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Automotive Industry: Casualty risk insurance perspectives

10 April 2023

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Opening

Jack See, Head Malaysia

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Risk trends from a casualty risk insurance perspective

Eric Hu, Manager of RES Casualty APAC

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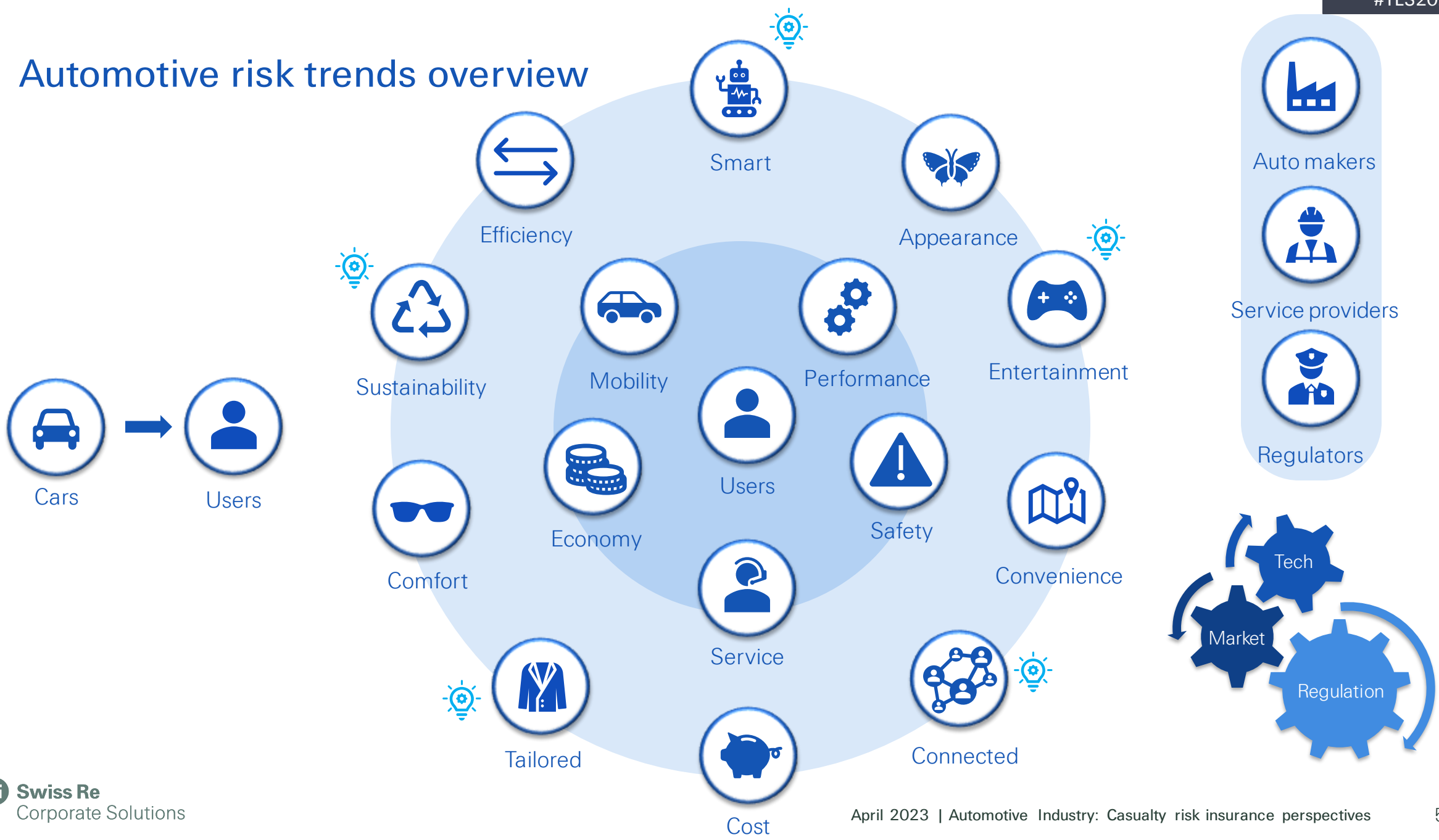
Automotive risk trends overview



Fast iteration of technology and business models are changing the risk landscape of the Automotive industry

C 

Connected Vehicles. V2X is quickly evolving and becoming more sophisticated, functional safety, vehicle reliability and cyber security topics have been more important than ever.

A 

Autonomous Driving. Upgrading of the E/E Architecture leads to ever complicated electronic systems in cars, combined with the sophistication of the algorithm are driving for very different risks.

S 

Shared Mobility. Enabled business mode with the help of technologies, it is not only to change the ownership of the vehicles but also the ownership of the risk.

E 

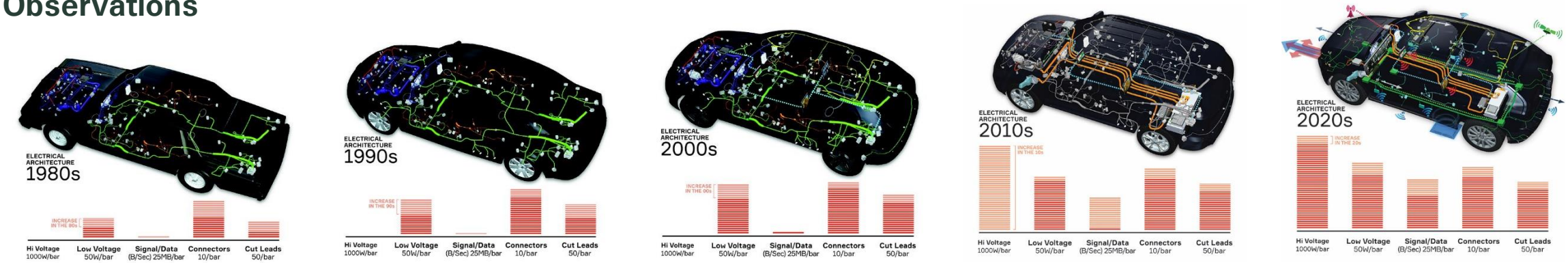
E-mobility. The iteration of E-mobility technologies within the sectors like HEV, MHEV, PHEV, BEV and FCEV are so quickly that the guarantee of the product safety is posing greater challenge than ever.

Connected and smart mobility are enriching the drive experiences but also increasing the complexity of the vehicles

Trends

- **Electronic components**
  - More powerful electrical and electronic parts components
  - Data stream increase (15,000 in 2018 → 100,000 in 2020)
- **E/E-Architecture**
  - Distributed E/E Architecture → Domain Centralized E/E Architecture → Vehicle Centralized E/E Architecture

Observations



Reference: APTIV. Evolution of Vehicle Architecture

Software is redefining the vehicles, introducing novel risk exposures in the meantime

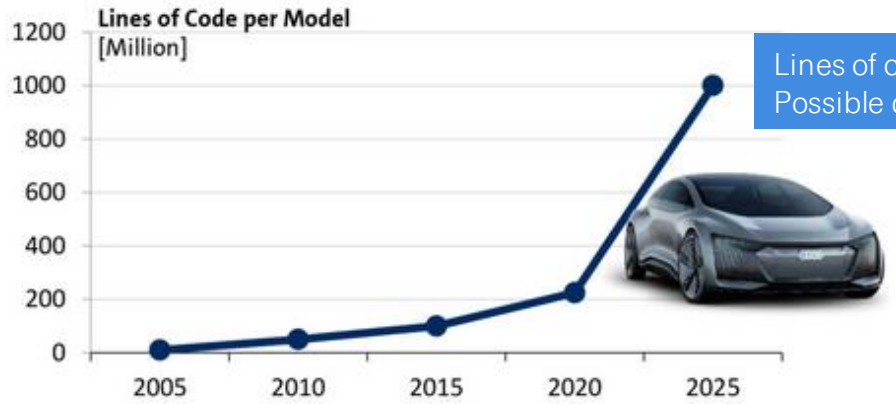
Trends and Risks

- Soul of the vehicle
- AI technology
- 1 billion lines of codes
- Potential bugs in the codes

"Every thousand lines of code would possibly introduce 4-6 safety defects into the system"

Mr. Ren Jia (Senior Safety Consultant of 360

Observation



Lines of codes → 1 billion
Possible defects → 4-6 million

Lines of code in comparison to other systems

- Boeing 787 → 6.5 million
- Chevy Volt → 10 million
- Android OS → 12-15 million
- Large Hadron Collider → 50 million
- Facebook → 62 million

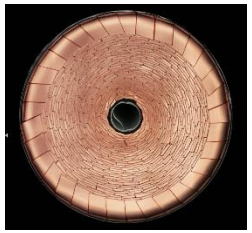
Reference: Volkswagen Roadshow 2020, Visual Capitalist,

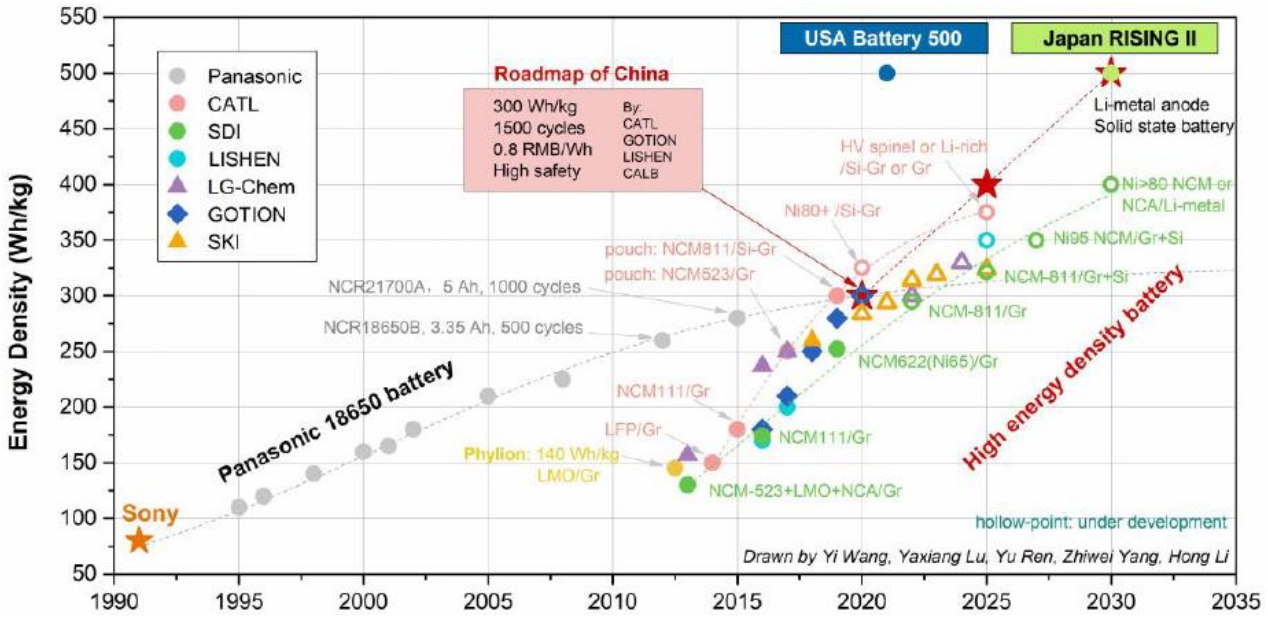
E-mobility development is driven by the Net-Zero target and urgency of energy transition

Trends

- New chemistries
- New materials (cathode/anode)
- New package type
  - Cell to Body (C2B)
  - Cell to Chassis (C2C)
- Higher energy density
- Quicker to the market
- New players

Observations





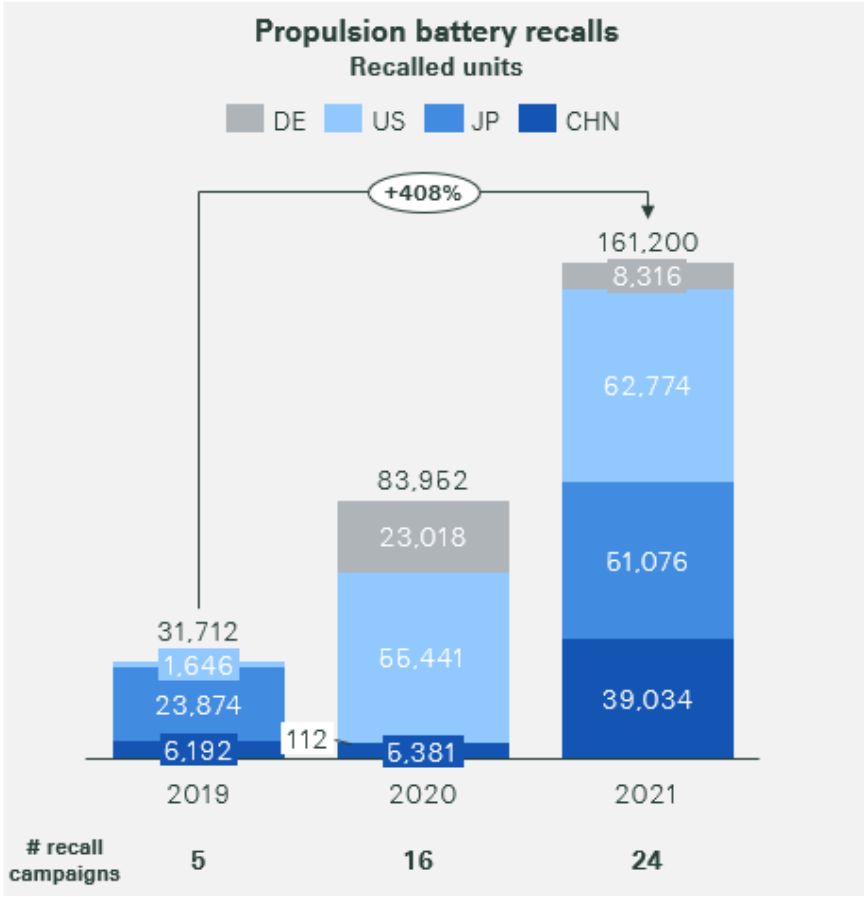
Reference: Panasonic, Tesla, Battery 2030, Hankel

The development of E-mobility is facing some unique challenges

Risk Features

- Battery fires
- Cell and pack defects
- Mechanical, Chemical, Electrical abuse
- Driving, parking, charging and even shipment
- Low defect rate could lead to a recall
- Higher recall cost

Recall Analysis



Reference: NHTSA, DPAC, MLIT, KBA, Swiss Re

Regulations and government policies are the booster to automotive industry's evolution and the Sword of Damocles for compliance and consumer protection

EV promotion programs. SEA countries are actively promoting local EV policies to encourage "Green Transformation", like the rest of the major automotive markets.

Road safe regulation. Major automotive markets are poised to make significant amendments in developing regulatory landscapes confronting the development of autonomous vehicles.

Cyber security governance. UNECE WP.29 and ISO 21434 have been released and implemented in many countries, which put the responsibility for cyber security on the manufacturers.

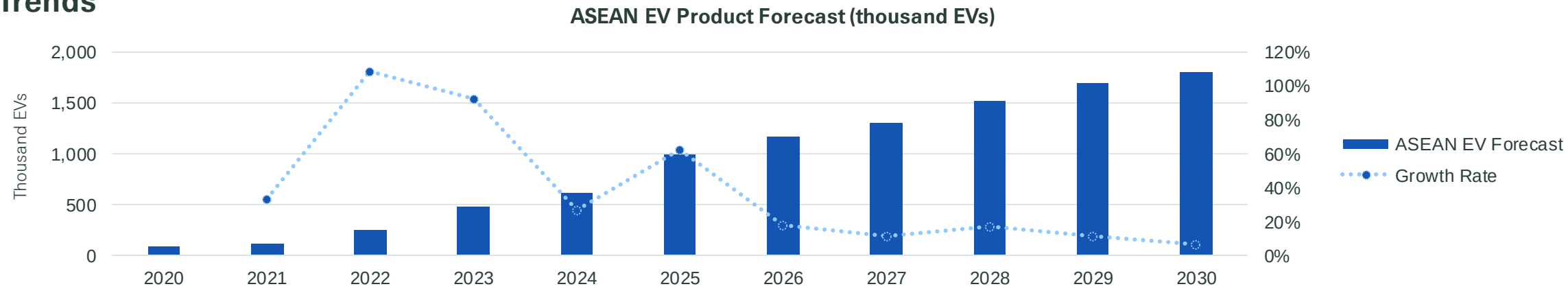
Automotive recall regulations. Automotive recall policies are made more stringent in major automotive markets such as in US, EU and China.

SEA governments are accelerating the electrification of transport and automotive industries

Examples

- **Malaysia** aims increased EV population to **15%** of auto sales by **2030**.
- **Singapore** will only allow registrations of EVs from **2030** and phasing out ICE vehicles by **2040**.
- **Thailand** has set a target for EV production to reach **30%** of total domestic vehicle production by **2030**.
- **Vietnam** government aims to achieve **net-zero** emissions in the transport sector by **2050**.
- **Philippines** enacts Electric Vehicle Industry Development Act **(EVIDA)** in 2022.

Trends

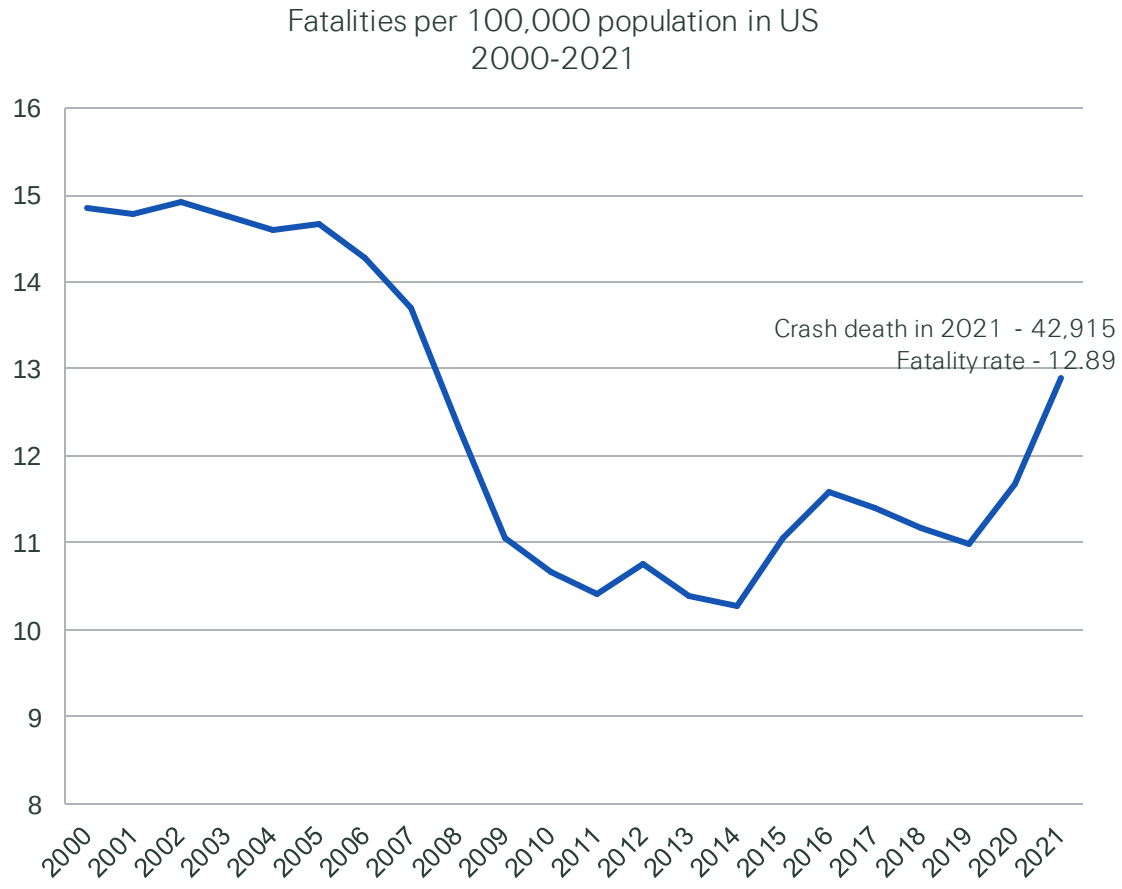


Reference: Singapore Ministry of Transport. IHS Markit. ASEAN Powertrain and Electrified Vehicle Outlook, ICCT.

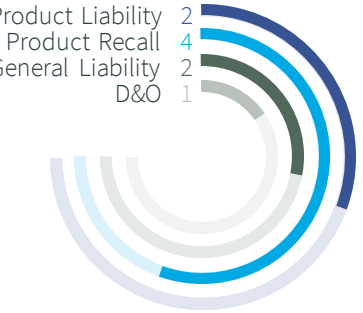
Road safety and automotive related regulations are becoming more stringent globally

Trends and Risks

- US senators urged NHTSA to issue new regulations
- EU applied the new vehicle type-approval framework
- EU applied new Vehicle General Safety regulation on 6 July 2022
- Malaysia government was reported to consider a lemon law to protect car buyers
- Law on Protection of Consumer further developed in Vietnam.



Reference: US crash death. New EU type approval rules. Lemon law in Malaysia, European Commission

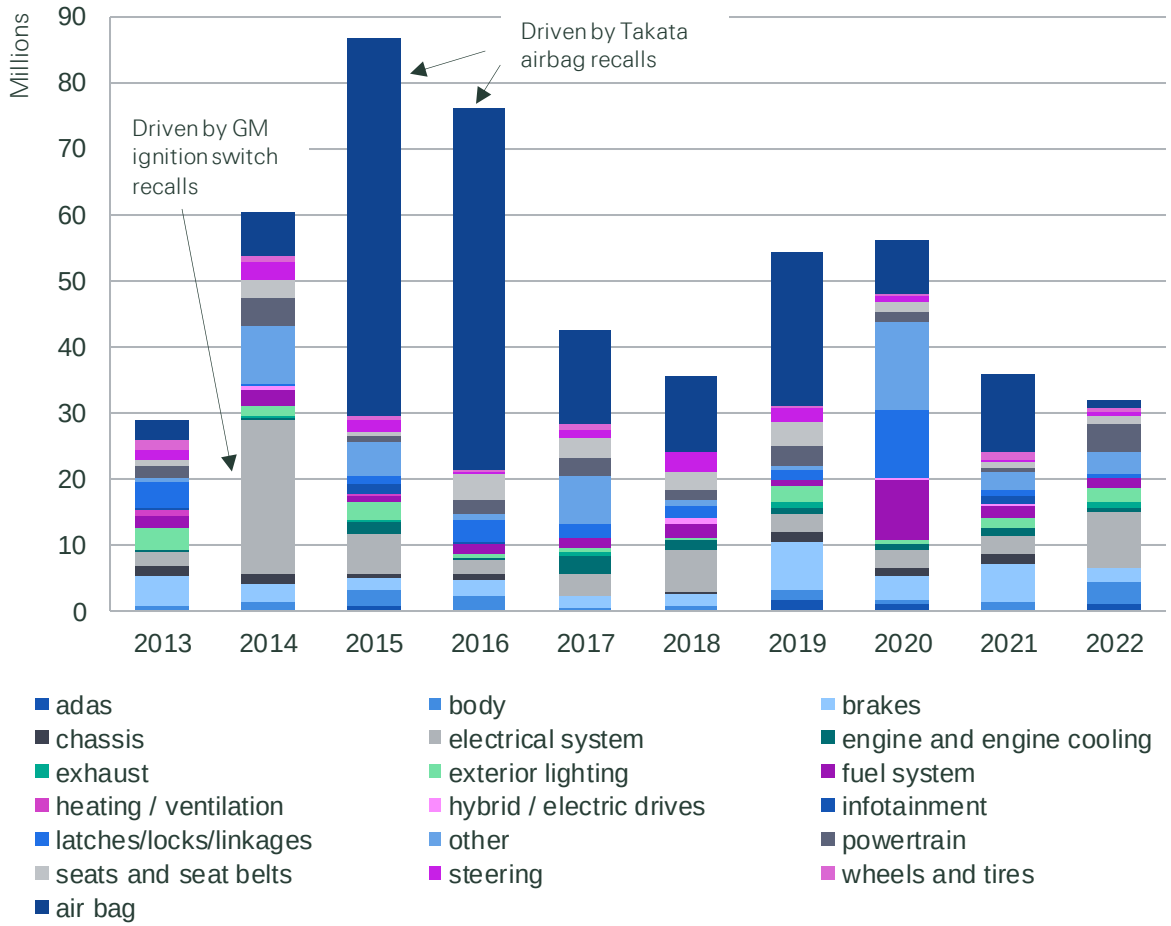


Stricter automotive recall regulations have been introduced in various countries

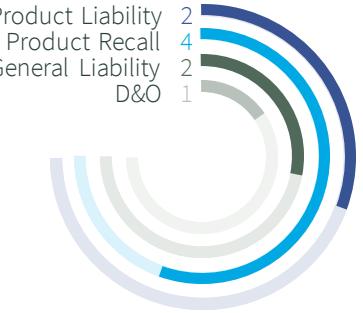
Trends and Risks

- Rising recalls, putting the Takata issue aside
- US NHTSA is introducing a new vehicle recall database
- China DPAC is strengthening the implementation of automotive product recall regulations and standards.
- Stricter and broader recall regulations are likely to increase the size and frequency of recalls in several countries.

NHTSA Automotive Recall Units by Product Group
2013-2022



Reference: NHTSA, DPAC, Swiss Re



Automotive companies must be prepared for the potential impact of recall events

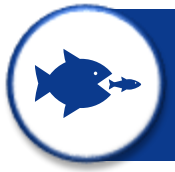
Recommendations

- Continuously monitor and analyze vehicle recalls events
- Monitor changes in relevant regulations
- Cross-departmental recall team
- Set up recall plans
- Mock recall drills

US	NHTSA	NHTSA - Branch of the U.S.government
Canada	Transport Canada	Transport Canada - department within the government of Canada
UK	VOSA	VOSA - Vehicle and Operator Services Agency
Japan		The Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
EU	RAPEX	RAPEX - EU Rapid Alert System
China	DPAC	DPAC The General Administration of Quality Supervision
Australia	Australian Competition & Consumer Commission	The Australian Minister for Competition Policy and Cosumer Affairs
South Korea	KNCAP 자동차 결함신고센터	The overlapped target mark of the KNCAP symbol
Germany	Kraftfahrt-Bundesamt	KBA - Kraftfahrtbundesamt

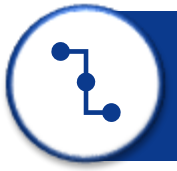
Reference: Swiss Re

Market dynamics is constantly altering the risks from inside of the automotive industry



Fierce competition between players. Both incumbent and new players are investing heavily in CASE, establishing their competitive advantages or at least staying relevant.

Shift of risk from OEM to suppliers. OEMs are increasingly calling for tighter contractual responsibility from their suppliers for potential product liability.



Supply chain reengineering. Vehicle contract manufacturing and concept of tier 0.5 automotive suppliers are becoming more and more common.

Revolution in manufacturing. Standardized platforms and micro-factories are increasingly adopted by OEMs, especially for new players.

Common vehicle platforms promoted by OEMs are creating better efficiency but also introducing new challenges

Trends and Risks

- Reducing the number of platforms
- Modular strategies
- Reduce costs and increase production flexibility
- Standardization of components
- Cross-brand/cross-model large-scale product recalls due to the use of the same parts

Vehicle platform

Shared set of common design, engineering, and production efforts as well as major components.

Observations

Honda:
Planned to reduce the number of trim options to one-third by 2025 in 2019.

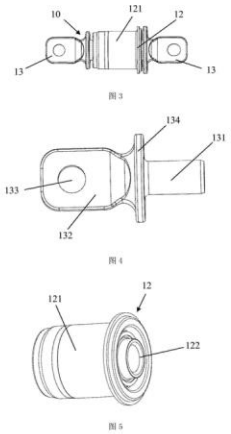
Ford North American:
Steadily reduce the number of platforms, from 15 in 2010 to 10 in 2016, and further reduce to 6 by 2026.

VW Group:
VW announced to reduce its platforms from 12 to 4 in 2016, and recently mentioned to unified all existing platforms to only one platform – SSP debut in 2026.

Toyota:
5 TNGA platforms underpin more than 50% vehicles as of 2020 and is expected to increase to 80% by 2023.

Reference: Doing more with less. VW reveals new auto strategy through 2030.

Standardized platform could lead to huge accumulation of defective parts subject to a common recall event



New design alleged to help reduce cost

- In September 2018, a global OEM joint venture announced a recall, affecting over **3 million vehicles**
- The recalled vehicle population involved **14 different models from 3 brands**, which were installed with the same defective "**control arm bushing**"
- It might deform and fell out when subjected to a large external impact, it might cause the vehicle to lose control and pose a safety hazard.
- The share price of the OEM **declined for 10%**

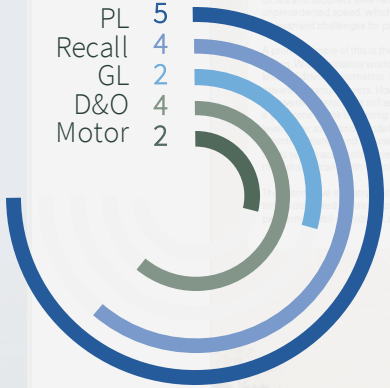
Reference: DPAC, Emao, Sina

More market updates over the automotive industry risk trends

Automotive chip shortage

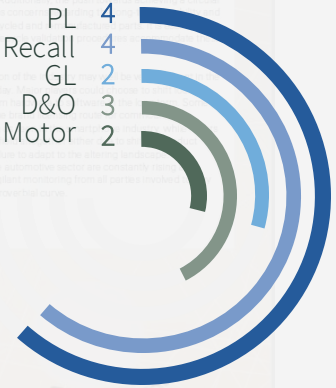
- Acceleration of Automobile Digitalization and Electrification
- The JIT supply chain management model is no longer applicable in the chip field

New players disrupting the status quo



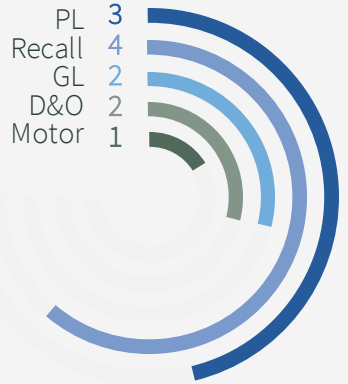
- China and California are the main countries and regions for the financing of "new forces"
- The competitive pressure faced by traditional OEMs will further intensify

Risk sharing through collaborations



- The rapid development of the new four modernizations has promoted various new cooperation models
- In addition to jointly sharing costs and sharing knowledge through cooperation

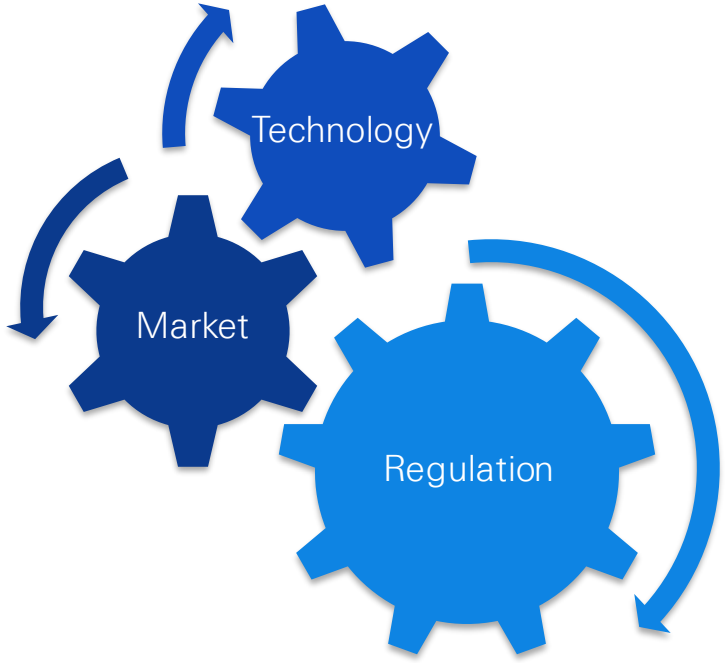
Vehicle contract manufacturing



- New forces prefer to enter the vehicle manufacturing industry by way of OEM
- The foundry model can allow new power players to focus more on electrification and intelligence

Reference: Swiss Re. Automotive Industry Trends: Casualty risk landscape

Wrap-up from RES



Driver of changes

Technical failures

Regulations uncertainty

Market completion

Supply chain disruption

Battery failure

E/E failure

Software defect

Cyber

Fire

Recall

The cost of EV recall can be significant, and the shockwave impact and reputational damage

Battery cell manufacturer →

Battery Cell →

Battery pack manufacturer →

Battery Module & Pack →

OEM

Electric Vehicles

- **Direct recall impact**
  - The OEM had to recall **141,685 units** of EVs worldwide,
  - The recall was reported to cost OEM around **USD 1.9 billion**

- **Shockwave and reputational damage**
  - **Production had to stop** from Aug 2021 till April 2022.
  - OEM offered EV owners a **USD 6,000 refund** as long as they promise not to sue.
  - New version offers **USD 6,000 price cut**.

Reference: NHTSA

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Automotive Recall Claims

Terence Chew-Lau, Claims Expert APAC

Another Month ...Another Series of Recalls - February 2023

- 16,000 units of hybrid electric cars in the U.S. over a software issue that could cause the car's hybrid system to shut down at high speeds which could increase the risk of a crash.
- 22,965 Lexus models in China over improper shape of fuel tank vent pipe shell which may crack.

114,000 units in U.S. over faulty rearview cameras that may not display images.

500,000 vehicles due to risk of injury caused by an issue during airbag deployment. The emblem on the steering wheel can come loose when the air bag is deployed and injure drivers.

362,758 vehicles over autonomous driving software issue that may allow the cars to drive straight through an intersection in a turn only lane, or through a stop-sign controlled intersection.

Price Is Going Up

Ignition Switch Issue

[GM settles deadly ignition switch cases for $120 million (usatoday.com)]

US$ 2.5 Billion

Including $900M settlement with the DOJ. Keys could slip out of the run position, thereby disabling the engine, power assists, and safety features including airbags which led to hundreds of deaths and injuries. 30M cars recalled.

Defective Airbags

[Takata Airbag Recall: Everything You Need to Know - Consumer Reports]

US$ 1 Billion

Agreed to pay over $1 billion in fines and restitution after auto makers had to recall more than a 47M cars as a result of defective airbag inflators which can explode with too much force, spewing shrapnel into drivers.

Suppliers Are Increasingly Targets

- **Air bag recalls have pushed the supplier to the regulatory forefront.**
- **Regulators now demand individual suppliers run a recall as opposed to focusing on the auto manufacturers**
- Since June 21015 :

➢---National Highway Traffic Safety Administration ('NHTSA') focusing on **information collection** and **audits of automotive** manufacturers and **their parts suppliers**

➢-----Both will be put on notice by NHTSA of investigations to promote OEM accountability and action

➢---**Failure of supplier to cooperate will result in fines**

Threshold For Recalls Is Coming Down

OEM's are adopting a more proactive philosophy that identifies defective components and orders recalls before the components cause a safety problem, **even when no injuries or deaths.**

GENERAL MOTORS

Recalled trucks and SUVs in the U.S. and Canada because the brake pedals can loosen and fail to work properly.

NISSAN

Recalled some Altima 2013 – 2015 model year sedans because of an issue with the secondary hood latch.

FORD

Recalled some of its F-150 trucks in the U.S. due to a seat-related issue that was not safety related.

Spike in Structure Components

Spike in recalls relating to **"Structure" components (such as, body, bumper, doors, hood, lift gates, tailgates and related components**).

- Ford, GM, Chrysler and Nissan have all had greater than 100,000 vehicles recalled across one or more campaigns, while Toyota has had several smaller campaigns over 'structure' components.
- Majority of Swiss Re Corporate Solution's Asia Recall claims involve 'Structure' components (and electronic components).

Example 1: Claim against Sun Roof Manufacturer

- **Insured A :** glass panels manufacturer
- **Customer B :** a car sun roof maker, whose glass sun roofs went into European OEM's cars.
- **A** informed that glass panels from **B**'s sun roofs were falling off in early 2016. Insured denied there were any defects.
- Demand made by OEM, wholesalers and **B**- they had incurred significant recall costs for 6,423 affected cars.
- Total claimed : EUR 9.5 million

B initiated arbitration proceedings against insured **A**.

- Insurers eventually settled for EUR 2 million under the Recall Policy.

Example 2 : Defective Electronic Components

- **Insured J :** Japanese Electronics trading house.
- **Product** : **photocouplers** from '**M**' – a component supplier in Malaysia
- **Customer**: Major **tier 1 Japanese manufacturer**.
- **Defect**: Photocouplers mounted on circuit boards in **compressors** and **chargers** short circuited. Vehicles had to be recalled due to malfunction of air conditioners and electric chargers.
- Tier 1 manufacturer replaced 4,500 defective compressors and chargers for the OEM and sought **US$ 3.5 million** from **J** for loss and expenses.

Example 2 : Defective Electronic Components

- **J**'s contract with **M** contained a Limitation of Liability clause, limiting any compensation by **M** to the amount actually paid by **J**, which was US$0.35/ piece x 4,500 = **US$1,575**!
- **J** therefore faced a multi-million $ claim without being able to obtain meaningful reimbursement from supplier.

Conclusion:

➢ It is necessary to examine the contractual terms of the relevant purchase contracts to determine whether there are Limitation of Liability or Exclusion Clauses that may severely restrict or negate attempts in recovering against these suppliers.

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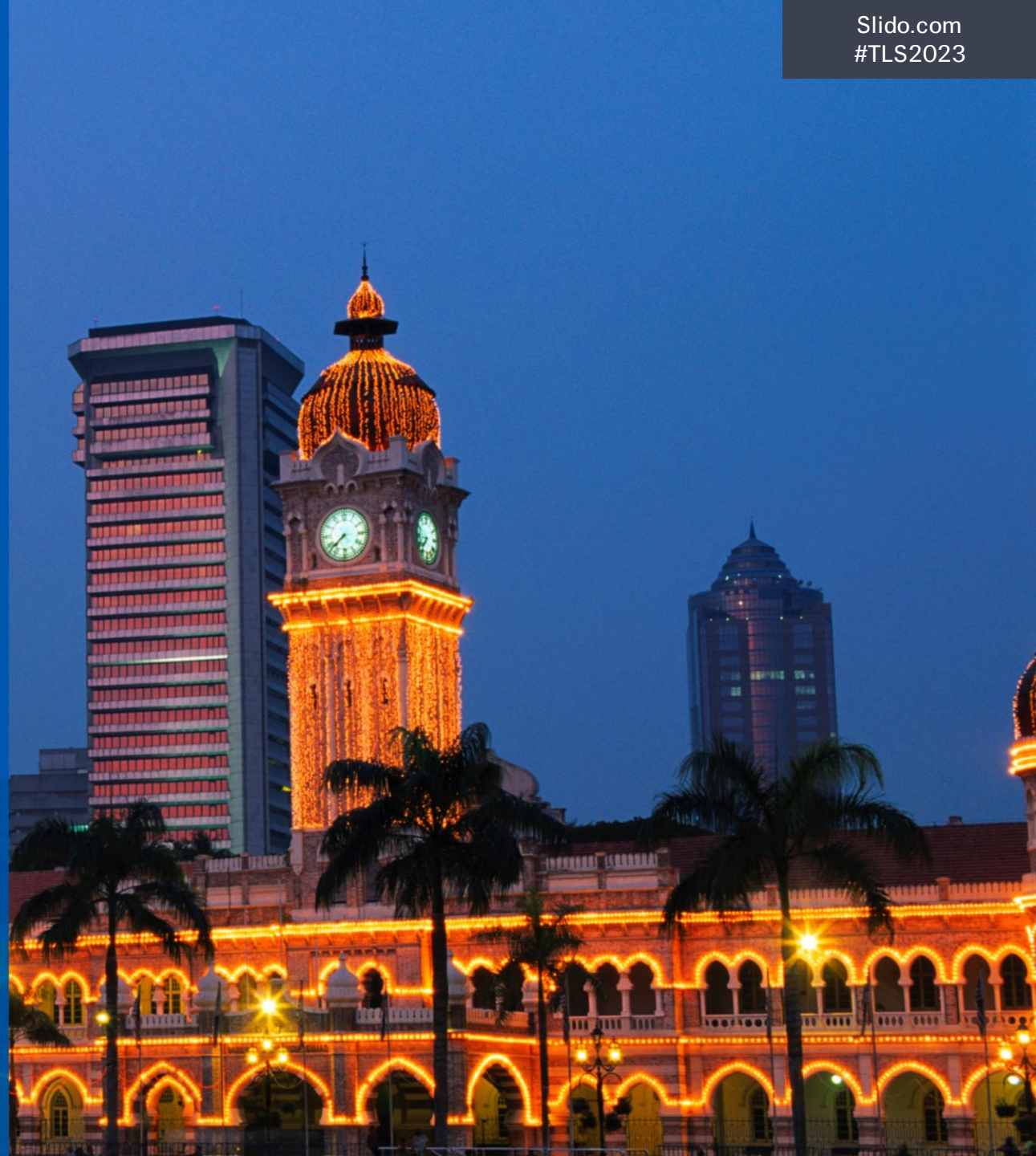
Automotive Liability Claims Trends

Terence Chew-Lau, Claims Expert APAC



Trends such as globalization and consolidation of industries means claims are getting bigger and spanning different jurisdictions

Size of awards increasing

- Largest claims are still from the U.S., but gradual trend towards more significant claims from other countries- e.g. collective actions in some countries; e.g. Netherlands, Germany, Italy, France, Spain, Poland, U.K., Australia, Singapore.
- Courts revising B.I. guidelines- leading to larger bodily injury awards, e.g. Singapore.

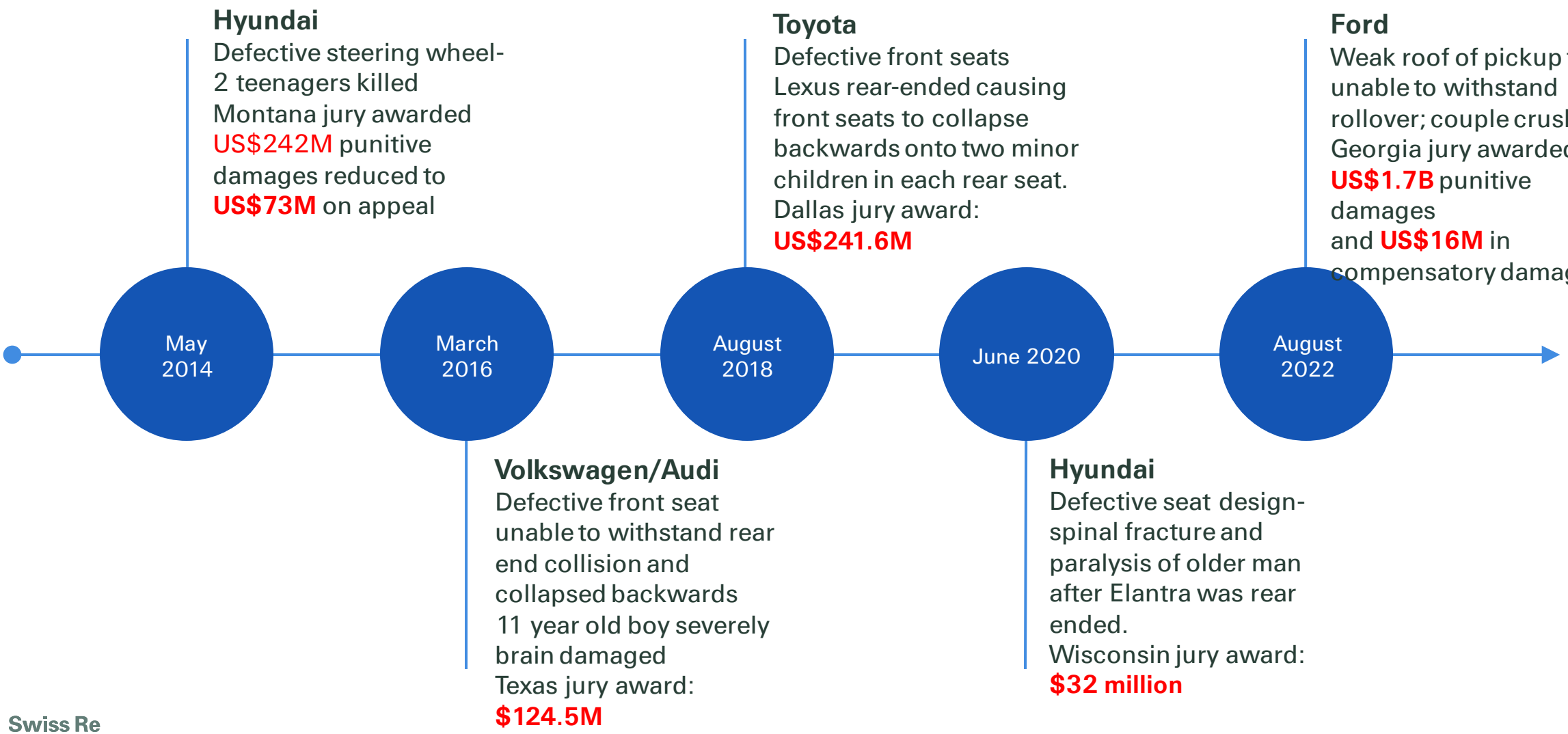
More international, complex and costly

- people become wealthier and more likely to seek compensation, especially in emerging markets
- growing trend outside U.S. towards consumer protection; e.g. EU Directive on Representative Actions;
- Tendency to stronger authority supervision and tighter rules outside of the U.S.
- Rise of Litigation Funders

Rising Legal & Medical Costs

- Rising legal costs - Litigation in the U.S. is becoming more expensive as legal costs continue to rise (multiplied by a factor of two or three in some instances)
- Rising legal and medical costs are also a feature of other markets,

Some Examples of Large U.S. Jury Verdicts



Even City Councils are now filing law suits!

From news article on 28th March 2023:

'The City of St. Louis has filed a Federal Law Suit against Kia and Hyundai, deciding to join a number of other communities, including Cleveland, Milwaukee, San Diego, Columbus, Ohio, and Seattle, that have brought comparable legal actions.'

Since a TikTok social media challenge highlighted the lack of engine immobiliser tech in Kia and Hyundai cars and demonstrated to viewers how to hot-wire cars using a USB connection and a screwdriver, making the cars easier to steal, Kia and Hyundai have come under fire. The cities wants to hold the companies responsible for the time of first responders and the cost to taxpayers, as there was a 270% increase in Kia and Hyundai's cars stolen just in the months of July and August 2022. The stolen cars are often used in other thefts, street racing, and even in some cases, shootings.

Conclusions

- Costs of Automotive Recalls are significant and part suppliers are potential targets.
- Exports of cars and parts to multiple foreign jurisdictions increases the complexity of recalls;
- Costs in defending Product Liability claims in multiple countries is very expensive.
- Size of bodily injury awards trending upwards and can be huge, especially in the U.S.
- Product Recall and Product Liability insurance essential; Coverage and Limits should be adequately assessed.

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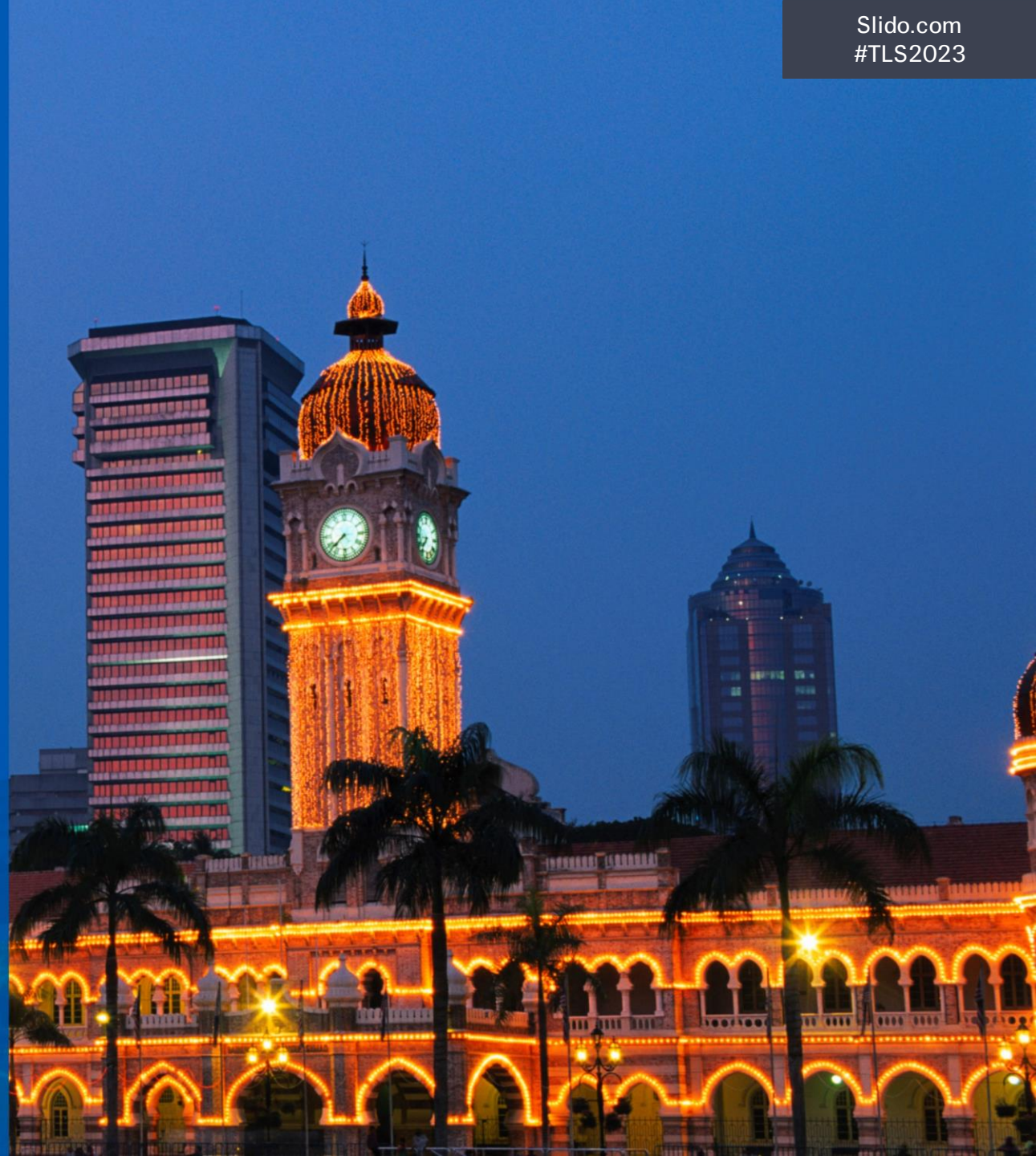
Casualty Risk Appetite

Seah Swee Koon, Senior Casualty Underwriter



Casualty Risk Appetite for Automotive Industry

Products Liability

- Components/Parts manufacturers & suppliers
- Automobile manufacturers

Product Recall (as a package)

- Components/Parts manufacturers & suppliers

XXX Airbags, Tires, Lithium-ion Batteries

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Q&A

Geoff Yeo, Distribution Manager

Unanswered questions

What information is needed to underwrite automotive risks?

Generally, the basic information required includes:-

- Role of the Insured (Manufacturer or Pure Trader, whether the Insured undertakes the design of the product)
- Estimated Turnover with breakdown by sales territory & product type
- Maximum batch size/ ordered quantity (in terms of number of units and value)
- How the Insured traces their products
- Aftermarket sales percentage
- Top 5 customers
- Quality Management certification and recall/crisis management plan (in particular if there's aftermarket sales)
- Loss experience for past 10 years (regardless of whether there is a policy in place)

We may seek for additional information for our further assessment depending on the nature & complexity of the risks.

Unanswered questions

What is covered under an Automotive Recall Policy?

An Automotive Recall policy typically covers Product Recall Expenses which may include (subject to policy terms conditions & exclusions):

- Costs of dismantling the defective product, costs of installing the non-defective products, or costs of repairing the defective products.
- Logistics costs
- Labour costs
- Storage costs
- Advertising costs
- Disposal costs

Unanswered questions

Given the potential for large claims in Automotive Recall and Liability, what sort of limits should an Insured purchase?

The Insured can consider the following factors such as

- Countries of distribution
- Risk exposure of products
- Estimated annual sales
- Maximum batch size or ordered quantity

With the above in mind and their insurance budget, this should help them to decide what is the appropriate limit they should purchase.

Unanswered questions

May I know why battery is excluded?

- We currently have no appetite for lithium-ion batteries due to poor claims experience on such products.

What is the difference between first-party recall and third-party recall?

- First-party recall refers to a recall action initiated by the Insured, e.g., an automotive component supplier.
- Third-party recall refers to a recall action initiated by a third-party, e.g., the Insured's customer which could be an automobile manufacturer.

Will you consider underwriting cyber and professional indemnity for EVs?

- We currently have no intention of writing cyber and professional indemnity for EVs.

Unanswered questions

How complete are you expecting the underwriting information provided to be? What is your acceptable threshold? Especially when it's related to risks associated with higher exposures like EVs

Please refer to Slide 39 for the list of basic underwriting information required for automotive risks.

For EVs - in addition, we will also assess

- the track records/experience of the manufacturers in EVs;
- stakeholders in the supply chain; and
- contract agreement with suppliers

We may seek for additional information for our further assessment depending on the nature & complexity of the risks.

Unanswered questions

What is our appetite for autonomous driving? How do we evaluate autonomous driving cars risk especially in city area?

We are actively working in the space of autonomous vehicles and will share more details when an appetite has been developed.

Nonetheless, we may evaluate Autonomous Driving (AD) cars risks from mainly three aspects:

1. Basic features: To understand and evaluate the fundamental risks arising from the setup of the vehicle, such as the type of the vehicle, level of autonomy applied, maturity level of the hardware and the algorithm.
2. Operational risks: To evaluate the risks arising from the operational features, such as Operational Design Domain (ODD) of the AD vehicles (includes elements like roadway type, geographic area, speed range, etc.), and the nature of the operation.
3. Safety setup: To evaluate and understand the risk mitigation and management measures.

Swiss Re
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Thank you!

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