

Global Risk Dialogue

Analysis and insight from the world of corporate risk and insurance



Floating solar makes waves

Insuring innovation in the energy transition

Construction risks and the drive to decarbonize

How green hydrogen could power us through to net zero

Marine claims ride a geopolitical storm as inflation bites

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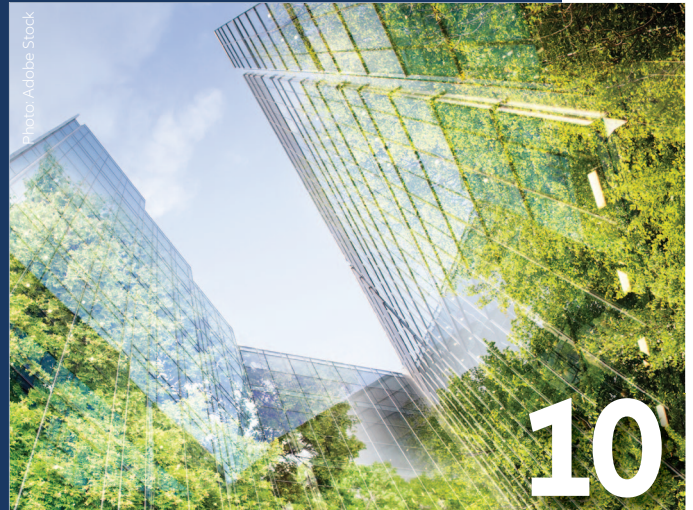
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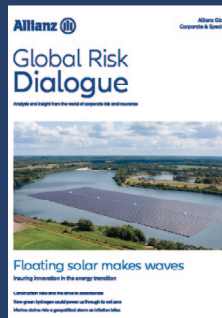
Floating solar panels make waves



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Content showcase: what's on at www.agcs.allianz.com



Let's start the dialogue

Welcome to the latest **Global Risk Dialogue**, the biannual exchange of ideas and opinions between AGCS and insurance professionals, risk managers, brokers, and the media. As we approach the end of another momentous year, we have drawn upon the expertise of AGCS risk engineers, claims experts, underwriters, and leaders, to bring you the latest thinking on emerging exposures and how to build resilience in a time of global uncertainty.

We hope you enjoy this latest issue.

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News from AGCS and Allianz



Photo: Adobe Stock

Get a swift overview with a simple tool

Risk assessments in 15 minutes

Getting an overview of where your business risks lie could be about to get easier, thanks to a new tool being developed and tested by Allianz Risk Consulting (ARC) at AGCS.

The Quick Assessment Tool enables customers to receive a report with a risk grading in about 15 minutes. It could prove useful for premises that are difficult to access or for multiple global locations that need to be reached quickly and cost-effectively. Although primarily designed for smaller risks not usually eligible for a visit from a risk consultant, the tool could be used by larger customers as a supplement to the AGCS ARC service, in order to audit suppliers as part of contingent business interruption plans or audit smaller sites.

The web application uses a questionnaire on property damage and business interruption, covering areas such as building construction type, fire and safety equipment, emergency action plans, and vendor management. Global rollout is planned for 2023.

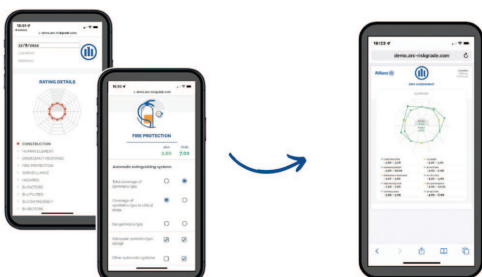


Photo: Adobe Stock

Awarded for insurance innovation

A unique partnership between AGCS, Munich Re and Google has been recognized at the *Business Insurance Innovation Awards 2022*.

The three companies won an award for the Risk Protection Program, an industry-first collaboration between a cloud provider and insurers. The program consists of two components: Risk Manager, a tool that helps determine a customer's security risk posture on the cloud, and Cloud Protection +, a cyber insurance solution built exclusively for Google Cloud customers. With the program, clients can get access to enhanced cyber insurance coverage for their entire cyber footprint on the Google Cloud platform.

The *Business Insurance Innovation Awards* recognize trendsetting products and services designed for risk management professionals.

Accolades for diversity

For the third year in a row, Allianz SE has been rated the most diverse and inclusive insurance company in the world, according to the Refinitiv Global Diversity and Inclusion Index. It was the only insurance company in the top 100.



TOP 100 COMPANY 2022
Diversity and Inclusion Index

The Refinitiv Diversity and Inclusion Index evaluates over 12,000 publicly listed companies globally, measuring 24 metrics across four main pillars: diversity, inclusion, people development, and controversies.

Loss log: Claims at Christmas

The holiday season should be a time of peace and goodwill for all but for businesses there are many perils and pitfalls which can disrupt this harmony. Over the past five years AGCS has received more than 400 claims from companies on Christmas Day (December 25) alone. What are the top causes? Spoiler: make sure any goods or cargo that are being transported are packed and stored correctly!

Top causes of loss on Christmas Day according to number of all claims received (by %)



10. Machinery breakdown (including engine failure) 3%

e.g. damage to industrial machinery, factory hardware, ship aircraft/vehicle engine etc.



9. Natural catastrophes 3%

e.g. damage or disruption caused by hurricanes, tornados, storms, floods, wildfires, extreme weather etc.



8. Defective product 4%

e.g. large product recall; cost of fixing defective automotive parts; lost business income due to premises closing; food contamination etc.



7. Fire/explosion 5%

e.g. building/factory fire; electrical fire; gas explosion; vehicle fire etc.



6. Bodily injury 6%

e.g. workplace injury; slip and falls at airports etc.



5. Willful acts (crime) 7%

e.g. theft and burglary, vandalism, rioting and looting etc.



4. Faulty workmanship/maintenance 8%

e.g. collapse of building/structure/subsidence due to faulty work; faulty manufacturing of products/components; inadequate maintenance etc.



3. Water damage 8%

e.g. boiler leakage; flooding in basement; flooding due to burst pipes; general escape of water in commercial premises; failure of primary heating, ventilation and air conditioning system etc.



2. Shipping incidents (sinking, collision etc.) 9%

e.g. collision with harbor wall; hull damage at sea; ship grounding; ship foundering; collision with another vessel etc.



1. Damaged goods (including handling/storage) 10%

e.g. goods/technical equipment damaged; vehicles damaged in transit; equipment lost on premises; contents of a container damaged etc.

Source: Allianz Global Corporate & Specialty (AGCS). Based on analysis of 424 business insurance claims where the cause of loss occurred on December 25 between January 1, 2017, and December 31, 2021, worth approximately €61mn in value. "Other" causes of loss account for 35% of the number of all claims. Claims total includes the share of other insurers in addition to AGCS.

Securities class actions continue to be a highly exposed area

4 questions for...



Hannah Tindal, Head of Directors & Officers (D&O), UK and Nordics, at AGCS

Hannah Tindal scans the risk landscape for boards of directors and shares the emerging areas of concern the team is keeping tabs on.

You moved from the US to London to take up your role at AGCS in April 2021. What differences do you see between risk trends affecting American board directors and those in the UK and Europe?

The risk trends for US, UK, and European directors are quite similar, but the litigation environment is materially different. In the US, the plaintiff's bar – the lawyers that represent those suing or bringing a lawsuit – is very active and the litigation funding industry is mature and growing. We've seen this lead to higher rewards and greater legal expenses.

That said, in recent years there has been a significant uptick in the availability of US-type securities class actions with 'opt-out' mechanisms across Europe and the UK. This was seen most recently in *Lloyd v Google*, a class-action lawsuit brought on behalf of over four million iPhone users over claims Google secretly tracked their personal data. The claim was subsequently blocked by the UK's Supreme Court. With an opt-out lawsuit, a claim can be brought on behalf of every person within a class unless they opt out of the class action. Because the classes get defined very broadly, they sweep in a lot of individuals, and the more people in a

class, the higher the potential damages. Understandably, this development into a more US-type litigation environment has become a major concern for directors.

At the end of 2021, an AGCS report listed the mega trends affecting D&O insurance as insolvencies, volatile markets, US litigation risk, and scrutiny over special purpose acquisition companies (SPACS), or 'blank-check companies'. How representative is that list today, given how fast world events are moving in 2022?

The AGCS **Directors and Officers Insurance Insights** report for 2022 continues to be relevant. Insolvency remains a material concern. The impact of the current geopolitical environment has heightened market volatility: surging inflation, higher energy prices, continued supply chain issues, and shortages in the workforce are all adding pressure on companies across the globe. Measures to support businesses during the pandemic are being withdrawn in countries worldwide. Half of the countries analyzed by Allianz Research in a recent study recorded double-digit increases in business insolvencies in the first half of 2022. After two years of declines,

a broad-based acceleration in business insolvencies is expected globally: +10% in 2022 and +19% in 2023.¹

We continue to monitor SPAC litigation. The pace of US securities claims in the first half of 2022 remained steady, and the number of SPAC litigation filings in particular stayed high. SPAC litigation activity could continue to remain elevated, given the amount of SPACs that are nearing the typical two-year deadlines they have to close deals.

The number of securities class actions against non-US issuers² fell from 88 in 2020 to 42 in 2021, but filings against non-US issuers still made up 20% of all filings in 2021. This continues to be a highly exposed area. Derivative litigation did see some favorable outcomes for non-US domiciled companies in 2021, with the dismissal of two derivative lawsuits filed in New York courts, including one against the pharmaceutical giant Bayer AG. While these outcomes could alleviate concerns about derivative lawsuits for non-US companies, there are several similar cases still pending (including against Volkswagen) and a recent meaningful settlement (of at least \$300mn in a derivative lawsuit³ involving the software company Renren), so the threat of this type of litigation continues.

What other emerging risks are you looking into – is anything particularly on your radar?

AGCS and the D&O insurance industry at large have been talking about the importance of ESG (environmental, social and governance) and the exposures it represents to companies for some time. We've seen ESG litigation gain momentum in 2021, a trend that is likely to continue. In particular, there has been an increase in climate change litigation, some of which is supported by litigation funders that provide capital to progress these cases. Such legal action is expected to increase the costs of D&O insurance⁴ for corporate companies in the future.

The evolving landscape for climate-related disclosures is heightening this sense of urgency. In the UK, two new laws came into effect in April 2022 to support the transition to net-zero carbon emissions: The Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022, and The Limited Liability Partnerships (Climate-related Financial Disclosure) Regulations 2022. These regulations

will not only impact listed companies, but those in their supply chains, which will also feel the pressure to transition to net-zero.

In March this year, the US Securities and Exchange Commission (SEC) also released proposed rules around climate-related disclosures⁵. These would require public companies to disclose climate-related information on a wide range of topics, from risk-management processes and governance to climate-related targets and goals, as well as many risks in between. If the disclosures are adopted, there will be significant pressure on companies to meet the requirements, particularly if they do not have existing procedures in place. US businesses have already seen an increase in investors citing climate change in their opposition⁶ to the election of management-backed directors.

Given the volatility of the D&O sector, how can insurers best navigate a shifting landscape while meeting the complex needs of clients?

AGCS believes the best way to meet complex D&O insurance needs is to listen and work in partnership with our brokers and customers. We want to understand the nuances of our customers' operations and their risk exposures, so we can better assess how trends may impact them. This will enable us to find specific solutions tailored to meet their needs. There is a lot of volatility in the global economic environment, but that does not necessarily need to translate to the D&O market if we can provide great sustainable solutions for the long term. At AGCS, we have seen decreases in D&O premiums, particularly with respect to our customers with improving risk profiles, despite the current and anticipated future economic headwinds. We believe the best way to navigate this shifting landscape is to underwrite it.

Biography

Hannah Tindal began her career as a paralegal in the US Air Force before moving into insurance as a surety underwriter. Tindal has since gained over 20 years' experience in the industry, holding leadership positions within large corporate insurers in North America, working across financial lines business, including commercial, financial institutions, cyber and professional indemnity. Now leading a team of commercial underwriters in London, Tindal is Head of D&O, UK and Nordics, at AGCS.

¹ Allianz Research, Energy Crisis, Interest Rates Shock and Untampered Recession could Trigger a Wave of Bankruptcies, October 27, 2022

² Harvard Law School Forum on Corporate Governance, Developments in U.S. Securities Fraud Class Actions Against Non-U.S. Issuers, March 18, 2022

³ Renrensettlement.com, Renren, Inc. Derivative Litigation, 2022

⁴ Financial Times, Climate Litigation Threatens to Push up Companies' Insurance Costs, August 28, 2022

⁵ Deloitte, The SEC Unveils Environmental Disclosure Requirements, July 18, 2022

⁶ The Wall Street Journal, More Investors Vote Against Corporate Directors Over Climate Change, July 21, 2022



A number of fires have compounded existing pressures on supply chains

Business interruption loss trends

AGCS analysis highlights how CBI claims have spiked following global supply chain disruption and the growing relevance of business interruption as a consequence of losses in property insurance.

Contingent business interruption (CBI) claims reached a new level over the past year, with the number of claims far in excess of recent years.

The sharp increase exemplified the growing interdependence and complexity of corporate supply chains, which were hit by a combination of pandemic-related disruptions, extreme weather, and, more recently, Russia's invasion of Ukraine. The automotive industry alone saw several CBI events during this period.

In February 2021, the 'Texas Big Freeze' in the US caused massive disruption to infrastructure, with many companies forced into temporary shutdowns by widespread power outages. Record freezing temperatures caused by Winter Storm Uri had cascading effects on companies

and services reliant upon power, including water, transport and medical services. The event is estimated to have caused economic losses up to \$155bn¹, while Uri caused \$15bn² in insured losses nationwide.

\$15bn

Insured losses caused by Winter Storm Uri in the US in 2021

Less than a month later, a fire at a semiconductor plant in Japan added to the growing global shortage of microprocessors, sending a ripple effect through global supply chains, hitting production in the automotive and electronics industries. The automotive sector was again hit with supply chain problems from the conflict in Ukraine, with the country being an important supplier of parts.

Opaque and complex exposures

Global supply chains have created opaque and complex exposures in recent years, with many companies having been reliant on a small number of key suppliers for materials, parts and services, according to **Scott Inglis, Head of Global Practice Group for Property and Business Interruption Claims at AGCS**. The interconnectivity of supply chains results in more CBI exposures and can have a substantial impact on various industries, sometimes in excess of \$1bn or more.

Fires, natural catastrophes, cyber-attacks and conflicts have added to existing strains on supply chains caused by the Covid-19 pandemic, with shutdowns at manufacturing plants and ports in China, delays to shipping and labor shortages. The 'Texas Big Freeze' in particular led to a number of large CBI claims that AGCS was involved with, as companies took several months to ramp up production following initial power outages.

The number of claims from this event and the large loss in the semiconductor manufacturing sector more than tripled the number of CBI claims in the previous three years – overall CBI claims have increased in number year-on-year for the past five years.

"The corporate world is now so interconnected and complex, businesses rely on each other for goods, services and infrastructure," says Inglis.



Winter Storm Uri led to widespread power outages in Texas, US

Average BI claim value rising

Costs associated with the impact of business interruption (BI) following the aftermath of a loss event can significantly add to the final bill from any incident and AGCS claims analysis also highlights the growing relevance of BI as a consequence of losses in property insurance.

The average BI property insurance claim now totals in excess of €3.8mn based on analysis of 2,379 relevant insurance industry claims notified between January 1, 2017 and December 31, 2021. This is compared with €3.1mn over a previous five-year analysis period ending in 2017.

For large claims (>€5mn), the average property insurance claim which includes a BI component is more than double that of the average property damage claim. Many expect property and BI claims to become even more expensive in future given the consequences of recent sharp increases in inflation around the world. The rising cost of rebuilds, repairs and labor, together with potential shortages of materials and longer delivery times and waiting periods could all further inflate BI values.

"Underwriters need to understand accumulations of exposures within corporate distribution and value chains, as well as the impact of disruption and actions taken to mitigate them."

AGCS' Global Claims Review 2022 report analyzes more than 530,000 insurance claims from 2017 to 2021 with a value of €88.7bn, highlighting the top causes of loss for companies and other emerging loss trends to watch. [Download the report.](#)

Our expert

Scott Inglis | scott.inglis@agcs.allianz.com

¹ AccuWeather, Damages from Feb. Winter Storms Could be as High as \$155bn, March 6, 2021

² Swiss Re, Global Insured Catastrophe Losses Rise to USD 112 Billion in 2021, the Fourth Highest on Record, Swiss Re Institute Estimates, December 14, 2021



Photo: Adobe Stock

The construction sector faces mounting pressure to reduce emissions

Building on new risks: construction in the age of greening



Fires, natural disasters and defective products are the top causes of claims on construction sites, but

the nature of these risks is changing as the global economy strives to decarbonize. Here, Blanca Berruguete, Global Industry Solutions Director for Construction at Allianz Global Corporate & Specialty (AGCS), explores how new building methods and materials are shaping the new risk landscape.

In June 2022, a fire outbreak at a hospital construction in Istanbul, Turkey, destroyed most of the newly installed medical and security devices, and injured three people. A few days later, firefighters from West Fargo in North Dakota attended a flaming construction site behind the town's Costco. And a month after that, a blaze broke out at a railway development in Stuttgart, Germany.

What was common in these and hundreds of similar incidents that occurred worldwide in the same month was the element of fire. Fires and explosions remain the number one cause of construction and engineering insurance claims, accounting for 27% of the value of insurance claims over the last five years, according to industry claims analysis by AGCS.

Natural catastrophes, such as hurricanes or floods, account for almost a fifth of claims by value (19%), followed by defective products (10%). Faulty workmanship or maintenance (8%) and machinery breakdown (7%) round out the top five causes of construction and engineering losses according to the value of claims.

“Fires and explosions have long been the primary cause of insurance claims in construction,” says **Blanca Berruguete, Global Industry Solutions Director for Construction at AGCS**. “And, despite significant improvements in risk management and fire prevention, they will always remain a significant hazard because of the nature of the work.”

Construction often involves hot work using open flames, such as with welding, the local application of heat with equipment like hot tar boilers or the generation of sparks during leadwork and grinding. Undertaking these activities in the vicinity of combustible materials, which are plentiful on building sites, creates the potential for disaster.

The risks and benefits of greening

The analysis was conducted on 22,705 insurance claims made worldwide between January 2017 and December 2021. The claims were worth approximately €12.8bn in value and include the share of other insurers as well as AGCS. But if there is an impression that the risks remain in stasis, that is not the case.

AGCS expects the global construction market to experience sustained growth over the next decade, driven by a surge in government spending on infrastructure, such as last year’s \$1trn bipartisan infrastructure bill in the US, factors such as rising populations in emerging markets, urbanization, a growing working age population, and the transition to a low-carbon or net-zero economy. According to a recent report from Marsh and Oxford Economics, the global construction industry is forecast to grow 42% to \$15trn by 2030¹. The construction industry is expected to be a major driver of economic growth in the coming decade, outperforming manufacturing and services.

The transition to a low carbon or net zero economy brings numerous opportunities, requiring significant investment in alternative forms of energy, such as wind, solar and hydrogen, as well as power storage, transmission and supporting services. According to the International Energy Agency (IEA), pursuing net



The 1 minute dialogue

- ▶ AGCS claims analysis identifies the top drivers of construction losses over the past five years – but the nature of these risks is changing.
- ▶ The transition to a net zero economy brings numerous opportunities but the use of new materials and construction methods will require close risk management co-operation between firms and their insurers.
- ▶ Constrained supply chain and material shortages will likely affect project delivery and margins.
- ▶ The cost of some property and business interruption losses will increase in future, driven by factors such as inflation and labor shortages.

\$15trn

Expected output of the global construction industry by 2030

zero will create a market for wind turbines, solar panels, lithium-ion batteries, electrolyzers and fuel cells of well over \$1trn a year by 2050², comparable in size to the current oil market. Huge investment is also required to make buildings more sustainable and lower greenhouse gas emissions. Green building in emerging markets represents a \$24.7trn investment opportunity by 2030, according to the International Finance Corporation (IFC)³. Climate change adaption and mitigation will also give rise to further opportunities for the construction sector.

However, this global construction boom will also bring challenges as well as opportunities. The rapid adoption of prototype technology and the utilization of new building methods and materials will require close co-operation between underwriting, claims and risk engineering, as well as between insurers and their clients as new technologies can significantly alter the risk landscape, especially when mass deployed, Berruguete explains.

Take offshore wind, for example, which is at the cutting edge of renewables. The global offshore wind energy market size⁴ is expected to increase

¹ Marsh, Guy Carpenter, Oxford Economics, Future of Construction, September 2021

² International Energy Agency, World Energy Outlook 2021 Shows a New Energy Economy is Emerging – But Not Yet Quickly Enough to Reach Net Zero by 2050, October 13, 2021





³ IFC, Green Buildings: a Financial and Policy Blueprint for Emerging Markets, 2019

⁴ Polaris Market Research, Offshore Wind Energy Market Share, Size, Trends, Industry Analysis Report, June 2022



Photo: Adobe Stock

Top 5 causes of claims by value in construction and engineering insurance

	1. Fire and explosion	27%
	2. Natural catastrophes	19%
	3. Defective products	10%
	4. Faulty workmanship or maintenance	8%
	5. Machinery breakdown	7%

Sources: Allianz Global Corporate & Specialty. Based on analysis of 22,705 insurance claims between January 1, 2017, and December 31, 2021, worth approximately €12.8bn in value. "Other" causes of loss account for 29% of the value of all claims. Claims total includes the share of other insurers.

from a revenue of \$33.5bn in 2021 to \$89.8bn by 2030, with a CAGR of 12.1%. This field is booming, particularly as offshore wind turbines are more efficient than onshore wind turbines due to consistent wind flow.

However, offshore wind farms are complex to build, especially as projects grow in size and move further out to sea into deeper waters. Construction also involves high-value components and specialist equipment and vessels.

Berruguete says offshore wind farms are subject to harsher weather and typically use new technologies, which can be pushed to their limits. Turbine blade damage or gearbox failure can cost double or triple the amount than for an onshore turbine to repair. Underwater cables, connectors and power converters are also expensive and time-consuming to repair.

"Any potential defects in design mean that the losses from such projects can quickly soar," says Berruguete, adding, "Often each new project uses new construction methods and sophisticated, yet sometimes prototype, technology that can be expensive to assess and replace. Not every insurance company can deploy capacity for

complex risks, where potential claims could be significant, due to the values insured."

New grids on the block

Berruguete says new risk challenges lie ahead for the construction industry as the world decarbonizes. "For example, while timber is being used more frequently in construction because of its lesser environmental impact, it presents challenges due to several unknown variables when it is damaged by either water or fire. The unknown exposures of newer construction materials used as part of sustainability and net zero strategies could also limit coverage capacity and hinder or delay projects."

The same questions that apply to individual building elements, such as concrete, also apply more widely. Green hydrogen – produced by splitting water into hydrogen and oxygen using renewable electricity – could be critical in a successful energy transition (see page 26). Yet, while the technology to produce green hydrogen is established, scaling up requires the construction of electrolysis plants, pipelines, and storage and export infrastructure, such as port terminals and shipping. An associated risk is that hydrogen is highly flammable and combusts at low concentrations. Leaks are hard to identify without dedicated detectors as hydrogen is colorless and odorless, and conventional fire systems are not designed to handle leaks. In 2021, the Medupi Power Station in South Africa, near the border with Botswana, was severely damaged after hydrogen used in the generator cooling system exploded. Reports have indicated that it may take years to repair and cost up to \$2.5bn⁵.

"Approaches to constructing the technology to produce green hydrogen in massive quantities, such as large electrolyzers, and then incorporating them into existing renewable energy infrastructure, is still in its infancy," Berruguete says.

"Companies operating in this space may face new risks because of the need to use prototype technologies and the risk that implementation involves possible infrastructure challenges. This is just one example of the new world of risks we are entering."

Green hydrogen will be an important component of many businesses' decarbonization strategy going forward, says Berruguete. "AGCS recently deployed capacity for the construction of one of the world's largest renewable energy hubs, to produce, store, and deliver green hydrogen in the US. Given the innovative nature of such large green hydrogen facilities, the underwriting and

⁵ IOL, Medupi Explosion May Cost Up To R40bn – Experts, August 11, 2021

risk consulting teams in North America worked closely with their counterparts in the headquarters in Munich. We had the chance to get to know the insured and understand their construction methodology in detail. There was also close communication between the AGCS energy and power generation practice groups. Such cross-collaboration across specialisms allowed the teams to confirm the project was technologically sound, used reliable equipment, employed experienced staff, and was overseen by reputable management.”

The decade of infrastructure

Despite the boom in construction, Berruguete observes some conditions could prevent firms from taking full advantage of the opportunities if these are not resolved or well-managed. Three are materials supply (exacerbated by the impact of rising inflation), labor shortages, and the increasing risk of cyber incidents as the industry embraces connected equipment and tools, sensors and cloud-based platforms.

Although construction is not traditionally exposed to cyber-attacks, the shared IT platforms being introduced on construction sites, for example, increase the vulnerability to cyber incidences and their potential consequences. These can include delays and reputation damage due to malicious hacks of critical project data.

Labor shortages are readily evident in many countries as construction firms have ramped up activity after Covid-19 lockdowns. Surges in growth could exacerbate the existing lack of skilled labor. The introduction of new construction designs, materials and techniques also introduces significant risks and constraints because not all staff are trained to work with them, which could result in repetitive loss scenarios.

Covid-19 demonstrated how industries can be dramatically disrupted. The pandemic caused the global market for raw materials to slow, resulting in long lead times for construction firms, adding to the existing demand for locally distributed products. The increase in demand has resulted in high prices for materials and delayed or cancelled projects.

“Let’s not forget that this pandemic is still on, that supply chains are still constrained, and geopolitical tensions are only adding to this situation,” Berruguete says. “This will all affect project delivery and margins.”

This is leading to one of the most dramatic ways the risk landscape in construction is changing – the rocketing costs of claims, again exacerbated



Many new construction methods are relatively untested compared to traditional methods

Getting concrete about climate change

Concrete is the second most consumed material on earth after water. Three tonnes are used annually for every person on the planet. Unfortunately, cement – the key ingredient in concrete – contributes about 8% of the world’s carbon dioxide (CO₂) emissions⁶.

Efforts are underway to develop ‘concrete 2.0’, new forms that use green and novel types of cement. But if these innovations prove commercially viable, underwriters and carriers will not have the luxury of years of rigorous testing and use to see how the product performs and what represents a good versus a bad risk.

From an exposure perspective, AGCS views certain new building materials or construction methods as ‘prototypes,’ Berruguete says. For instance, in modular construction – whereby elements of a building are constructed off-site – many design codes and standards do not yet have adequate guidance, as it is relatively new to the market compared to more established codes and standards for conventional construction methods, which have developed over decades. It is also difficult to assess the resilience of modular construction to extreme natural perils. Underwriters work closely with brokers and clients to learn about such new construction methods and materials before they insure their attendant risks.

“There’s always this collaboration when it comes to exposure and innovation,” Berruguete explains. “The more information clients share with us, the better we understand what they’re doing.”

by surging inflation, Berruguete adds. Claims create two issues: the expense of replacing damaged material and the time it takes to replace that material. Both are affected by current supply chain issues and labor shortages.

“The cost of construction is soaring in many countries due to higher prices for energy and raw materials. The costs of cement, timber and steel have risen dramatically; steel, for example, is almost 50% more expensive than it was a year ago, while construction costs are nearly 20% higher in the US and over 25% higher in the UK. At the same time, competition for talent could also drive up wage inflation, further increasing costs,” says Berruguete.

Our expert

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⁶ Chatham House, Making Concrete Change: Innovation in Low-carbon Cement and Concrete, June 13, 2018



5G could propel us towards the Fourth Industrial Revolution

5G technologies: what do businesses need to know?

The global rollout of the 5G network promises to be transformative, with unprecedented levels of speed, capacity and potential – but the interdependent nature of the technologies involved also brings a proliferation of risks. Here, AGCS experts discuss the opportunities and the threats that will face risk managers as the digital revolution progresses.

In China, doctors perform ultrasounds on Covid patients in Wuhan using an ultrasonic robot they control from 700km/435 miles away. In South Korea, manufacturers adjust their maintenance schedule according to data gathered from sensors enabled by a subscription-based smart factory service. At an American football stadium, fans stream rich game action to their smartphones, discussing team stats transmitted almost instantly in augmented reality.

These are just three use cases illustrating the potential of 5G-enabled technologies, from the countries taking the lead in its rollout. This is advancing at different speeds across numerous regions, and it is estimated the number of 5G global connections will reach one billion by the end of 2022, according to the mobile network operators organization GSMA¹. By 2025, two in five people around the world could be living within reach of a 5G network.

¹ GSMA, The Mobile Economy 2022, February 22, 2022

In our increasingly connected world, the proliferation of smart devices and data-hungry apps is putting pressure on existing 4G networks. The 5G – or fifth generation – network promises to be up to 100 times faster than 4G, with lower latency (the time needed to send data from one point to another) and greatly increased capacity. It will enable the hyper-connectivity that could power us through the Fourth Industrial Revolution using the Internet of Things (IoT), transform the way we travel, remodel our healthcare, optimize food production, and maximize energy sources and usage. Technologies such as artificial intelligence (AI), virtual and augmented reality, advanced analytics, and robotics will be boosted by 5G's enhanced reach, speed, and reliability. All this could enable global economic output of \$13.2trn by 2035, say researchers at IHS Markit².

All sectors could be affected – virtually

“5G is going to enable the advancement of technological applications across almost all sectors,” says **Jody Yee, Global Industry Solutions Director for Technology, Media & Telecoms at Allianz Global Corporate & Specialty (AGCS)**. “Telecommunications companies will be able to provide faster speeds for communications, streaming or downloads. In the office, we’ll be able to host more people on a video call. With 5G’s greater capacity, we’ll be able to better utilize advancements like cloud computing and storage. Telcos will monitor equipment remotely and use drone technology for smarter maintenance. Tech businesses will process more data and use AI to enable advances such as smart mobility and autonomous vehicles. For consumers, the streaming trend that rocketed during the Covid lockdowns will be given a boost with greater speeds and bandwidth.

“These developments represent significant opportunities for the tech, media and telecoms sector. By 2035, it is believed the global 5G value chain – such as the network operators, application developers, technology providers, and equipment manufacturers – could create \$3.6trn in economic output and support 22.3mn jobs³.”

High dependencies create high risks

As well as unlocking vast potential, the 5G rollout will introduce significant new risks, meaning the risk profile of companies using or providing 5G goods and services will change. Businesses will have to adapt to an ongoing technological revolution which presents many unknowns. Unforeseen consequences, real or perceived, are a hazard – as was seen in January 2022, when concerns over the effects of 5G technology on



The 1 minute dialogue

- ▶ 5G has the potential to transform almost all industry sectors, ushering in a new world of hyper-connectivity and facilitating the Fourth Industrial Revolution.
- ▶ As a software-dependent network with high dependencies and an increased ‘attack surface’, it will present significant new security risks.
- ▶ Risk mitigation measures must take into account all stakeholders across the supply chain.
- ▶ Collaboration across sectors, institutions, governments and nations will be needed to create the infrastructure required and agree standards.

\$13.2trn

The potential global economic output 5G could enable by 2035

aviation systems disrupted airlines in the US, or in April 2020, when conspiracy theorists in the UK vandalized phone masts in the mistaken belief they were linked to the Covid-19 outbreak.

Unlike previous generations, the 5G network will be a software defined network and ‘virtualized’, meaning many functions that once relied on hardware will now be virtual software capabilities, with attendant software-related security issues. As the amount of interconnected devices, networks, services, and mobile data increases, so will the potential attack surface.

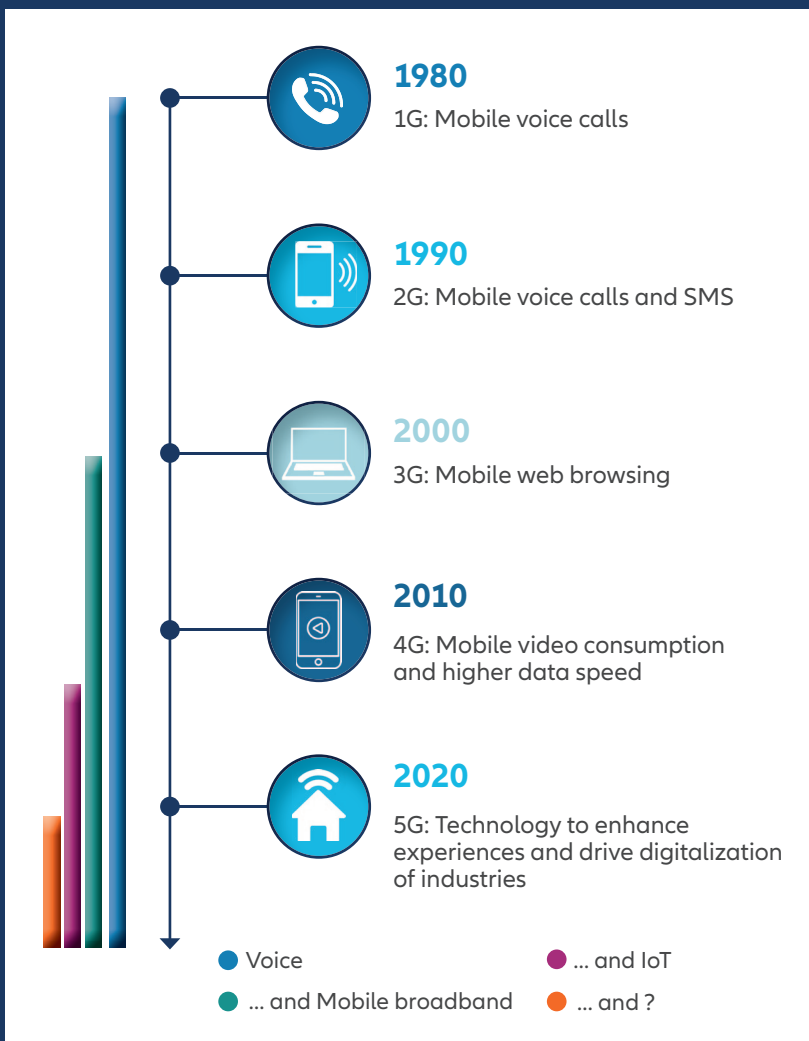
The interconnected nature of the 5G network, with its infrastructure, service providers and users, also magnifies the issue of supply chain security and business interruption losses should something go wrong.

“The high dependencies in the overall concept, from the companies that provide the 5G-enabled technological solutions to those that buy and use them, is the critical issue here,” says **Oliver Lauxmann, Global Practice Group Leader, Chief Underwriting Office – Liability, at AGCS**. “One of the most important features of 5G, with its speed and low latency, is that it offers solutions in real time, 24/7. So if there’s any interruption in the chain it could have a direct impact on the

² IHS Markit, The 5G Economy: How 5G Will Contribute to the Global Economy, November 2019

³ IHS Markit, The 5G Economy: How 5G Will Contribute to the Global Economy, November 2019

Ringing the changes: 5G timeline

Source: Ericsson⁵ Design: AGCS

processes that follow, not only for a specific client, but potentially on a regional or even global level.”

These solutions could be deployed in mission-critical systems within first response services, transport, healthcare, and energy provision, where low latency or interference could have near-instant knock-on effects, with catastrophic consequences.

What businesses need to consider

“Businesses will need to ask whether the speed of the rollout correlates to their security measures,” says Lauxmann. “If you’re a provider, what procedures are in place to ensure the stability of your systems and services? Issues such as connectivity, identity and access management, and device locations all come into play. Risk management will need to center around the availability, security and integrity of all systems because an interruption could not only result in financial losses for your business but also reputational damage.”

Equally, businesses need to identify all the relevant stakeholders in the ecosystem – their network infrastructure providers, customers, end users, data centers – to determine the opportunities for attack or outage. Even trusted suppliers can be hacked, as was seen in 2020, when an attack on the US technology firm SolarWinds impacted numerous companies, and government agencies, costing each company affected an average of \$12mn or 11% of annual revenue.⁴

“Risk management will need to center around the availability, security and integrity of all systems because an interruption could result in financial losses and reputational damage.”

The supply chain is not only vulnerable to cyber-attack or human failure, but also to geopolitical upheaval and natural catastrophe. Bottlenecks, such as the Suez Canal blockage of 2021 or the recent semiconductor shortage, could also disrupt service provision, as could overreliance on certain suppliers. There is concern, too, over communication gaps with so many stakeholders involved – if updates for new components or software are not well communicated by manufacturers or service providers to users, there could be consequences along the supply chain.

A closer look at the cyber threat

“5G will enable the proliferation of highly complex, multi-domain environments,” says **Rishi Baviskar, Global Cyber Experts Leader, Risk Consulting, AGCS**. “A crucial difference between 5G and its predecessors is the distinct feature of network ‘slicing’. Slicing utilizes Software Defined Networking (SDN) and the complementary technology Network Function Virtualization (NFV). This allows many different virtual networks to be created on a shared infrastructure, each of which can be customized to different requirements. This flexibility delivers intrinsic security through segmentation. Slices depend on APIs – application programming interfaces – which are designed to communicate with each other, so the reliability of the overall software supply chain becomes hugely significant.

“On the plus side, slicing enables segregation, which allows slices to be isolated in case of a security issue, but if those slices are misconfigured or there is no isolation mechanism, the network can be exploited.

⁴ TechRepublic, Cybersecurity Study: SolarWinds Attack Cost Affected Companies an Average of \$12 Million, June 28, 2021

⁵ Ericsson, Discover the Power of 5G

“As well as increasing the software attack surface, slicing means many different stakeholders will be using multiple virtual networks which run on common hardware resources, whether it’s for storage or processors. A hardware failure could have a mighty service impact.”

A lack of standardization and a regulatory framework that is still evolving present further security risks. Larger telecoms businesses and their equipment suppliers embed best practice into new procedures and products, but there is a risk that others, with fewer resources or in jurisdictions with less robust regulation, might be tempted to cut corners. This could have widescale consequences in a world where the number of everyday devices that are connected could surge.

To mitigate against this new world of risk, Baviskar recommends methods that are already good practice: standardization with all interfaces, proper configuration, authorization and authentication, encryption, protecting APIs (especially if they are from open sources), and system ‘hardening’ – configuring IT assets to reduce their vulnerability to attack. These should go hand in hand with a robust business continuity plan.

Unprecedented levels of collaboration

The global rollout of 5G will require widescale collaboration between businesses, the public sector and governments, as well as between nations across the world. High levels of investment will be needed to create the infrastructure required, agree standards, innovate new products and services, develop new business models, and educate users and providers about the risks and potential of 5G technologies.

Recent examples of collaborative innovation include the combined forces of Ericsson, TIM (formerly Telecoms Italia) and automations systems company Comau, which are developing 5G-enabled solutions for smart manufacturing based on the benefits of network slicing, as part of the EU-funded 5Growth project. Network slicing was also key to the recent completion of an end-to-end proof of concept with software and services provider Amdocs and A1 Telekom Austria Group, which aims to drive next-generation experiences and on-demand connectivity for consumers and businesses.

“However, there is a disparity of technological advancements globally,” says Yee. “With the high investment costs involved, there is a danger some poorer economies may not benefit from the positive impacts of 5G technologies, which could widen inequalities between nations. It could be



The growth of 5G in numbers

1bn	Expected number of 5G subscriptions by the end of 2022
650+	Number of 5G smartphone models that have been launched
32.7%	Percentage of total mobile subscriptions in South Korea that are 5G (August 2022)
64%	Expected 5G adoption in Australia, Japan, Singapore and South Korea in 2025 by percentage of connections
4%	Expected 5G adoption in Sub-Saharan Africa in 2025 by percentage of connections
\$600bn	Capex investment requirement faced by mobile operators, of which roughly 85% will be in 5G networks
352mn	Expected number of active IoT connections in Europe in 2023
20+	Service providers that had launched public 5G standalone networks by end 2021, expected to double in 2022

Sources: Ericsson, GSMA, Omdia, ETNO

beneficial for certain aspects of infrastructure to be regionalized in order to facilitate the rollout in regions that might otherwise be left behind.”

As the 5G rollout advances, AGCS will maintain an intense risk dialogue with clients about the developing technologies involved. “The dialogue will focus not so much on 5G itself, but rather on the implications of using so many connected devices in so many different industries, from autonomous cars to remote surgical operations to self-propelled tractors,” says Lauxmann. “As new issues emerge, we will support our clients by discussing the potential impacts on safety-related measures, how their risk management should be adapted, and what our policies are. We intend to be fully involved in these discussions as the risks and opportunities presented by 5G technologies emerge.”

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Larger vessels carry higher concentrations of risk

Not all plain sailing – 5 claims trends to watch in marine insurance

Although the long-term positive safety trend for the global shipping industry continues – total losses have more than halved over the past decade – a number of factors are leading to ever larger claims, AGCS industry loss analysis shows.

1. Fire top cause of claims by value

Fire and explosion has overtaken sinking and collision as the number one cause of marine insurance losses by value over the past five years, according to AGCS analysis of more than 240,000 claims with an approximate value of €9.2bn. Fires accounted for 18% of the value of marine claims analyzed (equivalent to around €1.65bn) during the period ending December 31, 2021, compared with 13% for a five-year period ending July 2018. The number of fires on board large vessels has increased significantly in recent years, with a string of incidents involving cargo fires, which are difficult to extinguish and can lead to the total loss of a vessel, loss of life and environmental damage.

A contributing factor is often mis-declared or non-declaration of dangerous cargos, while the International Union of Marine Insurance (IUMI)¹ recently noted an increase in engine room fires, which may reveal some underlying risk, including crew competencies and modern technologies.

Another notable recent trend has been the threat posed by lithium-ion (Li-ion) batteries in electric vehicles or cargo that is not stored, handled, labeled or transported correctly. Highly inflammable, they have been implicated in a number of car carrier, container ship and container fires in recent years. A battery fire may have been a contributing factor in the March 2022 sinking of

ro-ro carrier **Felicity Ace**² in the Atlantic Ocean, along with its cargo of 4,000 vehicles. In January 2020, a fire on the container ship **COSCO Pacific**³ was attributed to the combustion of a Li-ion battery cargo that was not properly declared.

Li-ion battery and electric vehicle fires burn more ferociously, are difficult to extinguish, and are capable of spontaneously reigniting hours or even days after they have been put out. Most ships lack the suitable fire protection, firefighting capabilities, and detection systems to tackle these fires at sea, which has been made more difficult by the dramatic increase in ship size. A new report from AGCS highlights a list of loss prevention measures **here**.

“Shipping losses may have more than halved over the past decade [54 total losses (over 100 GT) at the end of 2021 compared to 127 at the end of 2012, according to the **AGCS Safety and Shipping Review 2022**] but fires on board vessels remain among the biggest safety issues for the industry. The potential dangers Li-ion batteries pose if they are not stored or handled correctly add to these concerns,” explains **Captain Rahul Khanna, Global Head of Marine Risk Consulting at AGCS**.

2. Inflation and exposure growth drive claims severity

With many countries seeing rates at or around 10%, soaring inflation is compounding existing trends driving higher claims severity, including larger vessels and environmental, social, and governance (ESG) factors. Higher steel prices, the increasing cost of spare parts, and rising labor costs are all impacting the cost of hull repair and machinery breakdown claims.

Accidents involving large container ships and car carriers are particularly expensive, reflecting the accumulation of cargo exposures and challenges in emergency response and salvage. In many cases, a small incident, such as a fire in mis-declared cargo or errors in stability calculations, have resulted in a total loss.

In particular higher salvage and wreck removal costs are associated with larger vessels, which require specialist equipment and rely on a limited number of ports of refuge. The ultra-large container ship **Ever Given** took almost a week to free having blocked the Suez Canal in 2021, while its sister ship the **Ever Forward** took a month to re-float after it ran aground a year later in Chesapeake Bay in the US. Both incidents were declared ‘general average’, a complex process



The 1 minute dialogue

- ▶ Fires on board vessels are the number one cause of marine insurance losses by value, with mis-declared or non-declaration of dangerous cargos an issue.
- ▶ Inflation is compounding existing trends driving higher claims severity. Higher prices for steel and spare parts and rising labor costs are impacting hull repair and machinery breakdown claims.
- ▶ Damaged goods, including cargo, is the most frequent cause of claims, with temperature variation, theft of cargo, and inadequate shipping containers areas of concern.
- ▶ Supply chain disruption continues to impact claims activity, as does climate change with extreme weather events and new exposures linked to the net-zero transition.

20,000

The number of containers the largest vessels can carry

whereby cargo interests and vessel owners share losses and the costs of salvage.

Salvage costs have also been rising in response to heightened ESG and sustainability concerns, which favor lengthy and expensive wreck removal. The capsizing of the car carrier **Golden Ray** in the US in 2019 was one of the costliest shipping incidents in modern times, costing⁴ over \$1bn, while the wreck removal of the **Rena** container ship, which sank in 2011 off New Zealand, cost an estimated \$450mn⁵. The Rena clean-up operation was not declared complete until April 2016.

Inflation is also adding to the problem of rising values at risk. The value of vessels and cargos has been rising at a time of growing exposures linked to larger vessels, which can carry over 20,000 containers at a time. The surge in demand for shipping has seen the value of vessels increase. According to Clarkson Research Services, the combined value of the global merchant fleet increased 26% to \$1.2trn in 2021⁶.

The average value of container shipments has also been increasing with inflation and an increase in the shipping of high value goods like electronics and pharmaceuticals.

² Allianz Global Corporate & Specialty, Safety and Shipping Review 2022

³ Port Technology, COSCO Says Lithium Battery Started Vessel Fire, January 8, 2020






⁴ Trade Winds, Golden Ray Set to Become One of Shipping’s Costliest Casualties, September 27, 2021

⁵ International Salvage Union, Wreck Removal

⁶ Splash 247.com, Value of the Global Merchant Fleet Hits an All-Time High, August 23, 2021



Top causes of claims by value in marine insurance

	1. Fire and explosion	18%
	2. Shipping incidents (e.g. sinking, collision, etc.)	17%
	3. Damaged goods (including handling/storage)	12%
	4. Machinery breakdown (including engine failure)	12%
	5. Natural catastrophes (e.g. hurricanes, storms, floods, wildfires)	9%

Sources: Allianz Global Corporate & Specialty (AGCS). Based on analysis of 244,451 insurance claims between January 1, 2017, and December 31, 2021, worth approximately €9.2bn in value. "Other" causes of loss account for 32% of the value of all claims. Claims total includes the share of other insurers in addition to AGCS.

"We see more high value goods being shipped by container, while the average cost rises with inflation," says Khanna. "It is not unusual to see one container valued at \$50mn or more for high value cargos like pharmaceuticals. Such cargos need additional risk mitigation measures, such as GPS trackers and sensors that provide real time monitoring on temperature, moisture shock, light and door openings, for example. Cargo interests should also keep a close eye on insured values. Clients may need to adjust their insurance and policy limits, or risk being underinsured. We have seen claims for high value cargos where the cargo interest was underinsured by as much as \$20mn."

3. Cargo claims continue to rise

Damaged goods, including cargo handling and storage, is the top cause of marine insurance claims by frequency and third largest by value over the past five years, according to AGCS analysis. The most common claims continue to be physical damage, typically from poor handling, storage and packing. But recent years have seen a number of high-value theft and temperature variation claims. Crime and theft are the third most frequent cause of claims.

Criminal gangs are targeting consumer electronics and high-value commodities like copper. Cargos are typically stolen from ports, warehouses or during transit by armed robbers

or fake handling agents. Latin America is a hot spot for cargo theft, although there have also been large claims in Europe.

The insurance market has also paid some large temperature variation and fire claims involving pharmaceutical shipments, according to **Régis Broudin, Global Head of Marine Claims at AGCS**. "Cargo values have risen noticeably in the past year. We recently saw a truck fire loss involving a cargo valued at \$73mn from just one transportation – a concerning trend."

"A global shortage of shipping containers has resulted in damaged containers being brought back into use."

The recent boom in container shipping, which puts cargo handling and port turnaround under pressure, has also affected claims. A global shortage of shipping containers has resulted in substandard and damaged containers being bought back into use, while a deterioration in the economic environment and the higher cost of living could have implications for future theft and civil unrest claims. "We have always seen cargo losses from defective containers, for example caused by ingress of water. But if a lot of substandard containers are brought back into use, the result could be a higher frequency of losses in future months," says **Captain Nitin Chopra, Senior Marine Risk Consultant at AGCS**.

4. Supply chain exposures and disruption continue to impact

Recent years have highlighted supply chain disruption exposures in shipping, as maritime incidents, natural catastrophes, cyber-attacks, Covid-19 and Russia's invasion of Ukraine have brought major delays. Further disruption has also been caused by port congestion, labor shortages and constrained container capacity.

The trend for larger ships is also increasing supply chain exposures. Larger vessels, while more efficient, require port infrastructure and logistical support that is more specialist than traditional shipping. There are greater concentrations of cargo risk on large vessels and in major ports, so any incident could affect large volumes of cargo and companies. Ports are also increasingly reliant on technology, where an outage or cyber-attack could cause chaos. "Commercial pressures are a contributing factor in many losses that resulted from poor decision-making," says Chopra. "The pressure on vessels and crew is high. Some may

be tempted to ignore issues or take shortcuts, leading to future losses.”

“Risk managers must take these factors into account and take a more risk-managed approach to the shipping aspect of supply chains,” explains Broudin. “In the past, companies have not paid enough attention to cargo risks and exposure accumulation. Companies need to start treating cargo risks more like property assets, tracking and monitoring exposures, and taking a more proactive approach to protecting them.”

In addition to improving the transparency of cargo exposures, companies should challenge freight forwarders on the risks, such as the quality of the vessel, loading and operation.

“Events over the past year have shown how fragile and interconnected supply chains are, and the critical role played by the shipping industry. It is essential companies understand their accumulations and consider ways to minimize exposure to major events,” says Khanna.

5. Climate risks contribute to claims

Climate change will increasingly affect marine insurance claims, with extreme weather events and new exposures linked to the net-zero transition.

Natural catastrophes are the fifth biggest cause of marine insurance claims, by frequency and severity for the five-year period ending December 2021, according to AGCS analysis. Extreme weather and natural hazards have contributed to a number of large vessel and cargo losses – at least 25% of total vessel losses reported in 2021 alone. In addition, drought in Europe during 2022 caused disruption to shipping on the Rhine, preventing many vessels from navigating this critical European shipping route fully loaded. In the US, many barges ran aground on the lower Mississippi River as drought dropped inland waterways to levels not seen for decades, impacting one of the most cost-efficient means of getting commodity crops such as grain into the global market.

Weather has also been a factor in the number of containers lost at sea, as heavy seas exert forces on large vessels and container lashings. According to the World Shipping Council⁷, the annual average number of containers lost at sea has increased 18% over the past 14 years to 1,629 in 2021. Average losses for the two-year period 2020-2021 alone were 3,113 compared to 779 in the previous period.

Efforts to decarbonize the shipping industry will also impact claims going forward. With 90% of



Companies need to start treating cargo risks more like property assets, tracking and monitoring exposures

international trade moved by sea, shipping is a major contributor to greenhouse gas emissions (GHGs). The International Maritime Organization (IMO) is working towards a 40% cut in GHGs across the global fleet by 2030 but this will require the industry to develop sustainable forms of propulsion and vessel design. A key risk in the transition will be the adoption of alternative fuels, which could include liquefied natural gas, green hydrogen and methanol, as well as electric- and wind-powered assisted vessels.

New technology and working practices can result in new risks or unexpected consequences. Machinery breakdown is the fourth largest cause of claims by frequency and value over the past five years – and there have been a number of these claims and contaminated fuel claims related to the introduction of low sulfur fuel oil under IMO 2020. This was introduced to cut sulfur oxide emissions, as marine fuels and bunkering have become more complex.

The shift to greener energy sources is also giving rise to new claims scenarios. In 2022, the drifting bulk carrier **Julietta D**⁸ collided with an offshore wind turbine foundation and transformer station in the Hollandse Kust Zuid windfarm, having previously collided with the tanker **Pechora Star** after its anchor gave way in a storm. With 2,500 wind turbines due to be installed on the North Sea before 2030, the risk of a ship to turbine collision is estimated at 1.5 to 2.5 times a year, according to the Maritime Research Institute Netherlands (MARIN).⁹

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⁷ World Shipping Council, Containers Lost at Sea 2022 Update

⁸ SWZ Maritime, Julietta D Damages Wind Turbine Foundation, Master and Chief Officer Under Suspicion, February 3, 2022

⁹ Maritime Professionals, Crash Between Wind Turbines and Ships, March 22, 2022



A day in the life of a marine risk consultant



Mara Blagojevic, Senior Marine Risk Consultant at AGCS, opted for a life less ordinary when she pursued a career in the marine industry. But how did she get where she is today and what does her daily to-do list look like? Here she shares her career journey, from sailing the world as a student to experiencing Hurricane Harvey at close quarters and making the move into the world of insurance.

I grew up in Chicago, on the shores of the mighty Lake Michigan. The city is one of North America's most historic transport hubs, an intermodal port with strategic links to the Great Lakes, Mississippi River, and the US railroad system. I don't come from a marine background, but my parents owned a trucking company with a fleet of 20 vehicles and a team of drivers. For as long as I can remember, I've been fascinated by logistics and how goods are transported around the world.

After high school, I followed this interest to the United States Merchant Marine Academy in Kings Point, New York, to study logistics and intermodal transportation. As students, we had the opportunity to work as deck cadets,



Preparing for take-off on a training exercise with the US Coast Guard (USCG)

130mph

The wind speed of Hurricane Harvey when it hit Texas, where Mara was working with the US Coast Guard

spending the equivalent of a year at sea on container ships, replenishment vessels, and cargo ships. I sailed to Spain, Morocco, the West Coast of the US, Hawaii, and the Suez Canal. Sometimes I would act as deck officer, driving the ship and navigating waterways, or I might be on lookout, or tasked with overseeing the movement of cargo. Once, I was on the bow of a vessel when it hit a pier in Morocco, coming in to port too fast. There were no human injuries but the ship spent 30 days in port for repairs.

Needless to say, these early experiences honed my problem-solving and time-management skills.

I then joined the United States Coast Guard as a marine inspector in Corpus Christi, Texas, on



The 1 minute dialogue

- ▶ Ever-larger vessels are creating the potential for higher exposures and losses.
- ▶ Fires on board, vessel stability, congested ports, and skills shortages are other areas of concern.
- ▶ Women in marine can find support or make connections through clubs and industry organizations.
- ▶ If more women share their positive experiences of seafaring it will encourage others on to this rewarding career path.

the Gulf of Mexico, where I learned the ropes of vessel inspections on barges, small passenger vessels, and ferries, as well as freight and tanker vessels. Navigating the world of compliance gives you a 360 view of the maritime industry and all its protocols. Inspectors must ensure the relevant treaties, rules and regulations are adhered to in areas like construction, stability, operations, staffing, safety and security.

Hurricane Harvey hits home

In August 2017, I faced one of the most momentous challenges of my career when Hurricane Harvey made landfall in Texas as a Category 4 hurricane. With just 24 hours' notice, I was assigned as liaison between the Coast Guard in Corpus Christi and the emergency response team for the local county. Most of the residents had already been evacuated, leaving only emergency response teams and a handful of us from the Coast Guard, camping out in the basement of the city's courthouse. The storm raged around us with wind speeds of over 130mph – the first hurricane I'd ever witnessed – and we had to rely on emergency generators when we lost power.

After the worst of the storm had passed, I spent time with the local response team, relaying search and rescue efforts to the captain of the port, county officials, and a Coast Guard command center further inland. At first, the weather conditions were so dangerous we couldn't launch any helicopters or boats, but as soon as we could, we set out to assess damages to the port and vessels, and oversee salvage operations – around half a dozen barges were washed up and grounded.

Most alarming was the news I received of a tug boat sinking in one of the channels, with people



— One of Mara's first inspections as a newly qualified USCG inspector in Corpus Christi, Texas

on board. As the liaison, I relayed the emergency to the appropriate personnel who were able to deploy necessary rescue efforts to ensure the six people on board were carried to safety.

Jumping ship into marine insurance

I later moved to a Coast Guard unit in Washington DC, where I undertook the training of others. As I moved up the ranks I became responsible for ensuring the standardization of training for over 50 recruiting offices and 330 field recruiters, leading inspections of offices all over the US.

Experiences like these, together with my knowledge of marine risks and regulations, made a move into insurance a natural fit for my skillset – and I jumped at the chance when the opportunity came. My husband was also on active duty in a similar line of work and we wanted to stop moving every few years and start a family. My first role was as loss control consultant with a marine insurer, and then in April 2022 I took up my present position as Senior Marine Risk Consultant at AGCS.

The marine team around me is fantastic – whether they're joining video calls from the other side of the world or sitting next to me in an

160

AGCS can call upon marine experts in 160 countries

office. We have so much collective experience. There are marine underwriting, claims and loss control experts in 160 countries, including master mariners, several former captains of large vessels, marine engineers, and specialists in supply chain security.

My role involves overseeing inspections of cargo handling – so the loading, off-loading, and transhipment of goods (moving containers from one vessel to another). Typically, my working day starts with a check of my emails, catching up on events I may have missed in different time zones overnight. I then go over any inspections coming up and ensure all parties involved are informed and ready to go. I review the reports of completed surveys and liaise with the surveyor or underwriter about the report's conclusion and any concerns I have from a risk consultant perspective.

Every day presents something novel and challenging. It's a fast-paced job in a dynamic

industry which is undergoing constant change, whether that's driven by new technologies, a global pandemic, natural disasters, conflict, or the bottlenecks we are presently seeing in ports all over the world. With so many different types of client, shipments, and risk profiles, I'm always learning something new.

New risks making waves

Change is stimulating, but there are trends in the marine industry that are giving us all cause for concern, and I don't see a quick resolution to them. Although shipping safety has generally increased in recent years, very large vessels are suffering disproportionately high losses. Over the past decade, container ship capacity has doubled and vessels are getting bigger, raising the prospect of higher exposures, losses, and salvage costs.

Recently, we've seen the industry afflicted by catastrophic fires, such as those aboard the car carrier **Felicity Ace** and container ship **X-Press Pearl**. With hazardous cargos like chemicals, or batteries in electric vehicles on board, the more containers, the higher the risk. Then there are concerns around vessel stability, staff shortages, and an increase in 'general average' – when the losses from an event are shared proportionately, depending on the values of the interested parties' cargos.

Ports are still congested following the Covid pandemic, leaving consignments at risk of theft and perishable goods vulnerable to spoiling. Congestion can require faster turnaround times in ports, putting pressure on staff who are loading and unloading cargo – a hazardous undertaking at the best of times.

Cybercrime is also an ever-present danger – ports in India, South Africa, and the US have been hit by ransomware attacks in recent years.

Brighter horizons

Despite the headwinds facing the sector, marine is a fantastic industry to work in. If I hadn't gone into insurance, I would have happily continued a career with the US Coast Guard – in fact, I still work with them as a reservist for one weekend a month and two full weeks of the year. It keeps my skills sharp and means I can be pulled out of reserves into an active position for a hurricane response in the Gulf of Mexico if I'm ever needed.

Of course, any job can be stressful, but I lead an active life, playing tennis or golf and working out



Mara in front of the huge spools of a cable-laying vessel she was inspecting with the USCG in Texas

four or five times a week with weight-training or Orangetheory, a type of high-intensity interval training. My husband and three-year-old daughter keep my feet on terra firma.

I've been in a male-dominated environment since I graduated high school and I'd love to see more women enter the industry. I believe if we work towards improving women's representation through the networks they're involved in, whether it's initiatives like Women in Maritime by the International Maritime Organization or clubs like Women on the Water here in the US, we can shed light on the opportunities that exist in the maritime world. If more of us talk, share, and promote the enriching experiences it has offered us, we can improve the gender balance in the industry and encourage more women on to a really rewarding career path.

Our expert

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Green hydrogen: full of promise but not without risk

Many countries are exploring the potential of green hydrogen to boost their progress towards net zero and reach their climate commitments. But how far are we from a widescale rollout and what will be the areas of concern for risk managers when it enters mainstream use?

From the Apollo space mission to Zeppelin airships, human ingenuity has long dreamed up ways to make the power of hydrogen fly. Now, as the world powers up to reach climate goals in the midst of an energy crisis, the universe's most abundant element is once again taking up airtime as debate continues over its usage and feasibility as part of a secure, low-carbon future.

Recent innovations have included French transport giant Alstom's fleet of hydrogen-powered trains in Germany and Siemens' planned rollout of a hydrogen train with Deutsche Bahn in 2024¹. Rolls-Royce and Airbus are researching the feasibility of hydrogen-powered aircraft².

Hydrogen's big selling factor is that, unlike fossil fuels, it produces no carbon dioxide when it is

burned, only water vapor. But most hydrogen today is produced using natural gas, or methane, emitting greenhouse gases (GHGs) as a result. This is known as 'gray' hydrogen. 'Green' hydrogen relies on energy from renewable sources like wind or solar and is emissions-free (*see chart*).

There is potential in green hydrogen to decarbonize high-polluting sectors, such as heavy industry, steel production, mining, and trucking. As well as powering mobility, hydrogen allows energy to be stored, distributed, or transported for conversion to electricity.

Over 70 countries around the world³ have national hydrogen strategies and it is estimated hydrogen could meet up to 24% of the world's energy needs by 2050. According to the International Energy



Green hydrogen could support global net-zero commitments

Agency (IEA)⁴, global hydrogen demand reached 94mn tonnes in 2021, and if governments fully honor their climate pledges this could increase to 130mn tonnes by 2030, with more than a quarter being met by low-emissions hydrogen.

In 2021, however, the globally installed green hydrogen capacity was only around 300MW – the equivalent of one gas turbine or less than the globally installed solar PV capacity 20 years ago.⁵ Widespread take-up of the technology will require the large-scale building of electrolysis plants with export infrastructure, storage and transportation facilities.

“The scale-up is challenged by production costs, land availability, the construction or repurposing of infrastructure, evolving technologies, storage (of hydrogen itself and the energy it generates), and water scarcity,” says **Steffen Halscheidt, Global Practice Group Leader, Oil & Gas, at Allianz Global Corporate & Specialty (AGCS)**. “Despite the hurdles, we have seen business interest gathering momentum, with projects around green hydrogen proliferating.”

In 2021 Swedish venture Hybrit⁶ announced it had supplied Volvo with steel for use in trucks made using green hydrogen, and recently Stockholm-based H2 Green Steel announced it had secured €3.5bn in debt financing⁷ from European financial institutions to build a hydrogen-powered plant in



The 1 minute dialogue

- ▶ Green hydrogen is produced without carbon emissions and could help to decarbonize heavy industry, steel production, mining and trucking.
- ▶ If governments honor their carbon commitments, over a quarter of the hydrogen produced by 2030 could be low-emission.
- ▶ The green hydrogen market is potentially global, and international trade is forecast to speed up from 2035, with one-third being traded across borders by 2050.
- ▶ Risks and hazards, such as leaks, fires and embrittlement, will be heightened as new players enter the market, existing infrastructure is repurposed and technology evolves.

northern Sweden. There are more than 100 pilot and demonstration projects for using green hydrogen and its derivatives in shipping, says the IEA, while in the power sector, projects involving the use of hydrogen and ammonia could result in a total capacity of 3.5GW by 2030⁸.

A future cross-border trade

“We’re looking at a potentially global market,” says Halscheidt. “The EU is driving green hydrogen and other renewables with its Green Deal. It recently announced the launch of a European Hydrogen Bank⁹, which will invest €3bn [over \$3bn] to support the hydrogen economy, and under its REPowerEU Plan¹⁰, it aims to import 10mn tonnes of renewable hydrogen by 2030 and produce 10mn tonnes domestically. However, some of the biggest hydrogen plants we’ve seen in the pipeline recently have been in the US and Middle East.”

Growth in green hydrogen is being propelled by stakeholder pressure on business to decarbonize, net-zero commitments and the need to reduce reliance on Russian gas. It is anticipated the costs of production will come down as fossil fuel costs rise, renewables costs continue to fall, higher production capacity creates economies of scale, and governments support development with subsidies.

The international hydrogen trade is set to pick up speed from 2035, according to a report from IRENA¹¹ (International Renewable Energy Agency), which envisages two-thirds of green

⁴ IEA, Global Hydrogen Review, September 2022

⁵ Munich Re, Securing the Power of Green Hydrogen, 2022

⁶ SSAB, Timeline for HYBRIT and Fossil-free Steel

⁷ Sifted, H2 Green Steel Secures Support for €3.5bn Debt Financing to Build its Hydrogen-Powered Plant, October 24, 2022

⁸ IEA, Global Hydrogen Review, September 2022

⁹ Offshore Energy, ‘A Game Changer for Europe’: EC Reveals Plan for €3 Billion Hydrogen Bank, September 16, 2022

¹⁰ European Commission, May 18, 2022

¹¹ IRENA, Geopolitics of the Energy Transformation: The Hydrogen Factor, January 2022

The hydrogen color spectrum

Color	Production method
Green	Electrolysis of water using renewable energy
Blue	Natural gas or methane reforming with carbon capture and storage
Gray	Natural gas or methane reforming
Yellow	Electrolysis of water using solar energy
Black/brown	Gasification of coal (black) or lignite (brown)
Turquoise	Thermal cracking (pyrolysis) of methane
Pink/purple/red	Electrolysis of water using nuclear power
White	Naturally occurring hydrogen

hydrogen production in 2050 being used locally, and one-third traded across borders. The agency sees green hydrogen competing on cost with blue by the end of this decade. Countries such as Chile, Morocco and Namibia are poised to become green hydrogen exporters, while fossil-fuel exporters such as the UAE, Australia,

\$9.5bn

Funding for clean hydrogen initiatives under the US Bipartisan Infrastructure Law

Oman, and Saudi Arabia have the potential to pivot to green hydrogen production as well as blue. Hydrogen importers are likely to include Japan, South Korea, and parts of Europe and Latin America. China is the world's biggest consumer and producer of hydrogen, using 24mn tonnes a year, followed by the US, which pledged \$9.5bn in its 2021 infrastructure bill for the country's fledgling clean hydrogen sector.

Assessing new risks and hazards

So what does the scale-up of a relatively new industry mean for risk managers and insurance?

"Many larger companies investing in hydrogen are known to us from their oil and gas activities," says Halscheidt. "AGCS risk consultants have extensive experience of the hazards of fossil fuel production as well as hydrogen. But we are now dealing with an industry preparing for rapid growth. Hydrogen can be produced almost anywhere, and it can be centralized or de-centralized. Along with the established oil and gas players, there will be new, less experienced, operators in the market and some will operate

remotely, using remote monitoring technologies, perhaps in repurposed facilities. It is essential robust risk-management protocols are in place."

As with other energy industries, fire and explosion is a major peril. The **Allianz Risk Barometer 2022** shows it to be the third highest risk in the oil and gas sector after business interruption and natural catastrophe.

"Hydrogen gas is a very small molecule, so it is easy for it to escape," says **Pietro Berardinelli, Senior Energy & Construction Risk Engineer at AGCS**. "You can't see or smell it, it's highly flammable, and when ignited the flames are almost invisible. Around 25% of hydrogen fires are the result of leaks, so proper handling is essential. The appropriate fire safety and detection equipment should be available, and care must be taken with the design of electrical installations, including reducing ignition sources, and buildings, to minimize gas confinement and subsequent explosions."

"Risk consultants will consider how accessible a site is and whether it is a greenfield or brownfield site," Halscheidt adds. "It's a given plants should not be built in flood zones and should avoid hurricane zones – if possible. The layout should avoid congestion, such as electrolyzers placed without adequate spacing. The use of firewalls to divide up spaces can mitigate large losses."

Green hydrogen plants also need to ensure consistent sources of renewable energy or risk business interruption losses if they lose power.

With new players entering the industry, new risks will enter the value chain. The reputation of suppliers and manufacturers must be assured, particularly as the production of green hydrogen is developing new technology and materials to reduce costs. "Some electrolysis technologies use scarce materials such as iridium and platinum and high technological membranes, which can result in long lead times and incur business interruption costs," adds Berardinelli.

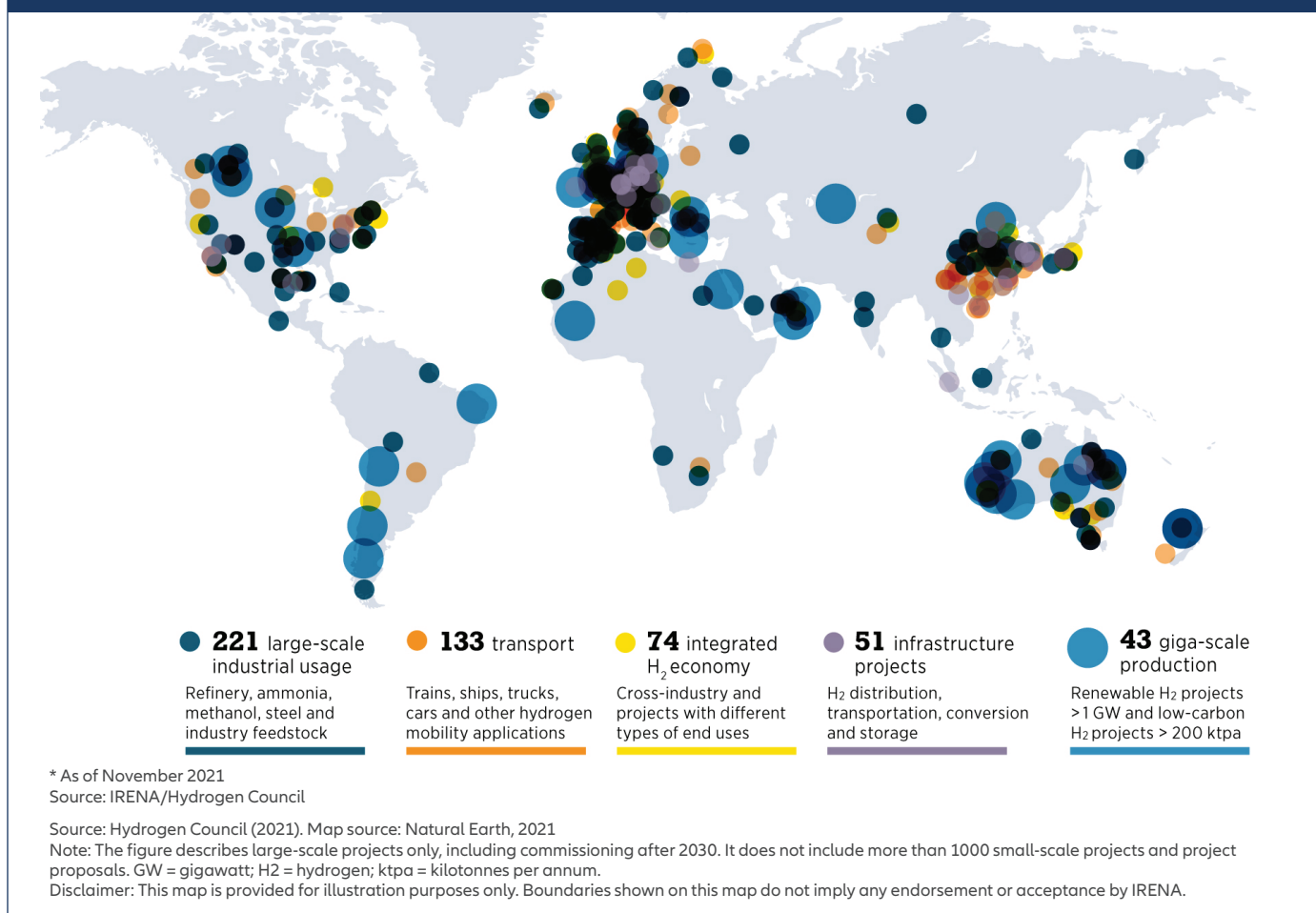
The right choice of materials is key to avoiding embrittlement – a material degradation caused by hydrogen to metal structures, not only in large machinery but also valves, piping, and components. Materials should be selected according to their expected loads and operating conditions such as gas pressure and temperature.

Adapting to an evolving market

Green hydrogen is an emerging industry, so AGCS has seen few major insurance losses to

Clean hydrogen projects and investment around the world*

Clean hydrogen includes blue hydrogen produced using carbon capture and storage and green hydrogen produced using renewable energy sources. Global announcements of hydrogen projects by 2030 add up to \$160bn of investment, with half of the investments being planned for green hydrogen production. Leading lights in the move towards green hydrogen are the EU, China, India, Japan, South Korea and the US.



date. "But there have been losses in the marketplace related to hydrogen fueling stations and hydrogen escaping followed by explosion because flanges were not assembled and tightened correctly," says Berardinelli.

The production of hydrogen has long been an inherent part of the refining process, Halscheidt notes, and AGCS is a well-established insurer of this. "Historically, hydrogen has mainly been produced by steam reforming, but a few years ago, there was a lot of discussion about 'Power to Gas' – where excess electricity is generated by renewables. AGCS took a deep dive into the potential and pitfalls of hydrogen power. It was the right step because the sector is now growing rapidly, as well as its attendant risks."

AGCS recently deployed capacity for the construction of one of the world's largest renewable energy hubs, to produce, store, and deliver hydrogen in the US. It will be built on the site of a coal-fired plant, which will be dismantled to make way for a cleaner, greener fuel. "Given the innovative nature of such

facilities, the underwriting and risk consulting teams in North America worked closely with their counterparts in Munich," says **Blanca Berruguete, Global Industry Solutions Director for Construction at AGCS**. "We got to know the insured and understand their construction methodology. There was close communication between the AGCS energy and power generation practice groups. Cross-collaboration allowed the teams to confirm the project was technologically sound, used reliable equipment, employed experienced staff, and was overseen by reputable management."

Halscheidt adds: "We will continue to develop our underwriting for projects of this kind so we can serve global clients and support their energy transition in line with risks as they evolve."

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Floating solar makes waves

With the race to net zero gathering momentum, floating photovoltaics – or ‘floatovoltaics’ – are gaining traction as a promising technology in the energy transition. Allianz Global Corporate & Specialty (AGCS) is on board as risk consultant and lead insurer with an innovative project in Germany.



Floating solar makes use of unused bodies of water

‘Floatovoltaics’ are solar photovoltaic (PV) panels that float on a body of water, usually unused, like coal quarries, mineral extraction pits, or reservoirs. They are a much-tipped route to clean energy, but they also have advantages over conventional PV panels mounted on land or rooftops.

Their construction on unused water opens up opportunities for solar installations, particularly where space is constrained, while avoiding the contentious prospect of building on agricultural or residential land.

In western Germany, renewable energy developer BayWa r.e. recently built the country’s largest floatovoltaic plant for Quarzwerke GmbH, which produces mineral resources. The plant’s 5,800 PV modules are set on a lake next to the company’s factory premises in Haltern am See and will have an output of around 3MWp, producing 3mn kilowatt hours of electricity per year – an annual saving of 1,100 tonnes of carbon dioxide compared to fossil fuels.

AGCS was lead insurer, and risk consultants worked closely with BayWa r.e. from an early stage to carry out risk analyses, identify potential areas of concern during construction, and collect data. PV systems are generally resilient to damage, but storms and hail pose the greatest risk, along with incidents related to electrical or technical equipment.

“Risk engineers also focus on the panels’ anchoring system,” explains **Oliver Höck, Senior**

Risk Consultant at AGCS. “This is a technology we are familiar with from other marine applications. However, if it is defective, panels can become detached and driven by wind or waves on to land or against other panels, leading to a major loss. Other common risks include damage during maintenance, perhaps when personnel climb on the systems, and theft, which can occur during construction, leading to delays in completion. Snow loads and UV radiation damage to cabling can also be hazards, but after analysis of the BayWa r.e. design, we did not deem these a significant risk,” adds Höck.

The design had other benefits too – the floatovoltaics are positioned to let light and air reach the water, which can flow naturally, to the benefit of local flora and fauna. The panels also minimize water evaporation and can protect against harmful algal blooms.

“Floating PV offers an attractive investment opportunity for companies in the raw materials and building materials industry, which often own water areas that are lying fallow or only partially used,” says Stephan Auracher, Managing Director, BayWa r.e. Power Solutions GmbH. “These hold immense potential for the energy transition.”

Lena Bieringer, Regional Expert Green Energy in Central Eastern Europe, AGCS, adds:

“Despite these positive attributes, the potential loss patterns show the complexity of the green energy business and highlight the importance of a strong, technically experienced and globally active partner like AGCS. Our expert risk consultants have worked with BayWa r.e. from the outset, providing insurance coverage for prototype equipment through to supporting the company’s ongoing expansion and growth strategy.”

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Watch: Cyber: The changing threat landscape



Global supply chains could be targeted

Ransomware remains a top cyber risk for organizations globally while business email compromise incidents are on the rise and will increase further in the 'deep fake' era. At the same time, the war in Ukraine and wider geopolitical tensions are a major concern as hostilities could spill over into cyber space and cause targeted attacks against companies, infrastructure or supply chains, according to a new report from AGCS.

The insurer's annual review of the cyber risk landscape also highlights the emerging threats posed by the growing reliance on cloud services, an evolving third-party liability landscape that means higher compensation and penalties, the impact of a shortage of cyber security professionals and considers why cyber security is increasingly seen as an environmental, social, and governance (ESG) issue.

Watch a short film highlighting the key findings of the report [here](#).

Read: Superstorm Sandy 10 years on

It is just over 10 years since Superstorm Sandy struck the Caribbean and the Eastern Seaboard of the US, with catastrophic results. As the US reels from the effects of another deadly storm, Hurricane Ian, a new AGCS report takes a retrospective look at Superstorm Sandy – the 'franken-storm' – and asks what lessons it offers for storm resilience today.



In the canon of costliest US hurricanes, Superstorm Sandy ranks in the top four. AGCS risk analysts explain what made the storm unique and why its impact was so devastating. As the lines between natural catastrophe and climate change begin to blur, businesses need to remain vigilant about preparedness plans for extreme weather events.

Read or download the report, including a five-step plan for boosting storm resilience, [here](#).



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