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EPCA

Building Supply Chain Resilience in the Petrochemical Industry

September 2022

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Background

This report is built on insights from the Petrochemical industry and provides clear guidance to transform towards the Supply Chain of the future

This report is based on a study carried out by EPCA and Deloitte Consulting in May-August 2022. It is **built on the insights from the Petrochemical industry** and is a must-read for all supply chain professionals and leaders in the Petrochemical industry.

The initial intent was to assess the impact of Covid-19 on Petrochemical Supply Chains in Europe. However, during compilation various other disruptions impacted Petrochemical Supply Chains, and it is expected that **we will continue to face disruptions in our Global Supply Chains**. The Vulnerability, Uncertainty, Complexity and Ambiguity (VUCA) is increasing.

The scope was broadened to **understand the impact of the recent disruptions and the longer term trends** on the Supply Chain of Petrochemical companies.

We surveyed and **interviewed over 170 Supply Chain professionals across more than 100 companies** (Producers and Logistics Service Providers (LSPs)), for their views on the expected impact of disruptions and trends on Petrochemical Supply Chains. The views and insights of these industry professionals form the basis of this report.

For an action-oriented report, we devised common themes and actions for Petrochemical Companies to thrive in uncertainty and build a resilient, future proof Supply Chain.

Although there is not a one-size-fits-all approach towards Supply Chains of the future, responses and research do indicate that in these turbulent times a reliable Supply Chain is a key differentiator in the decade ahead!

Note: A word of gratitude for EPCA's Supply Chain Programme Committee (SCPC) Members for their contribution and support

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The Supply Chain narrative

The four points on which to build a resilient Petrochemical Supply Chain

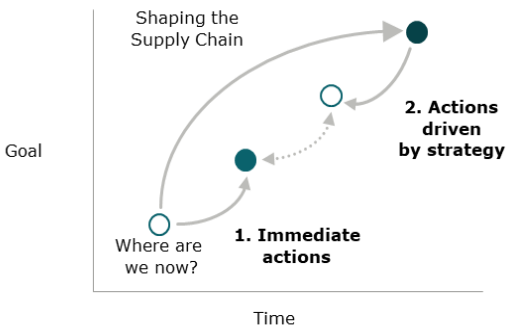
- Sustainability
- VUCA
- Digital Transformation
- Workforce transformation
- Rules and Regulations

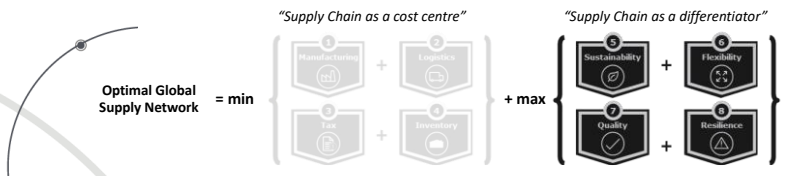
1. VUCA has come in addition to other fundamental shifts in the Petrochemical Supply Chain and its customers.

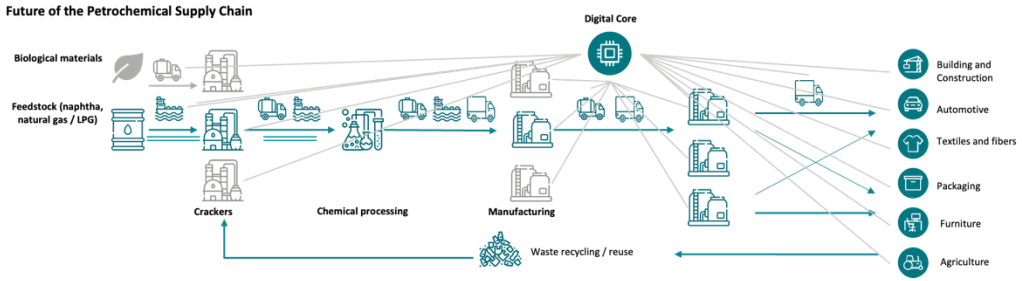
2. As a result, your Supply Chain setup and capabilities will increasingly be an integral driver of company success.

3. This will mean changing your Supply Chain setup to be more regionally focused with strong segmentation capabilities.

4. The pace at which this change is happening is much faster than your asset replacement cycle, you must set your target on the horizon to create a resilient Petrochemical Supply Chain.







Executive Summary

Building a Supply Chain that thrives in a VUCA world and withstands long-term developments (like sustainability) requires a strategic rethink and immediate short-term action

Disruptions and trends…

Both the intensity and frequency of disruptions are increasing[1], for example the Covid-19 pandemic, Texas freeze, and Ukraine war, and these affect all industries.

End-to-end Supply Chains are impacted, interconnected segments of the Supply Chain increase the overall disruption.

The recent disruptions also impacted the Petrochemicals end-markets. Erratic demand, material availability and logistics capacity were recognised across the value chain.

Additionally, trends and developments like sustainability, circularity and technological advancement will drive Supply Chain design in the Petrochemical industry and its end-markets.

…impact the Supply Chain in the Petrochemical industry[2]…

Bouncing back: VUCA is here to stay, organisations are still catching-up on balancing demand and supply. During the recent disruptions

- vulnerabilities and uncertainties in the Supply Chain were higher than ever before and organisations struggled to deal with the complexity and ambiguity
- Supply Chains were impacted and 70% of respondents still feel that supply constraints persist

The physical network set-up: more regional and complex Supply Chains will develop as

- sustainability and availability of recyclable feedstocks will be drivers for increased focus on region-for-region network design
- Producers will rethink their supplier base and sourcing strategies. It is expected that their customers will do the same

The capabilities: reliable Supply Chains are a differentiator with the right talent and data since

- in the future data sharing capabilities along the value chain need to be improved, starting with internal data
- Supply Chain talent is scarce and expected to require a different skillset compared to today

…and require a call to action in the short and long-term

Fueled by trends and disruptions, the requirements of the Supply Chain of the future will change in the years ahead, with an increased focus on ESG, Integration and Flexibility.

There is no silver bullet, but Supply Chains are likely facing questions that impact their operating model whilst being confronted with the need for some immediate actions.

In the short-term: execute a set of foundational actions in performance management, enhancing process maturity and adherence, improving data quality and attracting the right talent to ensure Supply Chains are ready to deal with the VUCA environment.

In the longer term: rethink your Supply Chain strategy and bring your Supply Chain setup in line with future requirements or business strategy. This requires a strategic rethink across all business dimensions of the Supply Chain, including vision and network, processes, governance, and infrastructure.

All organisations and consumers will be impacted by these changes and disruptions to Supply Chains.

The winners of tomorrow are the ones that are the most adaptable to change today.[3]

Source: 1: Springer, UNDRR 2: Survey EPCA Members – impact on Petrochemical Supply Chains and their LSPs, executed June 2022, 3: Inspired by Darwin: It is not the strongest of the species that survives, not the most intelligent that survives. It is the one that is the most adaptable to change.

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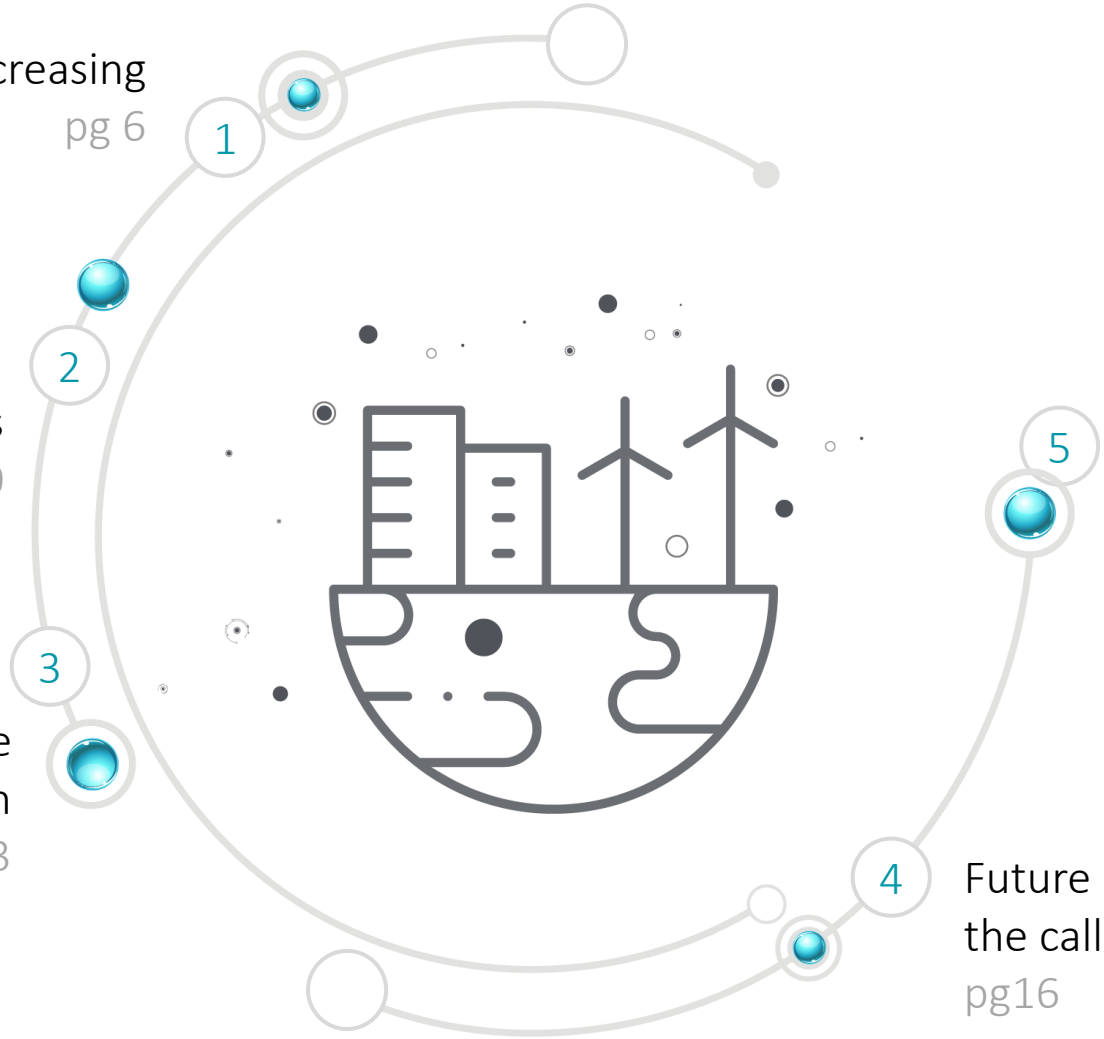
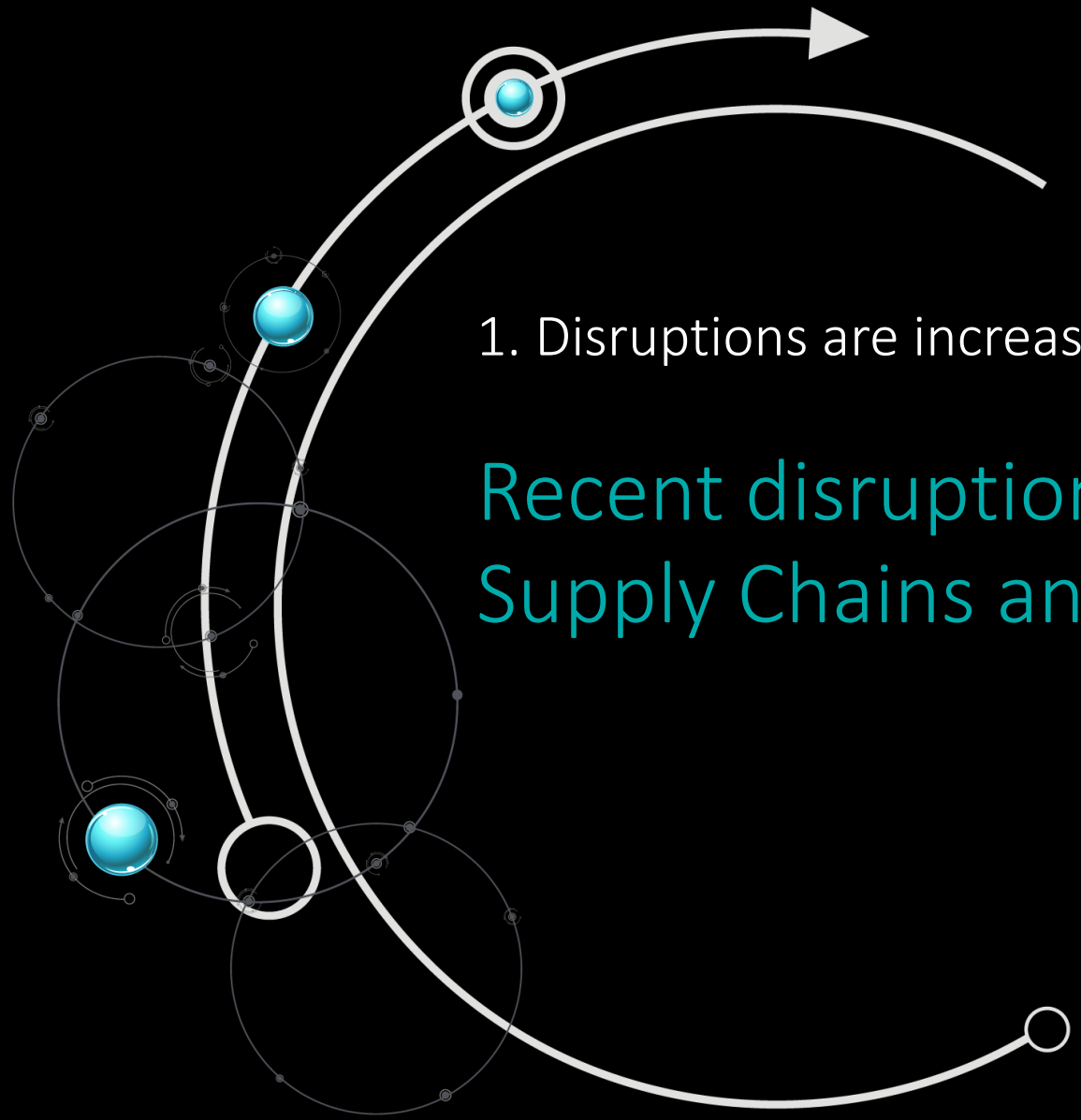
Supply Chain resilience in the Petrochemical industry: develop common themes and actions to thrive in uncertainty and gain insights to build a resilient Supply Chain



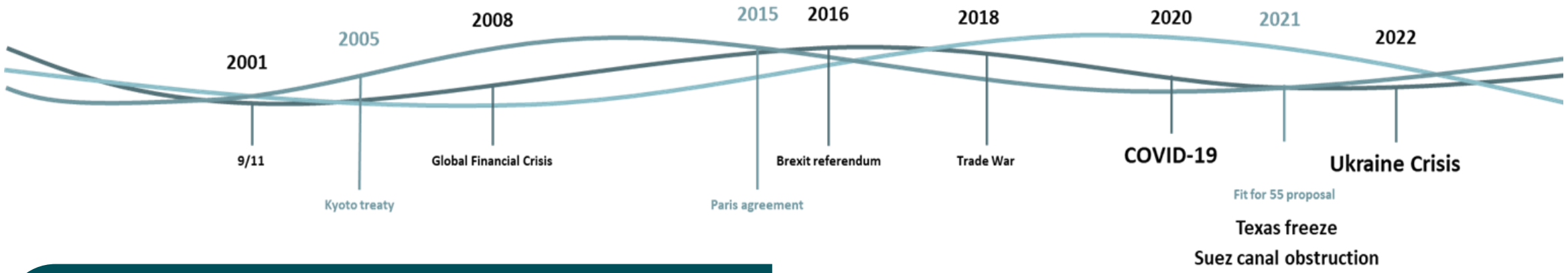


1. Disruptions are increasing

Recent disruptions impacted Petrochemical Supply Chains and their end-markets

The new normal: Disruptions are increasing…

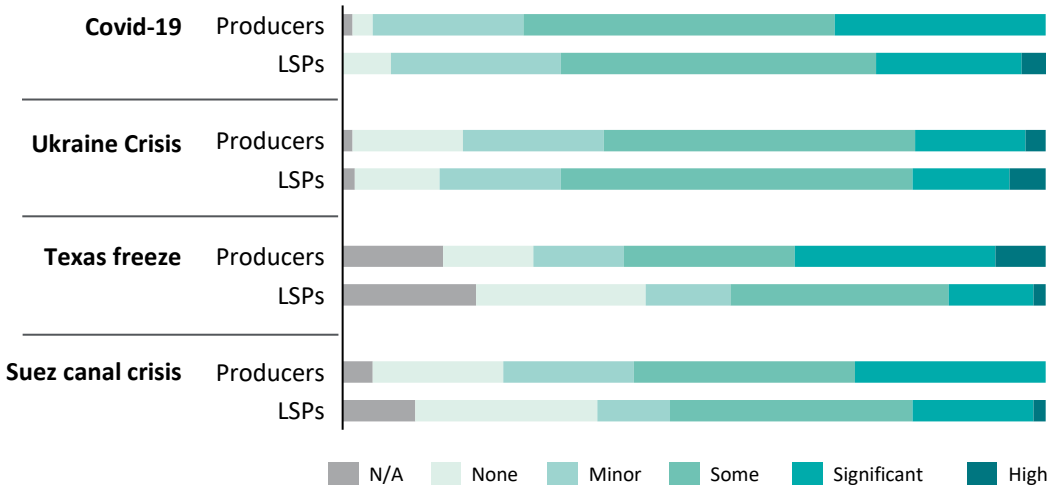
In less than three years the world was confronted with a series of significant disruptions which all had major impacts on Petrochemical Supply Chains



Comment

- The Texas Freeze followed by COVID-19 were events with the highest impact for Producers in the Petrochemical industry with over 30% of respondents marking these as significant or high impact and indicating that there were strong delays in their Supply Chains. For LSPs, COVID-19 caused the highest impact as nearly 25% of respondents experienced a significant or high impact on their Supply Chains
- Some respondents indicated that the disruptions are "not applicable" to them. Given the interconnection between the various Supply Chains and the impact across the industry, it is arguable whether there is no impact, or whether there is a lack of visibility to understand how they were affected: What is the knock-on effect of these disruptions in adjacent Supply Chains?
- Driven by globalisation, lean Supply Chain management practices have become very popular requiring low inventory volumes, levelled and just-in-time production, and accurate transport scheduling, leading to more cost-effective and responsive supply chains. This places enormous pressure on continuous operation and stable environments, but also increases their vulnerability consequently increasing the operational and financial impact of Supply Chain disruptions[2]
- In the period between 2020-2022 organisations were confronted with four distinct events[3] that significantly disrupted the Supply Chains in their industry: Will this be the “New Normal”?

Impact of recent disruptions on Supply Chains[1]



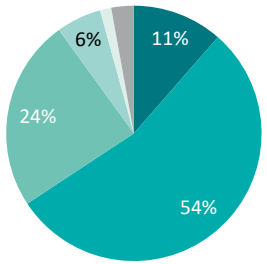
Note: 1. Survey EPCA Members – impact on Petrochemical Supply Chains and their LSPs, executed June 2022, 2. Springer, 3. This is non-exhaustive, other events that potentially impacted the Supply Chain include China’s zero COVID policy, Hurricanes (such as Ida), trade wars, and China’s energy crisis.

…mainly impacting material availability and logistics in the Petrochemical Supply Chain…

End-to-end Supply Chains are impacted and interconnected segments cause an increase in the overall disruption

The main impacts on end-to-end Supply Chains are:

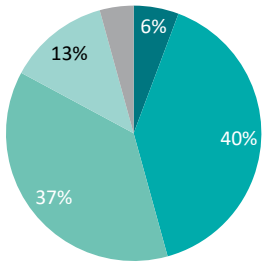
Material availability



The companies most impacted were those heavily dependent on factories in China for raw materials, parts, or finished goods. The industry is also very dependent on the availability of gas (from Russia).

Panic-buying exacerbated the shortages as companies and governments rushed to stock up while they could.

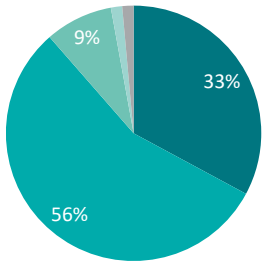
Manufacturing



Several companies were forced to shut down their production units during COVID-19.

The Ukraine-Russia **conflict caused high energy prices to impact production facilities** and a chemical plant under attack completely disrupted manufacturing operations.

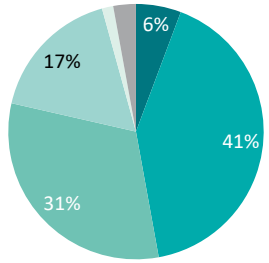
Logistics



Transportation between East and West is disrupted by COVID-19 and geopolitical events.

High pressure on **limited deep-sea, port and road capacity** is leading to higher transportation costs which are amplified by a lack of personnel (e.g. the driver shortage). Logistic operations continue to be **difficult to plan** with good accuracy.

Demand patterns



Demand for Petrochemical products declined during the first months of the pandemic, with erratic patterns across different end-markets. The economy swiftly bounced back as consumers, with cash from government relief aid and savings, resumed spending.

Demand patterns were shifting. **Historical data was no longer usable** for sales projections due to stockouts and lower demand.

Comment

- Logistics and material availability suffered the biggest impact
- *"Empty containers are not even returned after arriving at a destination. It is not easy to manage the logistic distribution if you lack containers for shipping. Of course, this is also affecting manufacturing operations"*
- 85% of respondents representing the LSPs reflected these experiences indicating that logistics capacity was significantly or highly impacted

High or complete stop | Significant | Some | Minor | No | Not Applicable

Sources: Survey EPCA Members – impact is on Petrochemical Supply Chains and their LSPs, executed July 2022, BBC

...and their end-markets

The disruptions also had a high impact on the Petrochemicals end-markets

How disruptions impacted the Supply Chain in the Petrochemical end-markets

		Material availability[1]	Manu-facturing[2]	Logistics[3]	Demand patterns[4]
Building and Construction	• Building and construction saw an unprecedented **decrease in demand** immediately after the beginning of COVID-19, and shortly after this global demand continued to outstrip supply, leading to product shortages, long lead-times and rising prices • Congestion and **delays at ports like Yantian and Ningbo** impacted availability of materials	⚠	⚠	⚑	⚠
Automotive	• Chips and other **components shortages** halted the assembly lines of several manufacturers and companies saw a sales decrease of 19% to 27% • Recent trade wars have resulted in more complex cross-border logistic operations between the US and China. In response to this, a European car manufacturer **re-shored its operations to the EU**	⚠	⚠	⚑	⚑
Textiles, Fabrics, and Fibres	• **Logistic costs have nearly doubled** since the pre-COVID era causing the fashion industry to suffer • Apparel and fashion firms are experiencing **irregular demand patterns** caused by online shopping, home deliveries, early purchase, and late returns	⚠	⚑	⚑	⚑
Packaging	• **High inflation** (highest in four decades) is causing higher raw material costs and reduction of margins for manufacturers	⚠	⚑	⚑	⚠
Furniture	• Demand for new **furniture decreased during the pandemic** due to lockdown, but increased sharply after the restrictions were lifted	⚠	⚑	⚠	···
Agriculture	• Ukrainian farmers are not able to **produce (and ship)** as much food as before the war and the **market is suffering**	⚑	⚑	⚠	···

Sources: 1 Deloitte outlook , McKinsey & Company automotive, McKinsey & Company Textiles , Taylor&Francis Furniture 2 Eurostat 3 S&P global 4 IBISworld

Indicative impact ⚠ High ⚑ Medium ··· Low

2. Trends impacting Supply Chains

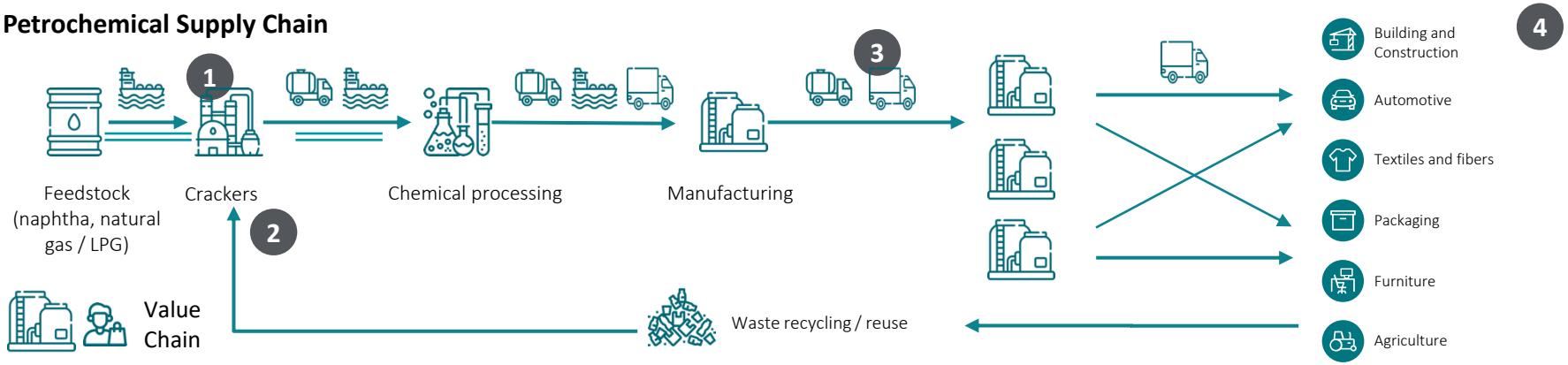
Look at the bigger picture, don’t address short-term disruptions in isolation

back

Trends impacting Supply Chains

Look at the bigger picture, don't address short-term disruptions in isolation. The key trends and developments in the Petrochemical industry will drive Supply Chain design…

Petrochemical Supply Chain



1 Feedstock	2 Downstream production	3 Logistics	4 Consumer pressure
Unbalanced supply and demand for raw materials	Diversifying multi-tier supplier base	Port congestion and higher ocean freight costs	Phase out of non-safe chemicals
Recycled products as feedstock	Worker shortages	High transportation rates due to driver shortages, sustainability charges and increased fuel costs	Push for sustainable products
Need for alternative feedstock	Change in energy sources	Increasing demand for flexibility in supply chains	Product shifts from e.g., plastics to carton
Price increases	Circular technology development	Evolving trade and customs landscape	EU commission set laws & regulations

Comment

- Underlying trends have impacted Petrochemical Supply Chains for longer than the disruptions seen in the last two years and will continue to do so. They include changes in **(sustainable) feedstock**, production and **circular** technology developments, logistics constraints and **consumer pressures** (such as **sustainability driving portfolio changes)**
- In addition, there are trends that are generic for all industries, like the **digital transformation, sustainability** and **workforce** transformation
- Trends and the **longer term** impact of **recent disruptions** should not be viewed in isolation as **both will shape** the Supply Chains of **tomorrow.**

Sustainability

"Fit for 55" will reshape the industry within Europe and there is a clear need to transform Europe into a renewable energy driven society.

Digital Transformation

Digital transformation is an ongoing trend and digital engagement and customer experiences have risen to take their place alongside product, price, and quality as performance yardsticks.

Workforce transformation

There is a general labour shortage together with the Petrochemical industry lagging in attracting talent compared to the consumer goods industry.

Sources: Deloitte Multiverse

How similar trends are shaping the end-market's Supply Chains

… and the design of the end-to-end value chain

Sustainability | **Digital Transformation** | **Workforce transformation** | **Rules and Regulations**

Building and Construction

- Materials for building construction are **becoming more sustainable** to produce and dispose of
- Pervasive **talent shortages** are rising rapidly on the boardroom's agenda
- Industry is exploring **strategic sourcing** and category management and developing modular construction capabilities
- **CBAM** (Carbon Border Adjustment Mechanism) will impact intercontinental transport

Automotive

- The future of mobility will change drastically, car manufactures are **phasing out the ICE** (Internal Combustion Engine) which significantly impacts the value chain of the automotive industry
- The industry and suppliers must re-evaluate **the sustainability of their products and value chains**. Their greatest challenge is to comply with legislative requirements while ensuring cost-effective manufacturing

Textiles, Fabrics, and Fibres

- New fabrics are being invented that are made from **recycled plastic materials**
- 3D printing across industries is experiencing rapid growth and fully customisable fabrics could become mainstream by 2030
- Fashion and **apparel firms** have **relocated** companies to Turkey and Morocco to diversify the Supply Chain
- Digitalisation led fashion retailers to use IoT, Big Data, and data science to support the sales process

Packaging

- Packaging companies are looking to use **recycled** products as a new **source of raw material**
- Global regulation is putting pressure on packaging products and forcing the industry to **shift to innovate new materials** such as synthetic plastic materials and reusable packaging

Furniture

- Furniture manufacturers are offering a service to collect **end-of-life** products giving them a new source of raw materials
- Companies are implementing augmented reality and virtual reality tools to improve the customer experience. E-commerce and home delivery have also sparked a digitalisation trend

Agriculture

- The National Farmers' Union has asked the government to preserve the **UK's self sufficiency** in food production at 60%
- Digital tools are being developed for **precision feeding and smart waste management** in farming operations
- Long-term **relationships** in the food chain help address some of the operational risks and disruptions and are also needed to meet the ambitious emissions targets and provide **traceable** 'Paris-proof' food
- **CBAM** will impact intercontinental transport

Sources: Deloitte – Prepare for CBAM

3. How to shape the Petrochemical Supply Chain

Focus on network, capabilities and ability to respond

Supply Chains will become more complex and likely more expensive

VUCA is here to stay. Reliable Supply Chains will be a differentiator becoming more regionally focused and more complex requiring an increased set of capabilities and better data

Bouncing back: VUCA is here to stay, still catching-up on balancing demand and supply

- During the recent disruptions, the vulnerabilities and uncertainties in the Supply Chain were higher than ever before and organisations struggle to deal with the complexity and ambiguity
- Supply Chains were impacted by the disruptions and 70% of respondents still feel that Supply Constraints persist

People are far more open to disruptive situations and learned from these disruptions how to adjust quicker, resulting in faster decision making.

The physical network setup: more regional and complex Supply Chains

- Sustainability and availability of recyclable feedstock will be drivers for increased focus on region-for-region network design
- Producers will rethink their supplier base and sourcing strategies. It is expected that their customers will do the same

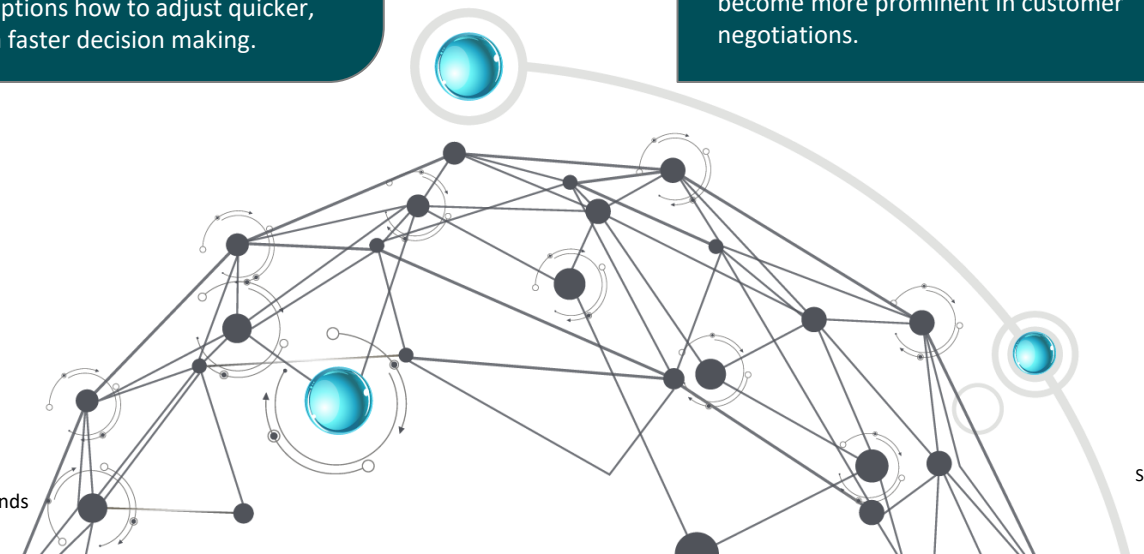
Not relying on a single source is a lesson learned from prior disruptions already, for example the hurricane season in the US Gulf a few years ago. However, going forward holding inventory to provide a better service to customers will become more prominent in customer negotiations.

The capabilities: Reliable Supply Chains are a differentiator with the right talent and data

- In the future, data sharing capabilities along the value chain need to be improved, starting with internal data
- Supply Chain talent is scarce and expected to require a different skillset compared to today

The Petrochemical industry had already made a leap forward in digitalisation. For the majority (planning) systems and processes were already in place and steps were made to improve working digitally with each other.

Conversely, sharing data across organisations is a vast challenge. The data is available, but the ‘data owner’ decides if it can be shared and with whom.



Source: Survey EPCA Members – impact on Petrochemical Supply Chains and their LSPs, executed June 2022

How to shape the Petrochemical Supply Chain

VUCA is here to stay: using the detailed survey results to address VUCA and differentiate your Supply Chain

Bouncing back: VUCA is here to stay, still catching-up on balancing demand and supply

Slide 25 >

- During the recent pandemic, 80% of respondents indicated that their crisis management capability had to be fine-tuned or developed. Currently, **30% of Supply Chains still operate in crisis mode**. This correlates with workforce fatigue.

Slide 26 >

- **VUCA is here to stay**: nearly all respondents indicated that during the recent disruptions Supply Chain vulnerabilities and uncertainties were higher than ever before and organisations struggle to deal with complexity and ambiguity.

Slide 27 >

- The recent disruptions impacted Supply Chains. **70% of respondents** still feel that **Supply Constraints** exist to a certain extent.

Slide 27 >

- The **constraints** for Producers were significant and highest in **logistics and raw material availability.**

The physical network setup: more regional and complex Supply Chains

Slide 28 >

- There is not one universal view on the **network** of the future, however it is expected that **sustainability** and availability of recyclable feedstock will be a driver for increased focus on the **region-for-region design.**

Slide 29 >

- Producers will **rethink** their **supplier base** and sourcing strategies. It is expected that their customers will do the same.

Slide 30 >

- LSPs in the Petrochemical industry expect that the network will be more local and sustainable with stronger focus on **intermodality and intracontinental** transportation.

Slide 31 >

- **Data sharing** across the value chain will become important to achieve network transition, although sustainability will be key. The industry is largely expecting a cost-free **greener transport.**

Slide 32 >

- There is a mixed view on how **regulators** will support the transition towards sustainable initiatives – incentives and sanctions are deemed likely; however, the regulators **might be late** to support this transition.

The capabilities: reliable Supply Chains are a differentiator with the right talent and data

Slide 33 >

- **Supply Chains** in the Petrochemical industry are a **differentiator** and were a high topic of focus during the pandemic.

Slide 33 >

- In the future data sharing capabilities along the value chain need to be improved, but **initial focus** is on **internal data.**

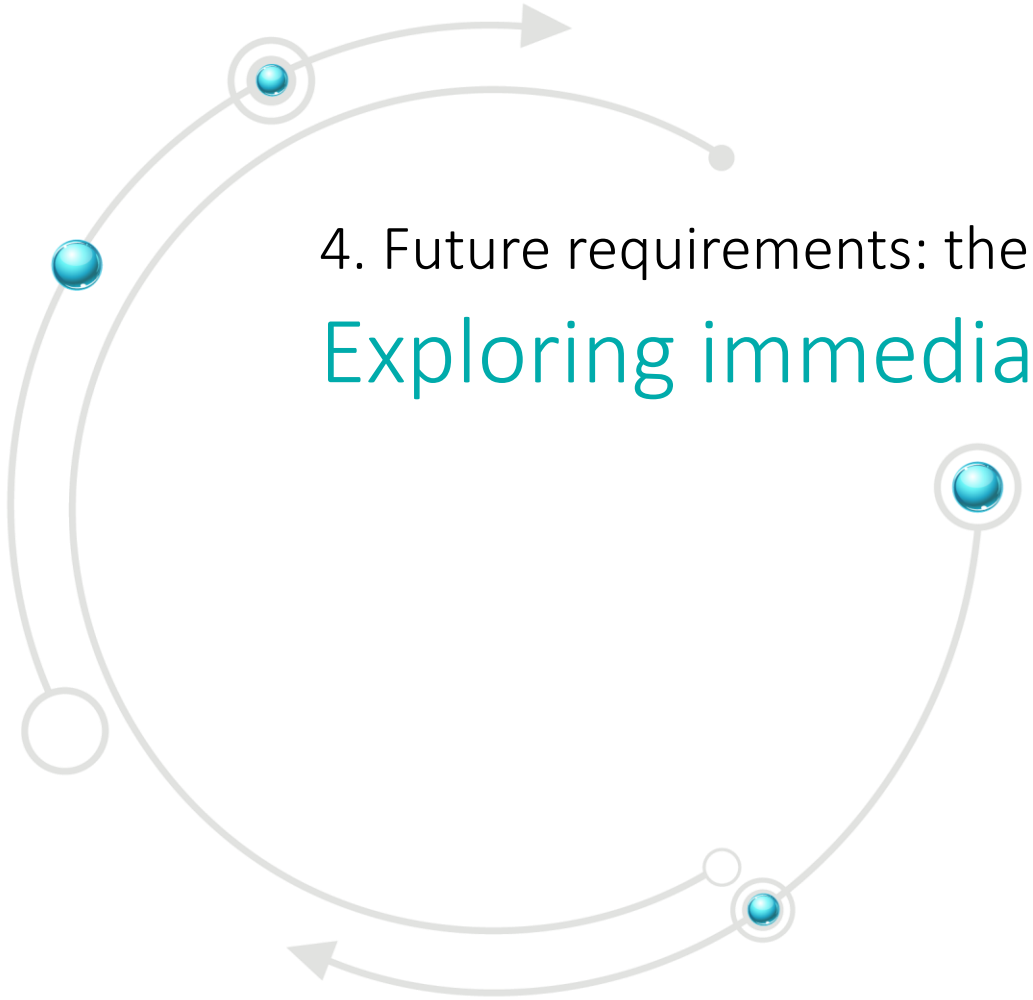
Slide 34 >

- **The IBP processes** were effective in most cases, but almost half of the organisations had to **review** them at least to a certain degree. IBP capabilities need (slight) improvement (including the ability to create scenarios).

Slide 35 >

- **Supply Chain talent is scarce** and expected to require a different skillset compared to today. Compensation, flexibility and the ability to offer work with advanced tools will be key to attract talent.

Source: 1: Survey EPCA Members – impact on Petrochemical Supply Chains and their LSPs, executed June 2022,



4. Future requirements: the call to action

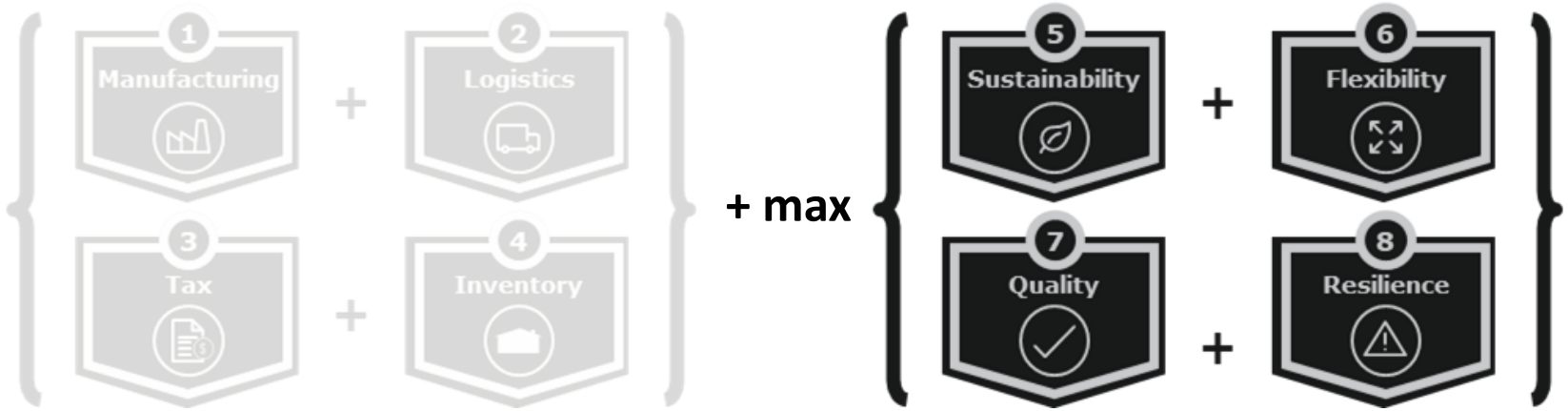
Exploring immediate actions and future direction

back

From Cost Centre to Differentiator: Supply Chains will likely be more expensive

Fuelled by trends and disruptions the requirements for the Supply Chain of the future will change in the years ahead. There is a shift from configuring "Supply Chain as a cost centre" to positioning "Supply Chain as a differentiator"

Optimal Global Supply Network **= min** *"Supply Chain as a cost centre"* **+ max** *"Supply Chain as a differentiator"*



Segmentation

In the trade-off between a central setup (economies of scale, ability to invest in automation, limited inventory risk) and a local setup (close to consumer, responsive, high service) there is no clear winner. Supply Networks need to be segmented, making network design choices for parts of the assortment, channels or markets.

Defining optimal

Defining what optimal means to your company is one of the main challenges in optimising a global Supply Network. What is the relative weight of inventory risk, compared to operational cost or a certain amount of CO2 emissions?

A key starting point is to align these definitions to your business strategy.

End-to-end resilience

Anticipating, reacting to, and facilitating **recovery from the unexpected.**

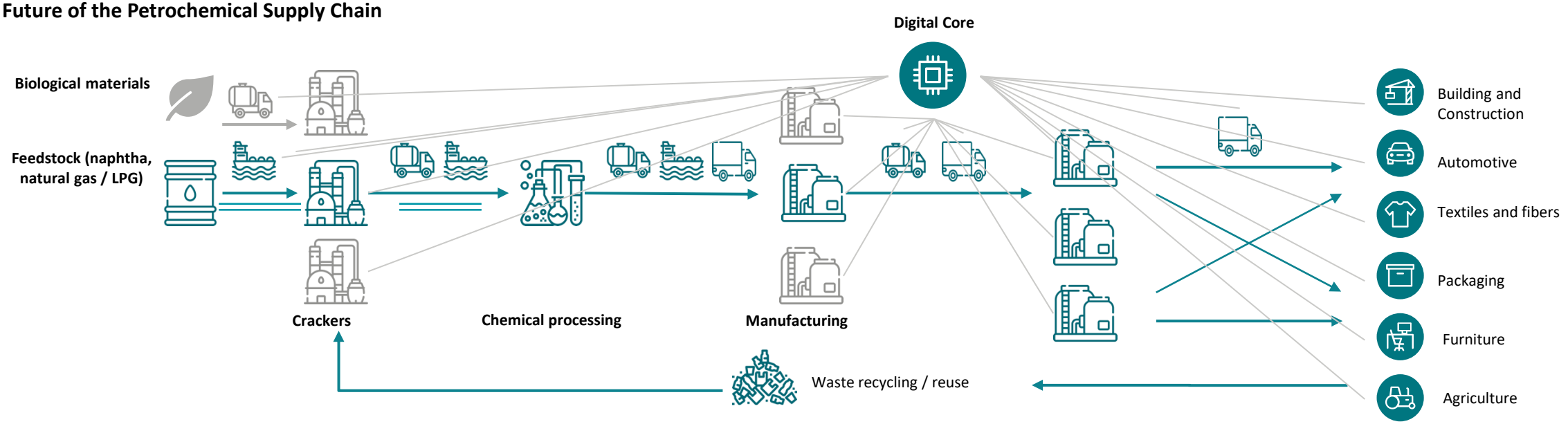
This becomes a key driver for success (for example with COVID-19, the container shortage, and blockage of the Suez Canal) and requires the end-to-end network (including manufacturing) to be reconsidered as well as routes to market (such as rail from China to Europe).

Source: Deloitte Analysis

Making the change requires a rethink of the Supply Chain...

In the future the (physical) set-up of the Supply Chain will change

Future of the Petrochemical Supply Chain



Vendor base will be diversified and more regional

- **Dual sourcing** will be a means to becoming more **resilient**
- **Sustainability** and availability of recyclable feedstock will increase the vendor base and complexity
- **CBAM** will impact intercontinental transport leading to more in-region sourcing

Segmentation: ability to run different Supply Chains in an integrated manner

- **Not** all product customer combinations require a **similar Supply Chain** set-up
- **The right Supply Chain archetypes** need to find the optimum between responsiveness, costs and pricing

Partner and share the risk in the Supply Chain, be resilient

- **Selecting the right partners** to build long-term relations will be key for resilience (scaling)
- **Data sharing** across the value chain is required for both sustainability and reliability

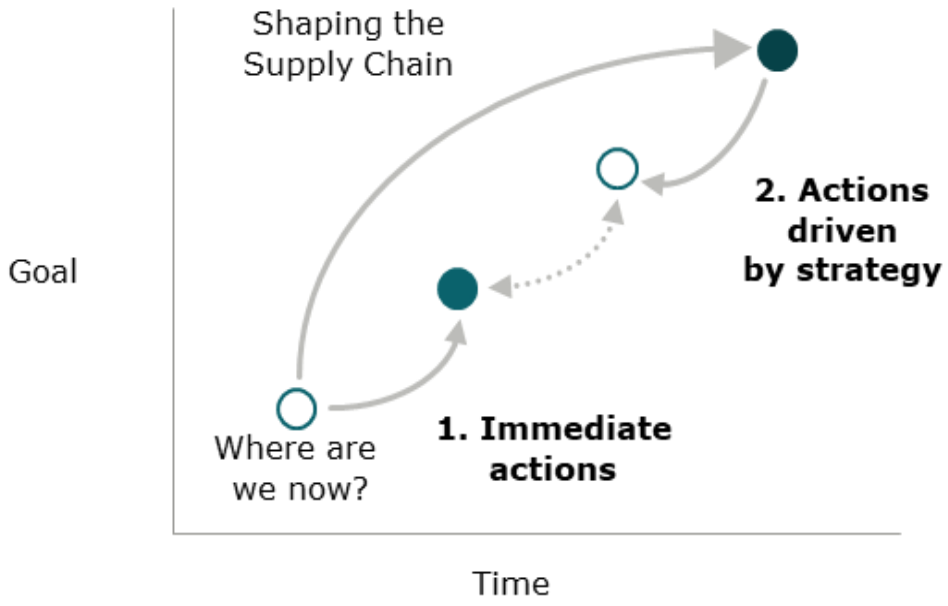
Client base is more diversified and segmented

- Customers will rethink their **supplier base and sourcing strategy** and will mitigate risks. Build capability to **differentiate service levels, costs and pricing** based on strategic importance
- Customers will **re-evaluate the sustainability** of their products and value chains

Making the change requires a rethink of the Supply Chain Operating Model…

To build a resilient, fit for future Supply Chain requires a disruptive approach to CAPEX Supply Chain decision making

Backward strategic planning process



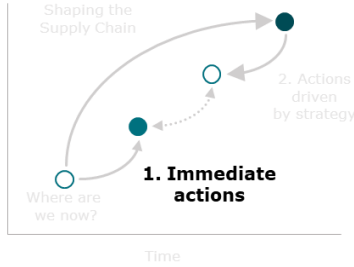
Given the big changes and the strain on the industry, it is unlikely that the strategic planning process of organisations will function as before:

1. To ease the current challenges and/or prepare for a next disruption, there could be several **immediate actions that are in line with future direction** (balancing budget, resources and timelines)
2. The big changes in the industry, combined with the importance of a well-functioning Supply Chain, force you to rethink your **Supply Chain Operating Model (longer term)**

The Petrochemical industry is operating from a current asset base. The starting point is not a greenfield situation. This is a complicating factor in shaping and realising the transformation. However, incremental decisions will not lead to the supply chain of the future. Now is the time to decide where to play and how to invest your CAPEX for the next decades.

Step 1: The immediate actions

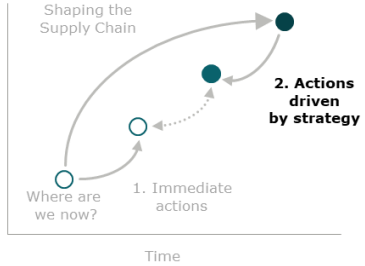
In the short-term execute a set of foundational actions around different topics to ensure Supply Chains are ready to withstand the VUCA environment

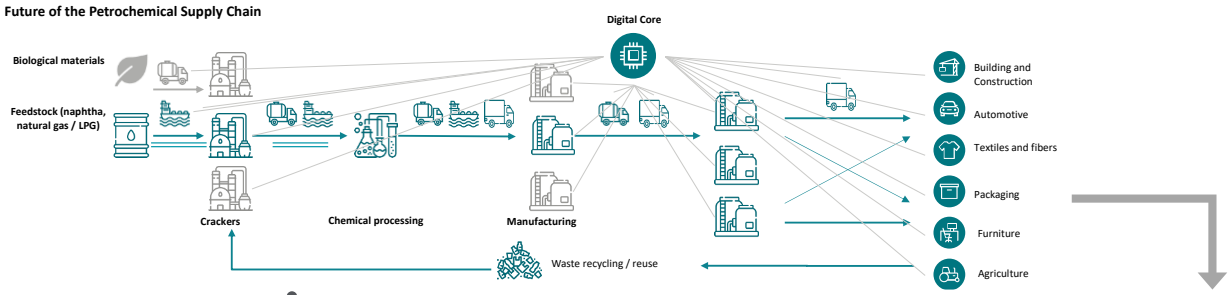


Topic	Objective	Key actions
Vision	Balance metrics and targets in the Supply Chain to incentivise the right trade-offs and decisions	• Provide senior leadership with the **instruments** to strike the right **balance between service levels, costs, working capital, and risk** • Build the ability to **differentiate service levels** in the Supply Chain • Apply **one common set of definitions** across the different levels and elements of the Supply Chain
Review and enhance planning maturity	Enhance maturity and further integrate commercial, finance and Supply Chain to work against “one number”	• Facilitate Commercial, Finance and Supply Chain to base their decisions on **one set of numbers** • **Integrate Supply Chain** (Planning) to react to disruptions adequately and improve process adherence across the Supply Chain • Review the **clock speed of the IBP** process to respond to the VUCA factor • Build capability to generate **what-if scenarios** to deal with Demand or Supply constraints and disruptions
Risk review	Reduce the vulnerabilities in the Supply Chain: sourcing, logistics and the network	• **Professionalise risk management** and actively manage the vulnerabilities in the Supply Chain • Seek opportunities to reduce vulnerabilities by applying dual **sourcing** for selected **bottlenecks**, balancing effort against risk (and ability to set-up specs) • Understand the vulnerabilities in the Supply Chain regarding logistics, move to alternative modes or assess opportunities to **reduce dependencies** in the **network**
Supply Chain talent	Put the right talent in place to support operations and the transformation (skillset and capacity)	• **Manage the talent portfolio** in Supply Chain to ensure that a competitive advantage is retained (include **succession planning**) • Assess the capability to attract the right talent. Build a Supply Chain organisation that is **attractive for Supply Chain talent** • Use resource planning to ensure sufficiently skilled teams in size and **capabilities** to make the **transformation**
Improve the Supply Chain data	Centralise data ownership and put data governance in place	• Assess the Supply Chain data and **centralise ownership** • Organise the data governance (**get clean, keep clean**) • Recruit a team to manage the data

Step 2: Supply Chain Operating Model

Where to play and how to win: the Supply Chain set-up of the future requires a strategic rethink across all business dimensions Goal





Topic	Key actions
Vision & Network	• Determine the Supply Chain archetypes that support the Business Strategy • Strike the balance between cost and service levels in the portfolio (differentiate cost to serve/pricing) • Determine the Supply Chain Operating Model (network and partnerships) for the future, drivers are sustainability, recyclable feedstock, stability, and optionality
Performance	• Set up Supply Chain **performance management, controls and reporting** based on the new equilibrium (including sustainability, flexibility, quality, and resilience) • Build a Supply Chain **control tower** to track performance near real-time
Processes	• Design and deploy (standardised) integrated Supply Chain processes, connecting the functions inside and outside of the Supply Chain • Enable Supply Chain Planning over different and uniform horizons across the organization
Governance	• Define Supply Chain governance model (and interfaces with Commercial) • Define how to organise for Excellence and Continuous Improvement in Supply Chain (Centre of Excellence) • Set up roles, responsibilities and job profiles within Supply Chain based on future requirements (focus on value-add activities)
Applications	• Define the intermediate and to be system landscapes and manage integration between the parties in the chain • Select technology solutions that support your journey. Be realistic in expectations regarding future tech
Data	• Start managing or exploring how to **further integrate data in the value chain**; partner for standards and fight fragmentation • Assess how to **increase use of client data** to enhance your forecast and **streamline ordering processes**

5. Reflection

Winning tomorrow by adapting to change today

back

Reflection

The transformation might not be easy, but the winners of tomorrow are the ones that are the most adaptable to change today

This report is based on the survey and interviews carried out in May-August 2022 amongst over 170 Supply Chain professionals, who form part of EPCA. It is inherently valuable to be able to grasp the **collective view of Supply Chain professionals** across the industry.

The results completely underline our expectations and outcomes from other isolated research into Supply Chain developments[1].

There is not one set of uniform actions that can be applied to all organisations in the Petrochemical industry.

In this report we describe our expectation **that Supply Chains in Europe need to transform significantly**, while at the same time the Petrochemical industry is operating from a current asset base. Our starting point is not a greenfield situation which is a complicating factor in shaping and realising the transformation.

Given the amount of change required, the winners of tomorrow are the ones that are the most adaptable to change today.

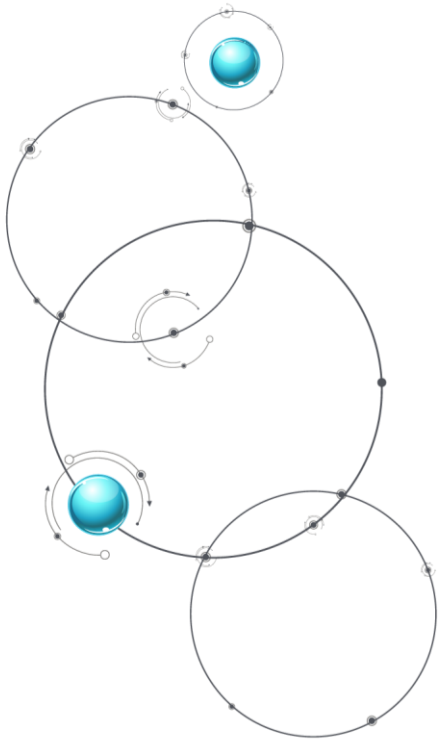
The topics and issues that organisations face are very similar – and the stream of disruptive events continues (VUCA):

- At the time of writing Europe faces possibly the driest summer in 500 years, with consequences for the energy sector (hydropower and power plant cooling) as well as impacts for logistics on European Inland Waterways[2]
- There is a labour shortage in Europe (66% of decision makers in Germany indicate they are short of skilled workers). There are 20 million fewer people working in 2022 compared to pre-pandemic levels with a slow rebound predicted, experienced across many sectors (such as air traffic)[3]
- Talent is scarce generally and there is also a need to solve the existing labour challenges caused by the industry's cyclical hiring, layoffs, and pollutive image, which impact attraction and retention of top talent[4]
- Laws and legislation around sustainability will impact organisations. The green deal will require the sector to accelerate the pace of innovation, embrace new technologies, get closer to end-markets and take a leading role in working across the value chain to deliver lower-carbon products and solutions[5]
- High inflation rates in Europe will impact the buying power of consumers as well as the Petrochemical industry directly as inflation is mainly driven by high energy prices[6]

Source: 1 Deloitte: From supply chains to supply networks; 2 Reuters; 3 PMI; 4 Deloitte: From Great Resignation to Great Reimagination; 5 Deloitte: Reducing Carbon, fueling growth; 6 Eurostat

6. Appendix

Looking in-depth at networks, capabilities and bouncing back

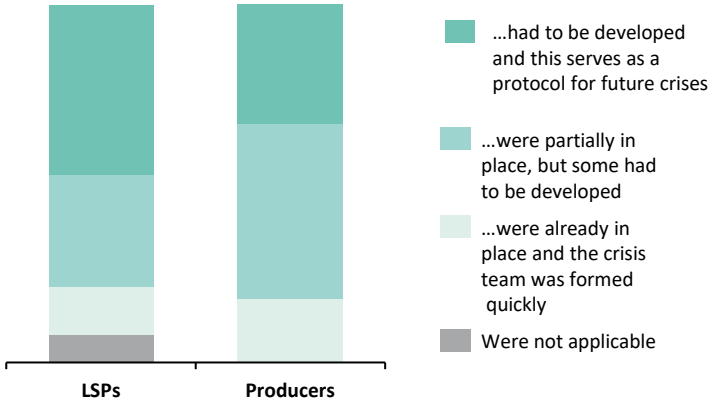


back

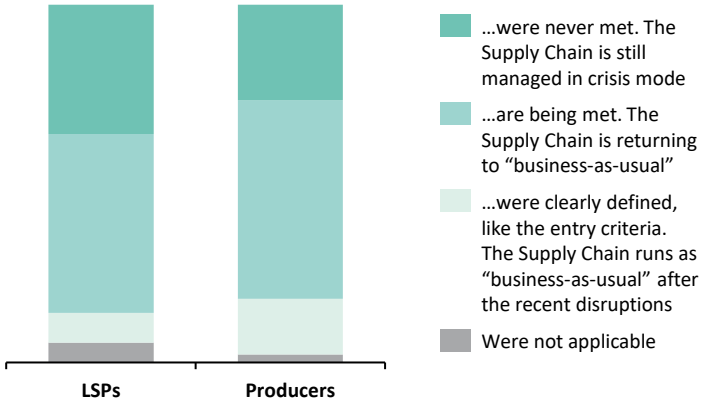
Responsiveness

During the COVID-19 pandemic 80% of respondents indicated that their crisis management capability had to be fine-tuned or developed. Today 30% of Supply Chains still operate in crisis mode, correlating with workforce fatigue

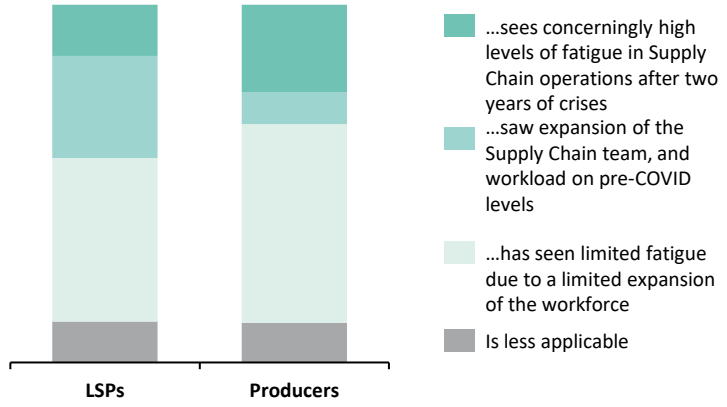
During the pandemic crisis management capabilities…



Crisis management exit criteria…



The impact of crisis mode on the workforce…



Comment

- Roughly 80% of respondents indicated that the crisis management capability had to be fine-tuned or developed
- This view is relatively similar for LSPs and Producers
- The crisis management capability developed could serve as a protocol for future crises

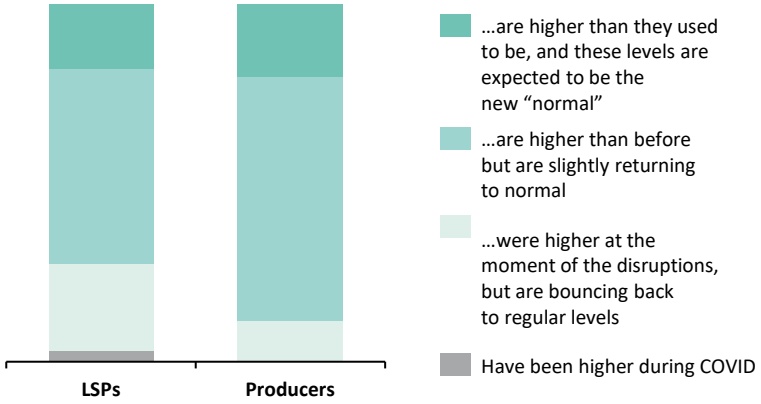
- In July 2022, approximately 30% of respondents indicate that their Supply Chain still operates in crisis mode
- In only 20% of cases, the Supply Chain is back to business as usual
- 80% of respondents indicating that they are either returning to "business-as-usual" or are still in crisis mode

- In July 2022, over 50% of respondents indicated that the fatigue of the workforce is limited
- On the other hand, 24% of Producers respondents indicate that the fatigue in Supply Chain operations is concerningly high
- These levels correlate with organisations that are still operating in crisis mode

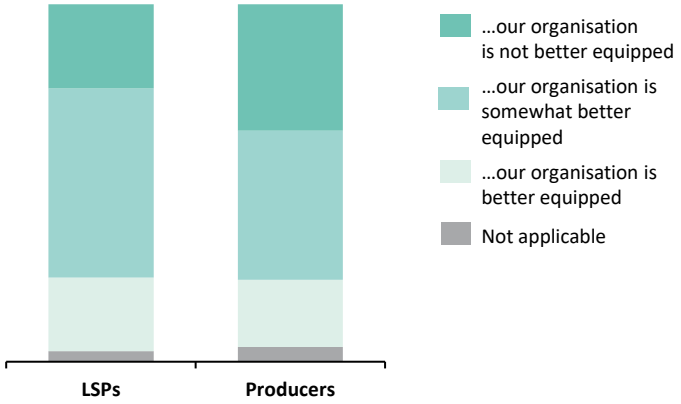
Responsiveness

VUCA is here to stay: nearly all respondents indicate that during the recent disruptions the vulnerabilities and uncertainties in the Supply Chain have been higher than ever before and organisations struggle to deal with complexity and ambiguity

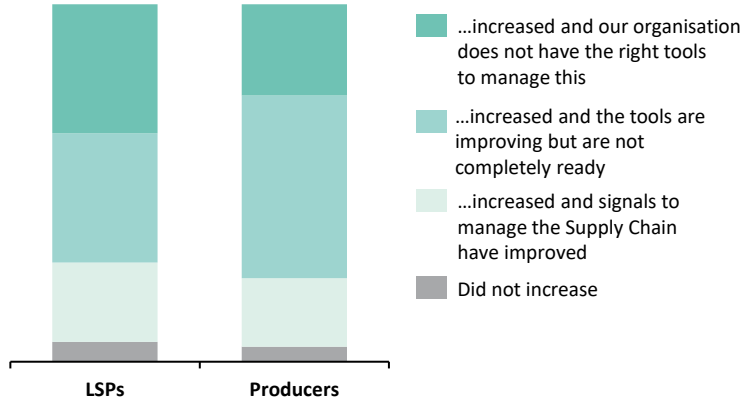
The Vulnerabilities and Uncertainties in the Supply Chain…(VU)



To manage the Complexity…(C)



The Ambiguity in the Supply Chain…(A)



Comment

- Nearly all respondents indicated that during the recent disruptions the Vulnerabilities and Uncertainties in the Supply Chain have been higher than ever before
- Roughly 20% of respondents indicated that the high levels of Vulnerabilities and Uncertainties are here to stay
- The views across LSPs and Producers are very alike

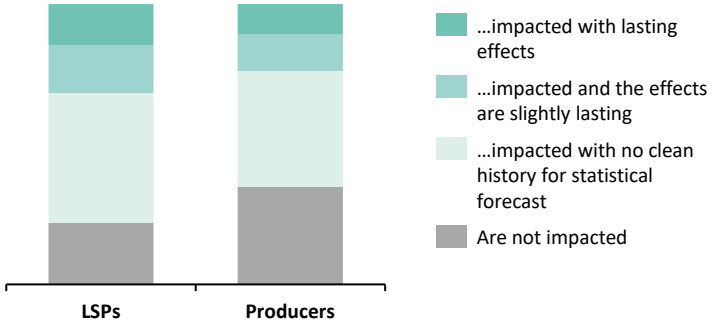
- To manage the complexity, 20% of respondents indicated that their organisation is better equipped (either Complexity is not applicable or they are better equipped) than before the pandemic
- This leaves 80% of respondents indicating that their organisation is somewhat better or not better equipped to handle complexity in the Supply Chain

- The Ambiguity in the Supply Chain definitely increased in the Pandemic
- Over 70% of respondents feel that the tools or organisation are not (completely) ready to manage the ambiguity in the current Supply Chains

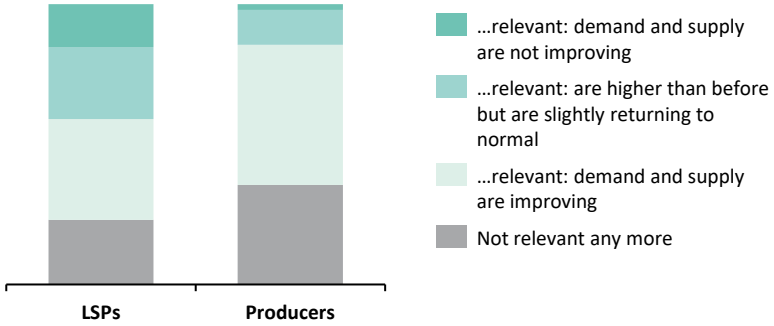
Responsiveness

The recent disruptions impacted the Supply Chains and 70% of respondents still feel that supply constraints persist

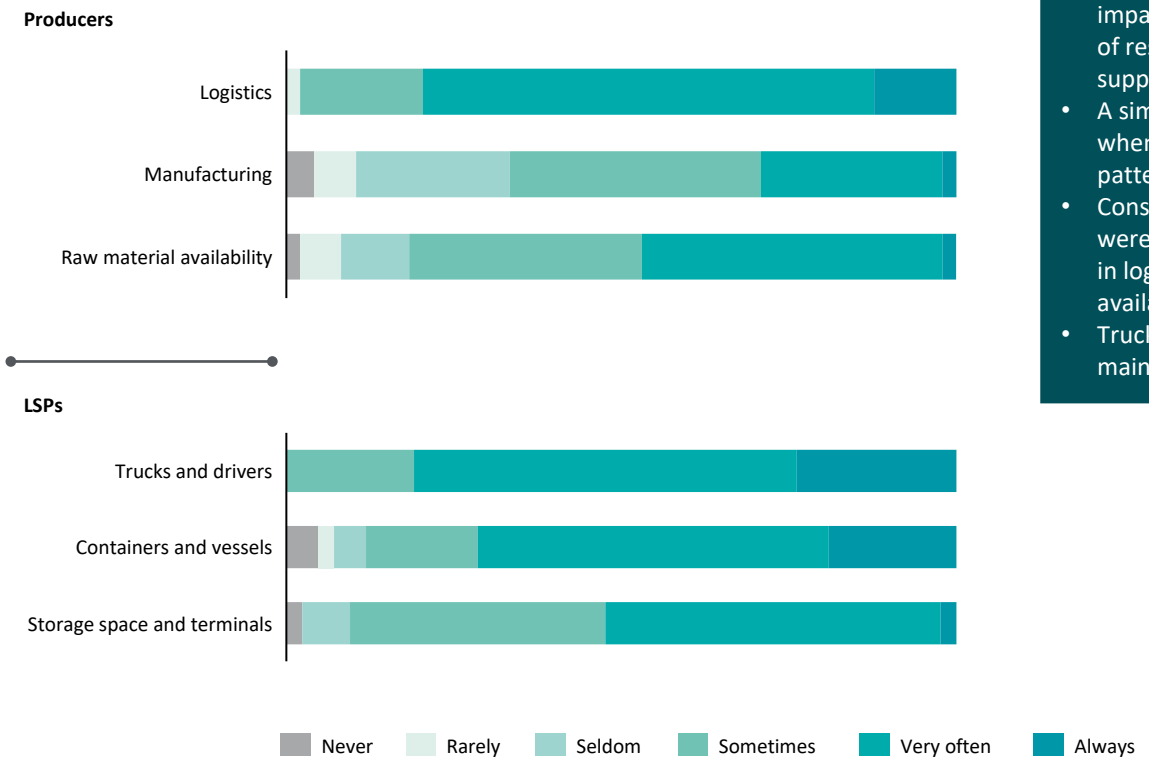
Demand patterns are…



Supply constraints imposed by COVID-19 are…



The Supply Chain constraints were mainly in…



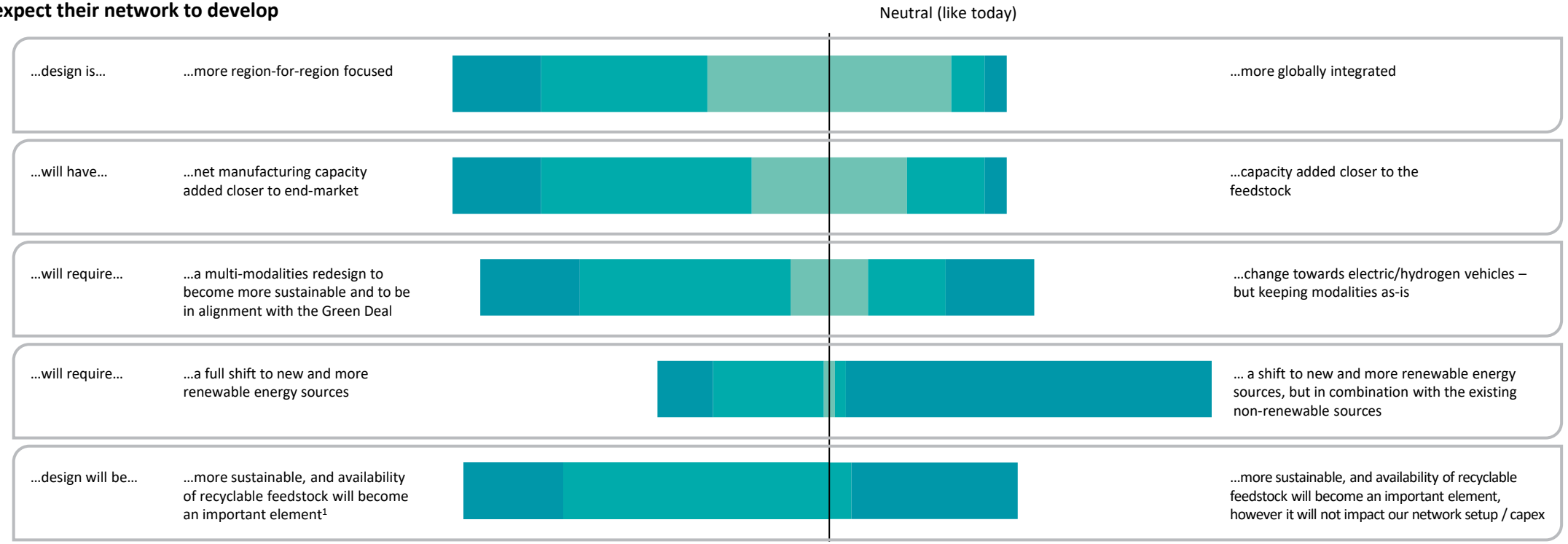
Comment

- The recent disruptions impacted Supply Chains. 70% of respondents still feel that supply constraints persist
- A similar view is experienced when zooming in on demand patterns
- Constraints for Producers were significant and highest in logistics and raw material availability
- Trucks and drivers were the main constraint for LSPs

How networks develop

There is not one universal view on the network of the future, however it is expected that sustainability and availability of recyclable feedstock will be a driver for increased focus on the region-for-region design

How Producers expect their network to develop



Comment

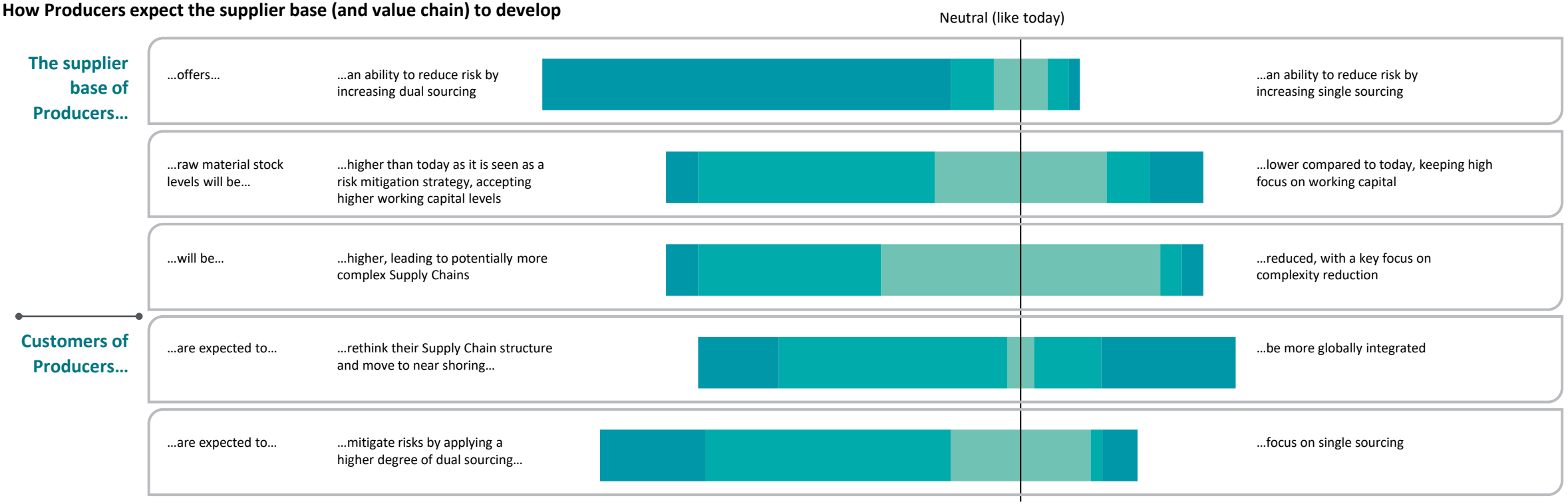
- Global developments are believed to impact the networks of the European Petrochemical industry. Petrochemical companies are expected to focus more on the region (recognised by shippers and LSPs). Nevertheless, reshoring might be difficult due to high cost of change and cost structures (for example energy availability and cost)
- It is expected that there will be a shift from pure globalisation to “glocalisation”, driven by a rethink of their Supply Chain strategies[1]

Note: 1. Deloitte analyses: Navigating the impact of Covid-19 on Chemicals and Materials

How the supplier base in the value chain might develop

Producers are rethinking their supplier base and sourcing strategies. It is expected that the customers of the Petrochemical Producers will do the same

How Producers expect the supplier base (and value chain) to develop



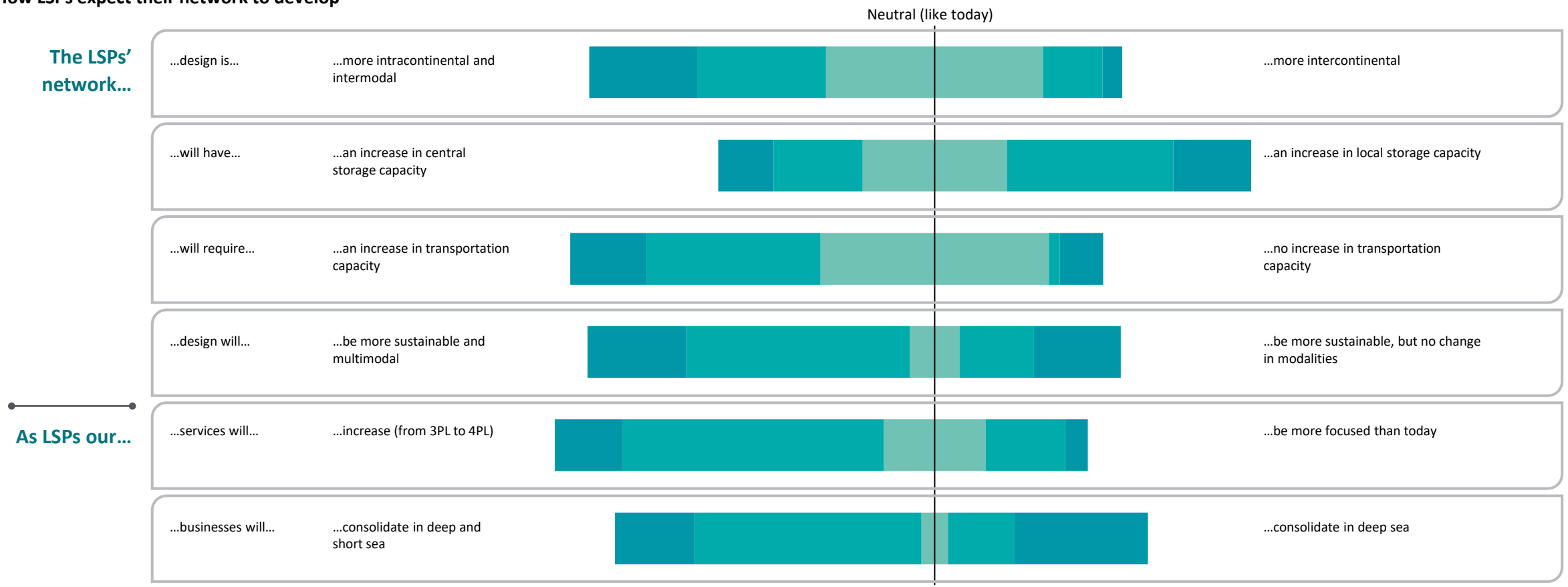
Comment

- Acknowledging the impact of recent disruptions on the Supply Chain, mainly on material availability, is making producers rethink their strategy. Trade–offs made regarding their sourcing strategies are leaning towards more dual sourcing and higher inventory levels
- The shared expectation is that Supply Chains are likely to become more complex due to a diversified supplier base

How networks develop

LSPs in the Petrochemical industry expect that the network will be more local and sustainable with stronger focus on intermodality and intracontinental transportation

How LSPs expect their network to develop

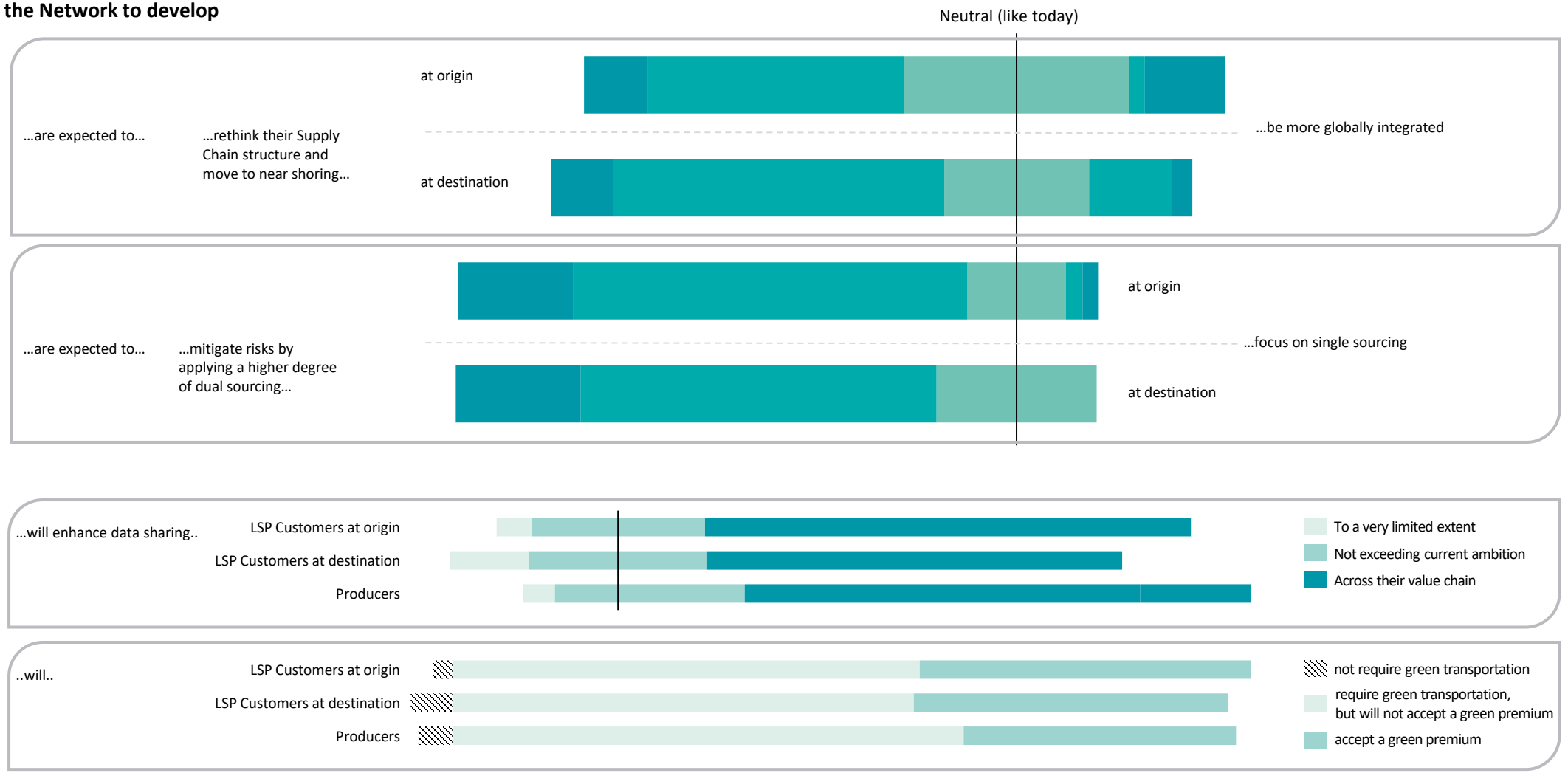


Comment
The view of LSPs in the Petrochemical industry is in line with the expectation of Producers that future networks will be more locally integrated, with higher focus on intracontinental transport and intermodality

How networks develop

Data sharing across the value chain will become important for the network transition, although sustainability will be key the industry is largely expecting a cost-free greener transport

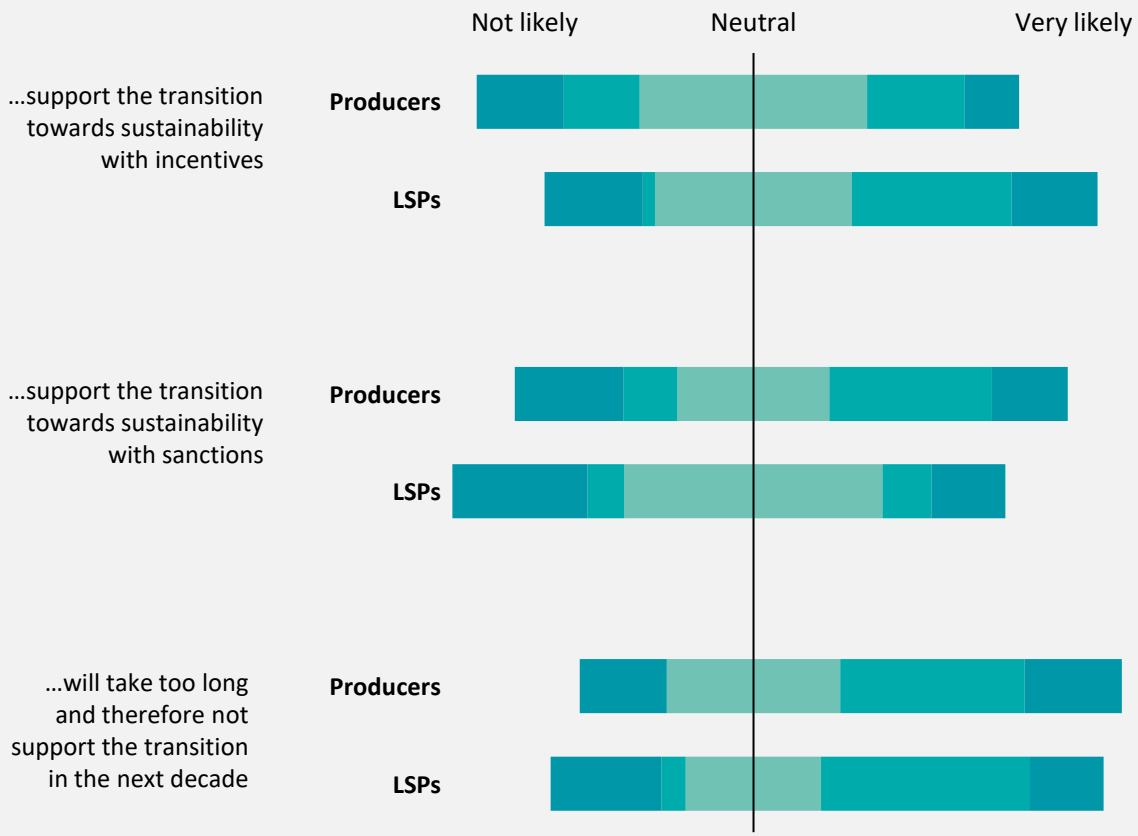
How LSPs expect the Network to develop



How networks develop

There is a mixed view on how regulators will support the transition towards sustainable initiatives – incentives and sanctions are deemed likely. However, the regulators may be too late to support this transition

The regulators…



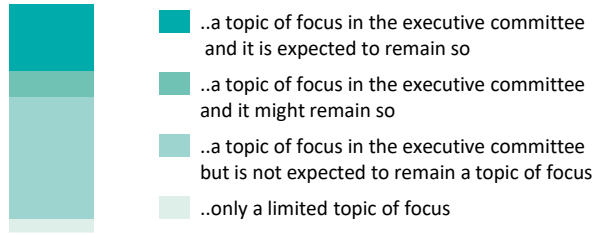
Comment

- Sustainability is going to happen. The Petrochemical industry will be crucial to drive it and take the initiative, not the regulators
- The change will likely affect plastic production and market, the production facilities in term of CO_2 production, and production practice which is supposed to become sustainable
- CO_2 reduction and a circular economy are going to change the face of the whole industry. Expect big changes in the supply chain as a result of more sustainability
- Renewable energy is also going to happen

Capabilities

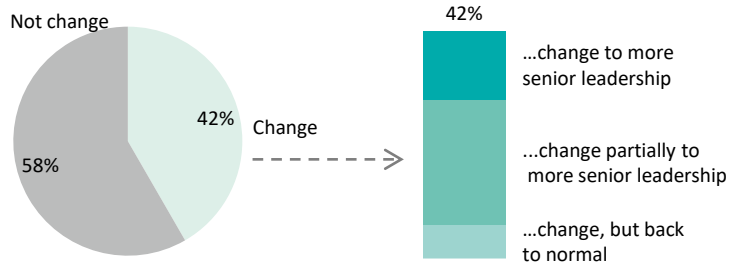
Supply Chains in the Petrochemical industry are a differentiator and were a high topic of focus during the pandemic. In the future data sharing capabilities along the value chain need to be improved, but initial focus is on internal data

The Supply Chain, during the pandemic, became…



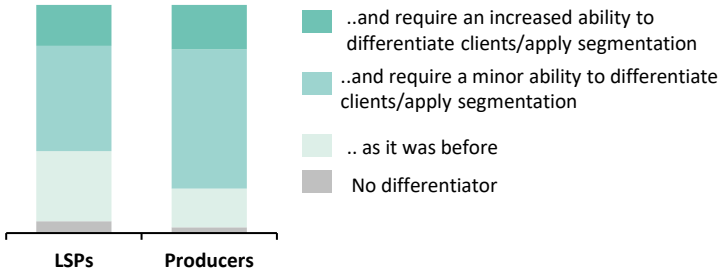
- During COVID-19, all respondents indicated that Supply Chain was a topic of focus. 40% expect that it might or will remain a topic of focus

The Supply Chain reporting lines did…



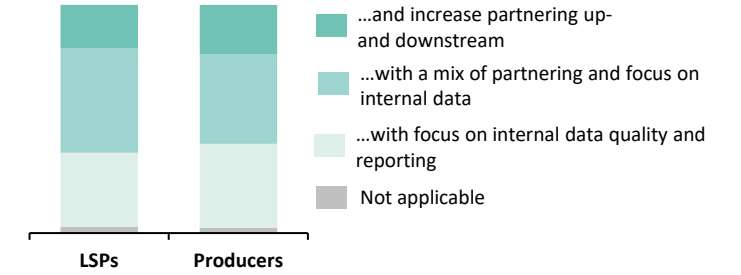
- 42% of respondents indicated that Supply Chain reporting lines changed
- In 12% of cases, it is indicated that Supply Chain reporting lines changed to senior leadership

Reliable Supply Chains will be a differentiator for the next disruptions…



- LSPs and Producers share the view that Supply Chain will be a differentiator
- Nearly 80% require a (minor) ability to enhance segmentation

The Supply Chain will need to facilitate data sharing…



- Nearly all respondents deem data sharing important, but nearly 80% of Producers and LSPs believe there needs to be an initial focus on internal data

Capabilities

The IBP processes were effective in most cases but had to be reviewed to some extent for almost half of the organisations. IBP capabilities need (slight) improvement, including the ability to create scenarios

The Integrated Business Planning…

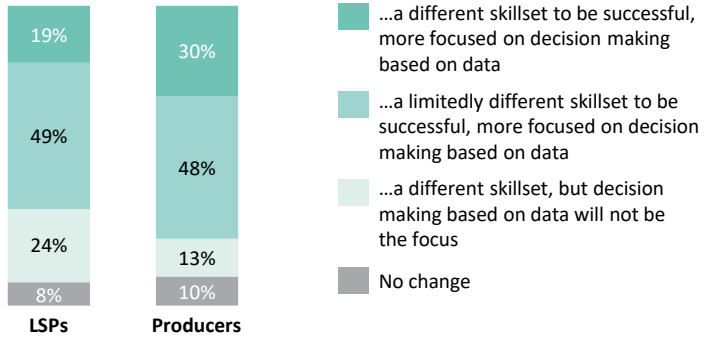
Comment

- The IBP processes were effective in most cases, but had to be reviewed at least to a certain degree for almost half of the organisations
- Over 50% of respondents indicated that their capabilities in IBP need (slight) improvement
- IBP gave a solid base for decision-making, but only 7% of respondents indicated that they were able to deal with different (financialised) scenarios around demand and supply planning

Capabilities

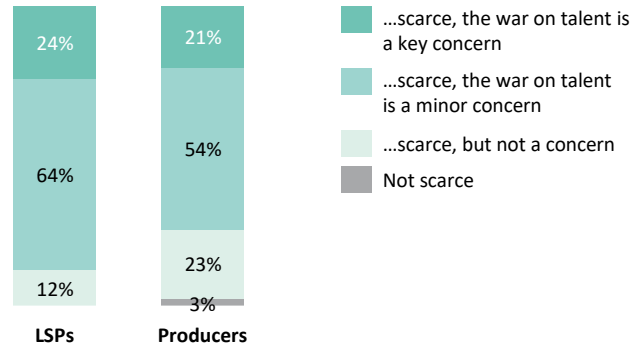
Supply Chain talent is scarce and expected to require a different skillset compared to today. Compensation, flexibility and the ability to offer work with advanced tools will be key

The Supply Chain talent needs…



More than half of the respondents believe that the future skillset of Supply Chain professionals should focus more on data-driven decision making.

Supply Chain talent is…



Supply Chain talent is scarce and for roughly 80% of respondents a (key) concern.

Comment

- There is a common view that Supply Chain talent is scarce. This is a concern to a lot of our respondents
- It is expected that talent will need to have a (slightly) different skillset than today, in order to be successful. The ability to make decisions based on data is going to be more important
- Attracting talent will be a balance between offering (for example) attractive compensation, flexibility, and ability to work with advanced tools

Drivers to attract talent

- Supply Chain talent is scarce. Producers and LSPs share the view that attracting talent requires a job that balances (for example): compensation, flexibility and opportunity to work with advanced tools
- Zooming in on the differences between LSP and Producers it is seen that Producers rank flexibility higher than advanced tools, while advanced tools are ranked slightly higher by LSPs.

Deloitte.