



ANNUAL REVIEW

2024

Annual review of the bulk storage and energy
infrastructure sector



TSA is an industry based organisation whose members are engaged in bulk storage and energy infrastructure and in the provision of products and services to the sector.

THE VOICE OF THE BULK STORAGE AND ENERGY INFRASTRUCTURE SECTOR —



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A MESSAGE FROM OUR PRESIDENT

Welcome to the ninth edition of the TSA Annual Review, a valuable resource for the bulk storage and energy infrastructure sector providing a broad range of statistics and insights on terminals, process safety, occupational health and safety as well as the industry's contribution to the UK economy. This year's publication also includes a new dedicated section on global tank storage assets and introduces data on global expansions and construction projects, regional capacity and market share as well as regional throughput data. The bulk storage and energy infrastructure sector plays a vital role in providing products and services that are critical to UK consumers. Terminals and tank farms are an essential part of global infrastructure networks ensuring that bulk liquids for the energy, manufacturing, food, agriculture, and transport sectors are supplied when they are needed and in the quantities required. They also provide greater resilience within the supply chain by ensuring flexibility to meet demand, particularly in periods where domestic supplies of stored products cannot be guaranteed. And around twenty-two of the terminals operated by TSA members in the UK are designated by the Government as Critical National Infrastructure (CNI) due to their importance in providing energy to industrial, transport and defence markets. Storage capacity also includes strategic reserves held for emergencies and supply disruptions. Most recently, the 'energy trilemma' of security, affordability and sustainability has come into sharper focus owing to shifts across energy markets and in the wider geopolitical landscape. Against this backdrop, the role of a resilient, robust, and innovative bulk storage infrastructure sector in mitigating potential market shocks and supply shortages and, as we look to tomorrow, in securing supplies of future energy carriers and industrial inputs, cannot be overestimated. Today, our sector is investing, innovating, and leading the way to open up a new frontier of possibilities and take full advantage of the wealth of opportunities ahead. I hope you enjoy reading our 2024 Annual Review of the bulk storage and energy infrastructure sector, and I'd like to express my sincere thanks to the companies and individuals who have supported its production and made its publication possible.

Wilma Kelly, June 2024



WILMA KELLY

Safety, Engineering and Sustainability Director

Certas Energy



THE BOARD OF DIRECTORS

The Tank Storage Association is the voice of the bulk storage and energy infrastructure sector. We represent the interests of over 80 member companies engaged in the storage of bulk liquids and gases and in the provision of products and services to the sector. Through our work, and collective voice, we champion the UK's bulk storage and energy infrastructure sector and its role in supporting growth and prosperity.

**WILMA KELLY**

TSA President

Safety, Engineering and Sustainability Director
Certas Energy

**ARUN SRISKANDA**

TSA Vice President

Managing Director
Oikos Storage

**MARTYN LYONS**

TSA Director

Independent Director

**PETER DAVIDSON**

TSA Chief Executive

Tank Storage Association

**NUNZIA FLORIO**

TSA Communications Director

Tank Storage Association

MEMBERS

Tank Storage Association's members provide and support an essential interface between sea, road, rail and pipeline logistics for a diverse range of essential products, including transport and heating fuels, chemicals, animal feed and foodstuffs. In the process, they are responsible for the direct employment of over 6,600 highly trained, specialised people. The association also takes a leading role in safety, encouraging cross-sector cooperation and knowledge transfer via a number of fora including the COMAH Strategic Forum and the Process Safety Forum.



ASSOCIATE MEMBERS

TSA plays a leading role in several industry, regulatory and Government forums and works to ensure that members' interests are at the top of the agenda. We tackle a wide range of issues relevant to the bulk storage and energy infrastructure and our committees are critical mechanisms for highlighting the most pressing matters facing businesses in our sector. Our Associate Members play an essential role in Technical, Safety, Energy, Skills, Health and Environmental matters and work with the association on a variety of sector specific issues.




ASSOCIATE MEMBERS (SUPPLIERS)

The Tank Storage Association is the voice of the bulk storage and energy infrastructure sector to Government, Parliament, Regulatory Agencies and in the media. We provide a wide range of support and services for our membership, including technical guidance and standards, insights, comprehensive monitoring, weekly updates and a quarterly digital magazine. Our Associate Members (Suppliers) make a valued contribution to our Technical, Safety, Energy, Skills, Health and Environmental work by sharing learnings, experience, new products, innovation and services and by contributing to the development of new guidance where appropriate.



Our aim is to build a strong community of businesses engaged in bulk storage and energy infrastructure and those providing equipment and services to the sector.



Through our work and collective voice, we champion the needs of our members in safety, health, environmental, skills and technical matters. TSA facilitates dialogue in key policy-making forums producing solutions on issues of interest to the sector.

TSA is a founding member of several industry safety groups, including the COMAH Strategic Forum which helps to set the UK's regulatory strategy. It also adheres to an ESG Charter affirming the sector's shared commitment to environmental, social and governance principles.

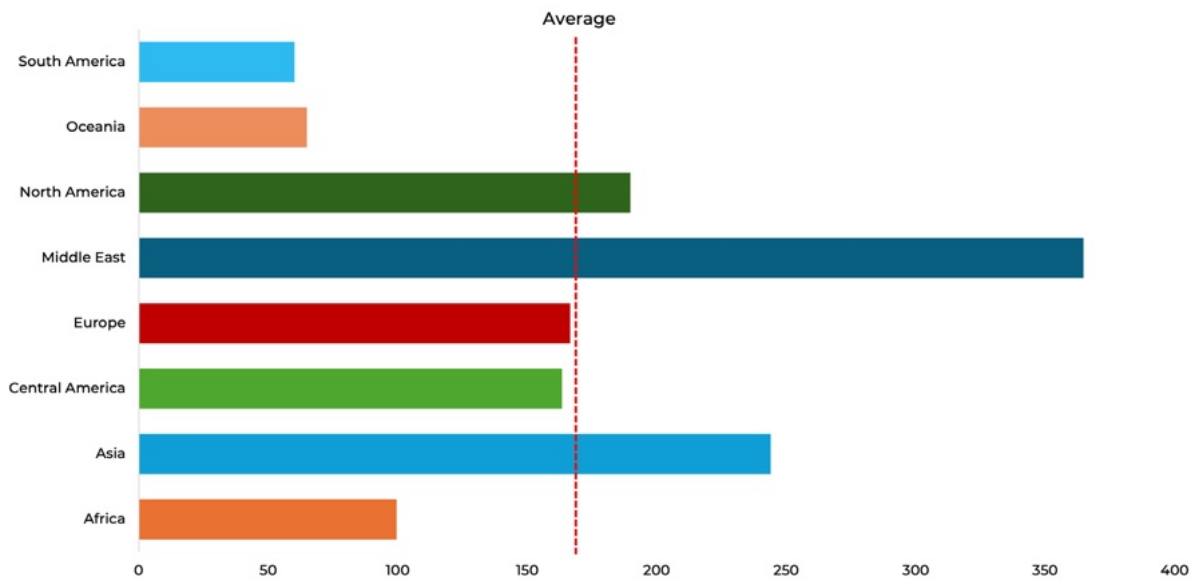
WE SHAPE PRIORITIES AND CONNECT INDUSTRY

TSA is tailored to serve its membership so that member organisations can have direct input on the issues most important to them. TSA's membership enables effective and dynamic industry-wide interaction, driving valuable connections across the sector in the UK and abroad.

GLOBAL TANK STORAGE ASSETS

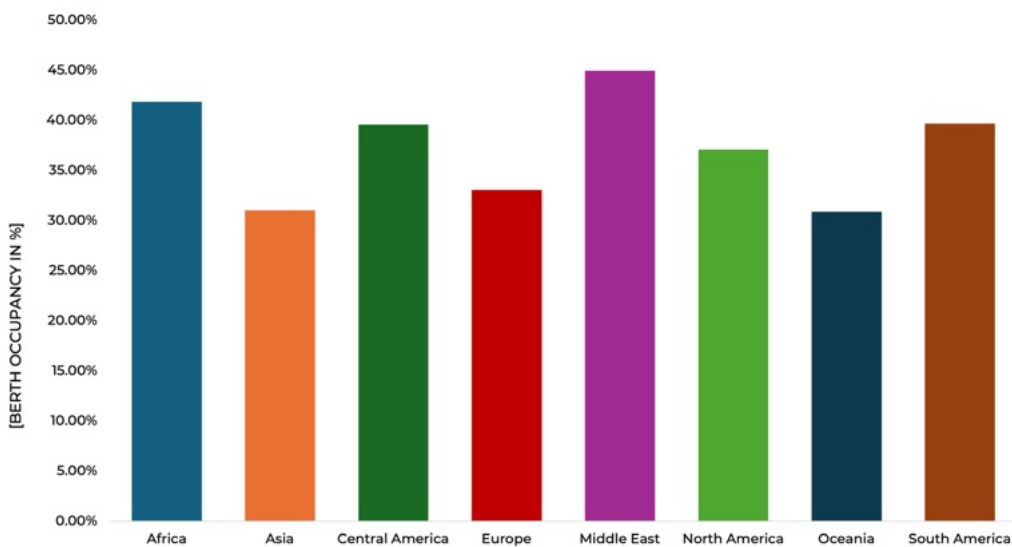
Tank storage infrastructure is an integral part of a complex web of global activities and supply chains. Terminals may either store single products or multiple products within a single facility and can provide supplementary services such as blending, heating, product treatment and analysis, warehousing, as well as bonded facilities for duty suspended products. Terminal operations are present throughout the world with storage hubs having become established in Europe, the United States, Middle East and Asia.

AVERAGE CAPACITY PER TERMINAL (kcbm)



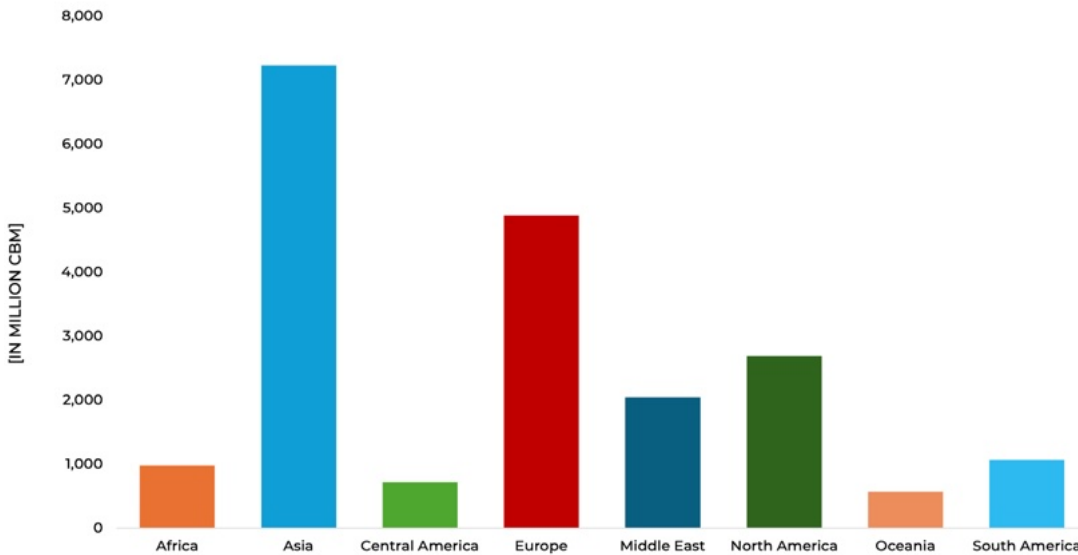
The Middle East holds the most capacity per terminal, far above the average capacity of 169 kcbm. In the Middle East, the average capacity is ~365 kcbm. Asia ranks second with 244 kcbm and North America ranks third with ~190 kcbm. The average capacity per terminal in Europe is ~167 kcbm.

AVERAGE BERTH OCCUPANCY (annualised)



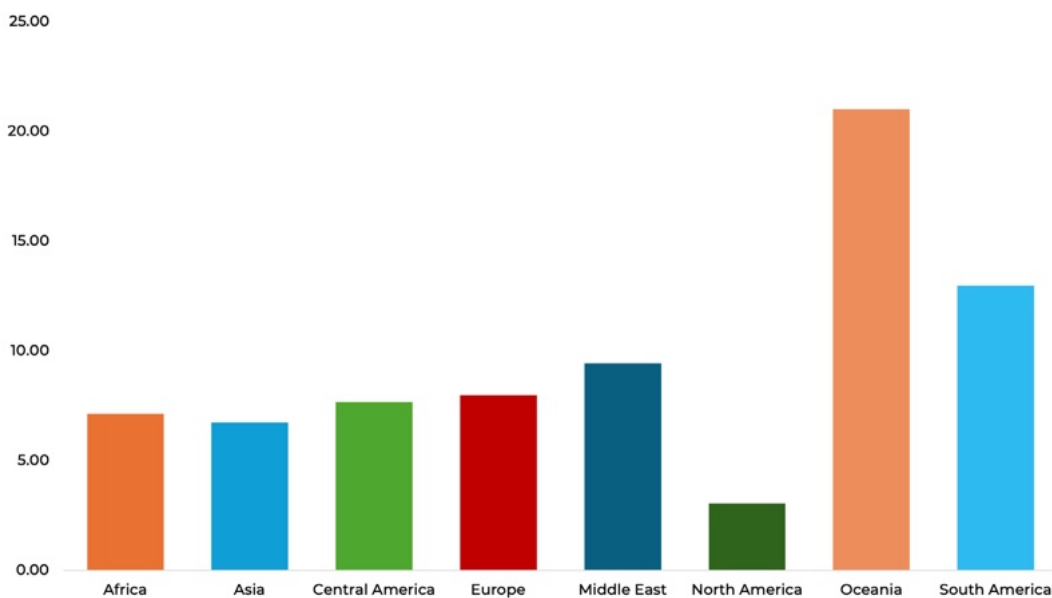
Berth occupancy relates to the time that berths are occupied by a vessel to either offload or load cargo.

THROUGHPUT 2022-2023 (in million cbm)



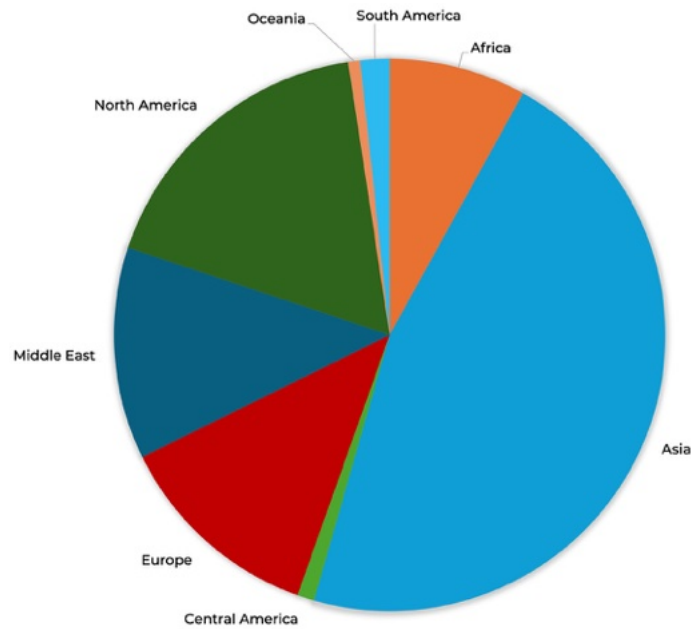
Throughput is the sum of the flow to and from a terminal. In the North American region, a lot of push boat-tug combinations are used. This is not incorporated in these logistical performance calculations as it is not possible to estimate the number of push barges that are used in such combinations. This has a notable effect on throughput levels and tank turns (see below).

TANK TURNS (annualised)



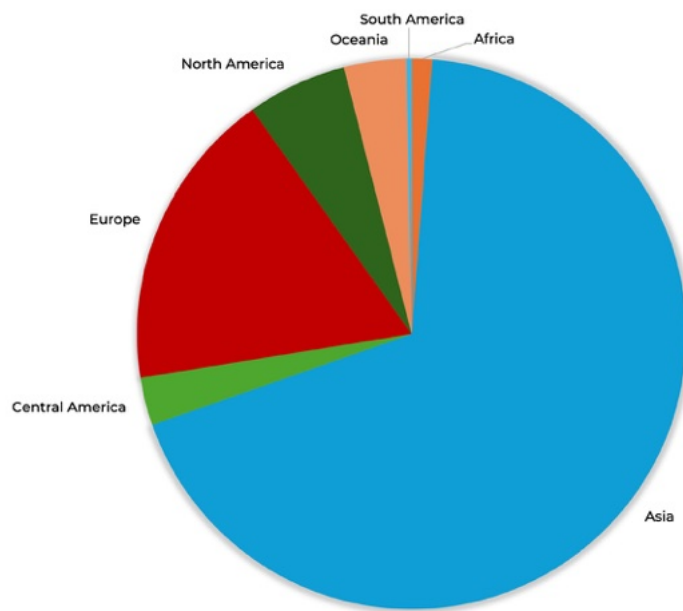
Tank turns are the number of times a tank is filled and subsequently emptied. For example, twelve tank turns per year are considered to be a large number of turns. Oceania has fewer terminals than other regions and it will therefore show more tank turns to make up for the region's lack of capacity compared to other regions.

TERMINALS PLANNED (cbm)



A number of projects have been announced with most storage investment planned located in Asia (20,852 kcbm or 46% of the total), followed by North America (7,856 kcbm or 17% of the total), the Middle East (5,576 kcbm or 12% of the total) and Europe (5,523 kcbm or 12% of the total).

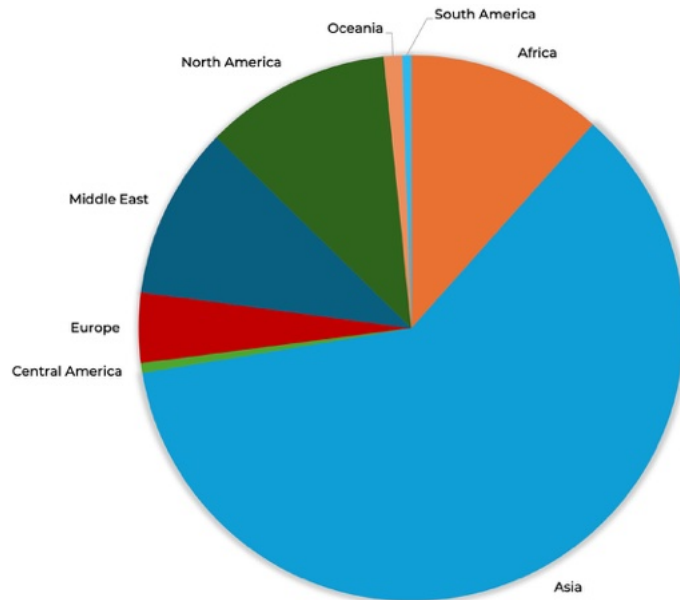
TERMINALS UNDER CONSTRUCTION (cbm)



Most tank storage capacity is being constructed in Asia with 68% of the total (~10,589 kcbm), followed by Europe with 18% of the total (~2,739 kcbm) and North America with 6% of the total (~909 kcbm). Other regions, such as South and Central America, Africa and Oceania have less capacity under construction, ranging between 0% and 4%.

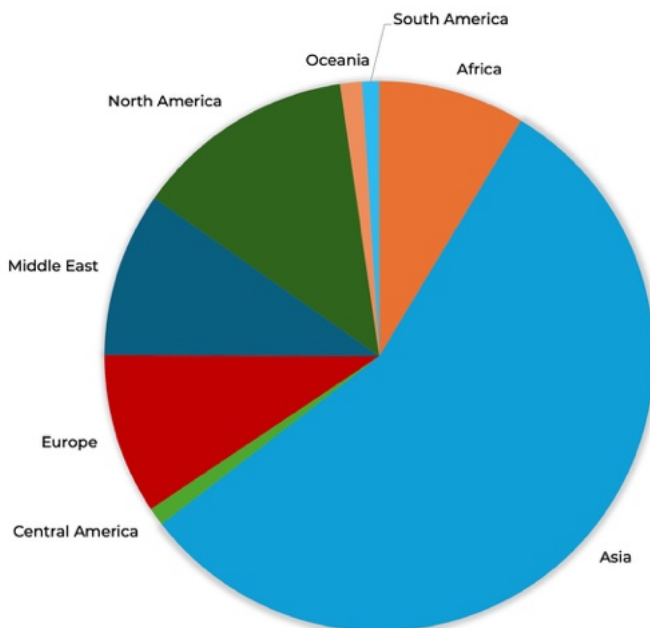


TERMINALS UNDER EXPANSION (cbm)



Globally, there are 120 terminal expansion projects being realised with most tank storage expansions taking place in Asia with 61% of the total (29,179 kcbm) followed by Africa with 12% of the total (5,560 kcbm), North America with 11% of the total (5,299 kcbm) and the Middle East with 10% of the total (4,910 kcbm). Expansions in other regions range from 1% to 4% of the total in Europe.

TOTAL ADDITIONS



Adding up all capacity projects under construction, under expansion or planned, the main growth area is Asia, more than doubling its storage capacity. Globally, some 108 Mcbm will be added.

THE BULK STORAGE AND ENERGY INFRASTRUCTURE SECTOR IN THE UK

The bulk storage and energy infrastructure sector plays a vital role in providing products and services that are critical to UK consumers. Tank Storage Association members provide and support an essential interface between sea, road, rail and pipeline logistics for many different substances including transport and heating fuels, chemicals, animal feed and foodstuffs. A large number of terminal operators are third-party providers which means they do not own the products they handle, but provide logistical services on behalf of their customers.

TSA MEMBERS AND ASSOCIATE MEMBERS

REVENUE IN 2023

£23.3bn

PLANNED INVESTMENT IN THE NEXT 5 YEARS

£1.5bn

EMPLOYEES AND LONG-TERM CONTRACTORS

6,603

TSA ASSOCIATE MEMBERS (SUPPLIERS)

REVENUE IN 2023

£745m

PLANNED INVESTMENT IN THE NEXT 5 YEARS

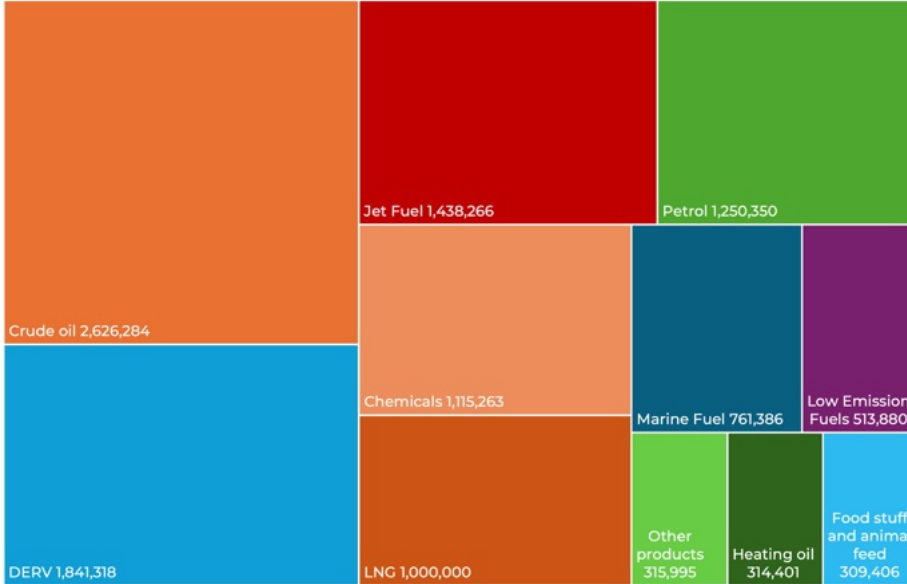
£116m

EMPLOYEES AND LONG-TERM CONTRACTORS

4,757

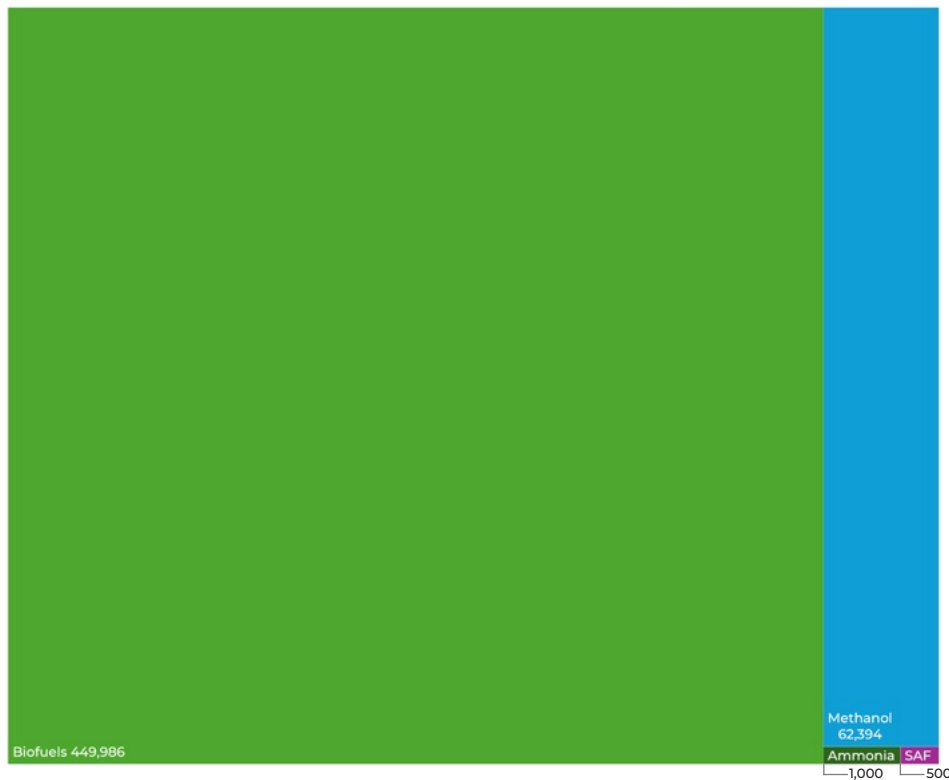
TERMINAL STATISTICS

STORAGE CAPACITY (cbm)



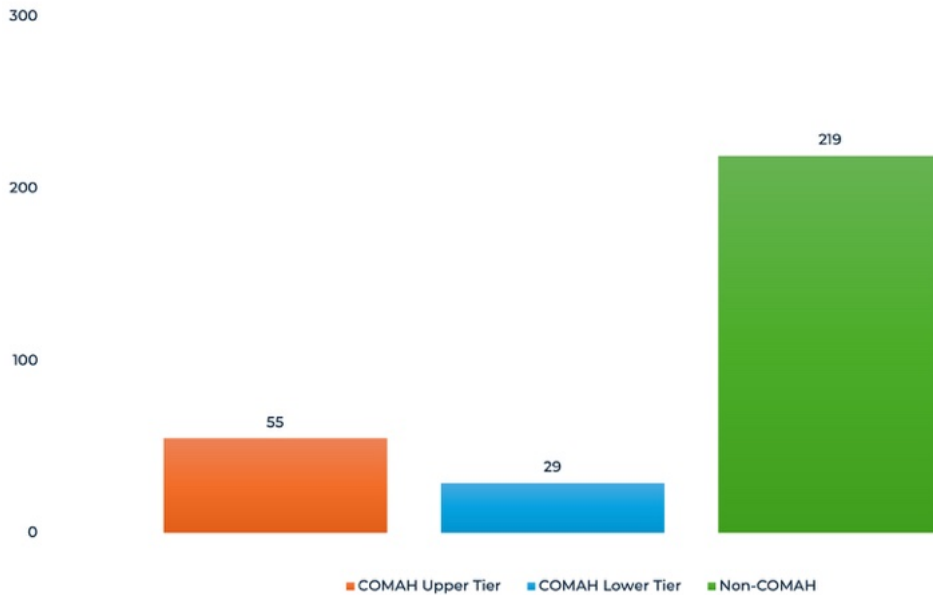
TSA members operate a wide variety of terminals across the UK and store many different substances including transport and heating fuels, low emission fuels (as seen in the breakdown below), chemicals, LNG, animal feed and foodstuffs. Collectively, TSA members have around 11.5 million cubic metres of storage capacity.

STORAGE CAPACITY (cbm) - LOW EMISSION FUELS



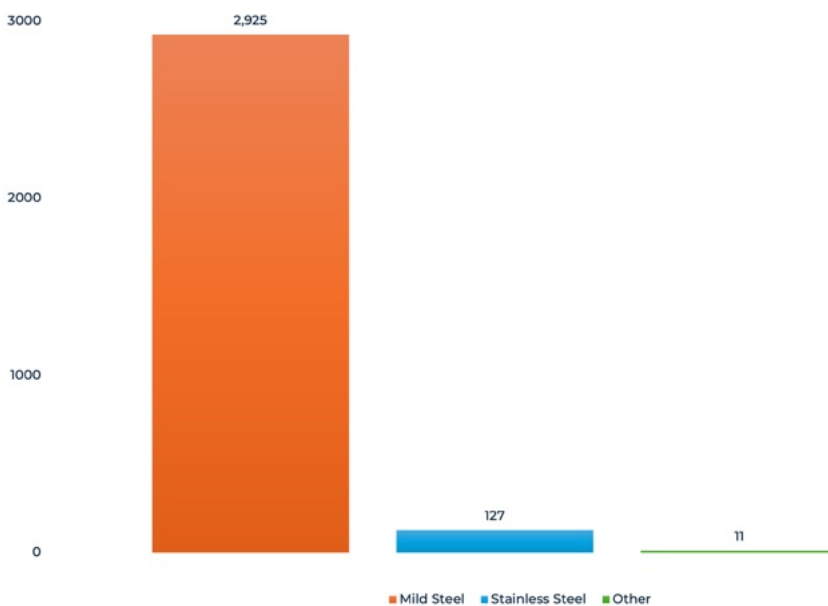
Well over 500,000 cubic metres of storage capacity is used for low emissions fuels including biofuels, methanol, ammonia and sustainable aviation fuels (SAF).

NUMBER OF TERMINALS



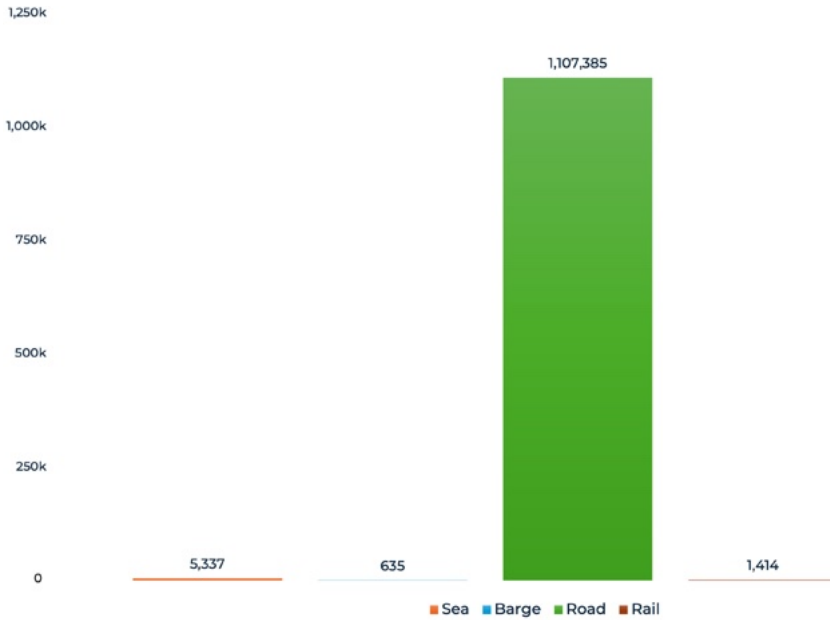
TSA members operate 302 terminals and distribution hubs in the UK. A COMAH site is defined as a business which stores above a certain volume of named substances on site. 55 terminals operated by TSA members are Upper Tier COMAH sites and 29 are Lower Tier COMAH sites. Around 22 of the terminals operated by TSA members are also designated by the Government as Critical National Infrastructure (CNI) due to their importance in providing energy to industrial, transport and defence markets.

NUMBER OF STORAGE TANKS



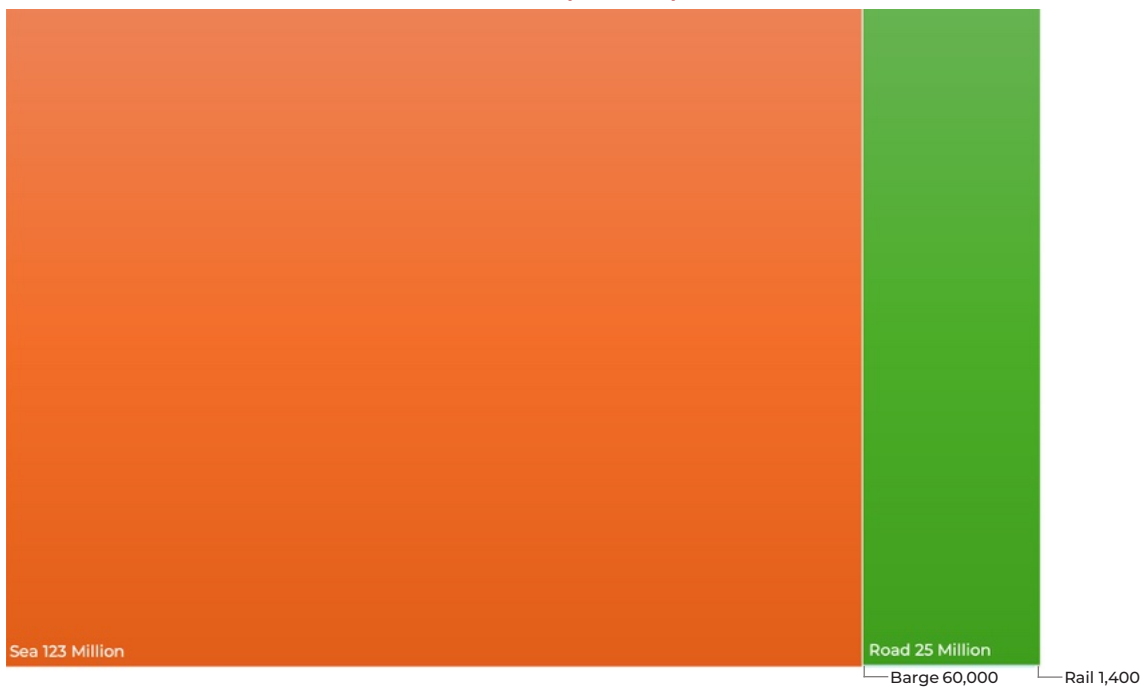
Terminals consist of a number of individual storage tanks. Storage tanks can be made of different materials, most commonly steel. Collectively, terminals operated by TSA members have over 3,000 storage tanks.

NUMBER OF MOVEMENTS



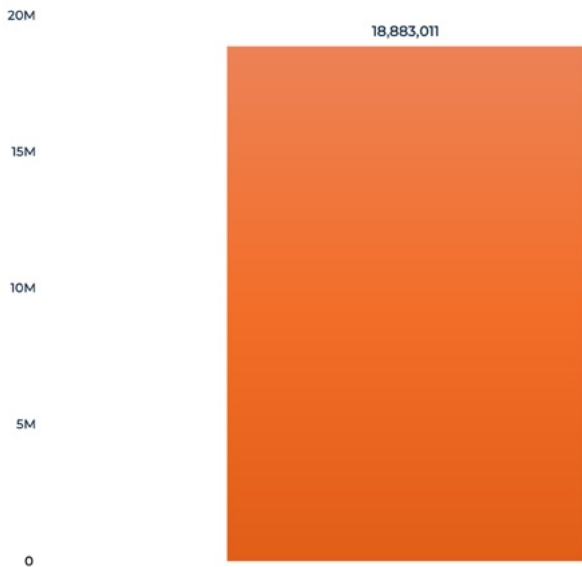
Movement of product into or out of terminals can be by seagoing vessel, inland barge, road tanker, rail tanker or pipeline. TSA members safely execute over one million movements each year. By far the greatest number of movements is carried out by road tanker. However, this is not representative of the volume of product moved by type. For example, there are far fewer movements by ship than road tanker, but the volume of product moved by ship is much higher.

VOLUME OF PRODUCT MOVED BY TYPE (tonnes)



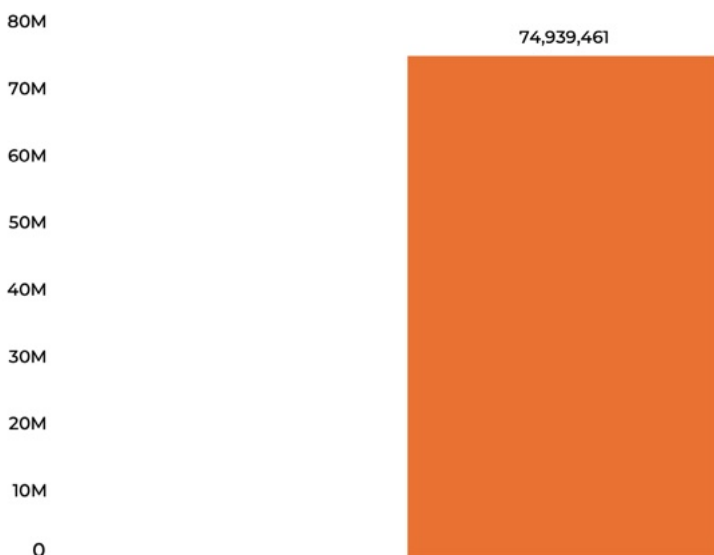
In 2023, around 123 million tonnes of product were moved by coastal shipping and around 25 million tonnes by road haulage. Around 60,000 tonnes of product were moved by barge and around 1,400 tonnes by rail.

PIPELINE THROUGHPUT (cbm)



Terminals also move product via pipeline and throughput is measured in cubic metres. A number of TSA members own and operate pipeline networks across the UK. Pipeline throughput reported by TSA member companies in 2023 was just under 19 million cubic metres (this figure excludes regasified LNG).

AGGREGATED THROUGHPUT (tonnes)

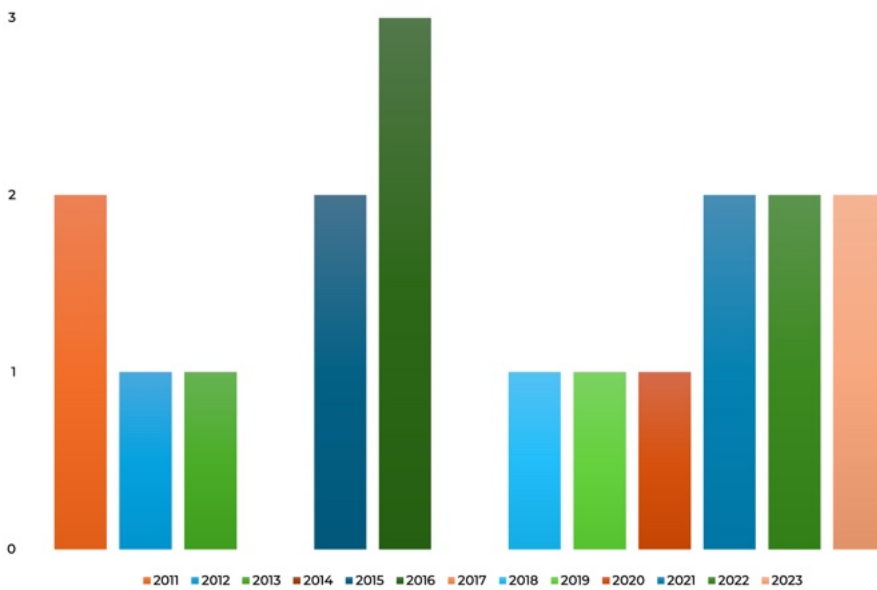


Throughput is the sum of the flow to and from a terminal. 2023 saw an aggregated throughput of just under 75 million tonnes.

PROCESS SAFETY

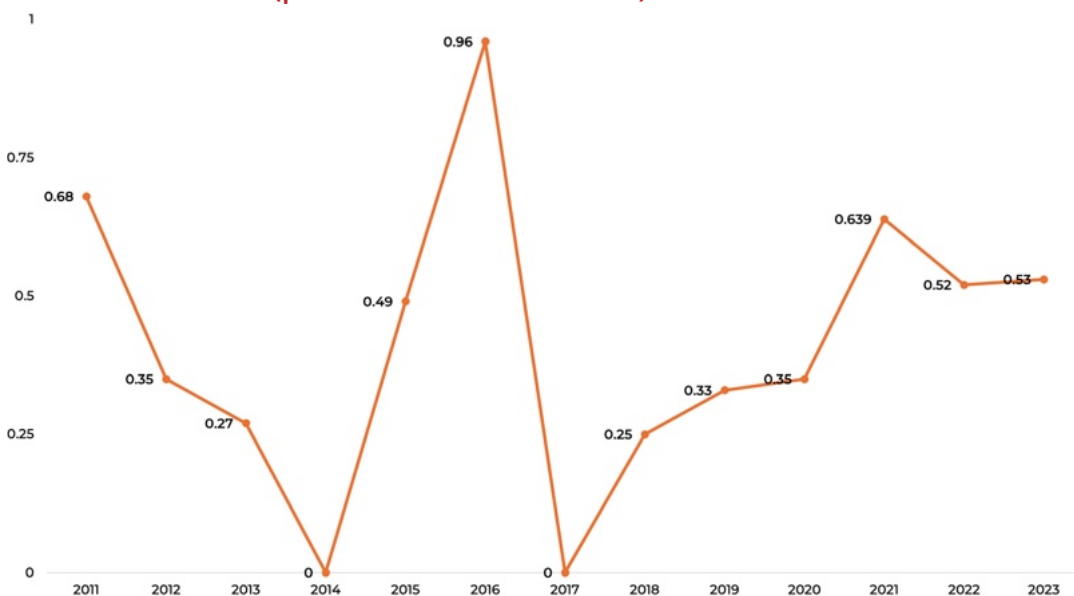
TSA members are fully committed to the Process Safety Leadership Group Principles of Process Safety. Our dedicated Safety, Health and Environment committee works closely with our peers, other industry sectors and regulators to share knowledge and good practice relevant to safe operations. To monitor our performance and highlight potential emerging issues, we collate, share and discuss process safety data quarterly with our members. We use the API RP 754 standard for our process safety performance indicators as well as our own leading indicators.

NUMBER OF TIER 1 EVENTS



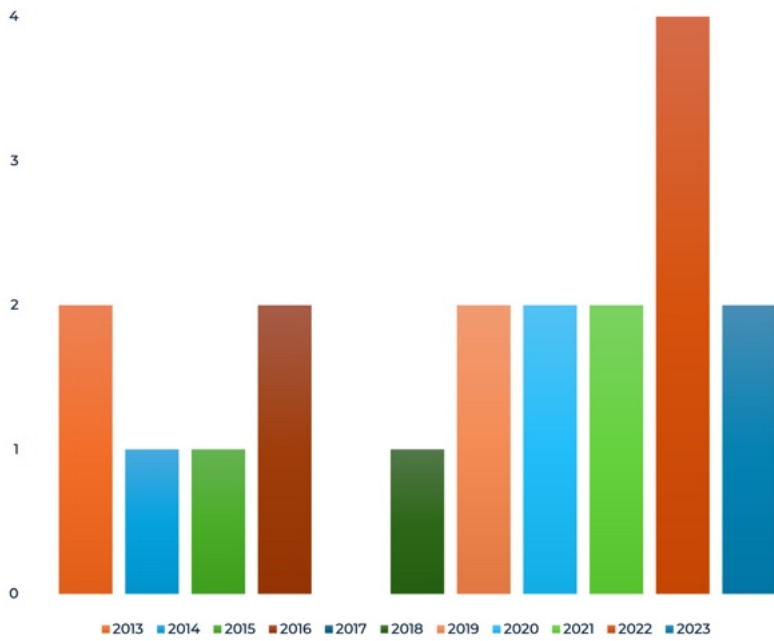
Tier 1 events are significant losses of containment (relevant to the hazard of the product stored). The number of Tier 1 events experienced by our members are very small, with two reported in 2023. The work that the TSA does with the UK regulator helps to ensure that we operate safely.

TIER 1 EVENT RATE (per million hours worked)



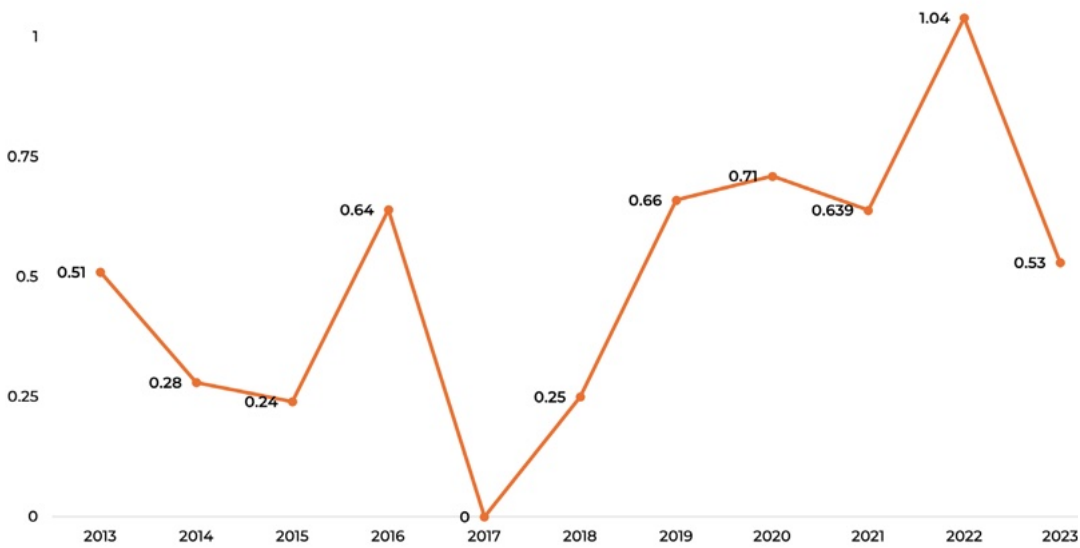
The event rate is calculated as the number of Tier 1 events divided by the total number of hours worked (including contractor hours) expressed per million hours worked.

NUMBER OF TIER 2 EVENTS



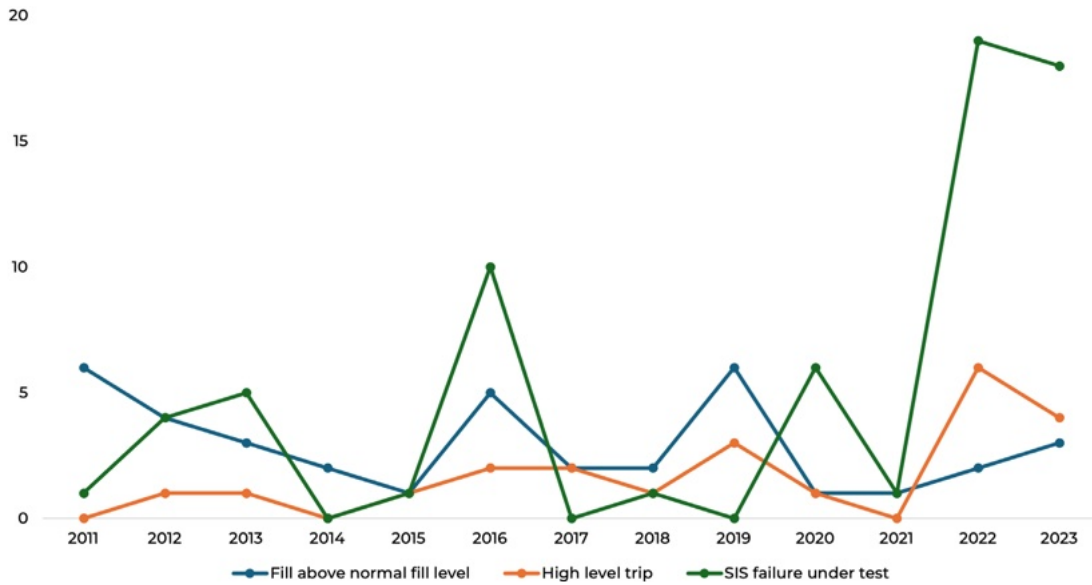
Tier 2 events are smaller losses of containment (relevant to the hazard of the product stored). Only two Tier 2 events were reported in 2023.

TIER 2 EVENT RATE (per million hours worked)



The event rate is calculated as the number of Tier 2 events divided by the total number of hours worked (including contractor hours) expressed per million hours worked.

TIER 3 LEADING INDICATORS



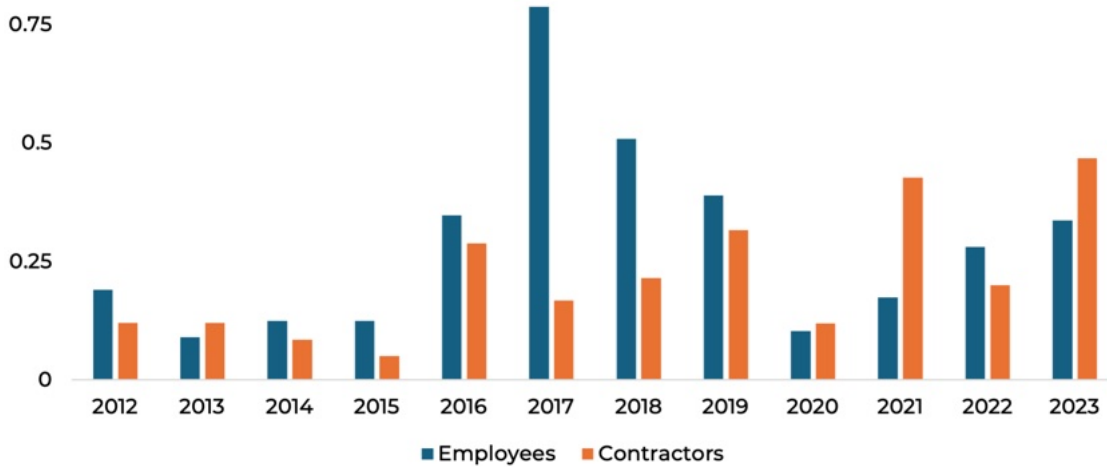
Tier 3 indicators (leading indicators) can be extremely useful in identifying areas of weakness before a more significant Tier 1 or Tier 2 event takes place. The TSA uses this information to determine if any further work is required in improving good practice or knowledge and skills. Throughout 2023, the TSA has shared safety messages regarding Tier 3 leading indicators in its quarterly statistics report to members. The TSA is also leading and contributing to several technical working groups in the Chemical and Downstream Oil Industries Forum (CDOIF) and the Energy Institute (EI) which are producing guidance to assist in the design, management, risk assessment and maintenance of process facilities.

OCCUPATIONAL HEALTH & SAFETY

Our members inform the UK regulator in accordance with the requirements of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). The TSA collates and shares this information with its membership on a quarterly basis.

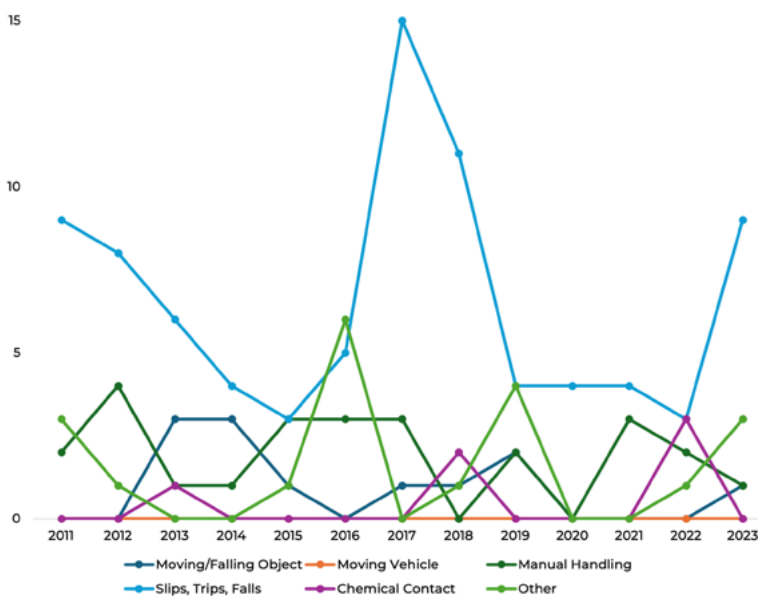
RIDDOR LTI RATE (per 100,000 hours worked)

1

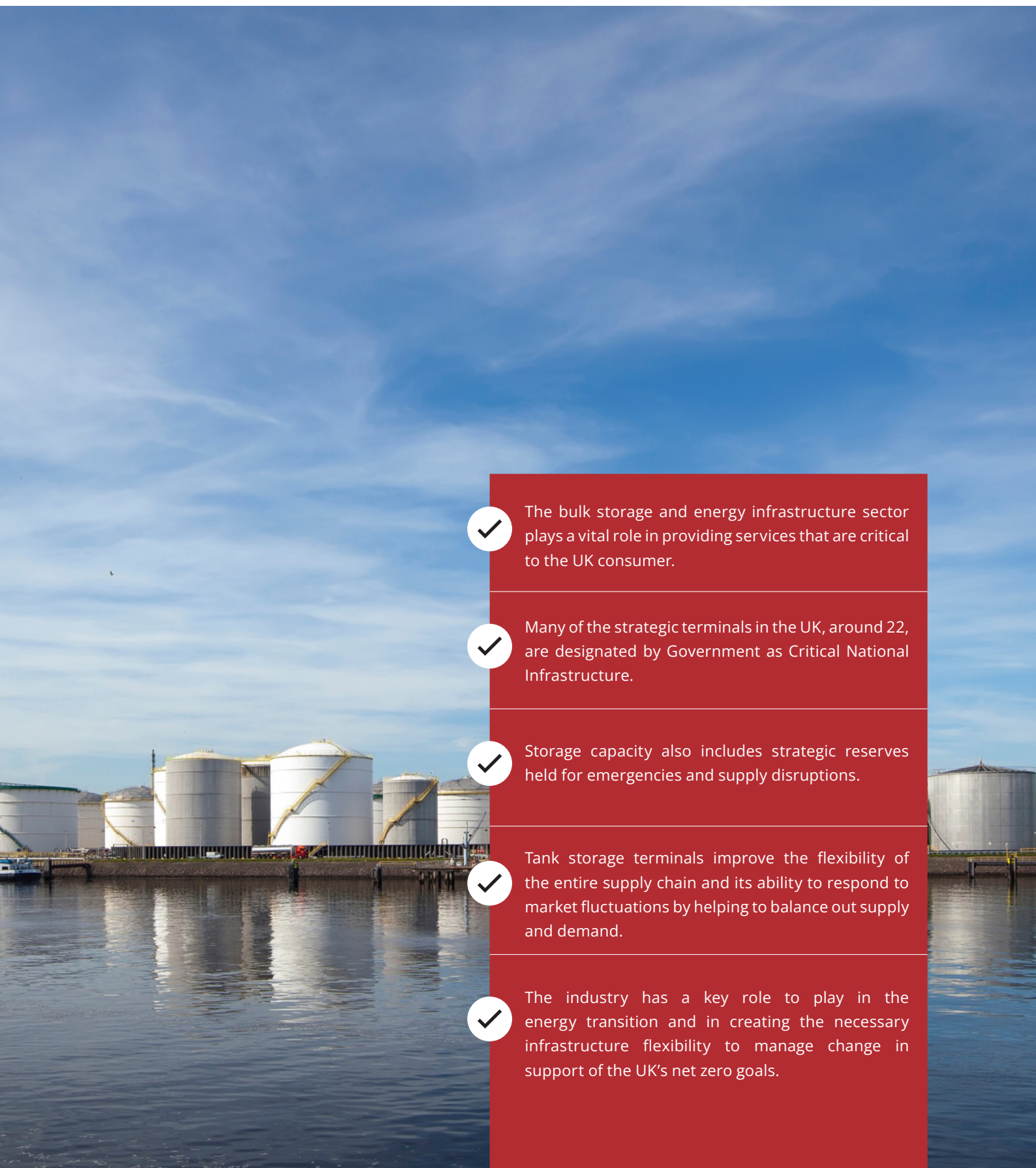


Lost Time Injuries (LTI) are those where an employee or contractor has been away from work due to a workplace injury for more than seven days. This is normalised per 100,000 hours worked to give an LTI Rate.

LTA CAUSE ANALYSIS



Lost Time Accident (LTA) causes examine the nature of Lost Time Injuries.



The bulk storage and energy infrastructure sector plays a vital role in providing services that are critical to the UK consumer.



Many of the strategic terminals in the UK, around 22, are designated by Government as Critical National Infrastructure.



Storage capacity also includes strategic reserves held for emergencies and supply disruptions.



Tank storage terminals improve the flexibility of the entire supply chain and its ability to respond to market fluctuations by helping to balance out supply and demand.



The industry has a key role to play in the energy transition and in creating the necessary infrastructure flexibility to manage change in support of the UK's net zero goals.



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