

REPORT

# The safetytech market.

Accelerating digital  
innovation for safety.



Lloyd's Register  
Foundation





Lloyd's Register Foundation is an independent global charity that helps to protect life and property at sea, on land, and in the air. To do this, we support education, research, public engagement, and promote scientific excellence.

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# Contents

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- 1 Foreword by Richard Clegg, Lloyd's Register Foundation**
- 3 Safetytech in context by James Pomeroy, Lloyd's Register**
- 4 The safetytech market and key findings**
- 5 Analysis**
  - 7 Market size
  - 11 Lloyd's Register Market Focus: Energy, marine and food
  - 13 Start-up market development
  - 15 Impact of safety incidents
  - 17 Trends driving growth
    - 17 The rate of decline for safety incidents has plateaued
    - 17 Real-time assessment and management of operational risk is the key enabler
    - 17 Most asset failures are random
    - 19 Safety and operational effectiveness are closely interlinked
    - 19 Complexity and complex safety incidents cost double
  - 19 A note on method
- 20 Conclusion**

## List of figures

- 5 Figure 1. The safetytech physical, digital flow
- 8 Figure 2. Combined technologies in the value chain
- 8 Figure 3. Safetytech whole market size 2023 (safety critical industries)
- 9 Figure 4. Safetytech market size 2023 (safety critical industries) by technology class
- 10 Figure 5. Safetytech market size 2023 by industry (safety critical industries)
- 10 Figure 6. Safetytech market size 2023 by sub-sectors of manufacturing and natural resources
- 12 Figure 7. Safetytech market size 2023 by sub-sectors of transportation
- 12 Figure 8. Safetytech market size 2023 by focus sectors: energy, marine and food
- 14 Figure 9. Safetytech market size 2023 for food
- 14 Figure 10. Development of the safetytech start-up market
- 15 Figure 11. Losses to BP from Deepwater Horizon
- 18 Figure 12. Safety incidents across the EU: 2008 to 2016
- 18 Figure 13. Barrier model with safetytech overlay
- 19 Figure 14. Complex safety incidents vs. simple safety incidents: cost comparison

# Foreword

**In this safetytech report, one word that stands out for me is *opportunity*.**

For Lloyd's Register Foundation, the big opportunity is that by accelerating the adoption of digital technology for safety we believe we can help make the world a safer place. That is what we are calling safetytech in this report.

We all value our personal health and safety, and we all have an expectation that we will work and live our lives free from harm. Yet estimates indicate over 2.8 million people die each year worldwide from safety accidents in the workplace or exposure to hazardous materials or situations, with significantly greater numbers injured. The consequences of these accidents are not always confined to the workplace and can result in regional, national or global consequences affecting us all. So a big opportunity from safetytech is protecting the safety of life and property of ourselves, our families and others.

Work related accidents are estimated to cost 3.9% of global GDP with a significant proportion of these costs falling on individual organisations. In addition to the human cost, accidents can damage the reputation, share price and public confidence of an organisation. So a further opportunity presented by safetytech is saving this financial damage.

Better safety is also often associated with improved efficiency and can act as a differentiator in competitive markets leading to business opportunity.

This report shines a light on how application of digital solutions on safety challenges leads to societal and business impact, in the process creating a new safetytech market. The size of this market and the opportunity it presents is estimated to be as big as \$863 billion by 2023.

We have tested the concept of safetytech through our award-winning Lloyd's Register Safety Accelerator, which has shown market demand from industries with safety challenges and a supply of technology start-ups that have solved these problems through open innovation, often repurposing their existing products to what is for them a new safety market.

The *opportunity* for safetytech clearly exists. As the safetytech market grows, we all win and the world is a safer place.

Professor Richard Clegg  
Foundation Chief Executive  
Lloyd's Register Foundation



**The *opportunity* for safetytech clearly exists. As the safetytech market grows, we all win and the world is a safer place.**



# Safetytech in context

**Safety systems and processes are fundamental drivers of efficiency and margin gain. Organisations routinely overlook this, to the detriment of their performance and staff.**

Major accidents present a significant business and societal risk that entails large-scale reputational, financial and operational implications, whilst also often creating personal liabilities for executives. Managed well, however, safety can unlock value for organisations through improved efficiency, margin gain and market differentiation, particularly in high-risk sectors.

Currently, despite the importance organisations assign to safety and how disruptive major safety failures are known to be, the methods and technologies used remain primitive, and most do not have a good understanding of how effective their critical safety controls are. While other organisational systems have evolved through the adoption of digital technology and data-driven insights to improve performance, often in real-time, safety continues to suffer from a lack of insight, innovation and technological advancement, and this is increasingly evident in the plateauing rates of decline in safety incidents.

Safetytech offers the opportunity to transform and gain competitive advantage.

Equally, safetytech represents a significant market 'threat' if used by competitors for advantage, particularly in safety critical industries. Safety is ripe for digital transformation and disruption, and safetytech offers the opportunity to use new technologies to eliminate hazardous activities and it will address many of the long-standing management issues organisations have experienced in this critical area of their business.

Organisations that do not however embrace and apply safetytech, will remain trapped and blinded by a lack of immediate knowledge and unable to act preemptively and efficiently, whilst their competition will be able to take the lead. The sector servicing safety processes and systems and their clients will experience competitive disruption from new technology enabled firms, who use real time monitoring and data capturing hardware and software, immediate AI enabled analysis, and automated outcomes.

Those who fail to act now will not only fail at reducing safety incidents and protecting their workforce, but suffer greater reputational damage, for their lack of prevention measures and their perceived disregard for quality of life and human safety.

James Pomeroy, Lloyd's Register  
Group Health, Safety, Environment & Security Director



**Those who fail to act now will not only fail at reducing safety incidents and protecting their workforce, but suffer greater reputational damage, for their lack of prevention measures and their perceived disregard for quality of life and human safety'**

# The safetytech market

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Safetytech is the collective term for the technologies, products and services that are beginning to disrupt safety approaches in traditional, safety critical industries and infrastructure, by applying active and dynamic risk mitigation and removal through extensive capture and use of operational data.

Only recently defined, the market for safetytech is forecast to expand rapidly in the short term led by start-ups and innovative players who will combine advanced technologies to offer new solutions to safety challenges.

## Key findings

- The combined global industry market potential for safetytech by 2023 is \$863 billion
- The safetytech market for safety critical industries is expected to be at least \$257 billion in 2023
- In 2023, traditional safety applications will represent just \$25 billion of market share in safety critical industries
- The biggest single technology class for safetytech is IoT which will enable 77% of the total market by 2023. Wearables, however, represents the fastest growth at 28% CAGR (compound annual growth rate)

# Analysis

Safetytech is not simply a set of discrete technology classes but a combination, or ‘mesh’, of technologies working together to produce new and innovative safety solutions. It enables effective asset, workforce and safety management and efficiencies by access to data, often real-time, and intelligence which in turn is driven by a continuous and cyclical flow of information and action (Figure 1).

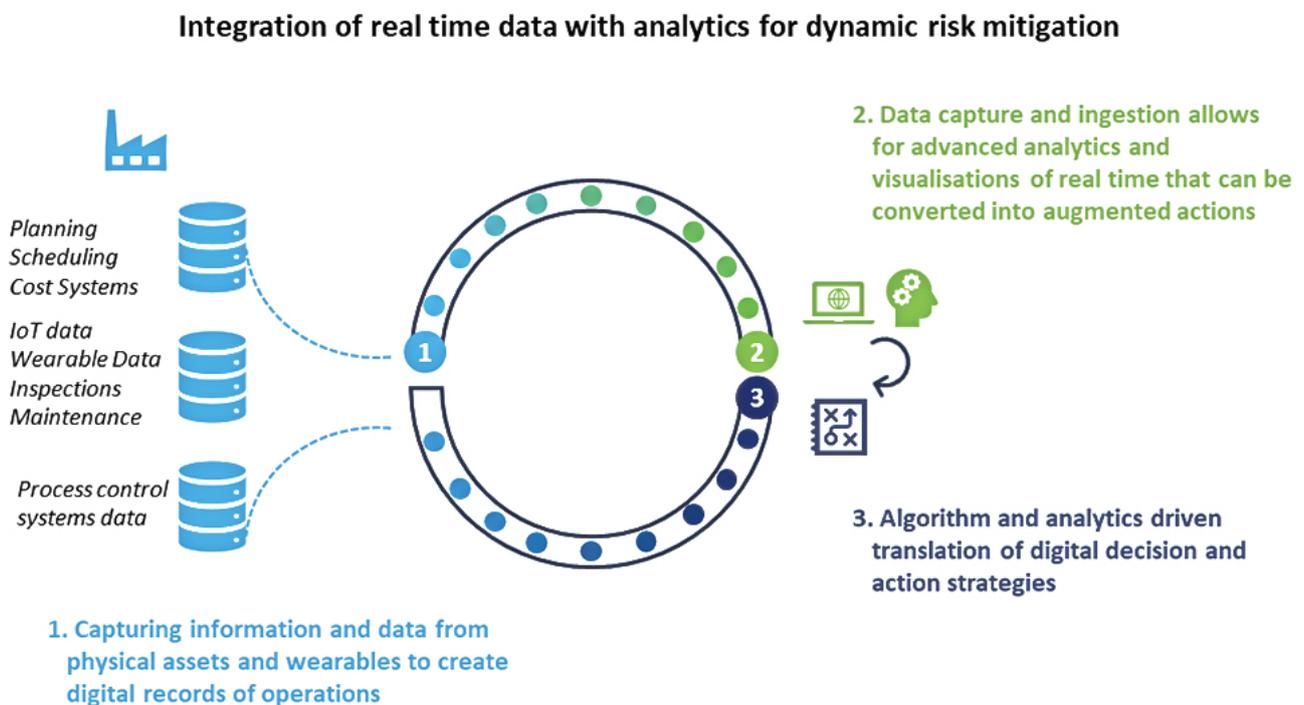
In general, safetytech information typically flows through three steps:

- Capture of physical data by sensors and the digitisation of data
- Storage, sharing and analysis of digitised operational data to produce meaningful insight
- Interpretation and transformation of insight into real-world action.

In this analysis, use cases are used to describe the situations where an application of technology has the potential to enhance safety. In order to describe safetytech in action, on the next page are some illustrative examples of what is possible today.

More than the examples described here, safetytech goes further, and provides predictive management, removes dangerous operational conditions and uses prescriptive analytics to prevent dangerous situations from occurring at all. With a focus on the systemic result, not simply the application of technology, it also achieves efficiency across the system.

Figure 1. The typical safetytech physical, digital flow



Examples of risks mitigated	Technologies used
<p>1. Extended supply chains face a myriad of risks such as supplier disruption, production failures or transportation delays.</p>	<p>AI solutions can ingest data from external and internal systems in a variety of formats. This can be supplier performance information, weather patterns or transportation carrier alerts. Using machine learning, the solution can identify different patterns that might indicate potential risk exposure. For example, repeated failure of a certain supplier to meet its commitments or publicly available weather forecasts that would present risk to operations. Additionally, the solution can analyse historical information to see how similar risks were mitigated and how successful these mitigations were.</p>
<p>2. The risk to people can be removed for hazardous inspections such as those at height, extreme locations or with life threatening substances.</p>	<p>Advanced, large load bearing drones and a variety of sensors that accompany them can more frequently and rapidly collect and communicate large amounts of data for downstream analysis and action.</p>
<p>3. Tasks that require detailed and complex steps in process but which occur in physically demanding environments are more likely to be more high risk, and present opportunities for error.</p>	<p>Augmented reality overlays on the display of glasses or other head-mounted displays (HMDs) providing step-by-step instructions on how to perform the task using the correct tools and parts.</p>
<p>4. As new technologies are adopted, risk may increase as current staff are trained up on new processes and procedure, and are learning to manage the newly acquired hardware.</p>	<p>Through HMDs, workers receive hands-free instructions on what they are working on from an expert in a remote location, who can offer guidance on the next steps. Experts can be in a contact centre, via a PC, or connected elsewhere with a tablet or smartphone. The expert uses voice, on screen 'marker pen' or instructional images, which the worker sees through the smart glasses.</p>
<p>5. Repeated reactive maintenance can mask previously unknown root causes risking more serious system failure.</p>	<p>An IoT mesh embedded deep within assets provides near real-time operational data to predictive and prescriptive analytics software suites. Analytics software detects anomalies in another part of the system, links the problem through machine learning, and predicts failure. A command is sent for preventative action.</p>



Traditionally, organisations have been accustomed to linear data and communications, with significant delays in data transmission, ingestion, analysis and consequent actions. They have been limited in their capability to take accurate, timely actions to protect their assets and people, and as a consequence, have had less control over the effect on costs and margin.

Figure 2 shows how technologies combine in the value chain, bridging gaps and providing real-time management of safety.

### Market size

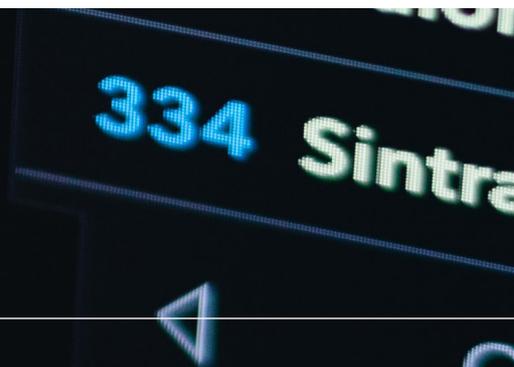
As the market has been sized based on aggregate forecasted spend, the challenge is to determine that the primary motivation for investment is a safety use case.

For the purposes of sizing, market data has been analysed as three layers in order to distinguish potential safety spend from direct safety spend:

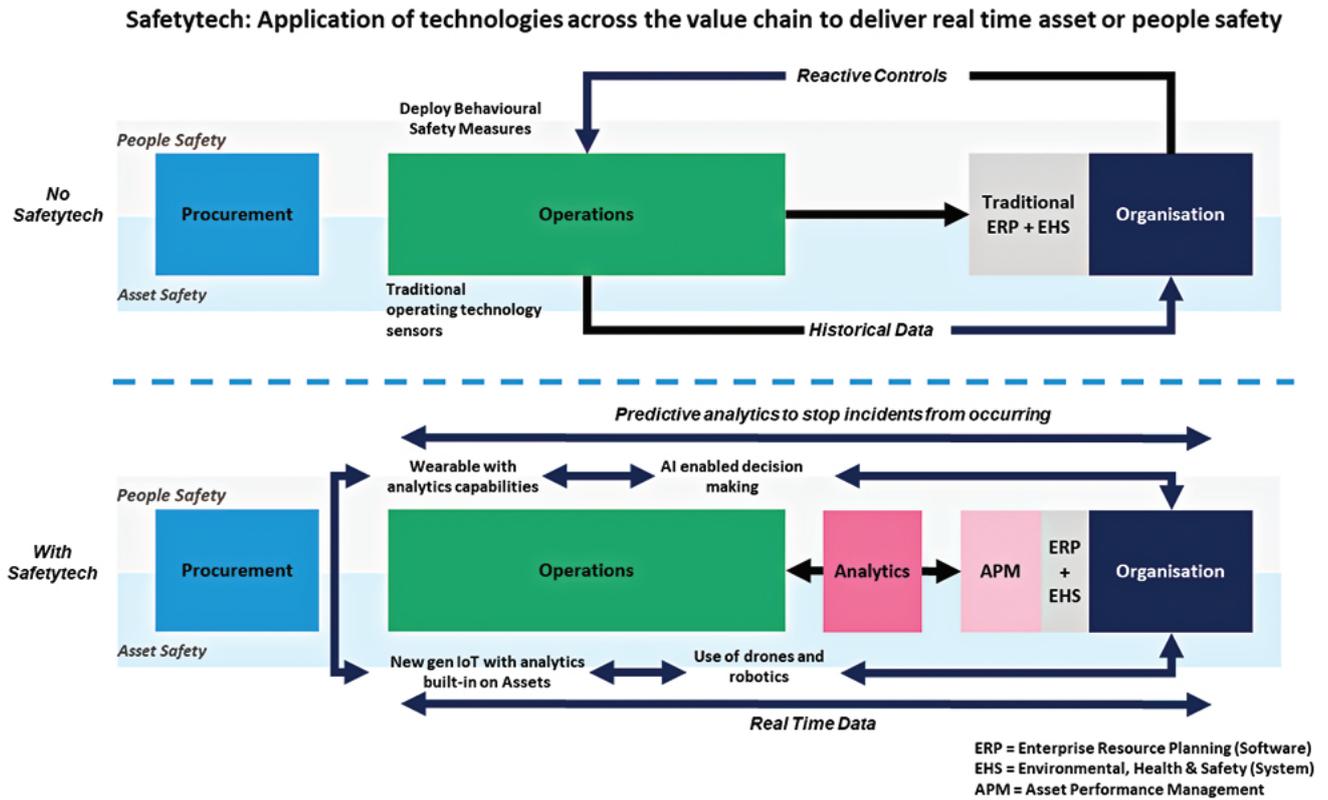
- Layer 1, Safety heartland (traditional safety technology market): This layer represents spending on solutions (e.g. environmental, health and safety (EHS) software) that have a sole purpose of improving safety. The primary rationale behind spending in this portion of the market is to improve safety.

- Layer 2, safetytech: This represents the spending on technologies (e.g. IoT, robotics, wearables and other hardware) that have a direct effect on safety and the rationale for investment is for safety specific use cases
- Layer 3, Adjacent: Layer 3 represents spending on technologies or solutions that have a positive effect on safety, and have either of the following two characteristics:
  - Very general and broad safety-related use cases such as building fire safety and heating, ventilation and air conditioning (HVAC) systems which are key to safety.
  - Spending is due to significantly different primary reasons than safety e.g. operational efficiency or quality, however as efficiency and safety correlate, these have been included here.

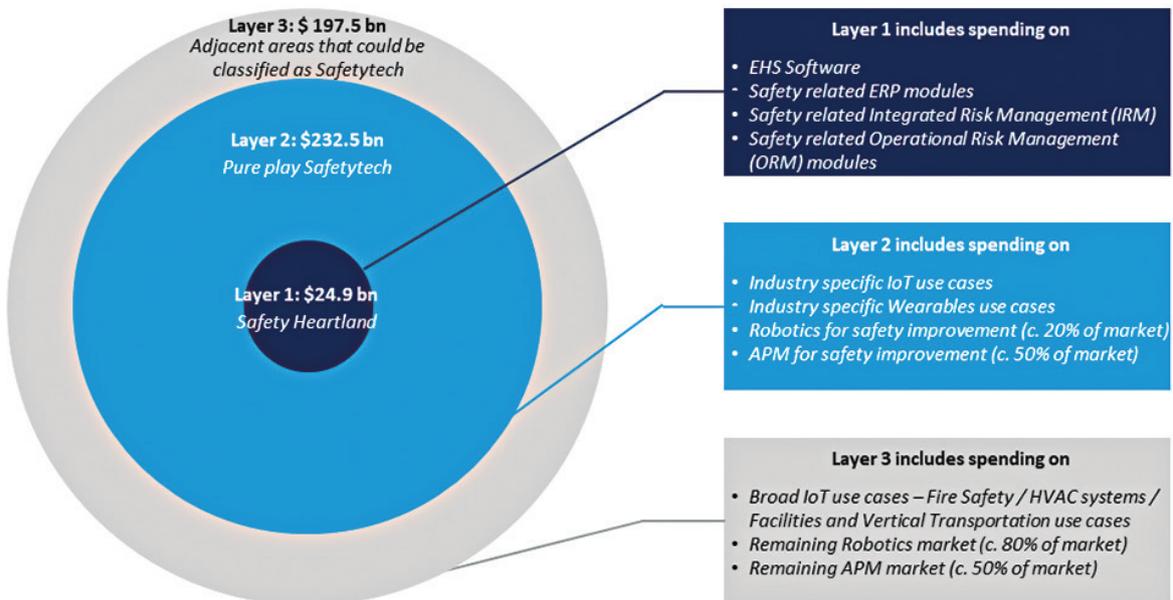
**The forecasted size of the safetytech market for safety critical industries (see Note 1) in 2023 is a total size of \$257 billion (layers 1 & 2) with a potential size of \$455 billion when including layer 3.**



**Figure 2. Combined technologies in the value chain**



**Figure 3. Safetytech whole market size 2023 (safety critical industries)**



Market sizes as of 2023

Components of market sizing layers

**Note 1 Safety critical industries:** Safety critical industries are isolated from total industry and includes manufacturing and natural resources, retail and wholesale trade, transportation and utilities. Heavy industry, construction and energy are further sub-sectors of these industries.

At an aggregate level (where we include all three layers of technology usage and application), the potential safetytech market for safety critical industries is expected to grow from \$272 billion in 2018 to \$455 billion by 2023, representing growth (CAGR) of 11%. This growth is largely driven by the markets for wearables 28%, robotics 15%, asset performance monitoring (APM) 17%, EHS system 12.5% and IoT at 9%.

**The largest proportion of the safetytech market by technology is IoT which represents nearly 77% of the market (growing from \$212 billion in 2018 to \$323 billion in 2023).**

IoT is considered as two sets of use cases across layers 2 and 3 only:

- Applications which are cross-cutting across industries and enable safety levels at a broader level (for example buildings and HVAC safety systems) and are classed as a layer 3 market

- Highly specialised IoT use cases which are relevant to industry sectors (for example well monitoring within the energy sector). This is classed as safetytech specific for safety critical industries and is counted as layer 2.

Safetytech when not specifically enabled by IoT technology still presents a very strong opportunity. These technologies, while representing 23% of the total, combine to create an overall market that is likely to be worth \$132 billion by 2023.

Figure 5 shows that the largest industry by market size for safetytech is manufacturing and natural resources (forecasted to be worth \$235.2 billion by 2023 and exhibiting a growth of nearly 10.5% CAGR).

We will now explore manufacturing and natural resources as well as transportation in more detail.

Manufacturing and natural resources is comprised of sub-sectors such as natural resources and materials, heavy industry and construction, energy, consumer non-durable products (including food manufacturing), life sciences and healthcare products, automotive and IT hardware.

The largest sub-sector by market size within manufacturing and natural resources is natural resources and materials, forecasted to be worth \$89.8 billion by 2023 and exhibiting a growth (CAGR) of nearly 14%.

Figure 6 shows other sub-sectors within manufacturing and natural resources that are likely to see large growth and adoption of safetytech as heavy industry (forecasted to be \$52.1 billion with a CAGR of 10.6%), energy (forecasted to be \$25.1 billion with a CAGR of 8.3%) and consumer non-durables (forecasted to be \$27.5 billion with a CAGR of 7.3%).

**Figure 4. Safetytech market size 2023 (safety critical industries) by technology class**

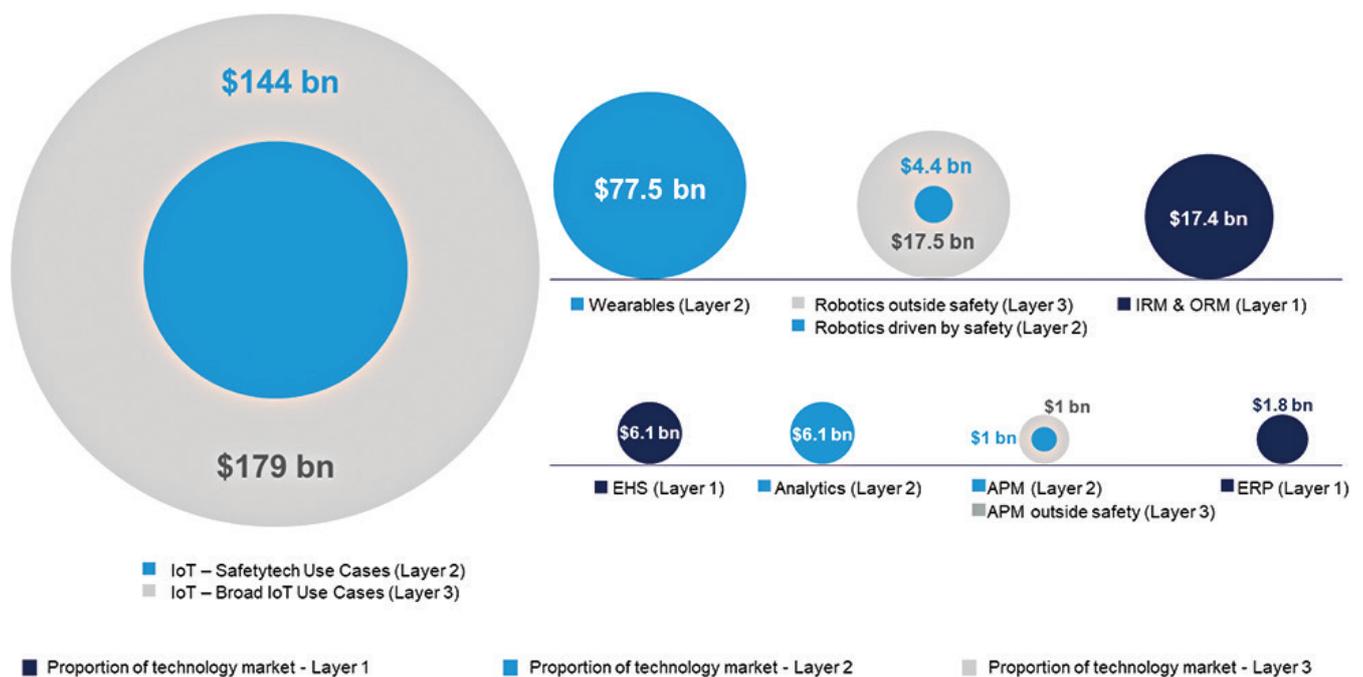


Figure 5. Safetytech market size 2023 by industry (safety critical industries)

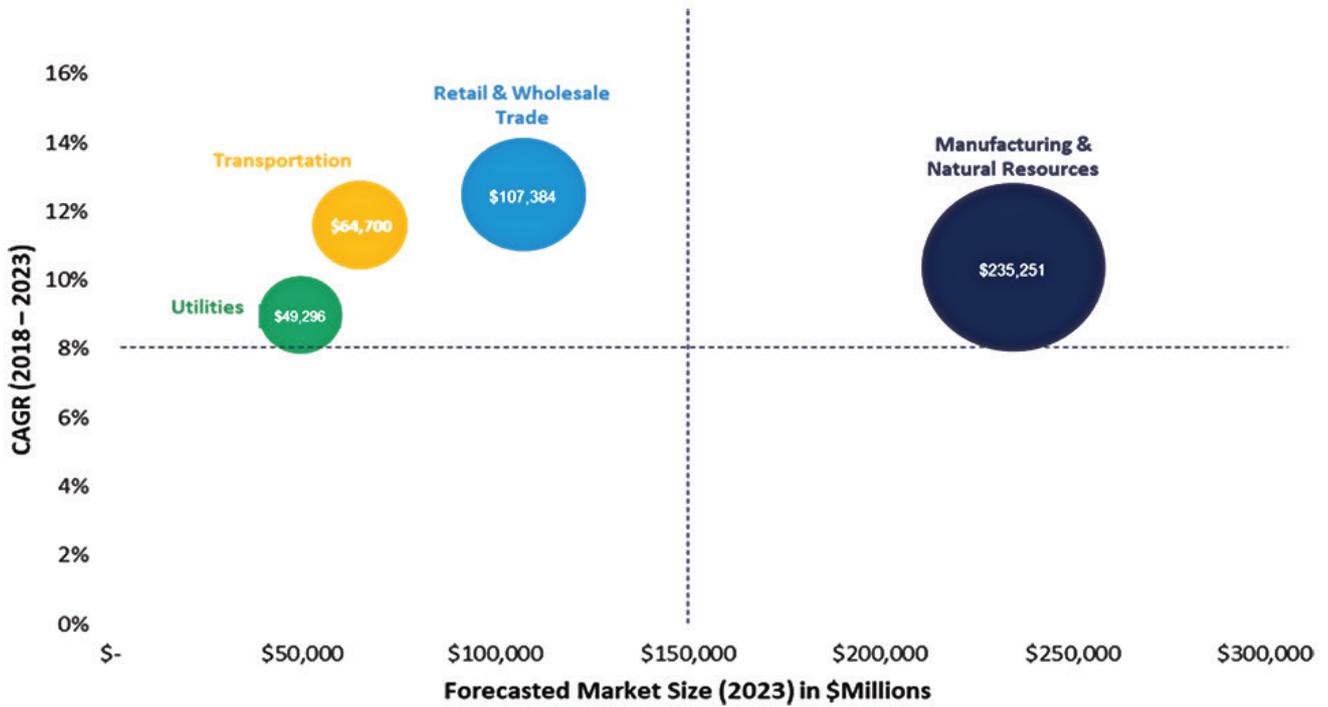
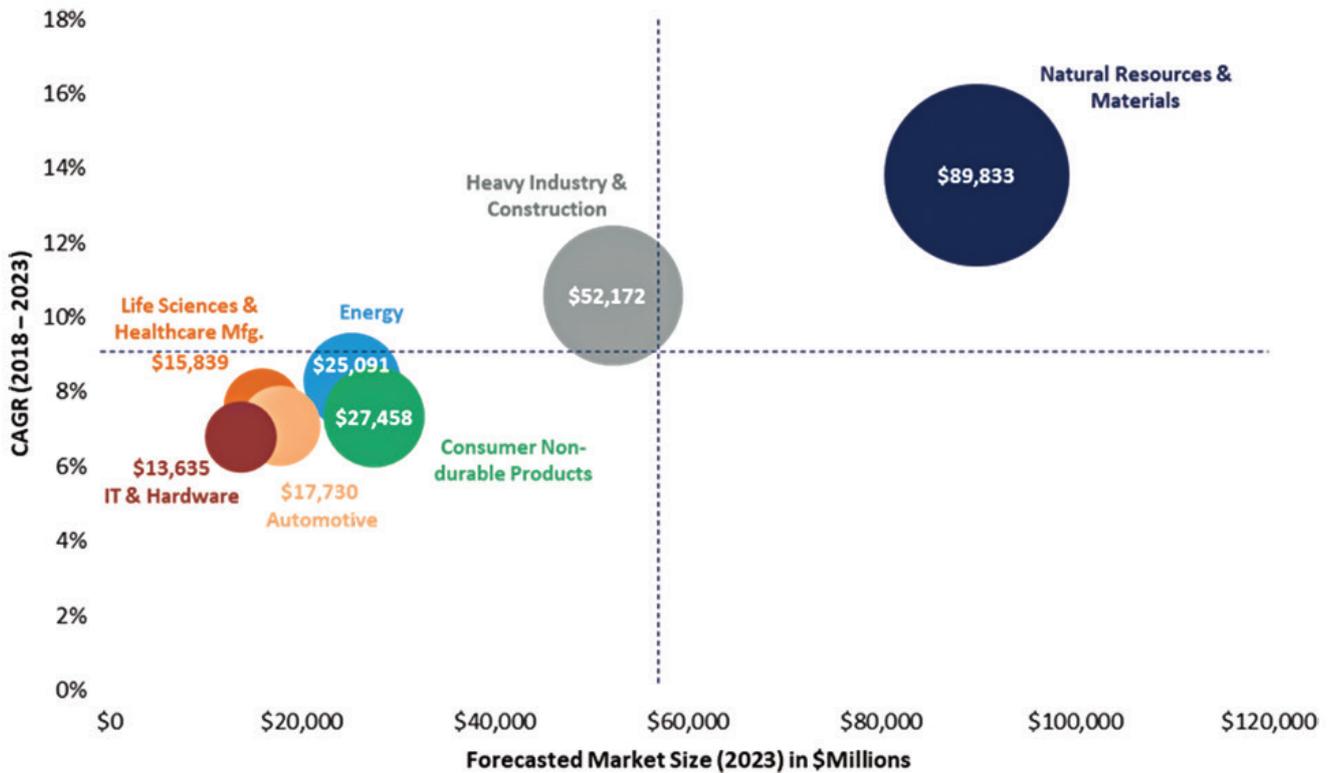


Figure 6. Safetytech market size 2023 by sub-sectors of manufacturing and natural resources





As noted on page 9, transportation is the second market we will be exploring in more detail.

Transportation as a safety critical sector is comprised of sub-sectors such as warehousing and couriers, motor freight, marine transportation and freight, and air transport and freight. For the purposes of this report, the transportation use cases for safetytech are limited to freight and B2B transportation (public transportation is excluded).

Figure 7 shows the largest sub-sector by market size within transportation is warehousing and couriers (forecasted to be worth \$34.9 billion by 2023 with a growth of 14% CAGR). The other sub-sectors that are likely to see large growth and adoption of safetytech are motor freight (forecasted to be \$9.6 billion with a CAGR of 10.2%) and air and marine transportation (forecasted to be \$6.9 billion and \$6.5 billion with CAGRs of 10% and 7.7% respectively).

## Lloyd's Register Market Focus: Energy, marine and food

We have developed a focused market sizing analysis for three key industry sectors: energy (onshore and offshore), marine and manufacturing (with a focus on food), specifically referred to as the Lloyd's Register Market Focus.

Cumulatively, the total market size of the safetytech market within these industry sectors is likely to grow to \$51 billion by 2023 representing an overall CAGR of 8.2%. This is roughly in line with the growth trajectory of the overall safetytech market.

Figure 8 shows the largest of these three sectors is the energy industry where the application and use of safetytech is forecasted to create a market that will grow to \$25 billion in 2023 with a CAGR of 8.3%, the fastest growth rate amongst the focus sectors.

The second focus sector is the safetytech market size of the marine industry which is expected to grow to approximately \$6.6 billion in 2023 with a CAGR of 7.7%.

Figure 7. Safetytech market size 2023 by sub-sectors of transportation

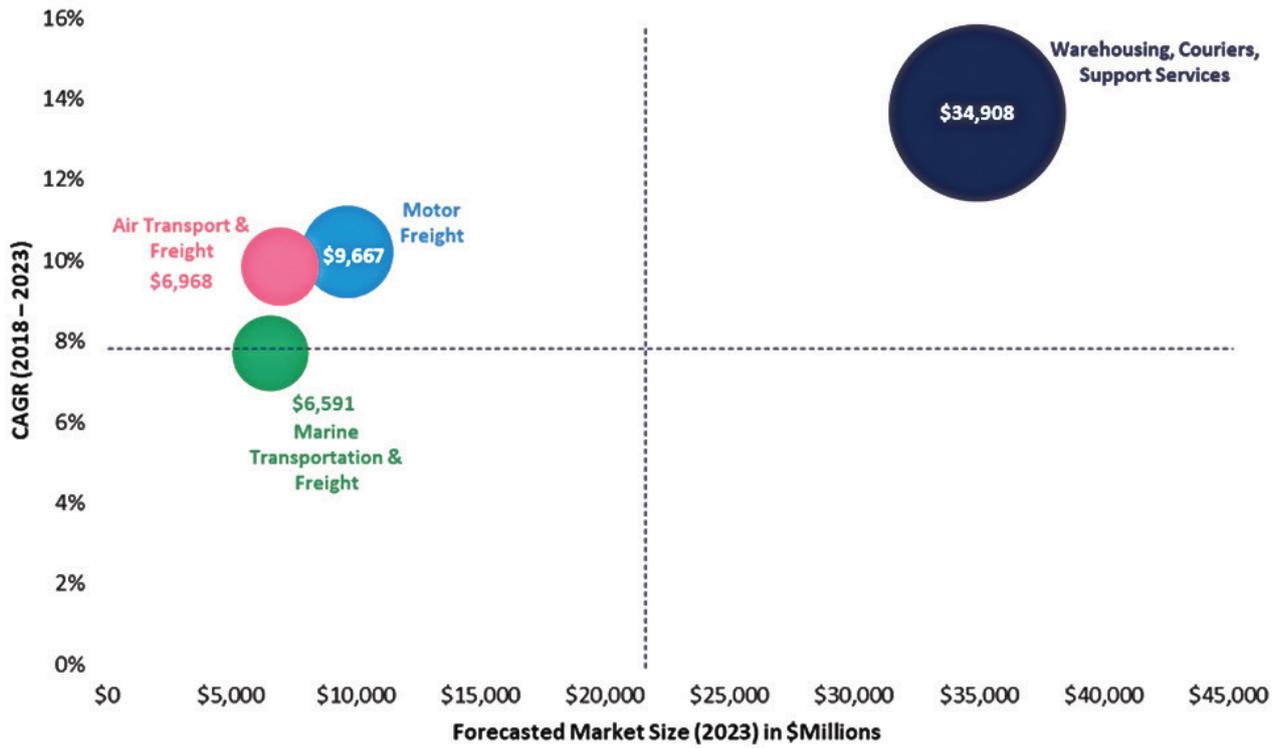
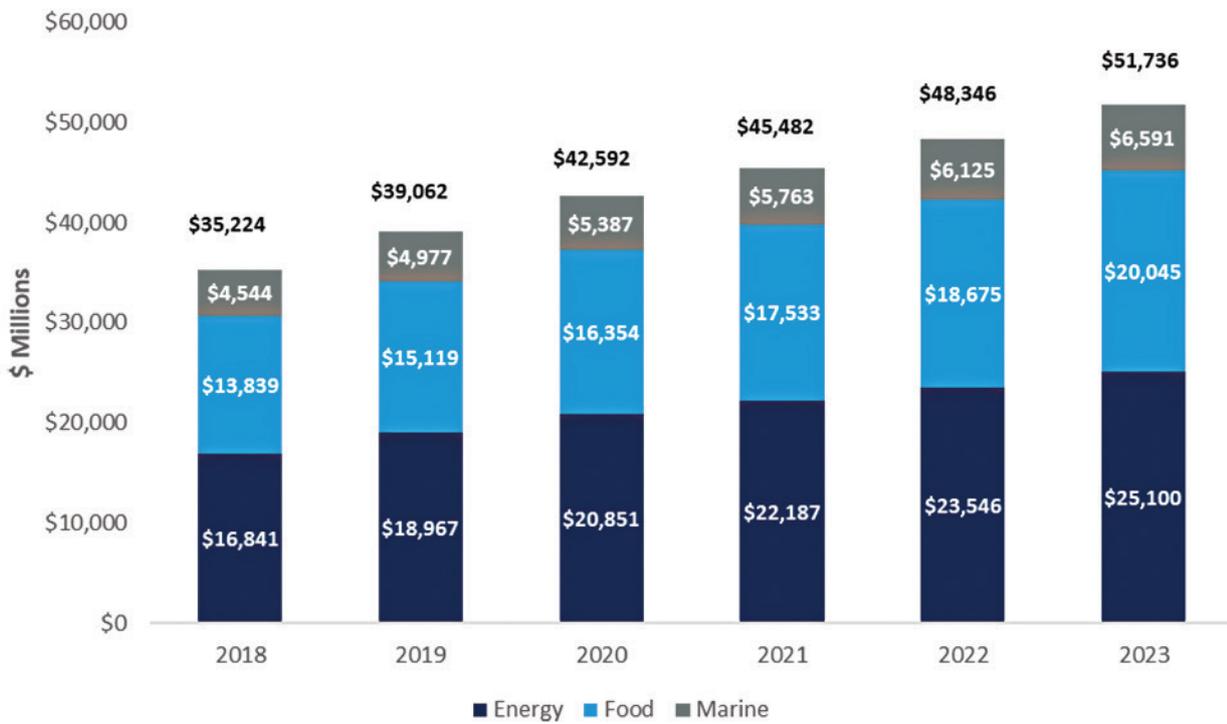


Figure 8. Safetytech market size 2023 by focus sectors: energy, marine and food





The food industry that applies to safetytech which has been included in the Lloyd's Register Market Focus is estimated to grow to \$20 billion by the year 2023 at a CAGR of 13%. It must be noted that the food market sizing developed within this report is an amalgamation of two markets, agriculture and aquaculture (which is a sub-segment of natural resources and materials), and food manufacturing (which is a sub-segment of consumer non-durables manufacturing), which you can see broken down in Figure 9.

There are two key drivers behind the expected large growth of safetytech within the food industry.

The first is within the earlier value chain of food, i.e. within agriculture and husbandry there has been heavy focus on precision farming and increasing yields while reducing or removing unnecessary / harmful chemicals that have been used in farming, horticulture or husbandry. Furthermore, agriculture has traditionally seen some of the highest percentage safety incidents in the world and does not enjoy the large insurance coverages that more advanced sectors, such as manufacturing and energy, use to mitigate risk.

The second is further downstream within food manufacturing and processing where global food supply

chains are leading to increased scrutiny of sustainability, traceability and ethical trading along with challenges around microbial contamination, allergen / mislabeling, chemical contamination of food and physical contamination in less than ideal production environments.

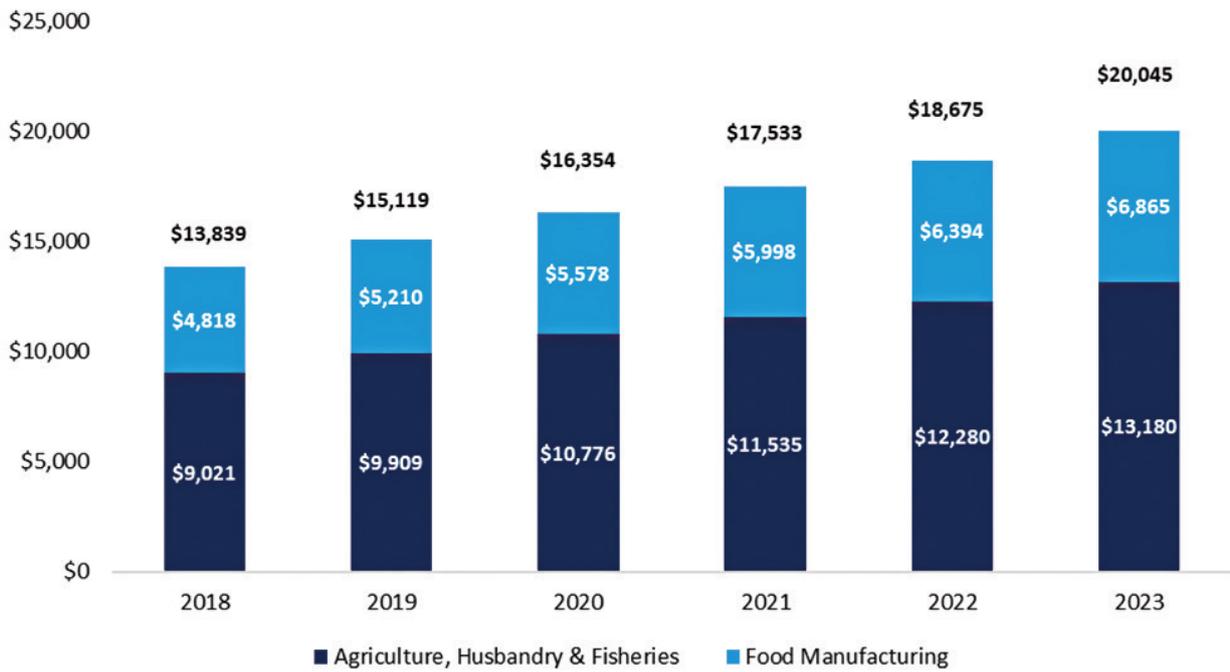
## Start-up market development

Technologies have matured; sensor and wearable hardware have become cheaper, easier to access and easier to configure, and analytics and AI have become more easily deployable solutions.

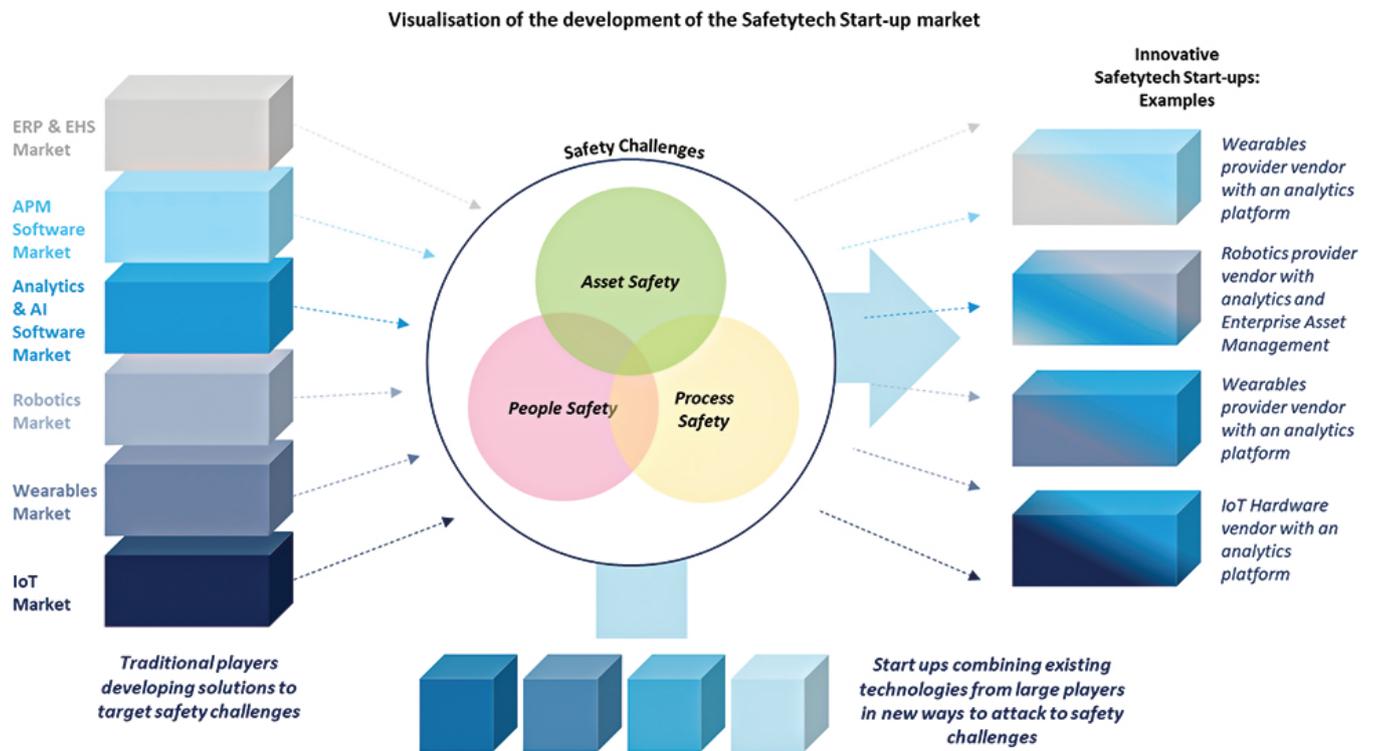
A clear and sizable opportunity for new start-ups and innovative technology firms to disrupt the safety solutions market is now present. These firms are likely to take existing modular solutions and combine them in new and innovative ways to offer product suites which are a mesh of technologies targeting very specific use cases. The true disrupters will turn investment once classified as operational efficiency towards safety.

Figure 10 illustrates how start-ups will cross traditional modular solution boundaries and merge people, process and asset safety challenges to create previously unimagined solutions.

**Figure 9. Safetytech market size 2023 for food**



**Figure 10. Development of the safetytech start-up market**



*As vendors and start-ups try to develop capabilities to tackle people and asset safety challenges they will attract a new generation of start-ups which will combine multiple technology types or technologies outside their core areas of expertise in new ways to deliver value*

## Impact of safety incidents

Annually, there are an estimated 2.8 million deaths<sup>1</sup> across the world which are directly attributable to safety incidents in the workplace or exposure to hazardous materials or situations. Work-related safety incidents result in the loss of approximately 3.9 % of the world's GDP<sup>2</sup>, while the financial cost of safety incidents to organisations is primarily suffered as an indirect consequence and is often unaccounted for in official figures.

Organisations face significant risks from safety incidents as well as people. Nearly 47% of the costs incurred by organisations, post-incident, are usually unaccounted for and a complex incident can have a cost impact of nearly twice that of a

simple safety incident<sup>3</sup>. It is in this context that the innovative application of new technology is primed to address both the human and financial impact of poor safety.

Safetytech will reduce and may remove the overall costs incurred as a result of safety incidents and accidents. These costs include not only hidden indirect costs but also damage from loss of reputation which can lead to contraction of enterprise value for listed companies.

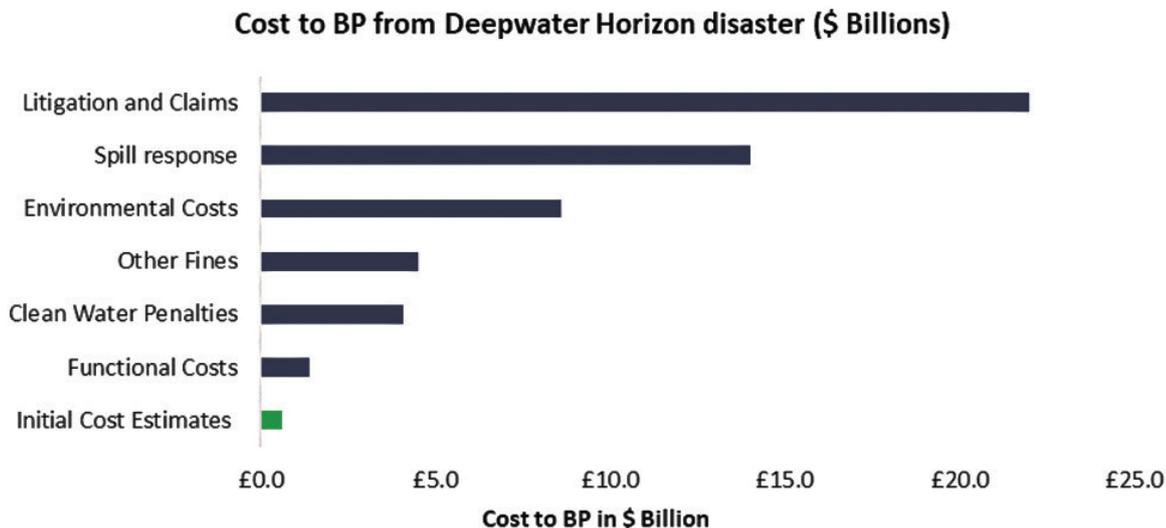
Whilst it is widely accepted that safety incidents cause physical damage to assets and lead to injury and fatalities, the reported loss figures corresponding to accidents do not include insured costs to businesses such as business interruption costs, penalties, paid out liabilities and

compensations and the loss of reputation (which can have serious consequences for share prices of publicly listed organisations). The April 2010 Macondo well blowout killed 11 people and injured a further 17 and was initially estimated to have cost BP an approximately \$590 million (Figure 11). However, over time the costs of the incident have ballooned to nearly \$55 billion (latest figures now estimate these losses to be approximately \$65 billion).

The figures do not include the loss of reputation and the damage to market valuation.

Research conducted by the Centre for Economic Policy Research (CEPR) shows that markets react strongly to safety incidents and leave a lasting impact on enterprise value.

**Figure 11. Losses to BP from Deepwater Horizon**



1. WHO & ILO <https://www.ilo.org/global/topics/safety-and-health-at-work/lang-en/index.htm>

2. EU-OSHA & ILO <https://osha.europa.eu/en/economics-occupational-safety-and-health-value-osh-society>

3. UK HSE data and extrapolation of Battaglia M, Frey M, Passetti E. (2014). Accidents at work and costs analysis: a field study in a large Italian company, *Industrial Health* 2014, 52, 354–366

4. CEPR research: <https://voxeu.org/article/how-does-stock-market-respond-petrochemical-disasters>

5. Event study methodologies are based on the overall assessment market investors who react in real time as they process available information in assessing a firm's market value. It is a forward-looking approach that allows separation the of the effects of specific news from macro risk factors.

The CEPR<sup>4</sup> surveyed previous studies on industrial accidents (including Exxon-Valdez) and built an original sample of 64 explosions in chemical plants and refineries worldwide from 1990 to 2005 (including the explosion of a BP refinery in Texas in 2005) and conducted a standard daily event study based on the financial markets<sup>5</sup>. CEPRs results are presented below:

- Shareholders suffer a significant loss of about 1.3% over the two days immediately following disasters
- One fatality or serious injury is associated with an additional loss of \$164 million, while the occurrence of a toxic release corresponds to an additional drop of around \$1 billion.

Furthermore, the consequences of an incident can extend far beyond the confines of an event and location. Consequences range across:

- Immediate vicinity – those in the vicinity of a major incident are not confined to just workers in an organisation but may include end users and local communities near the site, as an incident occurs.

The Bhopal disaster is the world's worst industrial disaster. A gas leak in 1984 at the Union Carbide pesticide plant in Madhya Pradesh, India affected many villages and towns in the surrounding area killing many thousands of people.

- Geographic reach – An incident may directly affect services and critical infrastructure that enables quality of life, far and wide from the initial incident, with a myriad of knock-on safety issues and situations arising.

A power black-out across South America in 2019 impacted 48 million people living in five countries due to an interconnected fault. Hospitals ran on generators, airports shut down and water supplies were cut off during the incident.

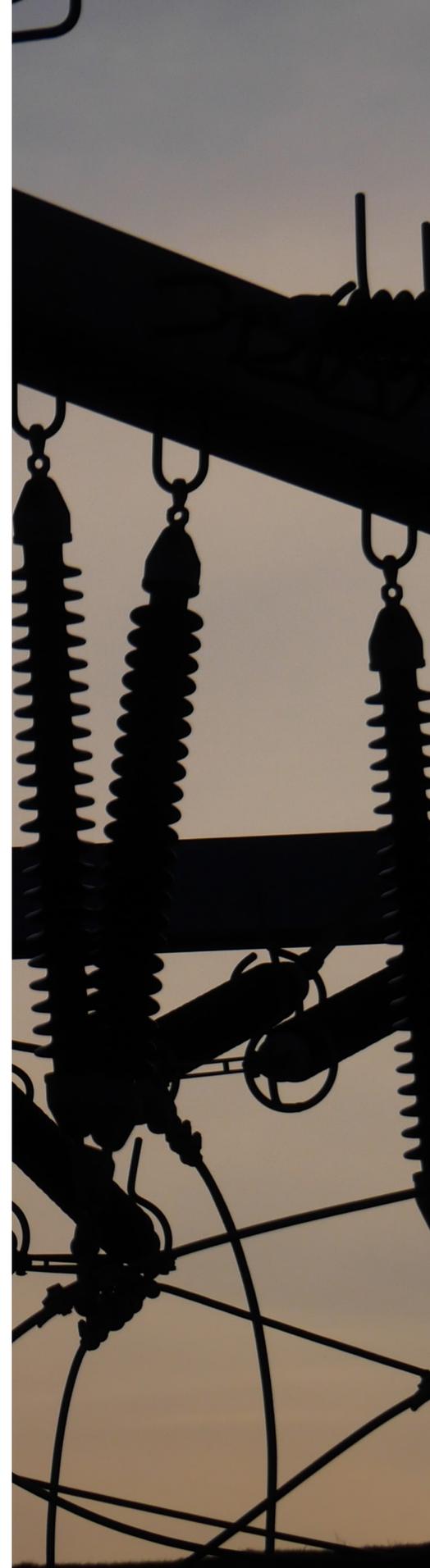
- Long term liability – this includes health and wellbeing risks which may only become evident over many years and may go on to have significant life altering and shortening impact.

Asbestosis is potentially fatal fibrosis of the lungs caused by asbestos dust exposure in industrial settings. It develops 20 to 30 years after first exposure to asbestos and affects workers exposed before the risks were fully known

- Environmental degradation – which may affect system resilience and long-term use and habitability.

In some areas of Ukraine, agricultural food products are still affected by the Chernobyl fallout and register radioactivity levels in excess of what is considered safe.

**Safetytech offers solutions and protection, keeping people safer and will protect society from the aftermath of the accidents and disasters that may also have significant consequences for the environment. The benefits of safetytech on our wellbeing, and the security it offers to our quality of life, is immense and critical to the quality of our future.**



## Trends driving growth

In addition to the clear opportunity presented by applying advanced technology, there exist several key factors which, together, will drive the growth and maturity of the safetytech market.

### The rate of decline for safety incidents has plateaued

Despite ever-accelerating advances in technology and endless ‘lessons learned’, the rate of decline in serious safety incidents across the EU and the US slowed to zero through 2012 and has remained static ever since. Industry is no longer getting safer.

Global data from the International Labour Organization (ILO), World Health Organization (WHO) and Workplace Safety and Health, indicates that nearly 7,620 people die as a result of occupational accidents or work-related diseases every day. This amounts to more than 2.8 million deaths per year that are directly attributable to inadequate safety measures and hazardous work environments.

Data from Eurostat (Figure 12) shows that while there has been a downward trend in fatalities in the European Union, the reduction in the number of safety incidents has largely been stagnant post 2012. Similarly, data from the US labour statistics department offers an equally dim view of safety improvements in the US. Between 2013 and 2017, the number of fatalities in the US increased with a CAGR of 3.3% from 3,794 in 2013 to 4,313 in 2017.

### Real-time assessment and management of operational risk is the key enabler

Safety has long suffered from an absence of real insight with most data being reactive and historical, such as incident rates and types. Much of the time, safety processes and activities operate within or slightly outside of expected parameters.

Traditional safety interventions have relied on analyses of situations that have led to incidents or previous accidents, however accidents are rare and represent less than 1% of the time that operations are performed. Monitoring normal situations presents the greatest opportunity to learn and improve but is currently not common practice. Safetytech will offer dynamic capabilities to monitor changing and developing risks and provide optimal courses of action to maintain the safety of operations.

In complex environments, risk is not static, and safeguards or barriers put in place can develop faults over time or be inactive for maintenance. Risk is often assessed and managed statically and in steady state conditions; risk studies conducted in workshops look at each mode of failure in isolation. Such approaches are rarely able to view the interconnectivity and dependencies across systems or model all the potential failure scenarios.

In addition, critical infrastructure and assets are themselves not static and evolve over time leading to multiple levels of capabilities and technology gaps that cannot be bridged with siloed applications of technologies.

A critical failure in most safety systems is the inability to monitor in real-time the effectiveness of individual control measures, and the collective protection the various barriers offer at any point in time.

Even within systems which utilise a series of barriers, systems that cannot communicate in real-time to drive actionable insights are susceptible to disaster. Modern assets and production environments are complex, tightly coupled and interlinked in nature. The failure to understand and address complex and connected safety systems has been a reoccurring feature in many high-profile accidents within the rail, aviation and petrochemical sectors.

### Most asset failures are random

Safetytech brings together technologies such as real-time data, analytics and AI to better prevent asset failures which lead to safety incidents and, previously, would have been hard or impossible to anticipate.

Organisations have largely based their asset management and safety approach on preventive time or usage-based approaches e.g. the study of usage counts such as flow meters, revolution counts or materials produced, as an indicator of an asset's condition.

However, these asset management techniques are based on indirect measures which are not monitoring the asset in real-time. A study conducted by the US Navy along with airlines in America found that time related failures only account for 11% of all failures while random failures accounted for 89% of asset failures<sup>6</sup>.

6. Allen TM (2001).US navy analysis of submarine maintenance data and the development of age and reliability profiles.

Figure 12. Safety incidents across the EU: 2008 to 2016

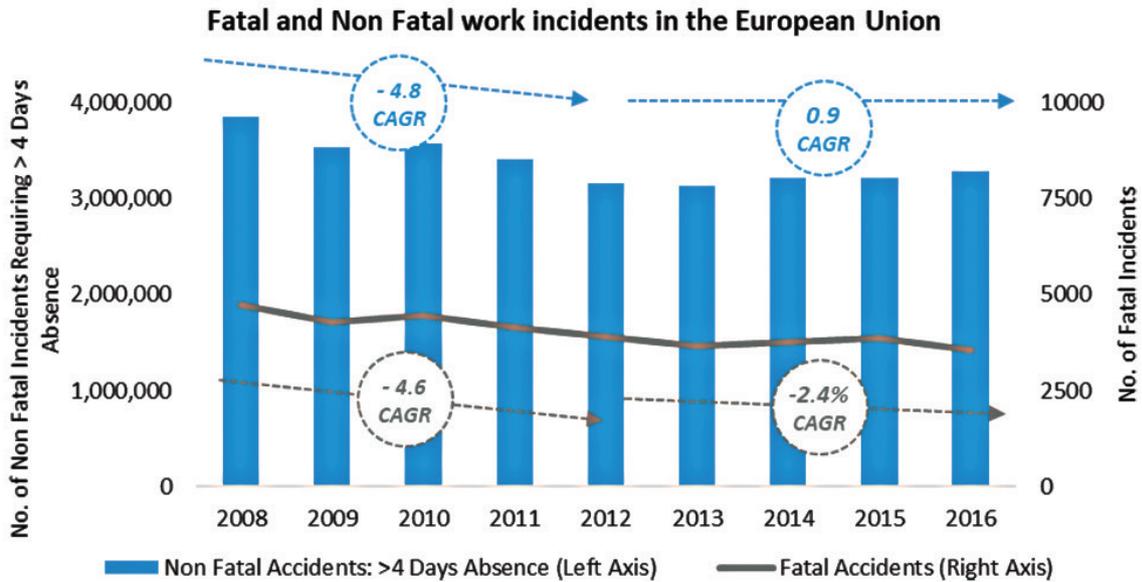
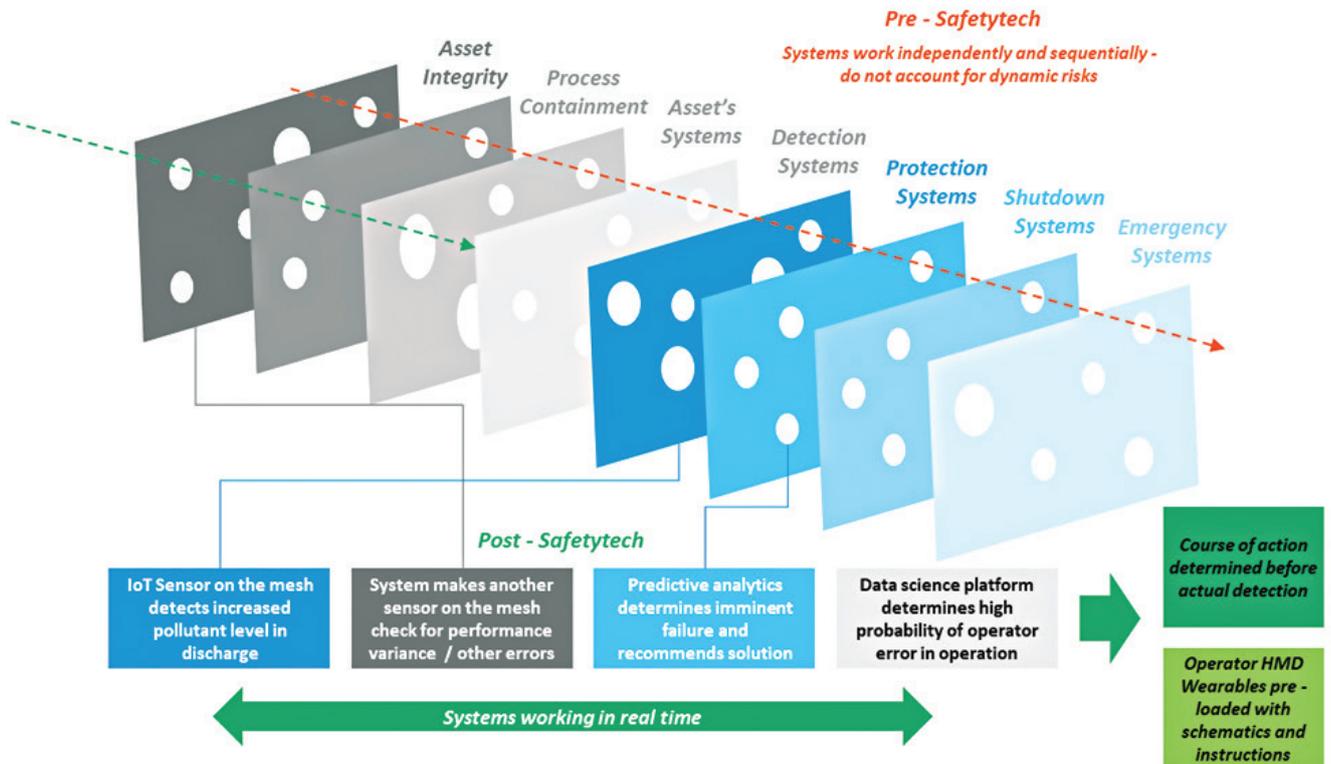


Figure 13. Barrier model with safetytech overlay

Even within systems which utilise a series of barriers, there are systems that cannot communicate in real time to drive actionable insights are susceptible to disasters



**Safety and operational effectiveness are closely interlinked**

Technology applied to a safety use case will often benefit efficiency and vice versa. Good safety is the presence of effective controls, not the absence of random accidents and safetytech will realise effective monitoring of these controls. Through safetytech, safe operations are efficient operations.

Over the course of the last few years, two perspectives have developed with respect to asset management and safety. The asset management view is that operations with effective and reliable assets are safer than those without. The safety perspective, however, sees asset management and reliability as a ‘component’ property and not a ‘system’ property like safety.

**Complexity and complex safety incidents cost double**

There is a step change in complexity of modern production and assets. It is increasingly challenging to model these complex systems. Recent research<sup>7</sup> reveals a strong positive correlation between the complexity of safety incidents and the level of associated costs that organisations must bear, with the post-event cost of complex, cascading safety incidents being double that of simple safety incidents.

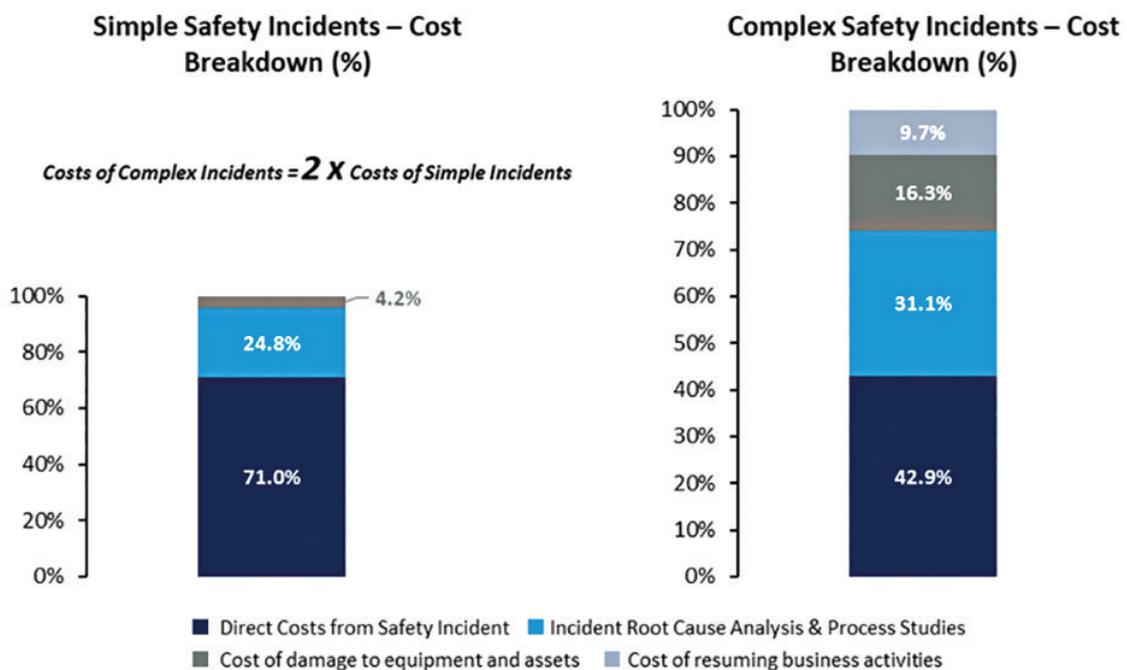
**A note on method**

The safetytech model and market forecast is based on a granular, bottom-up build of revenues associated with specific hardware and software use cases, representing end-user direct spend on safety.

This has largely been driven by the combination of two methods; use case driven sizing which is used to map the IoT and wearables markets and the spending behind application technology which has been used to map software markets such as enterprise resource planning (ERP), EHS system and APM.

In areas of technology markets where spending can have multiple rationales e.g. investment is for elements of safety along with another primary outcome such as operational efficiencies, market sizing relies on expert interviews to approximate the likely proportion of the market where safety ranks highest as an investment motivation.

**Figure 14. Complex safety incidents vs. simple safety incidents: cost comparison**



7. UK HSE data and extrapolation of Battaglia M, Frey M, Passetti E. (2014). Accidents at work and costs analysis: a field study in a large Italian company, *Industrial Health* 2014, 52, 354–366

## Conclusion

Safetytech will provide industry with deeper insight and real-time actionable intelligence to protect their infrastructure, assets and people while improving operational efficiency.

As a result of its deep impact to society, people and organisations; safetytech is likely to become established as a new market space and untapped commercial opportunity worth billions of dollars.

Safetytech is being applied to significant safety challenges as the scale of the opportunity stimulates innovative solution providers and start-ups in much the same way that large-scale and systemic challenges in banking, coupled with technology advances, established the now burgeoning financial technology (fintech) market.



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## Get in touch

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