain Ecosystem

Supply Chain Executive Report: Shaping Supply Chain Disruption in a Volatile Risk Environment

Supply Chain Executive Report: Future of Supply Chain — Crisis Shapes the Profession

Strategic Planning Assumption: By 2025, 90% of public sustainable packaging commitments won’t be met due to reliance on plastics and single use packaging.

Analysis by: John Blake, Laura Rainier and Sarah Watt

Key Findings:

- Enterprise commitments to sustainable packaging have centered on 100% of packaging being reusable, recyclable or compostable by 2025. However, according to the Ellen MacArthur Foundation (EMF) 2020 Progress Report, among the public signatories to these commitments, some have shown little to no progress against these measurable targets. 

- Among the EMF Global Commitment signatories, less than 0.1% of plastic packaging has been reported as being compostable. Difficulties in application and access to industrial composting and the greenhouse gas (GHG) footprint of compostable plastics currently on the market have deterred organizations.

- Further, among the EMF signatories, the adoption of reusable packaging sits at only 1.9% of packaging used — 98.1% still in single-use format.
Market Implications:

Organizations that do not meet environmental packaging reduction goals or that are viewed as misleading consumers, are likely to face legal action by stakeholders. In addition, the continuing struggles of the recycling infrastructure and broken aftermarket for recycled materials will put further pricing pressures on those who are committed to or aspire to increase use of recycled packaging. The producers of over 95% of plastics globally have not yet committed to increasing the recycled content in the plastic resins they provide to their customers.  

Companies will also need to take action to limit the impact of the growth of Extended Producer Responsibility (EPR) legislation across the world:

- Many countries in the European Union, such as France and Germany, have long-established EPR programs.
- Japan, South Korea and South Africa and many other countries have followed suit.
- In 2021, Maine and Oregon passed the first EPR legislation in the United States.
- UK Packaging Waste Regulations are being reformed and new EPR legislation will be coming into force in 2023.
- Many Asian and Latin American countries have a series of legislation underway banning or dictating the use of packaging.

These factors will require organizations to innovate their business models, such as incentivizing consumers to embrace reusable packaging and developing in-store refill models with retailers. Efforts such as these will be needed to reduce single-use packaging as the infrastructure and aftermarket for PCR content will be limited for the foreseeable future.

Here is an example we are seeing:

- Seventy-one percent of global plastics (by weight) are not broadly recyclable. While chemical recycling technology promises to more efficiently recycle a wider range of plastics, these methods have not been broadly adopted.
Innovating and expanding business models often requires a “test and learn” mentality. Loop enables brands and retailers to make a shift from single use packaging to reusable packaging. Loop, just two years after its introduction via major CPG brands, is driving the resurgence of reusable packaging by partnering with retailers such as Carrefour, Kroger and Tesco and restaurant chains including McDonald’s and Tim Hortons. By 1Q22, Loop plans to be selling products in reusable packaging in 191 stores and restaurants worldwide.\(^8\)

**Recommendations:**

- Overcome inertia and poor coordination within the organization by moving beyond high-profile, brand-driven target setting to actionable and feasible targets based on packaging formats and the three- to five-year outlook for infrastructure and aftermarkets.

- Increase your organization’s access to nonvirgin plastics by driving supplier relationships and challenging your suppliers to be committed to producing sustainable packaging materials.

- Engage with local and national governments to drive improvements to recycling infrastructure, consumer education and aftermarkets for recycled plastics.

- Commit to driving scale in required areas of collection and recycling through pre-competitive partnerships to scale innovative recycling methods and packaging solutions.

- Create a pipeline of new products that don’t rely on plastics or single-use packaging by driving your organization to embrace upstream innovation to create new products and business models.

- Assure supplier base and manufacturing are fit for future use by assuring new product development (NPD) and investments in manufacturing are not at odds with long-term sustainability needs and commitments.

**Related Research:**

*Supply Chain Top 25: What the Leaders Are Doing to Enable Sustainable Packaging*

*Video: Sustainable Snacking Through Sustainable Packaging at Mondelez*
Supply Chain Brief: 5 Things Supply Chain Leaders Need to Know About Sustainable Packaging

Strategic Planning Assumption: By 2024, supply chains redesigned for modularity will operationalize business model innovations in half the time of competitors.

Analysis by: Jennifer Loveland

Key Findings:

Evolution of customer expectations, channel dynamics, product portfolios and financial models has been a reality for supply chains. Recent turmoil has reinforced supply chain expectations for more fluidity in customer and business expectations of supply chains. For years, the pace of strategic change has been accelerating as digital technologies enable new business models and ways of working. Unprecedented levels of disruption that will take quarters or years to stabilize will accelerate these trends. Critical drivers of business model and operating model evolution include:

- **Expanding digital business models**: Seventy-four percent of supply chain leaders expect to support new business models (e.g., product to services, pay-as-you-go, usage metered and subscriptions) as part of a digital business strategy by the end of 2022. Ninety-two percent of supply chain leaders expect to adopt new business models within five years of the current COVID-19 disruption.

- **Shift to selling solutions rather than just products**: When supply chains must support customer solution offers that combine personalized collections of products, data and services with ongoing value delivery, 80% customize processes to a large or moderate extent to support specific solution offers. At each phase of the service life cycle, over 20% create roles unique to those solutions.

- **Diversifying customer expectations**: Fifty-seven percent of supply chain practitioners say the ability of competitors to provide the “extremes” of product characteristics and delivery speed to match individual customers and/or consumer preferences is among the top five most critical contributors to changing how they define, organize and operate supply chains.

- **Increasing rate of disruption**: In a Gartner survey, 68% of supply chains indicate that since 2019, they have been constantly responding to high-impact risk events for which they weren't prepared. As disruptions increase, the quest to build site and partner redundancy in increasingly local-for-local supply chains requires more sites and partner resources within the supply chain.
Market Implications:

A critical source of competitive advantage for supply chains will be the ability to make operating model change easier, faster, safer and less costly. Modular operating model designs help create composability, breaking supply chain resources and processes into “LEGO blocks” of capabilities that can be quickly reused and reconfigured. Composability of supply chain modules enables tailored outcomes for various parts of the business to support growth. Operating model designs prioritizing modularity through commonality, standardizing connections for interchangeability and “good-enough” solutions that can be broadly adopted provide smart flexibility to rapidly operationalize innovation. Composability of modular supply chains shortens the time to create or capitalize on an emerging opportunity. Quick action can minimize the impact of an emerging threat or disruption. Higher composability has the potential to improve company competitive position by enabling faster time to market and reducing the costs and risks of disruption.

Here are specific examples from interviews conducted for Supply Chain Executive Report: Tame Complexity With an Operating Model Life Cycle: 12

- Cisco operationalized a separate supply chain to support a new business model selling optics and silicon as components to web scale clients rather than complete solutions. Existing supply chain capabilities were composed with seven points of new capabilities with less than a few dozen dedicated employees and taking less than 18 months.

- Roche leveraged unique capabilities, such as patient-based planning and zero safety stock at affiliate distribution centers (DCs), combined with traditional supply chain capabilities to allow effective service of less than a dozen patients with products that are high value, yet low volume. They rolled the pilot across 20 markets within a year.

- Unilever has built targeted sources of composability to support product portfolio evolution and shifting business needs. One example is their work to reduce time to qualify a new supplier from over a year to less than three months by pre-screening suppliers likely to meet qualification standards, using concurrent short duration e-auctions and finalizing qualifications remotely.

Recommendations:
Create a culture focused on the four principles of composability — modularity, autonomy, orchestration and discovery — by adopting a mindset that change is the means to new business value.

Enable modularity by creating independent, autonomous building blocks for modularity with common interfaces to allow rapid discovery and orchestration for new outcomes.

Shorten time to operationalize business model shifts by building composability in aspects of the operating model that are critical to address trends in customer expectations, channel dynamic and product portfolios for your company and industry.

Create smart flexibility to adapt swiftly, effectively and efficiently to shifting requirements by targeting operating model modularity to build composability in areas of complexity, volatility, risk, uncertainty or fluid requirements.

Tailor outcomes to different aspects of the business to enable profitable growth by building modularity to differentiate supply chain service and financial balance between cost, cash and capital outcomes.

Related Research:

Becoming Composable: A Gartner Trend Insight Report

Part 1 — Enable Competitive Advantage With End-to-End Supply Chain Segmentation: Segment Based on Customer Order Needs

Supply Chain Executive Report: Thriving in Constant Change

Strategic Planning Assumption: By 2024, 70% of global organizations will report metrics to track realization in supply chain against corporate diversity, equity and inclusion objectives.

Analysis by: Dana Stiffler and Marco Sandrone

Key Findings:
The COVID-19 pandemic and the social justice movement that originated in the U.S. in 2020 reminded the corporate world of the importance of diversity, equity and inclusion (DEI) in all aspects of society. Customers, investors and employees are becoming more aware and companies are now expected to meet increasing expectations from different stakeholders in this area.

Based on the 2021 Gartner/ASCM Supply Chain Diversity, Equity and Inclusion Survey:

- Forty-two percent of global companies have DEI objectives and report DEI metrics in their management scorecards.

- Eighty-three percent of an extended list of Gartner top 25 organizations (30 in total) have people management/employee engagement listed among their corporate priorities and measure the adherence to their objectives with metrics, such as percentage of women and other underrepresented groups in leadership positions.

- Supply chain organizations are not exceptions in terms of DEI expectations posed on businesses. Gartner research suggests that supply chain leaders have started improving their diversity efforts, as employees expect employers to take a stand on societal and cultural issues. In a recent survey of supply chain organizations by Gartner and the Association for Supply Chain Management (ASCM), it emerged that 62% of supply chain organizations are focused on dimensions of ethnicity/race as part of their recruitment strategy. It also emerged that most DEI initiatives in place at supply chain organizations prioritize education and awareness-raising (30%), followed by recruiting (20%) and integrated pipeline planning (20%).

**Market Implications:**
It’s become increasingly clear that less inclusive, equitable and diverse organizations will lose valuable talent, customers and investors. Preliminary data from Gartner’s upcoming 2021 Future of Supply Chain Survey \(^\text{13}\) shows between 50% to 60% of supply chain leaders are sensitive to how this will affect performance. They believe that over the next three to five years customers will intentionally shift their business to companies that demonstrate inclusive, equitable and diverse leadership and employee experience, even when it costs more. Employees too will act with their feet, and head to companies where they can be part of more diverse and inclusive teams, with equal pay and opportunity. Organizations have responded by strengthening the pipeline of female talent entering and moving up within the supply chain organization by enhancing “pull-in” initiatives, such as improved recruitment practices and integrated pipeline planning. In 2021, a focus on improving racial and ethnic diversity was the top focus for supply chain leaders (62%), with similar initiatives in play. \(^\text{14}\)

Here are specific examples we are seeing:

- Several organizations have been monitoring gender equality for a number of years, for example:
  - Philip Morris International \(^\text{15}\) aims to fill 40% of management positions with women by 2022.
  - Toyota Motor Corporation Australia \(^\text{16}\) has pledged to achieve a 40:60 gender balance by 2025, including senior levels.

- Meta \(^\text{17}\) has recently committed to a 30% increase in the number of people of color in leadership positions over the next five years. Other organizations who set similar targets are Alphabet, \(^\text{18}\) HP \(^\text{19}\) and RBC. \(^\text{20}\)

- Accountancy firm KPMG \(^\text{21}\) has become one of the first major U.K. firms to set a target for the number of senior staff from working-class backgrounds. The group wants 29% of its partners and directors to come from a working-class background by 2030, which it defines as having parents with “routine and manual” jobs, such as factory workers and care workers.

**Recommendations:**
Define how the supply chain organization can contribute to the realization of the corporate DEI strategy by starting from the strategic priorities that are instrumental for corporate success. If people management and/or employee engagement are part of your corporate goals, clarify inside and outside the supply chain group how the supply chain organization’s goals connect up to the corporate DEI goals.

Define a set of lagging metrics that allows the executive team to track the high-level DEI performance and the achievement of the expected outcomes. Percentage of underrepresented talent out of total workforce representation is a case in point. Diversity can be assessed on the basis of gender, racial/ethnic minority, sexual orientation, gender identity, disability status or veteran status. Pay equity is also a lagging metric that could be assessed.

Enable root cause analysis and corrective actions by establishing a set of leading metrics to monitor the functional activities that support achieving the business outcomes. If your objective is to increase the representation of underrepresented talent in the supply chain organization, a metric that indicates how likely the organization is to meet this objective is “percentage of underrepresented candidates receiving interviews.” While the number of underrepresented candidates considered for a position is not a business outcome, a well-designed recruitment process should lead to achieving the objective to build a diverse team.

Related Research:

Ignition Guide to Developing a Diversity Recruitment Strategy for Supply Chain

2021 Supply Chain Diversity, Equity & Inclusion Survey: Commitment Skyrockets, Requires Follow-Through

2021 Women in Supply Chain Survey Shows Resilience, Improvement in Representation

Strategic Planning Assumption: By 2026, more than 50% of supply chain organizations will use machine learning (ML) to augment their decision-making capability.

Analysis by: Pierfrancesco (Pier) Manenti

Key Findings:
Market Implications:

Over the next 10 years, people and businesses will continue to progressively delegate the authority of decision making to physical robots and software intelligent assistants. CSCOs must prepare their supply chain by embracing hyperautomation technology and by responsibly managing its implications on the workforce.

Hyperautomation involves the orchestrated use of multiple technologies, tools or platforms, including AI, ML and RPA. Hyperautomation is an unavoidable market state in which organizations must rapidly identify and automate all possible non-value-added human activity to remain cost-competitive. The cause of this is an extensive and expensive set of business processes — across many functions of the end-to-end supply chain — that require humans to perform manual tasks and decisions.
The most frequently discussed use cases for hyperautomation include transactional processes automation (order entry, for example) and complex decision making (scenario planning, for example). Decision making in the supply chain will progressively move from a “form of art” — where decisions are based on gut feeling and experience — to a fact-based decision-making capability. Hyperautomation will eventually augment humans’ decision-making capabilities and support the creation of an autonomous supply chain. Such a supply chain of the future will be able to automatically plan in real time and run automated operational actions in a frequent, granular and cost-effective way.

Improving decision making through the use of advanced analytics and AI (AA/AI) is rated highly by supply chain users in companies of all sizes and across all industries and geographies. Respectively, 70% and 63% of respondents to Gartner’s 2020 Supply Chain Technology User Wants and Needs Survey said they are currently investing, or planning to invest, in advanced analytics or artificial intelligence. This shows very high demand, but how different types of companies typically look to invest in emerging technologies cannot be overlooked. In the same study, Gartner found that 61% of respondents identified as either mainstream (41%) or conservative (20%) adopters of technology. Typically these types of adopters are cautious when buying and tend to invest in packaged solutions. This is because they are more risk averse than aggressive-adopters that will often buy or build early-stage solutions often from raw building blocks like an AI engine.

Here are specific examples from interviews conducted for Supply Chain Executive Report: Pursuing an Autonomous Supply Chain With Hyperautomation:

- Intel’s autonomous planning uses ML to autonomously analyze results from the planning engine and explain plan changes cycle over cycle in great detail, including what drove particular changes. It can identify the need for a new plan and then start an auto-run. If the scenario meets all stated goals, it can autonomously publish it as the plan of record for the company. It’s also able to create a knowledge base that gets stronger over time by accumulating supply chain knowledge and expertise.

- Nestlé is deploying hyperautomation to make its order-to-cash process more automated and intelligent. The company is exploring ML technologies that can predict different customer ordering patterns, estimate risks, forecast short-term customer orders, propose different allocation scenarios and autonomously make real-time adjustments to the allocation.
Siemens is rolling out a brand-new predictive demand planning (PDP) capability based on machine learning. The proof of concept has demonstrated it yields better forecast accuracy and huge productivity, in a context of frequent changes to the product portfolio and demand variability. The core of PDP is an ability to select the best-suited prediction for each time period automatically, through the “Champions model” selection.

Recommendations:

- Leverage emerging technologies such as RPA and ML to rapidly identify and automate non-value-added activity and augment more complex decision-making by working closely with the CIO and creating fusion teams.
- Support people through this transformation by leading digital skills development programs and by recruiting new skills externally.
- Navigate the transformation by developing an integrated, end-to-end roadmap that is driven and prioritized by the business case.

Related Research:

Supply Chain Executive Report: Pursuing an Autonomous Supply Chain With Hyperautomation

Video: Predictive Demand Planning at Siemens

Video: Intel — Autonomous Planning

A Look Back

In response to your requests, we are taking a look back at some key predictions from previous years. We have intentionally selected predictions from opposite ends of the scale — one where we were wholly or largely on target, as well as one we missed.

On Target: 2021 Prediction — By year-end 2030, limited sequestration capacity will more than double the cost of carbon, invalidating weak GHG ambitions that rely on carbon offsets and sequestration technology breakthroughs.
CSCOs need to note the acceleration of carbon pricing adoption within organizations, the inflating unit price per ton of CO2e and the limitations of offset strategies. At the time of the original prediction, one in five of the 2,000 largest global companies had net zero pledges, and that has now risen in nine months to one in three. What this means for CSCOs is that they need to factor in a higher cost of carbon into their investment decision making processes.

This “predict” was made in March 2021 by Gartner’s Energy and Utilities team. The aim of the predict was twofold:

- To advise Gartner clients that in economic terms, GHG emissions represent a negative externality, which had either not been effectively or correctly priced — and so they should expect the cost of carbon to rise over the decade.
- To caution companies from overreliance on carbon offsets or sequestration. It is likely there will be insufficient natural or manmade offsets to support the acceleration of net-zero emission targets being set.

So how has this prediction been hit so quickly? COP26! After six years of haggling, countries finally agreed to the Article 6 rules governing trading of emission reduction units. This had been hanging over from Paris and now, the agreed Article 6 rules will eliminate double counting and create a framework that ensures proper accounting of voluntary carbon markets.

There are many ways of pricing carbon — from internal shadow pricing and internal carbon taxes that companies can use to drive their ROI calculations on investments, to external market mechanisms such as border taxes and emissions trading schemes (ETS). (For a fuller explanation of carbon pricing, see Quick Answer: What Does the Energy CIO Need to Know About Carbon Pricing.) One of the more well-established markets is the European Union ETS. In January 2021 their carbon price stood at €32, and on 12 November it was €64. Now that 196 countries have signed off on Article 6, the cost of carbon around the world will need to come in line. If not, the EU has indicated it is investigating the option of a carbon border adjustment mechanism (CBAM) to ensure the cost does not create an uneven playing field where imported goods have not accounted for the carbon externality.
Now that our prediction on the doubling of carbon price has already been reached, let’s turn attention to the second part of the prediction regarding the feasibility of achieving net zero pledges through carbon offsets or sequestration. As companies push the scale and pace of efforts to achieve net zero, they will exhaust the availability of cheaper carbon offsetting such as tree planting, the liquidity of the carbon futures trading will have decreased and still the capacity of carbon sequestration will yet to have been scaled. It is therefore important that companies setting internal carbon prices, shadow price or internal taxation schemes should connect these initiatives to current or anticipated market carbon prices. Or they should be otherwise factoring in carbon costs into their mid- to long-term strategy and business model. This enables the enterprise to position for future conditions and make sound longer-term investment choices. Enterprises must plan for escalating costs:

- **Carbon reduction:** Many carbon reduction strategies are profit positive or neutral (e.g., switch to green energy tariffs through Power Purchase Agreements, energy efficiency initiatives or insulation). But alone, they will not allow most companies to meet their net-zero pledges. Shadow pricing schemes must account for changing market conditions, with steep cost for abatement for Scope 3 emissions. CSCOs with difficult to reduce dependence on fossil fuels, such as natural gas, may face an abatement cost cliff as natural gas technology substitutes, such as hydrogen, may not be available at scale.

- **Carbon sequestration:** There are insufficient natural sequestration resources to support global collective net-zero ambitions. Studies indicate that reforestation of this magnitude — approximately the size of the U.S. — is possible but would introduce significant land use issues. These land use issues create competition between biofuel, food and offset through tree planting schemes. Reforestation offsets, when executed poorly, can lead to monoculture diminishing biodiversity.

**Recommendations:**

- CSCOs must align internal carbon pricing strategies against current or anticipated market mechanisms, such as emission trading schemes. Be mindful of additional costs, through carbon border taxation schemes.

- Holistic carbon costs must be factored into decision making by including it into key processes, such as capital investment in new manufacturing capacity.
CSCOs with high dependence on natural gas combustion or producing fugitive emissions should assess whether operational carbon capture and resale as a buy-product is a viable financial proposition.

Work with your CFO to modify environment, social and governance reporting to include carbon impacts and evaluate adjusting the chartered accounts to reflect an internal carbon shadow price or internal carbon tax. Use that elevated price to accelerate momentum behind carbon emission reduction plans by factoring it into ROI calculations.

Related Research:

How Energy Executives Can Get Ahead of Environmental Risks With Strong Greenhouse Gas Commitments

4 Supply Chain Sustainability Leadership Actions in Response to the IPCC Report

Quick Answer: What Does the Energy CIO Need to Know About Carbon Pricing?

Missed: 2019 Prediction — By 2021, 70% of Global 250 companies will disclose the financial risks of climate change in response to intensifying shareholder interest.

While the carbon pricing prediction has been met early and the number of net zero pledges is accelerating, our missed prediction shows that even the world’s largest companies are behind the curve in disclosing the financial risks of climate change. At the time the ‘predict’ was made back in 2018, the KPMG Survey of Corporate Responsibility Reporting 2017 revealed that only 48% of companies acknowledged climate change as a financial risk in their annual reports. The KPMG International survey, “Towards Net Zero: How the World’s Largest Companies Report on Climate Risk and Net Zero Transition” shows that by the end of 2020, the number had risen to 56%. This was despite the World Economic Forum top risks by likelihood in 2021, in which four out of five risks were linked to the impacts of climate change.

Research shows that companies are now beginning to report, though not as quickly as originally expected. International organizations such as the Taskforce on Climate-Related Financial Disclosures (TCFD) are enabling this pursuit by providing clear guidance. This, coupled with national initiatives and technology evolution in this area, will drive up the number of organizations reporting.
National initiatives to support reporting are now moving at pace, with the U.K. Government launching proposals in March 2021 to make climate-related financial disclosures mandatory from public listed companies, large private companies and limited liability partnerships. 32 This is supported in the U.S., with the SEC making a statement in September 2021 confirming that “a number of its disclosure rules may require disclosure related to climate change.” 33 Furthermore, the European Union has proposed a Corporate Sustainability Reporting Directive that aims to ensure companies report the information that investors and other financial market participants require. 34

Outside of the U.S. and Europe, China and India have also set reporting requirements. 35,36 This supports our expectation that we will see a large increase in both the coverage and quality of reports in the next five years. While these overall trends will increase disclosure, we have not seen this materialize broadly. Forty-four percent of the world’s 250 largest companies (G250) do not yet acknowledge climate change as a financial risk to their business in their corporate reporting. 37

Recommendations:

- CSCOs must identify the relevant standards and frameworks, and align the climate strategy with the ones that matter the most to their organization, such as TCFD.

- Ensure that your supply chain keeps up with the changing reporting standards and disclosure practices by assessing each area of carbon inventory, climate impact, carbon expenditure and climate risk.

Related Research:

What Do I Need to Know About Carbon and Climate Accounting Standards?

Quick Answer: Using Green Premium Calculations to Assess Investment in Clean Technology

Infographic: Race to Net-Zero Greenhouse Gas Emissions
Evidence

1 The Gartner Supply Chain Research team conducted more than 70 interviews with CSCOs from large and midsize enterprises to study various approaches supply chains take to mitigate risk. Additionally, throughout December 2020, the research team sent out invitations to complete an online survey to a wide group of heads of supply chain globally. We received 262 completed responses during the survey period for this Gartner Supply Chain Signature Series Risk Survey. We analyzed the data using a wide range of statistical procedures (e.g., simple t-tests, multiple regression analysis, and factor and cluster analyses).

2 2021 Gartner View From the Board of Directors Survey. This survey was conducted to find out how boards of directors (BoDs) view digital-business-driven business model evolution and the impacts on their enterprises. It also aimed to help understand BoDs’ expectations of executive leaders and how BoDs translate their board focus to actual executive actions and overall corporate performance.

The survey was conducted online from May through June 2020, among 265 respondents from the U.S., EMEA and Asia/Pacific.

Companies were screened to be midsize, large or global enterprises.

3 2020 Gartner Future of Supply Chain Survey. In September and October 2020, Gartner Supply Chain Research sent invitations to complete an online survey to its community members, to Gartner clients, and to a wider group of practitioners in supply chain and other functions globally. We received 1,346 completed responses during the survey period for this 2020 Future of Supply Chain Survey. We had participants across industries, e.g., high tech (20%), healthcare and pharma (14%), CPG (11%), industrial (10%), food and beverage (9%) and retail (9%), and most worked in supply-chain-related functions, e.g., supply chain (49%), logistics/transportation and distribution (9%), purchasing/procurement (9%) and operations (7%). Of the respondents, 57% were from North and South America, 29% were from EMEA, 13% were from Asia and Australia and others were from the rest of the world. Additionally, 63% of the participants were from $10 billion-plus companies, and 62% of the participants were at VP/director level or above.
4 2020 Gartner Digital Supply Chain Decisions Survey. From 21 January to 5 March 2020, Gartner Supply Chain Research sent invitations to complete an online survey to its community members, to Gartner clients, and to a wider group of practitioners in supply chain and other functions globally. We received 268 completed responses during the survey period. We had participants across industries, e.g., high tech (18%), food and beverage (15%), CPG (13%) and industrial (10%), and who mostly worked in supply chain related functions, e.g., supply chain (47%), logistics/transportation and distribution (9%), and purchasing and procurement (8%). Of the respondents, 48% were from EMEA, 30% were from North and South America, 21% were from Asia and Australia, and others were from the rest of the world. More than half (59%) of the participants worked for $10 billion-plus companies, and 47% of the participants were at VP/director level or above.

5 Global Commitment 2020 Progress Report, Ellen MacArthur Foundation.

6 Global Commitment 2020 Progress Report (Figure 14, Breakdown of global plastic packaging market), Ellen MacArthur Foundation.

7 Global Commitment 2020 Progress Report (Figure 20, Plastic producer signatory volumes as a share of global production), Ellen MacArthur Foundation.

8 Loop Hopes to Go Mainstream With Reusable Packaging, The Associated Press (AP).

9 2020 Gartner Opportunity After Crisis Survey. In May and June 2020, Gartner Supply Chain Research sent invitations to complete an online survey to Gartner clients, community members and a wider group of practitioners in supply chain, and other functions globally. We received 528 completed responses during the survey period. We had participants across industries, e.g., high tech (15%), industrial (14%), CPG (12%) and food and beverage (10%), and most worked in supply-chain-related functions, e.g., supply chain (36%), purchasing and procurement (10%), logistics/transportation and distribution (9%). Of the respondents, 44% were from EMEA, 37% were from North and South America, 18% were from Asia and Australia, and others were from the rest of the world. More than half (55%) of the participants worked for $10 billion-plus companies. Additionally, 54% of the participants were at VP/director level or above.
10 2021 Gartner Enterprise Operating Model For Composable Offers and Enterprises Survey. This survey was conducted to identify core capabilities enterprises that sell “solution offers” leverage to enable better performance. The research was conducted online during May and June 2021, among 290 respondents in North America, EMEA and APAC across industries, functions and company sizes. To qualify for the survey, respondents were screened for understanding of design, execution, coordination and challenges related to customer-facing products and solutions that include a physical widget and some combination of digital component, digital service or physical service (such as, “solution offers”). The survey was developed collaboratively by a team of Gartner analysts and was reviewed, tested and administered by Gartner’s Research Data and Analytics (RDA) team. Disclaimer: Results of this study do not represent global findings or the market as a whole but reflect sentiment of the respondents and companies surveyed.

11 2019 Gartner Future of Supply Chain Survey. In September and October 2019, Gartner Supply Chain Research sent invitations to complete an online survey to its community members, Gartner clients, and a wider group of practitioners in supply chain and other functions globally. We received 1,374 completed responses during the survey period. We had participants across industries and mostly worked in supply chain related functions, e.g., supply chain (50%), logistics/transportation and distribution (9%), purchasing/procurement (8%). Of the respondents, 50% were located in North and South America, 35% were from EMEA, and others were from Asia and Australia or the rest of the world. More than half (58%) of the participants were from $10 billion-plus companies, and 57% of the participants were at VP/director level or above.

12 Supply Chain Executive Report: Tame Complexity With an Operating Model Life Cycle

13 2021 Gartner Future of Supply Chain Survey. This study surveyed 983 supply chain leaders at Gartner client organizations across 10 major industries and four regions. Respondents were asked to rate the changes that will most likely shape the supply chain’s reality in the coming years across the three sections: changing customer expectations, changing future of work and changing enterprise expectations and the extent to which they expect their organizations to invest in them.
14 **2021 Gartner Supply Chain Diversity, Equity and Inclusion Survey.** This study was conducted to capture high-level data on broad DEI efforts (ethnic minorities, women, LGBTQ+, physical ability and others) and drill-down on ethnic and racial DEI data and best practices in supply chain organizations. The research was conducted online from 11 November through 14 December, 2020 among 298 respondents primarily in North America. ASCM partnered with Gartner to develop the survey and recruit participants. The sample was augmented with recruitment efforts by social media.

Qualified participants work in organizations that have an internal supply chain organization or in organizations where supply chain is a separate business unit, specialty or practice area, or those who are vendors of supply chain services and solutions.

The survey was developed collaboratively by a team of Gartner analysts who follow supply chain enablers and ASCM leadership and was reviewed, tested and administered by Gartner’s Research Data and Analytics team.

15 **Leveraging the Talents of Women,** Philip Morris International (PMI).

16 **Women in Leadership: Companies You Should Join to Make It to the Top,** WORK180.

17 **Facebook Diversity Update: Increasing Representation in Our Workforce and Supporting Minority-Owned Businesses,** Meta.

18 **Our Commitments to Racial Equity,** Google.

19 **HP Diversity, Equity, and Inclusion,** HP.

20 **RBC Action Plan Against Systemic Racism,** Royal Bank of Canada (RBC).

21 **KPMG’s U.K. Arm Among First to Set Targets for Working Class Staff,** Reuters.

22 **2021 Gartner CEO and Senior Business Executive Survey.** Gartner conducted this research from July 2020 through December 2020, with questions about the period 2020 to 2023. One-quarter of the sample was collected from July through August, and three-quarters from October through December. In total, 465 actively employed CEOs and other senior executive business leaders qualified and participated. The research was collected via 390 online surveys and 75 telephone interviews. This research is based on a subset of data of n = 199 CEOs and senior business executives from supply-chain-intensive industries.
By job role, the sample mix was: 287 CEOs; 115 CFOs; 29 COOs or other C-level; and 34 chairpersons, presidents and board directors.

By geographic region, the sample mix was: 183 North America; 109 Europe; 97 China, Japan, Australia and other APAC; 56 Brazil, Mexico and other Latin America; 13 Middle East; and 7 South Africa.

By enterprise revenue, the sample mix was: 46 with revenue of $50 million to $250 million; 122 with $250 million to $1 billion; 226 with $1 billion up to $10 billion; and 71 with $10 billion or more.

23 Supply Chain Executive Report: Future of Supply Chain — Crisis Shapes the Profession

24 2020 Gartner Supply Chain Technology User Wants and Needs Survey. The survey was conducted from 2 November to 17 December 2020, to explore the roles digital and technology play in supply chain, how supply chain organizations leverage digital and technology for competitive advantage, how supply chain organizations are organizing to support their digital initiatives, and their changing views on how best to exploit emerging technology in their supply chain management (SCM) organizations.

A sample of 520 supply chain professionals, with their primary workplace located in North America (including the U.S., Canada and Mexico), Western Europe (including the U.K., Germany and France) and Asia/Pacific (including Australia, New Zealand, China, Singapore and India), completed a web-based survey.

- Qualifying organizations operate in the manufacturing, retail, wholesale trade, transportation and logistics, healthcare providers, and natural resources industries and report enterprisewide annual revenue for fiscal 2019 of at least $100 million or equivalent.
- Qualified participants have a role tied to a supply chain function and are in manager or above roles. Supply chain professionals are involved in their company’s investment decisions regarding SCM processes, strategies and supporting technology in a decision-making capacity, as advisors to the decision makers or members of the decision-making group.

The survey was developed collaboratively by a team of Gartner analysts, and was reviewed, tested and administered by Gartner’s Research Data and Analytics (RDA) team.
Disclaimer: Results of this survey do not represent global findings or the market as a whole, but reflect sentiment of the respondents and companies surveyed.

25 Supply Chain Executive Report: Pursuing an Autonomous Supply Chain With Hyperautomation

26 Net Zero Tracker, Net Zero Tracker.

27 Daily Carbon Prices, Ember.

28 Total Cost of Carbon Capture and Storage Implemented at a Regional Scale: Northeastern and Midwestern United States, Section 2.3.2, The Royal Society (Interface Focus).

29 Examining the Viability of Planting Trees to Help Mitigate Climate Change, NASA, Global Climate Change: Vital Signs of the Planet.


32 Mandatory Climate-Related Financial Disclosures by Publicly Quoted Companies, Large Private Companies and LLPs, GOV.UK.

33 Sample Letter to Companies Regarding Climate Change Disclosures, U.S. Securities and Exchange Commission.


35 Sustainability Reporting Landscape in India, The Reporting Exchange.

2020 Gartner Sustainability Survey. This study was conducted to understand how stakeholder (customers, employees, investors, regulators and partners) pressure for more aggressive economic, social and environmental sustainability action is growing, and to identify best practices from early adopters to provide sustainability advice to the Gartner clients. The study explored different sustainability goals and targets set by organizations and how the level of investment in the sustainability programs has changed over time. It also focused on the value and benefits derived from the sustainability programs.

The research was conducted online during November and December 2020 among 183 respondents from North America, Europe, APAC across all industries except energy and utilities, in $250 million or more in annual revenue.

Respondents were screened for job titles at the director level or higher and their level of involvement in their organization's sustainability. Any respondents whose organization did not engage in sustainability activities at all or who were limited to achieving compliance were screened out.

The survey was developed collaboratively by a team of Gartner analysts and was reviewed, tested and administered by Gartner's Research Data and Analytics team.

Recommended by the Authors

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Hype Cycle for Supply Chain Strategy, 2021

3 Transformative Partnerships to Accelerate Transportation Emissions Reduction

Top 25 North American Supply Chain Undergraduate University Programs, 2020

3 Sustainability Trends Shaping Supply Chains in 2021