

Successfully Navigating Supply Chain Disruptions

Center for Automotive
Research (CAR) Webinar



October 28, 2021



Here with us today



Akshay Singh

Partner, Strategy& PwC

Automotive and Smart Mobility
Akshay.Singh@pwc.com



Paul Carrannanto

Partner, Strategy& PwC

Automotive and Industrial Products
Paul.Carrannanto@pwc.com



Tanjeff Schadt

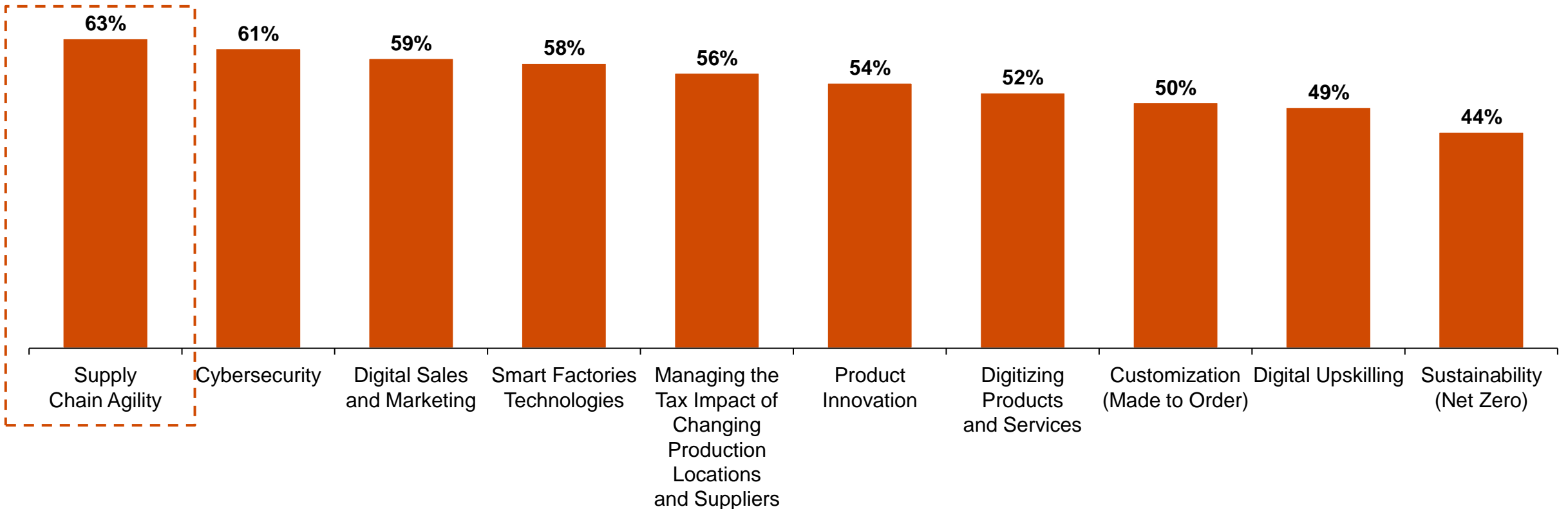
Director, Strategy& PwC

Automotive
T.Schadt@pwc.com

Supply chain agility is the #1 business priority for companies over the next 1-2 years

Survey of Automotive and Industrial Manufacturing Clients¹

(n=607)

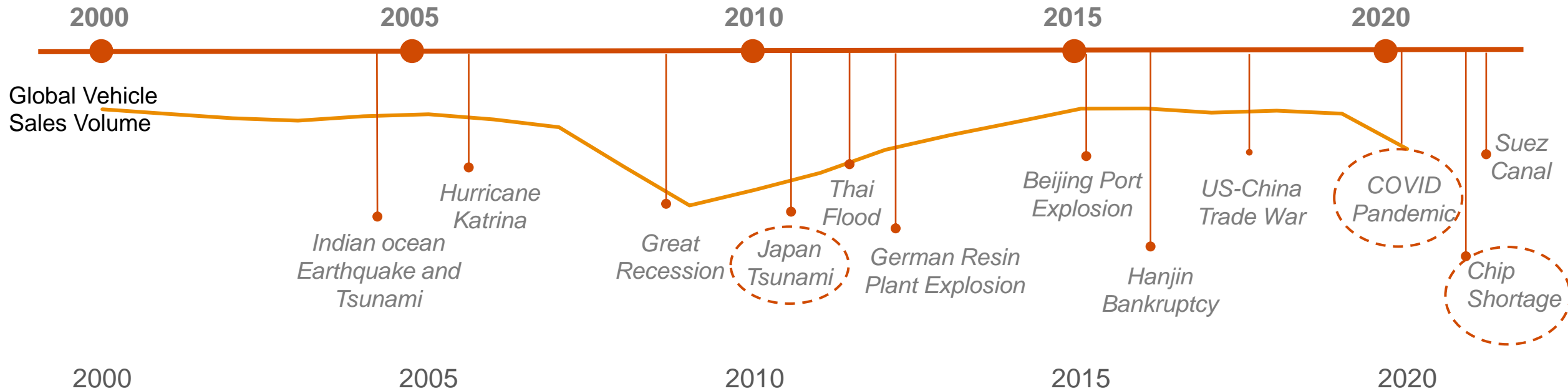


% denotes those who selected high/very high priority for each item

1. Question: "What level of priority is your company giving to the following business areas over the next 1-2 years?" Survey Size: 607 respondents
Source: PwC Global Manufacturing COO Pulse Survey 2021

Supply chain disruptions are occurring with increased frequency

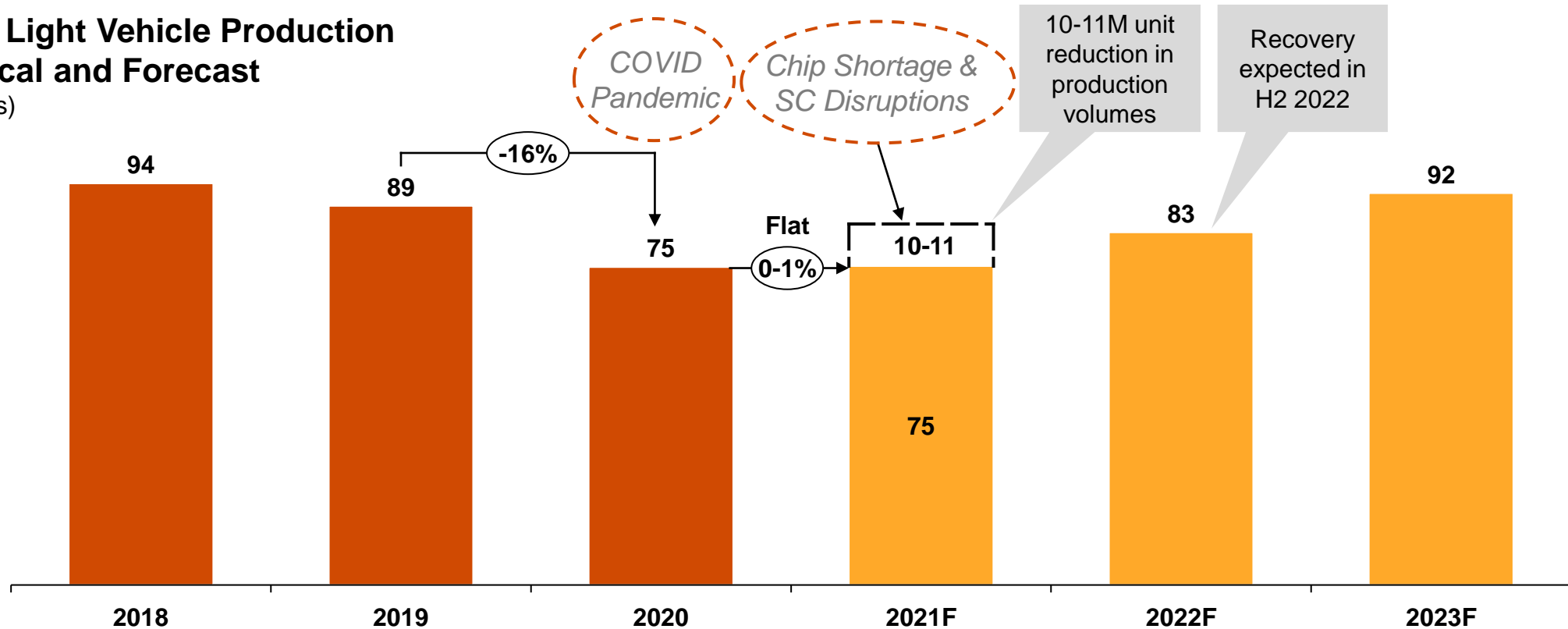
Supply chain survival of disruptive events is considered a new norm for global business operations



Sources: [HIEC](#) "US-China Trade War and Impacts on the European Auto Industry"; [Carmichael Fischer](#) "The Effect of Trade Wars on the US Automotive Industry"; [Statista](#) "Cars Sold Worldwide Between 2010 and 2021"; PwC Analysis

Global automotive production has declined ~16% due to COVID and the global chip shortage, and a recovery is not expected until late 2022

**Global Light Vehicle Production
Historical and Forecast**
(in M units)

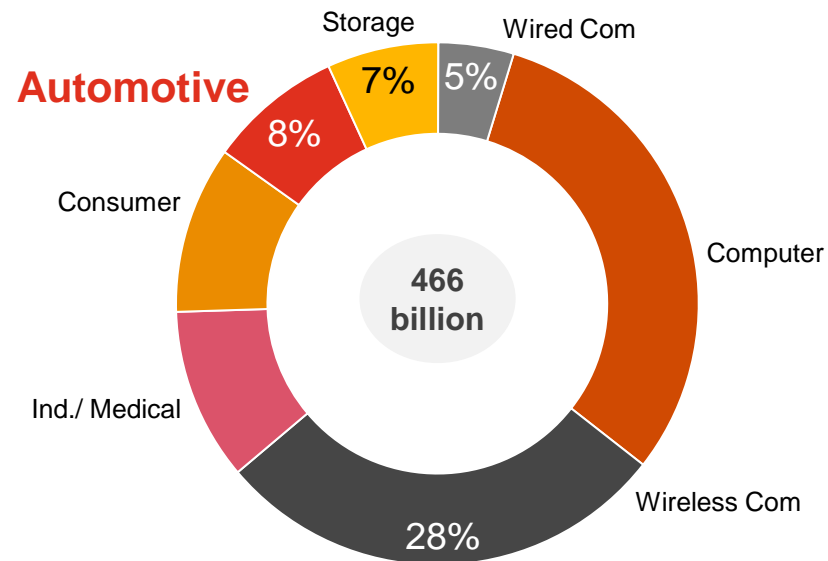


Based on industry forecasts, the global chip shortage and supply chain disruptions will result in ~\$260B - \$300B¹ lost revenue for automotive OEMs globally in 2021 and will likely persist through the end of 2022

1. Assumes weighted average global retail price of \$30K / vehicle and average dealership new vehicle gross margins of 8-10%.
Sources: Automotive News, Moody's, IHS Markit, J.D. Power, MarketWatch, Statista, MercerCapital, and PwC Autofacts analysis

The global microchip shortage was driven by massive demand shifts during COVID and long lead times for new orders and new capacity

Semiconductor 2020 revenue by Customer Industry



Automotive industry has low purchasing power accounting for only 8% of total sales

Chip Shortage Root Causes

- 1 Covid-19 related demand shock and drastic reduction in automotive orders
- 2 Rising demand in consumer electronics and other industries during Covid-19
- 3 Investment reluctance in old technology among chip producers
- 4 Export curbs on US equipment to Asian foundries manufacturing for Huawei
- 5 Downtime of a large-scale production facility causing additional bottlenecks

Sources: SIA "Strengthening the global semiconductor supply chain in an uncertain era"; IDC "PC Demand Remained Strong in the Second Quarter Amid Early Signs that Market Conditions may be Cooling"; PwC Analysis

Beyond microchips, there are several other critical automotive materials that may be at risk of future disruptions

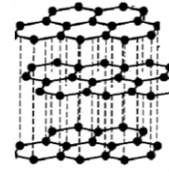
Critical EV Battery Materials at Risk



Cobalt



Lithium



Graphite

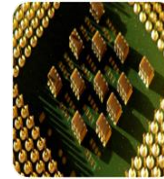
Other Critical Automotive Materials at Risk



Al



Rubber



Silicon

Other Materials at Risk Due to

- Limited Supply
- Expected automotive demand growth
- Expected demand growth from other industries

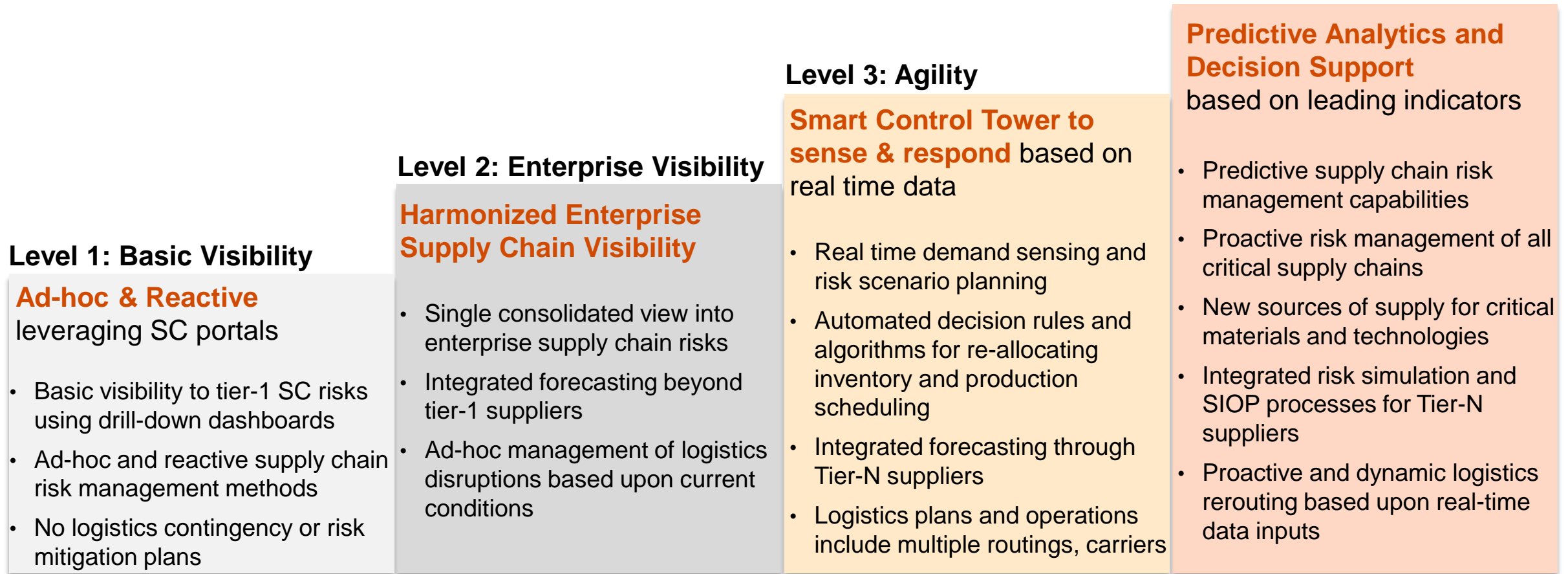
Important that OEMs and Suppliers Identify the Materials within their systems and sub-systems that are Critical

In addition to the examples above, other critical materials such as resin, neodymium, and copper pose a supply chain risk

Sources: [Automotive World](#) "Survey Reveals Aluminum Remains Fastest Growing Material"; [BBC](#) "Why the world is running out of sand"; [BusinessWire](#) "Global Construction Market Expected to Reach \$16.6 Trillion by 2025. Growing at a CAGR of 7%"; [Reuters](#) "Shortages flagged for EV materials lithium and cobalt"; [NS Energy](#) "Profiling the world's largest cobalt-producing countries"; [NS Energy](#) "Lithium prices could triple by 2030 as demand outpaces supply"; [PR Newswire](#) "Graphite Market to hit \$36,889.1 Mn Revenue by 2030"; [The Car Guide](#) "Is Rubber the Next Shortage Threatening the Auto Industry?"; PwC Analysis

Industry leaders are employing advanced supply chain risk management methods to create supply chain resilience

Supply Chain Risk Management - Maturity Model

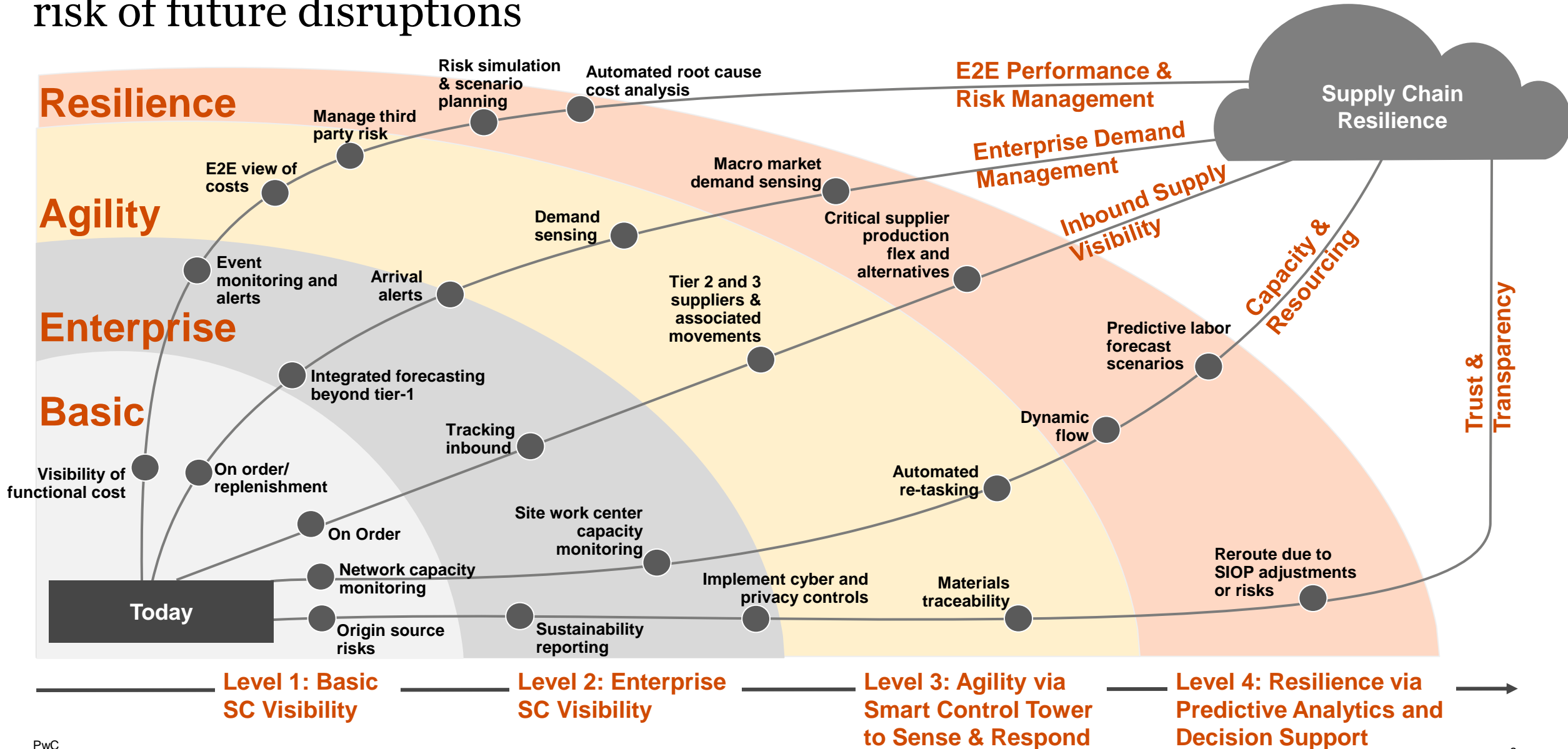


Supply Chain Risk Management Maturity

Basic

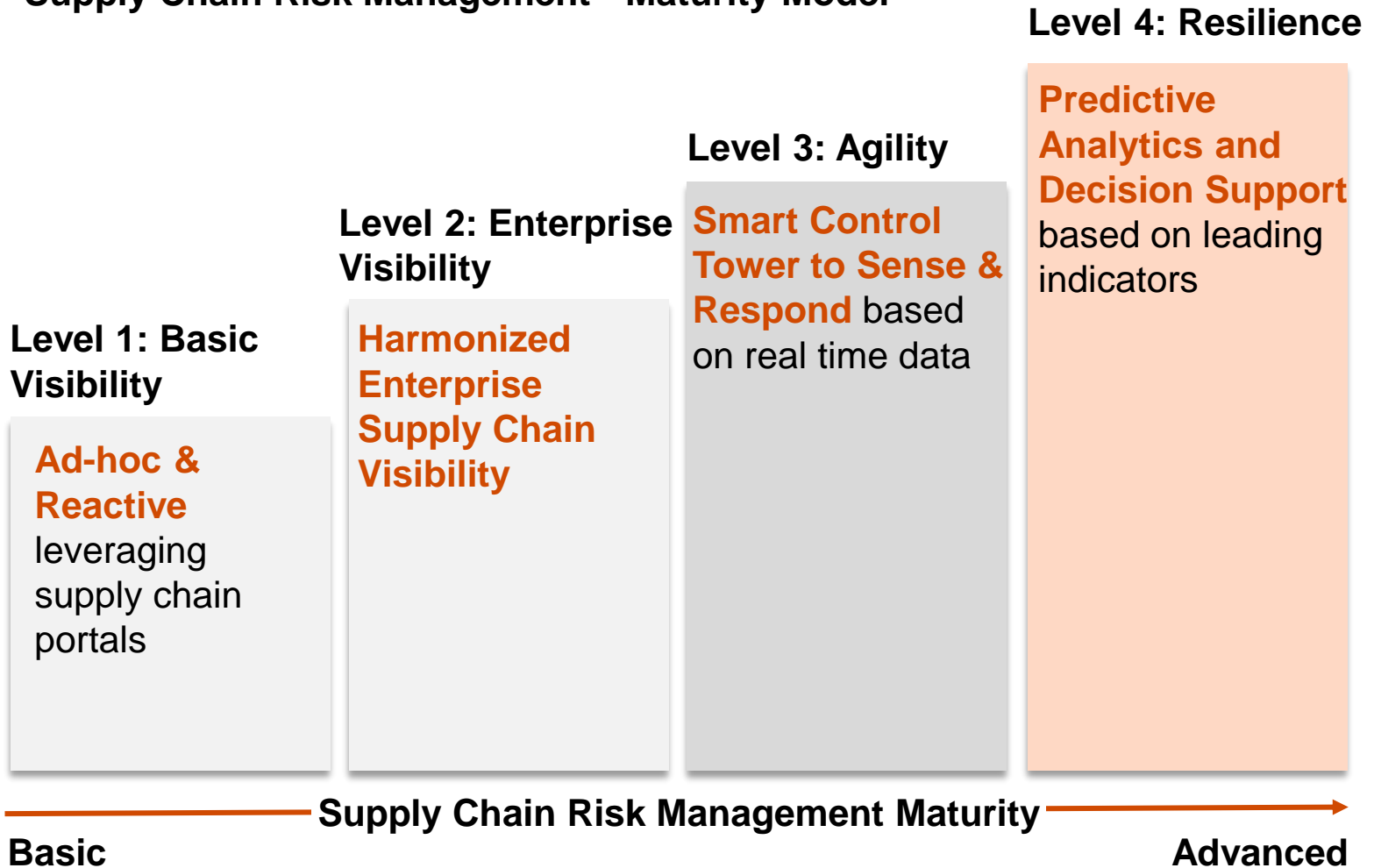
Advanced

Creating E2E visibility, agility, and resilience are critical to mitigate the risk of future disruptions



How mature is your organization in managing supply chain risks?

Supply Chain Risk Management - Maturity Model



Questions?

Please submit questions
using the Q&A function on
your toolbar

[pwc.com](https://www.pwc.com)

© 2021 PwC. All rights reserved. Not for further distribution without the permission of PwC. “PwC” refers to the network of member firms of PricewaterhouseCoopers International Limited (PwCIL), or, as the context requires, individual member firms of the PwC network. Each member firm is a separate legal entity and does not act as agent of PwCIL or any other member firm. PwCIL does not provide any services to clients. PwCIL is not responsible or liable for the acts or omissions of any of its member firms nor can it control the exercise of their professional judgment or bind them in any way. No member firm is responsible or liable for the acts or omissions of any other member firm nor can it control the exercise of another member firm’s professional judgment or bind another member firm or PwCIL in any way.