



REACTION

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Articles include:

A risk management approach to
cyber security

Trade environment changes — Tariffs

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Introduction



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Welcome to the January edition of REACTION Magazine.

Following another good year in the chemical industry, the question on everybody's lips is how long can the good times last?

Certainly, headwinds are building around the global economy including a slowdown in China, continued instability due to Brexit and rising economic protectionism.

It was an honor to be invited recently to participate in an expert panel at the GPCA Annual Forum in Dubai, which focused on free trade and protectionism. The venue was packed and most of the executives in attendance were concerned with the current direction of travel and potential impact on the global chemical industry.

With that in mind, we have an article in this edition focusing on trade and customs challenges and opportunities resulting from the recent tariff announcements. We also return to the massively important issue of cyber security and how it should be looked at with an enterprise-wide risk management lens.

Finally, I'd like to share with everyone a recent video we produced in association with the Chemical Industries Association in the UK — highlighting the ongoing impact of shale gas and how it continues to change the global chemical landscape and particularly how that may impact Europe even more in the years ahead. ([Link](#))

If there are any other topics you would like us to cover in future editions of REACTION, please don't hesitate to contact us.

Contents



4

A risk management approach to cyber security

| | |
|---|----|
| Growing threats, rising costs | 6 |
| Attacks on chemical companies | 7 |
| Beyond a generic approach | 8 |
| Quantified risk management | 9 |
| Collaborative security in Germany | 11 |
| Questions to ask about cyber security initiatives | 12 |



14

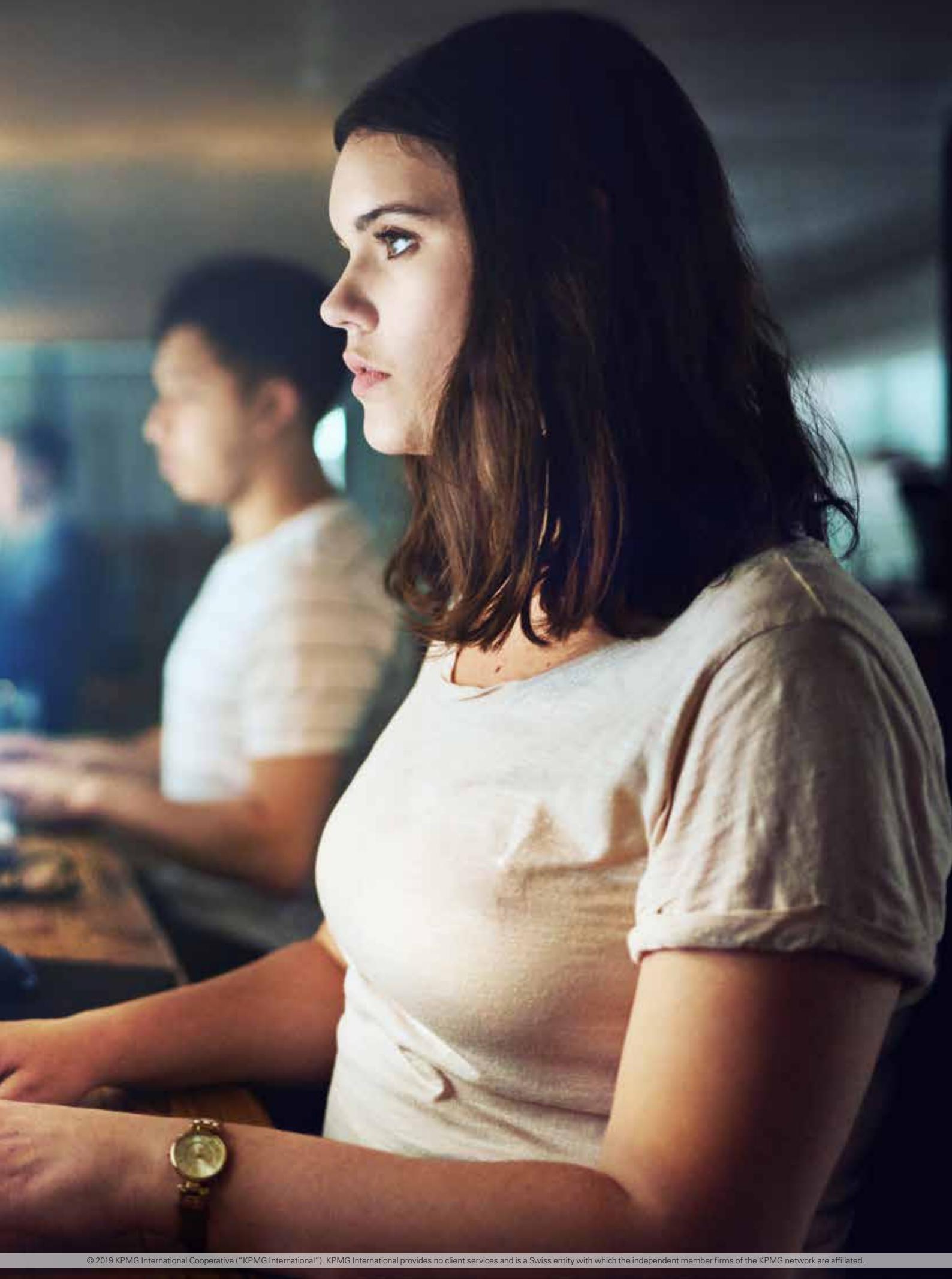
Trade environment changes – Tariffs

| | |
|---|----|
| US trade actions ... | 16 |
| ... and global reactions | 18 |
| What this means for US chemicals | 18 |
| Four steps to consider in developing your tariff strategy | 19 |

A risk management approach to cyber security

By Michael Gomez and Marko Vogel

The arms race is heating up in cyber security. We all know that cyber attacks are now a matter of when, not if. We also know that new technologies such as Internet of Things (IoT) devices and artificial intelligence (AI) can be used by attackers across multiple industries around the world. Chemical companies are increasing their defenses, but they can lack a structured understanding of cyber risk in terms of potential damages, their specific monetary implications, and the best way to allocate funds and resources to contain cyber threats. A risk management approach backed by effective governance and communication can help companies mitigate risk while optimizing their cyber security investments.





Growing threats, rising costs

Cyber attacks are a growing — and a very expensive — threat to organizations. In the [2018 Harvey Nash/KPMG CIO Survey](#), 33 percent of respondents reported a major cyber attack in the last 2 years.¹ Another survey suggests that the average total cost of a data breach is about US\$3.62 million.² In 2017, cyber attacks were estimated to cause US\$5 billion worth of damages — a 15-fold increase since 2015.³

Today's cyber attacks have become far more sophisticated, destructive and widespread, originating not only from individual hackers but also, according to reports, from nation-state military intelligence and services and advanced cyber crime syndicates.⁴ Hackers have moved from denial-of-service (DoS) attacks to ransomware, theft of competitive information, interception or altering of communications, the shutdown of industrial processes, and at times, knowledge manipulation through the news and social networks. In addition, hacking tools are now readily available on the 'dark web', and the tools themselves are becoming increasingly more effective and automated.

Instead of targeting a single employee in an organization, hackers can now target every employee in various ways on a regular basis, increasing the likelihood of penetrating the organization's IT systems. In the same way, the increased use of the Internet of Things (IoT) technology provides hackers with a growing number of entry points and unforeseen vulnerabilities to exploit. More than three billion smartphones and eight billion IoT devices are now in use globally.⁵ Gartner predicts over 20 billion connected things by 2020, all of which represent a portal to networks that can be hacked or compromised.⁶

AI is another example of innovation becoming a two-edged sword.⁷ Along with tremendous potential for good, AI could also support a new generation of hacking threats. These threats include automating attacks and significantly improving the targeting of victims; better impersonating individuals for more effective social engineering; creating and targeting fake news; better code and better use of attack resources for DoS attacks; and developing more virulent malware and viruses.⁸

To read more about the
2018 Harvey Nash/
KPMG CIO Survey
click here or visit
[kpmg.com/energy](#).



¹ Harvey Nash/KPMG CIO Survey 2018, <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2018/06/harvey-nash-kpmg-cio-survey-2018.pdf>

² Cost of Data Breach Study: U.S., IBM Security and Ponemon Institute, June 2017, <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=SEL03130WVWN&>

³ What is a cyber attack? Recent examples show disturbing trends, CSO, 7 March 2018, <https://www.csionline.com/article/3237324/cyber-attacks-espionage/what-is-a-cyber-attack-recent-examples-show-disturbing-trends.html>

⁴ Cyber Security and Risk Management 2018, Financier Worldwide, <https://www.financierworldwide.com/annual-review-cyber-security-risk-management-2018/#.W4bQuM5KiM8>

⁵ 5 of the biggest cybersecurity risks surrounding IoT development, Networkworld, 27 June 2017, www.networkworld.com/article/3204007/internet-of-things/5-of-the-biggest-cybersecurity-risks-surrounding-iot-development.html

⁶ Gartner Says 8.4 Billion Connected "Things" Will Be in Use in 2017, Up 31 Percent From 2016, Gartner press release, 7 February 2017, www.gartner.com/en/newsroom/press-releases/2017-02-07-gartner-says-8-billion-connected-things-will-be-in-use-in-2017-up-31-percent-from-2016

⁷ The AI Cybersecurity Arms-Race: The Bad Guys Are Way Ahead, Forbes, 26 April 2018, www.forbes.com/sites/gilpress/2018/04/26/the-ai-cybersecurity-arms-race-the-bad-guys-are-way-ahead/#12e433dd148e

⁸ Using AI for Evil: A Guide To How Cybercriminals Will Weaponize And Exploit AI To Attack Your Business, Forrester, 16 April 2018, www.forrester.com/report/Using+AI+For+Evil/-/E-RES143162



Attacks on chemical companies

The chemical industry is exposed to many of today's cyber risks. As discussed in [REACTION Magazine, Edition 18](#), chemical manufacturers are vulnerable to attack not only on the enterprise side with their IT systems, but also on the operational side through their control systems and connected networks.⁹ In a manufacturer's supply chain, for example, an attack originating on either the enterprise or operational side can result in physical damage with suppliers that experience business interruption related to a shutdown of IoT devices or technical damage when hackers gain access to a supplier's network through unsecured devices.¹⁰

Several recent hacking attacks on petrochemical plants in Saudi Arabia underscore the dangers faced by the chemical industry today. In January of 2017, computers were attacked at the National Industrialization Company (known as Tasnee), a privately owned Saudi petrochemical company.¹¹ This was accompanied by a similar attack on Sadara Chemical Company, a joint venture between Saudi Aramco and Dow Chemical.¹² Then, in August of 2017, hackers launched a major attack on an unnamed petrochemical company with a plant in Saudi Arabia.¹³ This attack was apparently designed to destroy data, disrupt the firm's operations and perhaps even trigger an explosion.¹⁴



This attack was apparently designed to destroy data, disrupt the firm's operations and perhaps even trigger an explosion.¹⁴"

⁹ Integrated control systems: new opportunities and cyber risks for chemical manufacturers, Reaction, Issue 18, December 2015, <https://assets.kpmg.com/content/dam/kpmg/pdf/2015/12/REACTION-18.pdf>

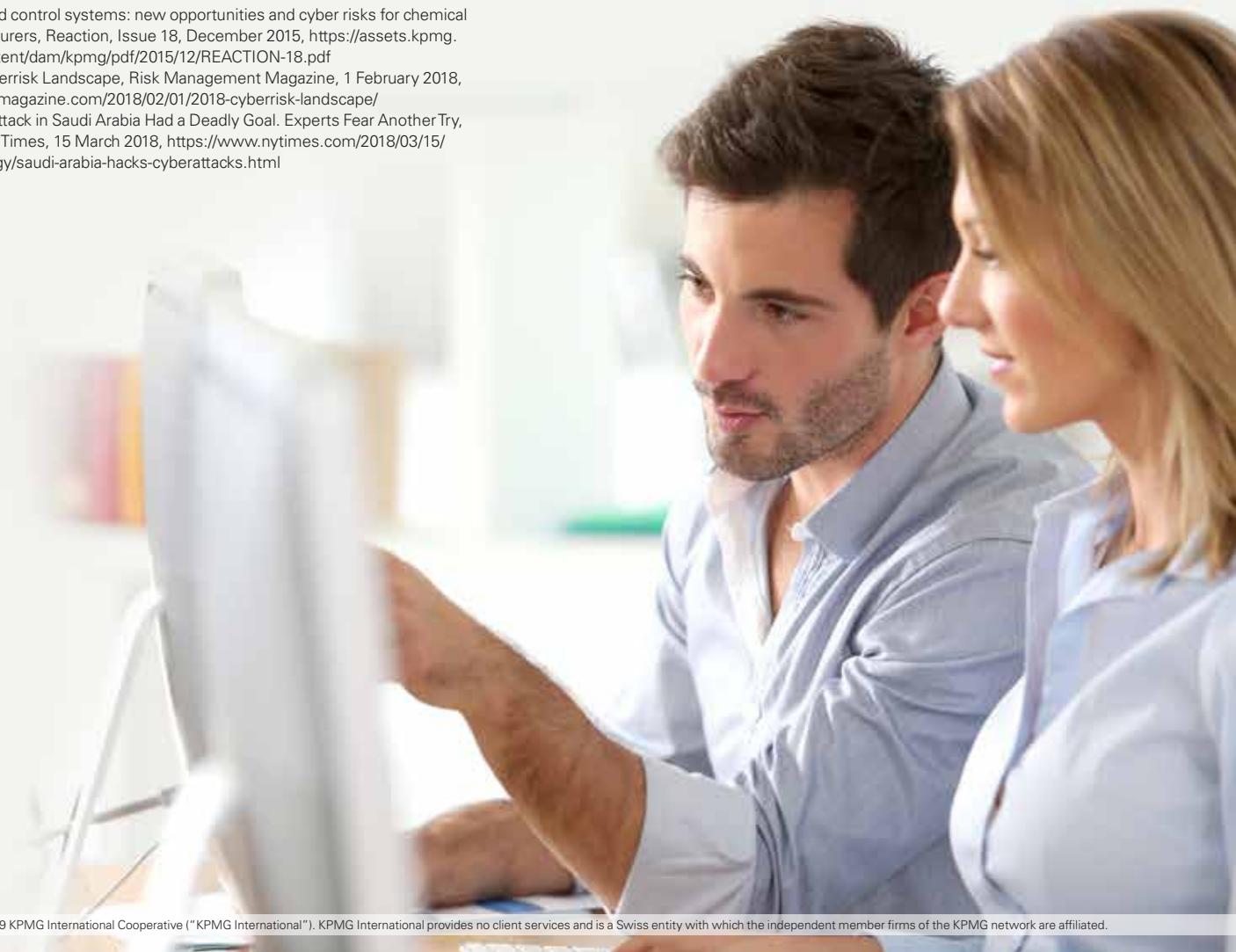
¹⁰ 2018 Cyberrisk Landscape, Risk Management Magazine, 1 February 2018, www.rmmagazine.com/2018/02/01/2018-cyberrisk-landscape/

¹¹ A Cyberattack in Saudi Arabia Had a Deadly Goal. Experts Fear Another Try, New York Times, 15 March 2018, <https://www.nytimes.com/2018/03/15/technology/saudi-arabia-hacks-cyberattacks.html>

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.





Beyond a generic approach

Although the threats and probability of being attacked are clear, ways to deal with cyber security issues are not always sufficiently understood. IT leadership needs to be able to make well-informed investment decisions which address cyber security risks. Business-sponsor engagement, including building understanding, confidence and credibility, is essential for IT leadership. However, today's risk assessment frameworks are often judgmental and limited by the use of generic checklists, involve subjective and qualitative assessments of risk, and rarely leverage substantiating evidence.

Numerous frameworks are currently available to chemical companies. Standards such as ISO 27001 help bring structure to the way security capabilities are described and organized, while creating a basis for auditing the management and implementation of these capabilities.¹⁵ But ISO 27001 does not really help an organization make judgments on the strengths and effectiveness of

the capabilities they require, or easily benchmark themselves against others. The NIST Cyber Security Framework¹⁶ partly fills this gap by providing capability maturity models, although these models remain subjective in their assessment approach. SANS offers their CIS Critical Controls, a recommended set of actions for cyber defense that suggests a number of ways to stop attacks.¹⁷

These frameworks are valuable, but remain relatively generic and cannot be tailored to the threat profile of a specific organization or the capabilities of a given attack group. At the same time, cyber security budgets are rising and companies want assurance from their IT leadership that the investments they make are well targeted and effective.

The challenge for us is to move beyond these broad categories and provide a consistent view of what motivates an attacker, which attack patterns they might employ, and how much effort they might be prepared to commit to attacking our critical assets.



At the same time, cyber security budgets are rising and companies want assurance from their IT leadership that the investments they make are well targeted and effective.”

¹⁵ ISO/IEC 27000 family — Information security management systems, ISO, <https://www.iso.org/isoiec-27001-information-security.html>

¹⁶ Cybersecurity Framework, US National Institute of Standards and Technology, <https://www.nist.gov/cyberframework>

¹⁷ The CIS Critical Security Controls for Effective Cyber Defense, SANS, <https://www.sans.org/critical-security-controls>



Quantified risk management

Risk quantification

To better manage cyber risk and increase their ROI for cyber security, chemical companies should consider a comprehensive, quantitative model for addressing cyber risks. An effective model includes a structured approach to both assessing a company's security capabilities and gauging the value of data, departments, business units

and other areas susceptible to attack. This can help IT leaders to budget security investments according to the actual business value of each asset being protected. A company might not want to protect a business unit that generates, say, US\$2 million of revenue with US\$4 million of security.

Such an approach could be based on a risk quantification model which consists of five key components:

- 1 Business view:** An understanding of the business, corporate vision and ambitions, business strategy and growth plans, intellectual property, unique processes, critical staff, critical assets, and suppliers to the organization.
- 2 Threat view:** An understanding of threat actors of concern to the firm, their intent and motivation, as well as the attack patterns they might typically adopt to defeat the security capabilities of the target firm.
- 3 Security view:** A structured assessment of the security capabilities in place within the organization to protect the critical assets. This should be done in a way that is repeatable and auditable, while achieving the highest degree of objectivity as possible.
- 4 Attack scenarios:** A catalogue of business cyber attack scenarios, which link the threat actor to the asset at risk. This includes an assessment of the likely loss to the business in that scenario and the potential gain to the attacker. These scenarios are the basis of a calculation of impact and are developed hand-in-hand with the business.
- 5 Link between threat and security:** A means of relating the attack vectors that an attacker might use to the security capabilities that make the attacker's life more difficult. This will help identify the costs those security capabilities might impose on an attacker and also how this changes the likelihood of that attack succeeding.

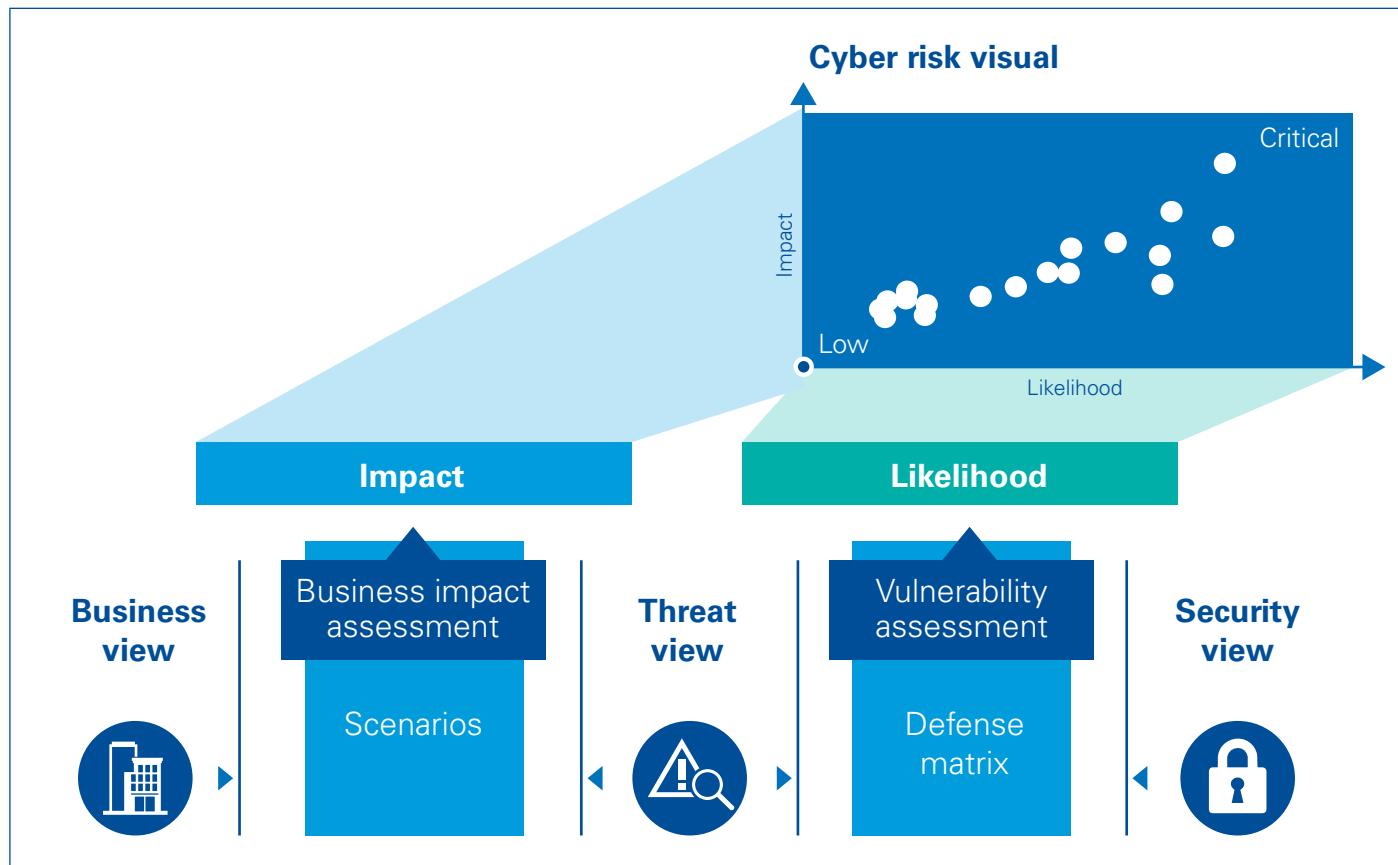


An effective model includes a structured approach to both assessing a company's security capabilities and gauging the value of data, departments, business units and other areas susceptible to attack."

In each of these five components, cost is a key factor, bringing structure to the way companies calculate the cost of cyber security as well as any loss caused by a cyberattack. Items to be considered might include:

- Costs in anticipation of cybercrime, such as antivirus software, insurance and compliance.
- Costs as a consequence of cybercrime, such as direct losses and indirect costs such as weakened competitiveness as a result of intellectual property compromise.
- Costs in response to cybercrime, such as compensation payments to victims and fines paid to regulatory bodies or other remediation costs.

There will always be residual uncertainty created by the discovery of new vulnerabilities, new attackers showing up, attacker economies and markets shifting in an unpredictable way. Nevertheless, this model will provide a best assessment of the known data, including straightforward extrapolations of the current reality and the basis for strategic actions and agendas.



Source: Cyber Risk: Providing a Robust Basis for Security Investment, 19 March 2015, KPMG, Shell and Microsoft



Collaborative security in Germany

Although companies naturally seek a competitive advantage in the business world, a collaborative approach can be better when it comes to cyber security. Threats do not come from other companies, but from hackers who often use similar strategies and tools to attack multiple companies at the same time. Companies can therefore benefit by joining forces to share security information, research and methodologies designed to strengthen their cyber defenses.

In 2015, several German companies founded Deutsche Cyber-Sicherheitsorganisation GmbH (DCSO) to enhance

cyber security for German companies.¹⁸ Along with the founding companies, the DCSO includes research institutes, Federal agencies, the German Federal Ministry of the Interior (BMI) and the German Federal Office for Information Security (BSI).

Participants contribute their own best practices and insights to DCSO's core services, such as product and technology assessments, threat detection, security audits and incident response. The DCSO Think Tank includes interdisciplinary teams that work on issues such as AI or blueprints of future security architectures.¹⁹



¹⁸ Cooperation for greater cybersecurity in Germany <https://www.bASF.com/en/company/news-and-media/news-releases/2015/09/p-15-342.html>

¹⁹ DCSO website, <https://dCSO.de/de/about-us/>



Questions to ask about cyber security initiatives

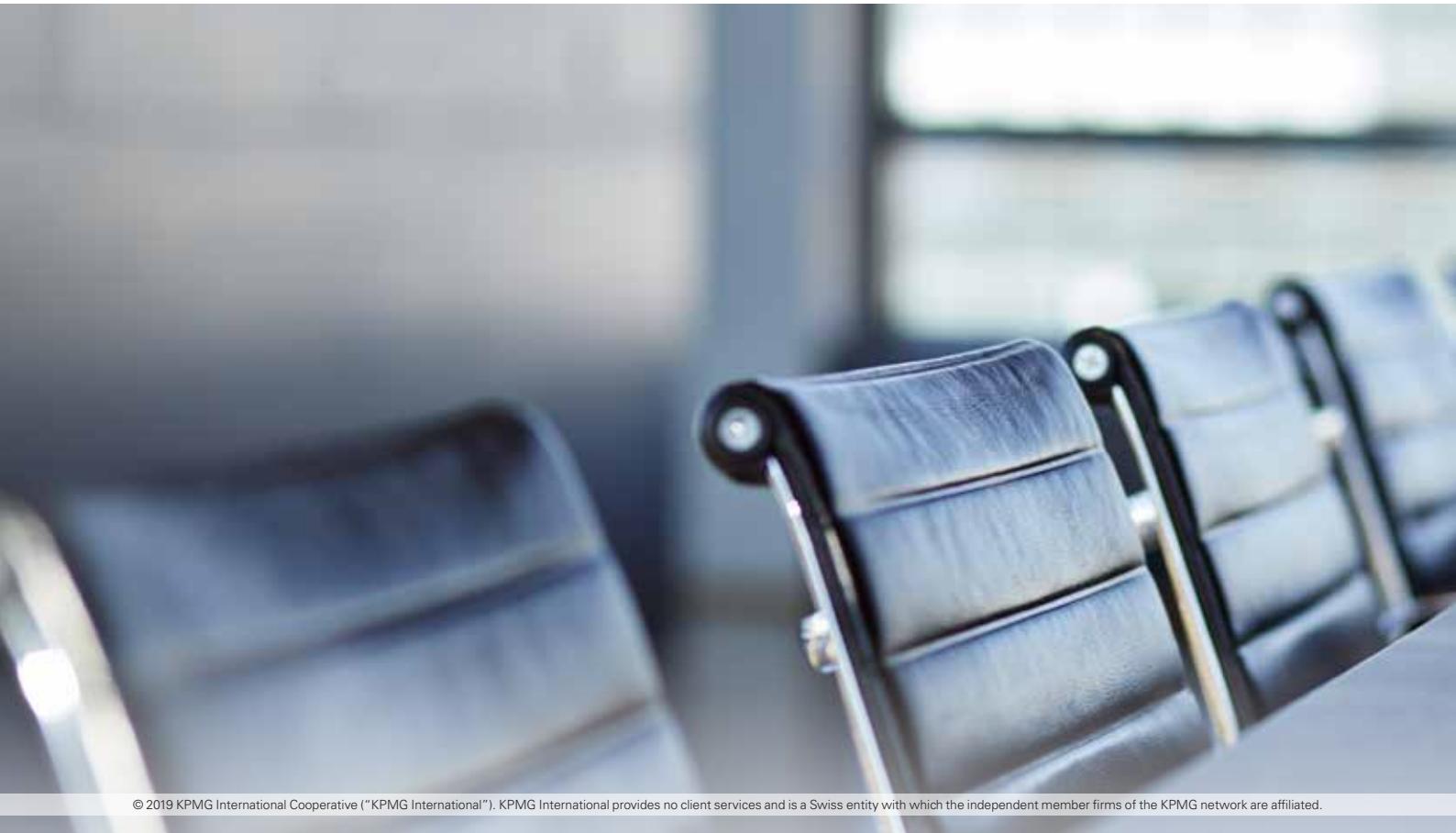
Fighting cybercrime requires a company-wide effort, with plans and processes incorporated into effective governance. However, not all company leaders are equally informed about the current state of cyber security and their company's defenses against cyber threats.

This communications breakdown is highlighted by two recent surveys showing that CEOs view their

companies' cyber security readiness very differently than their CIOs.²⁰ The KPMG US CEO Outlook 2018²¹ found that CEOs put cyber security as their top risk, but 77 percent believe their organizations are either "very well" or "well" prepared for a cyber incident. This stands in contrast to only 22 percent of CIOs and tech leaders who feel the same way.²²

To ensure proper governance for cyber security, board members can ask questions like these:

-  — What roles do senior leaders and the board play in managing and overseeing cyber security, cyber incident response, and who has primary responsibility?
-  — Do we have a chief information security officer (CISO), and who does the CISO report to? Is there a direct line to the CEO?
-  — Do we need a separate, enterprise-wide cyber risk committee for more regular communication?





Communication frequency and effectiveness are equally important. Better communications can be supported by discussions in the following areas.

- Is the frequency of our meetings adequate?
- Is the frequency and content of communication from management adequate?
- What is our incident response plan, and how are we learning from incidents that are happening?



Communication effectiveness can be measured by asking questions like these.

- Do we have a holistic, board-specific framework that closes the loop on effective communication throughout the organization?
- Are we asking the right questions and sharing the right information for a reliable information flow?



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²⁰ CEO and CIO cyber disconnect: Fixing the communications breakdown, CIO, 21 August 2018, <https://www.cio.com/article/3299028/leadership-management/ceo-and-cio-cyber-disconnect-fixing-the-communications-breakdown.html>

²¹ KPMG US CEO Survey 2018, https://home.kpmg.com/us/en/home/insights/2018/01/growing-pain.html?utm_source=vanity&utm_medium=vanity&mid=m-00003791&utm_campaign=c-00053430&cid=c-00053430

²² Ibid.

Trade environment changes – Tariffs

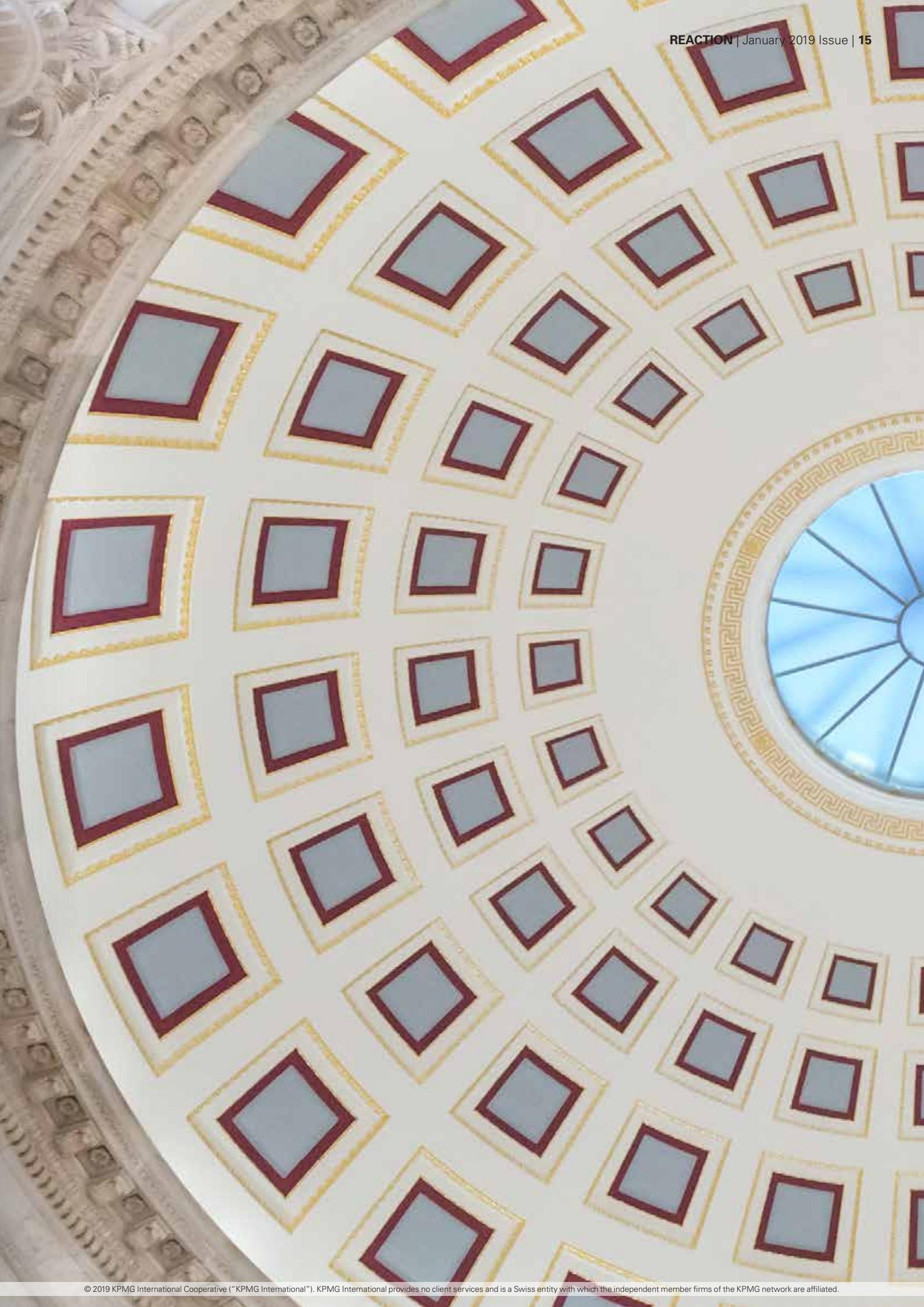
Are mitigation strategies impacting the investment and growth strategies of chemical companies?

By Christine Griffith, Anjit Bajwa and Doug Zuvich

As of December 2018, the Trump administration has imposed tariffs on over US\$200 billion of goods imported from China, and China has responded in kind with tariffs on US\$50 billion worth of goods on the US.²³ The size and scope of these tariffs are unprecedented. These actions are affecting a large number of chemical manufacturers, their customers and suppliers. The long-term impact is not yet clear.

What can be acknowledged, however, is that chemical companies are closely watching changes occurring on a near-daily basis and, in some cases, already taking steps to reconsider their investment and growth strategies, so they can better address both immediate and long-term consequences.

²³ Trump Hits China With Tariffs on \$200 Billion in Goods, Escalating Trade War, 17 September 2018, <https://www.nytimes.com/2018/09/17/us/politics/trump-china-tariffs-trade.html>





US trade actions ...

Section 301 Tariffs and Actions Timeline, updated 6 December 2018²⁴

| | |
|--------------------------|--|
| August 2017 | US investigation into unfair trade practices by Chinese initiated |
| March 2018 | US Department of Commerce releases findings that China is conducting unfair trade practices related to technology transfer, IP, and innovation |
| April 2018 | US announces 25 percent tariffs on 1,300 Chinese products, Two lists: US\$34 billion + US\$16 billion |
| 6 July 2018 | US tariffs on US\$34 billion (no chemicals) imposed; Chinese tariffs on 545 products (no chemicals) |
| 10 July 2018 | 10 percent tariffs on US\$200 billion, 6,000 products (1,505 chemicals); the proposed 10 percent tariff to jump to 25 percent on 1 January 2019 |
| 20 July 2018 | US threatens tariffs on up to US\$505 billion (basically <i>all</i> imports from China) |
| 3 August 2018 | Chinese tariffs on US\$60 billion announced (987 of 5,207 products are chemicals) |
| 23 August 2018 | US tariffs on US\$16 billion imposed (includes US\$2.2 billion on chemicals); Chinese tariffs on US\$16 billion imposed (includes US\$2.0 billion on chemicals/plastics) |
| 24 September 2018 | US tariffs of 10 percent imposed on US\$200 billion (US\$16.4 billion on chemicals) |
| 30 November 2018 | US and China agree to halt additional tariff increases for a 90-day period, including the scheduled increase in tariffs for List 3 from 10 percent to 25 percent |

²⁴ Source: An Assessment of the Impact of Retaliatory Tariffs on US Chemical Exports to China: Jobs Lost and Economic Harm, ACC, 7 September 2018, <https://www.americanchemistry.com/Policy/Trade/An-Assessment-of-the-Impact-of-Retaliatory-Tariffs-on-US-Chemical-Exports-to-China.pdf>; ACC Responds to Announcement of Additional Tariffs on US\$200B of Chinese Goods, American Chemistry Council press release, 11 July 2018, <https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/ACC-Responds-to-Announcement-of-Additional-Tariffs-on-200-Billion-of-Chinese-Goods.html>; The US-China Trade War: A Timeline, China Briefing, 3 December 2018, <http://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/>; Outlook for Chemistry and the Economy, presentation, Michigan Chemistry Council, 16 October 2018



The US has undertaken three major tariff actions, each one with increasingly significant implications for the chemical industry:

Section 201 safeguard tariffs — Tariff-rate quotas on imported solar panel components (starting at 30 percent) and residential washing machines (starting at 20 percent) from any country, effective 7 February 2018.

Section 232 national security tariffs — Additional tariffs on specified steel (25 percent) and aluminum (10 percent) products from all but several countries, effective 1 June 2018.

The tariffs were issued pursuant to Section 232 of the Trade Expansion Act of 1962, which authorizes tariffs for national security reasons. The proclamations were revised several times, but as of 31 May 2018, Argentina, Australia, Brazil and South Korea were the only countries exempt from the steel tariffs from 1 June, and Argentina and Australia the only countries exempt from the aluminum tariffs. Notably,

steel and aluminum imports from the European Union, Canada and Mexico are now subject to tariffs.

In addition, presidential proclamations issued on 30 April clarified that duty drawback was not available to recapture 232 duties paid on subject products that are imported and subsequently exported. They also further clarified practices associated with admitting and withdrawing products from a Foreign Trade Zone (FTZ).

Section 301 unfair trade practice tariffs — Additional tariffs (25 percent) on over 800 individual goods of Chinese origin, in a variety of industries. Section 301 is based on findings from an investigation by the Office of the United States Trade Representative (USTR) into unfair trade practices by the Chinese under Section 301 of the Trade Act of 1974.²⁵

As of 6 September 2018, Section 301 includes three product lists:²⁶

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The first list includes 818 products, although only one product — a reagent (2845.90) — is in the chemical sector. The US imported US\$3.6 million worth of this product last year from China. Imports from China represented 6 percent of the total US\$63 million of the product imported to the US in 2017.

02

More than half (54 percent) of the proposed tariff lines in List 2 are products in the chemical and plastics industry, facing a 25 percent tariff rate when imported from China. There are 152 tariff lines that directly impact US chemicals imports, and 147 of these tariff lines are plastics and plastic products. The value of these imports from China was US\$2.2 billion in 2017.

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On 10 July 2018, the USTR published a list of another US\$200 billion worth of Chinese imports that will face 10 percent or 25 percent tariffs. The Administration made a statement on 1 August that it intends to raise the tariff rate for List 3 goods from 10 percent to 25 percent. This would dramatically amplify the negative impact of the tariffs. This list covers more than 6,000 products including 1,505 chemicals and plastics products. One-fourth of the products targeted are chemicals and plastics products. The value of these imports from China was US\$16.4 billion in 2017.

²⁵ Findings of US Section 301 Investigation, March 22, 2018, <https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF>

²⁶ Statistics in these List descriptions are from An Assessment of the Impact of Retaliatory Tariffs on US Chemical Exports to China: Jobs Lost and Economic Harm, ACC, 7 September 2018, <https://www.americanchemistry.com/Policy/Trade/An-Assessment-of-the-Impact-of-Retaliatory-Tariffs-on-US-Chemical-Exports-to-China.pdf>



... and global reactions

China has responded in kind if not in volume to US trade actions, publishing two lists, the first of which targets approximately US\$34 billion in imports with 25 percent tariffs that went into effect on 6 July. A second list of Chinese tariffs worth US\$16 billion in imports from the US would be activated on 23 August 2018 and target medical products, chemicals, and energy products with 25 percent tariffs.²⁷

In September 2018, Canada and Mexico reached an agreement with the US to update the North American Free Trade Agreement (NAFTA), a pact that governs more than US\$1.2 trillion worth of trade among the three nations.²⁸ The new deal, known as the United States–Mexico–Canada Agreement (USMCA), is designed, among other things, to encourage more cars and truck parts to be made in North America. Starting in 2020, to qualify for zero tariffs, a car

or truck must have 75 percent of its components manufactured in Canada, Mexico or the US, an increase from the current 62.5 percent requirement.²⁹ Despite the new trade agreement, however, the US 25 percent tariff on imported steel and 10 percent tariff on imported aluminum remain in place — as do Canada and Mexico's retaliatory trade measures against the US.³⁰

The EU has introduced retaliatory tariffs impacting over US\$3 billion in US products, including motorcycles, clothing, and agricultural products. In the cases of both the EU and Mexico, many analysts agree that the tariffs are targeting industries in areas of the US that are politically strategic to President Trump.

Lastly, retaliatory tariffs from Turkey are underway for over US\$1 billion in US goods, including coal, paper, tobacco, automobiles, cosmetics, machinery, and petrochemical products.



There is no acceptable tariff rate for global chemicals trade with China or any US trading partner. Only zero tariffs will maximize our industry's potential to deliver innovative products to new regions and increase social, environmental and economic sustainability around the world.”³¹

— American Chemistry Council



What this means for US chemicals

The potential costs of Chinese tariffs on US imports is not insignificant. Across all Chinese tariff lists for US exports into China, there are 5,207 product lines, 987 of which are chemicals and plastic products. There are 132 lines for plastics. The value of the chemicals and plastics exports exposed to these tariffs was approximately US\$8.8 billion in 2017.³² About US\$2.9 billion of that total is related to plastics exports.³³

According to a scenario developed by the ACC,³⁴ if importers in China are more challenged to find alternative sources to US products, the loss in US chemicals and plastics exports would be equivalent to US\$1.6 billion annually. In a worst case scenario where Chinese customers fully adjust their supply chains to substitute for US-sourced goods, the loss to US chemical and plastics exports could reach US\$6.1 billion annually.

In line with this analysis, many US business leaders in the chemical industry argue that new taxes on Chinese imports would seriously harm the US chemical sectors.³⁵ It should also be noted that some US chemical companies have been harmed by Chinese industrial policies and thus welcome the tariffs.³⁶

²⁷ Factbox: China tariffs on revised list of \$16 billion U.S. goods, Reuters, 9 August 2018, <https://www.reuters.com/article/us-usa-trade-china-products-factbox/factbox-china-tariffs-on-revised-list-of-16-billion-u-s-goods-idUSKBN1KU168>

²⁸ US, Canada and Mexico just reached a sweeping new NAFTA deal. Here's what's in it, Washington Post, 1 October 2018, https://www.washingtonpost.com/business/2018/10/01/us-canada-mexico-just-reached-sweeping-new-nafta-deal-heres-whats-it/?utm_term=.db2f07280d75

²⁹ Ibid.

³⁰ Trump wants to have a giant signing ceremony for the updated US–Mexico–Canada trade deal, but the other two countries are refusing because of tariffs, Business Insider, 19 October 2018, <https://www.businessinsider.com/trump-usmca-nafta-deal-ceremony-canada-mexico-tariffs-2018-10>

³¹ ACC press release, <https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/ACC-Responds-to-Announcement-That-US-Will-Proceed-With-Tariffs-on-200-Billion-in-Chinese-Imports.html>. See also ACC: Tariffs on \$16.4 Billion in Chemicals and Plastics Products on U.S. “List 3” Could Have Irreparable Impact on U.S. Manufacturing Supply Chain, ACC, 20 August 2018, <https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/Tariffs-on-16-Billion-in-Chemicals-and-Plastics-Products-on-US-List-3-Could-Have-Irreparable-Impact-on-US-Manufacturing-Supply-Chain.html>

³² An Assessment of the Impact of Retaliatory Tariffs on US Chemical Exports to China: Jobs Lost and Economic Harm, ACC, 7 September 2018, <https://www.americanchemistry.com/Policy/Trade/An-Assessment-of-the-Impact-of-Retaliatory-Tariffs-on-US-Chemical-Exports-to-China.pdf>

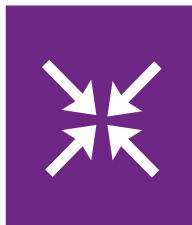
³³ Ibid.

³⁴ Ibid.

³⁵ Warnings grow about impact of tariffs on chemicals from China, C&EN, 23 August 2018, <https://cen.acs.org/policy/trade/Warnings-grow-impact-tariffs-chemicals/96/i34>

³⁶ China tariff plan slammed by chemical industry, C&EN, 28 July 2018, <https://cen.acs.org/policy/trade/China-tariff-plan-slammed-chemical/96/i32>

Four steps to consider in developing your tariff strategy



1. Assess the impact: The first step is to assess the financial and operational impact of the tariffs. This effort includes reviewing import data; identifying impacted products; identifying indirect imports through suppliers; understanding supplier and customer contractual agreements; and validating tariff classification and country of origin assumptions.



2. Capture tariff mitigation opportunities: Once you have an understanding of what your trade activity looks like, you can begin mapping approaches to mitigate the impact of any tariffs that may apply. This would include evaluation of available cost savings programs that may have gone unused in the past as well as tariff-engineering approaches to potentially exclude certain products from consideration under the tariffs altogether. Begin assessing whether any duty savings programs or strategies might be feasible/more attractive in the new trade landscape.



3. Optimize network and commercial offerings: Upon identifying and beginning the implementation of your tariff mitigation efforts, you should create and deploy an objective-driven change program to close the rest of the gap. This effort could include analyzing your supply chain network and sourcing alternatives; applying country of origin rules to your products to identify ways to obtain an origin other than China without wholesale manufacturing location changes; and conducting a total cost analysis to identify other cost-containment measures. Further, you should consider that new tariffs may put a strain on supplier relationships and could require the rethinking of pricing practices.



4. Evaluate strategic alternatives: Leading companies are also building strategic road maps to navigate anticipated further trade challenges. Elements of these road maps include identifying strategic levers for creating supply chain flexibility and agility; building and evaluating future trade scenarios including location of capacity additions; and developing plans for the mitigation of further trade developments including hedges against tariffs and non-tariff barriers that block market access.



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KPMG in the industry

14th Annual Chemicals wine dinner

More than 20 senior executives from leading chemical companies attended the 14th Annual Chemical Sector Wine Tasting and Networking Dinner in Shanghai. This long-standing event always attracts top management from across China to gather and discuss current events and issues in an informal setting. Once again, Paul Harnick and Mark Harrison joined Norbert Meyring to bring an international perspective to complement the local knowledge of KPMG China.

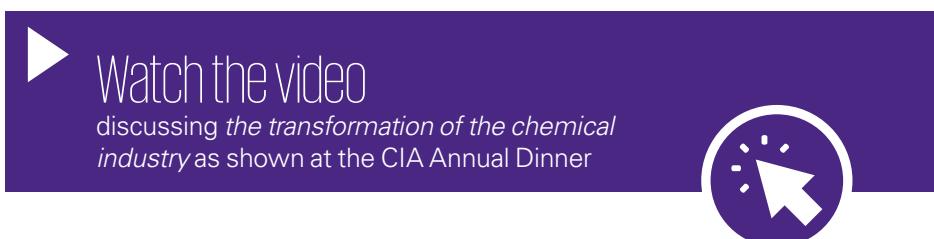


Solutions for our Future



Working for chemical and pharmaceutical businesses

The CIA Annual Dinner is an occasion for celebration, networking and great entertainment. The evening provides an excellent opportunity to entertain valued existing clients, network with prospective customers and generate new business contacts. It is one of the largest industry events of its kind and regularly attracts over 1,000 diners including senior representatives of chemical companies and leading figures from the city, industry, government, stakeholders and the news media.



Deal Capsule: transactions in chemicals – October 2018

Deal Capsule is a KPMG in Germany publication on current M&A activity in chemicals and life sciences markets.

As featured within KPMG in Germany's October issue of Deal Capsule, M&A within the chemical sector shows to be remaining stable. In addition, high performance materials and industrial gases dominate the chemicals deal landscape while US and China remain the most active countries in the sector.

Figure 9: chemicals announced deals by size of transaction Q1–Q3 2018*

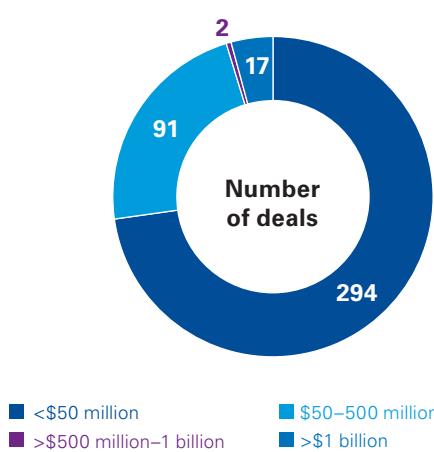
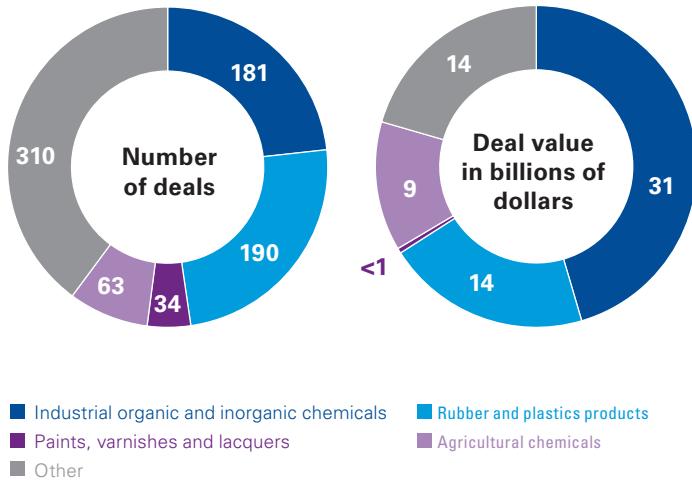


Figure 10: chemicals announced deals by category Q1–Q3 2018*



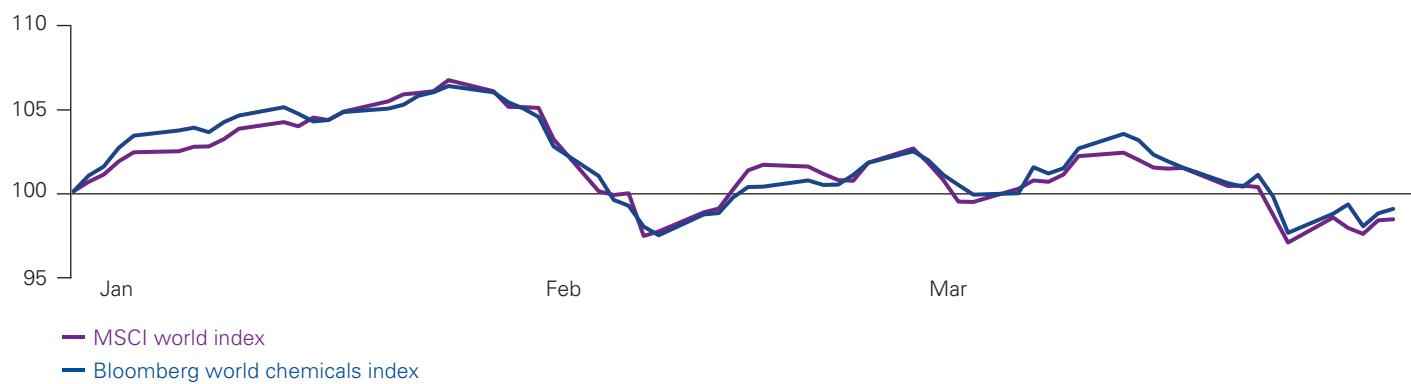
* Includes deals with a disclosed deal value.

Sources: Thomson One, KPMG Analysis

* Includes all deals, with disclosed and undisclosed deal value.

Sources: Thomson One, KPMG Analysis

Figure 15: Development of chemicals share prices Q1 2018



Sources: Bloomberg, KPMG Analysis

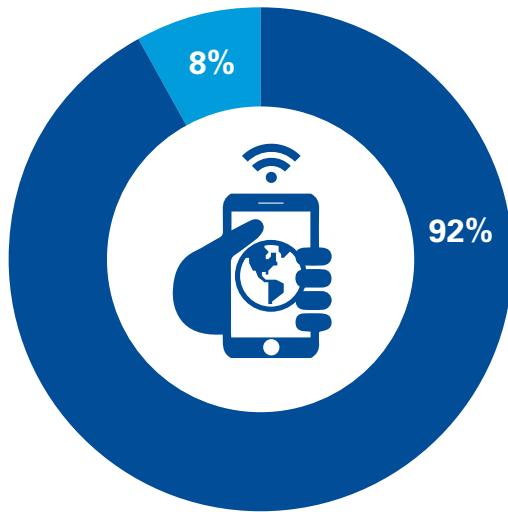


REACTION 23 webcast highlights

During our recent REACTION Magazine webcast, **Dr. Bernhard Kneissel**, Director Deal Advisory, Strategy, KPMG in Germany, discussed reinventing chemical companies with digital transformation.

Throughout the webcast, participants provided their feedback on key industry issues with the results shown below.

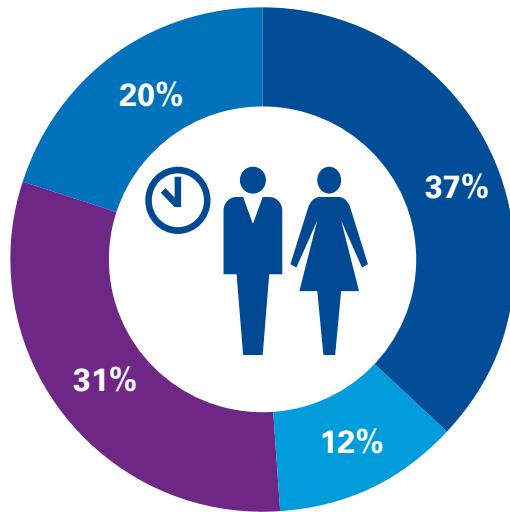
Do you believe digital transformation has become a part of the fourth and latest industrial revolution?



- A Yes
- B No

Number of respondents = 50*

From the list below, what component holds back innovation the most at your company?

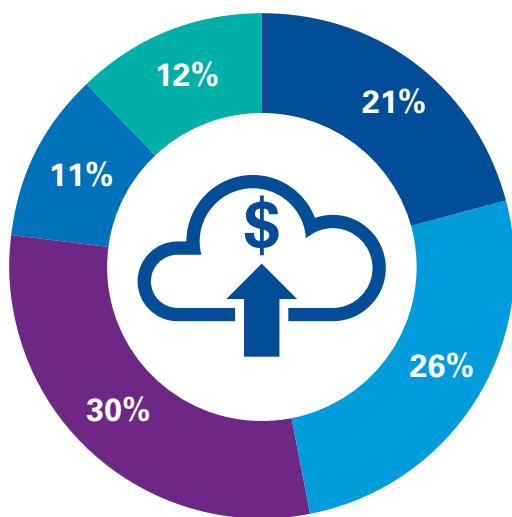


- A Lack of budget
- B Lack of skilled workers
- C Lack of know-how to evaluate potential of technology
- D Lack of acceptance of technology in the company

Number of respondents = 51*

*Source: Chemistry 4.0: Reinventing the chemical company with digital transformation, Global Chemicals Institute webcast, KPMG International

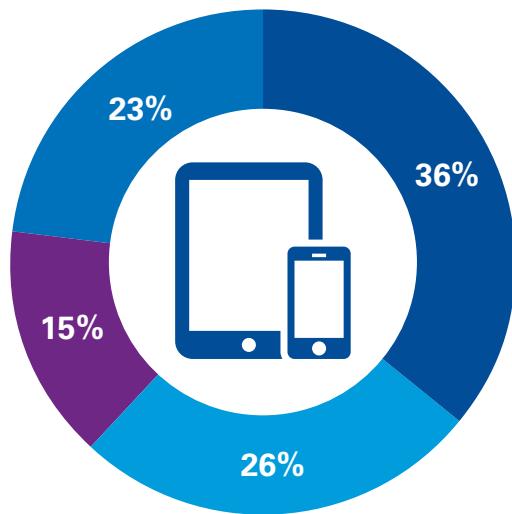
How does digitization support your company in providing customer-driven innovation?



- (A) Provide better end-customer solutions and new services
- (B) Support better promotion planning, forecasting and monitoring of customer demand
- (C) Improve connectivity, increase customer proximity and strengthen customer loyalty
- (D) Facilitate out-of-the-box thinking about product and service delivery
- (E) Other

Number of respondents = 47*

The biggest use I have for digital technology in my company is:

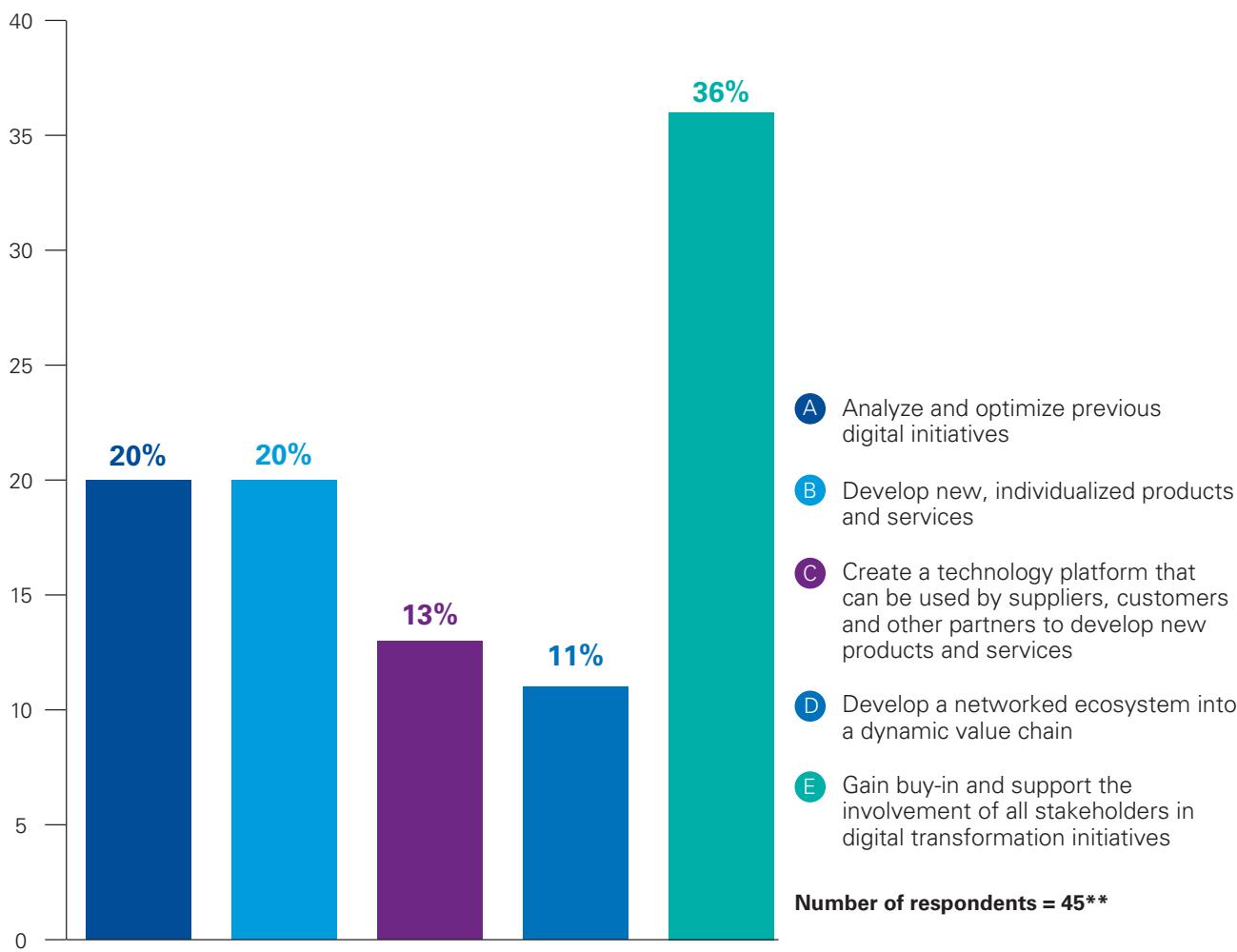


- (A) Smarter manufacturing
- (B) Stronger customer relationships
- (C) Faster innovation
- (D) Other

Number of respondents = 47*

*Source: Chemistry 4.0: Reinventing the chemical company with digital transformation, Global Chemicals Institute webcast, KPMG International

During the transformation process, what step is the most important for your company to complete?*



*Note: Percentages might not add up to 100% due to rounding.

**Source: Chemistry 4.0: Reinventing the chemical company with digital transformation, Global Chemicals Institute webcast, KPMG International



Global Chemicals Institute webcasts

REACTION 26: Getting up to speed on the new mobility

The automotive industry is speeding towards a new era marked by electric-powered vehicles, autonomous vehicles and shared mobility. Even as global sales tick downward, individual vehicles will be used more intensively, spending less time parked and more time on the road, transporting people and goods in a growing number of ways. For automotive chemical companies in particular, the new mobility will mean a dramatic shift in product portfolios, clients, end users and business models to address an industry ecosystem that's becoming larger, more dynamic and far more interconnected.

Listen to **Charlie Simpson**, Partner and Head of Mobility 2030, Global Strategy Group, KPMG in the UK and **Natasha Patel**, Associate Director, Global Strategy Group, KPMG in the UK, discuss these issues.

Chemistry 4.0: Reinventing the chemical company with digital transformation

Digital transformation has become a part of the fourth and latest industrial revolution. Although many industries are making great strides in digital transformation, the chemical industry has been more a laggard than a leader. However, to remain competitive and explore new opportunities, many chemical companies are using digital technology for smarter manufacturing, stronger customer relationships and faster innovation. In the front ranks of digital transformation are companies that are no longer selling chemicals; they're selling solutions to customers' problems through new business models for the delivery of enhanced services and customized specialty chemicals. Listen to **Dr. Bernhard Kneissel**, Director, Deal Advisory, Strategy, KPMG in Germany, discuss Chemistry 4.0.

REACTION 24 webcast: Adapting to a changing geopolitical landscape

Geopolitical uncertainty is on the rise. Volatile oil and gas prices, shifting alliances in the Middle East, shocks to the European Union (EU) such as Brexit, the expansion of China, the Trump administration in the US, and the rise of nationalism and opposition to free trade — all these developments and more are increasing stress levels across the business world. Traditionally, the chemical industry has been more reactive than proactive about dealing with geopolitical disruptions. However, chemical companies would do well to consider appointing a Chief Geopolitical Officer (CGO) to help them address uncertainties in an increasingly turbulent world. Listen to **Rohitesh Dhawan**, Director Strategy and Alliances Eurasia Group, and **Andrew D. Bishop**, Deputy Director of Research, Eurasia Group, discuss these issues.

Global chemicals: Key industry trends and opportunities

China's growth ... Indian development ... US shale ... European recovery ... Trump ... Brexit ... South China Sea ... With all of these and other issues affecting the global chemical industry, it's a great time to make sense of what's really happening. Join our three most senior industry leaders, **Paul Harnick**, **Mike Shannon** and **Norbert Meyring**, for a roundtable webcast where they discuss the key challenges and opportunities for global chemical companies in today's dynamic and increasingly complex world.

Visit kpmg.com/chemicals to learn more about KPMG's Global Chemicals Institute and to listen to our webcasts.

KPMG Global Chemicals Institute bookshelf

A selection of relevant KPMG global chemicals magazines and insights.

To access these, please visit kpmg.com/reaction.



REACTION 26 Magazine

This edition takes a look at getting up to speed on the new mobility, provides an update on Brexit and investigates new deals for Japanese chemical companies.



REACTION 25 Magazine

In this edition, we take a look at the progress chemical companies have made to close the gender gap. We investigate and explore the growth of the Indian chemicals market. In addition, we also delve into the consolidation of the paints and coatings sector.



REACTION 24 Magazine

This edition explores geopolitical trends and their impact on global chemical companies, synergies within the industrial gases market, an outlook for the US chemicals industry and a look at innovation with AkzoNobel.



REACTION 23 Magazine

In this edition, we take a look at the ongoing digital transformation changing the face of the global chemical industry. We also investigate and explore what chemical companies need to do to be successful in supporting human rights. Last, but certainly not least, we examine the increasingly uncertain world trade environment global chemical companies are facing.

KPMG's Global Chemicals Institute

These are exciting times for the global chemical industry, and KPMG member firms are proud to support such a vital part of modern life. KPMG clients produce components in phones and tablets, the majority of non-metallic automotive parts, paints, coatings, personal care products, packaging, water treatment products, agrochemicals and a multitude of other products around the world. Equally as important, we are committed to helping the global chemical industry maintain its unwavering focus on sustainability and products designed to improve our lives and make the planet healthier.

We also recognize the challenges involved with running a global chemical organization today. The advent of US shale gas has led to a major decline in natural gas prices and a major shift in investments for US companies. The global industry's 'center of gravity' is shifting from the West to emerging economies in Asia. The industry continues to go through widespread transformation through M&A. Key industries for chemical demand such as automotive manufacturing and construction are rethinking how they do business and what they need from their suppliers. New tax, regulatory and tariff arrangements are impacting the structural and operational value chains of chemical companies. Innovative technologies such as the Internet of Things, advanced analytics, and Big Data are changing the face of manufacturing, marketing and customer relationships.

KPMG member firms help chemical organizations to compete and thrive in this rapidly evolving business environment. Backed by a global network of over 1,000 professionals, KPMG global chemical practices provide tax, audit and advisory services, as well as a range of information resources and thought leadership to help industry executives stay informed and up-to-date on recent developments in their sector. The KPMG Global Chemicals Institute enables more than 7,500 members across 67 countries to share their knowledge, discuss recent events and collaborate on innovative projects.

With KPMG member firms, chemical organizations can develop new ways to create robust, sustainable and flexible strategies, teams and operating models that quickly adapt in a dynamically unfolding future.

For further information, please visit us online at kpmg.com/chemicals or contact:



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