


Scientific and Technical Advisory Committee
2024 Review of the Technical and Innovation programme



Technical
Innovation



**Creating a better
energy future
Collaborating to
accelerate the
transition to net zero**

The background image shows two women wearing hard hats (one red, one yellow) in an industrial setting, looking at a large yellow folder or set of plans. The woman in the yellow hat is pointing upwards. On the left side of the image, there is a white geometric pattern of interconnected hexagons and lines.

Contents

Key work areas ›

Introduction > **By Nick Wayth**

The Energy Institute and where we fit

The energy transition is the biggest challenge of our time, and the Energy Institute's Technical and Innovation programme is at the forefront of driving tangible change to tackle this monumental task.

As we face an increasingly complex global energy landscape, the need for collaboration, innovation, and shared expertise has never been more critical. Our Technical and Innovation programme is designed to enable industry leaders and practitioners to not only respond to this challenge, but to lead it. Through a robust blend of technical insight and industry-driven collaboration, the Energy Institute is providing the tools, resources, and partnerships essential for this transformation.

2024 was another stand-out year for our Technical and Innovation programme – steered carefully and thoughtfully by the EI's Scientific and Technical Advisory Committee (STAC). This Review highlights the sheer breadth of work ongoing across the industry as the Energy Institute stewards wide-ranging industry guidance – all helping ensure the highest standards of HSE, sustainability, and operational efficiency.

At its core, our technical work programme is designed to generate tangible, value-adding returns for our industry partners. Our members are not just participants but influential contributors to the future of the global energy sector – their expertise and experience have a direct voice in shaping the course of the industry.

Dr Nick Wayth CEng FEI FIMechE
Chief Executive, Energy Institute



“As we face an increasingly complex global energy landscape, the need for collaboration, innovation, and shared expertise has never been more critical.”

A year of collaboration delivering support for the energy transition

I am delighted to welcome you to the 2024 annual review of the Energy Institute's Technical and Innovation programme. As the Chair of the Scientific and Technical Advisory Committee (STAC), the driving force behind the EI's technical and innovation work, it is my privilege to work in collaboration with members of the EI, regulators and wider stakeholders, and to lead the development and delivery of technical resources which are used globally across our industry.

The year has been remarkable in a number of ways: through the continued development of much needed and pragmatic guidance that is helping our industry address the transition to net zero; through collaboration, across member companies, regulators, wider stakeholders and industry sectors; and through continued development, sharing and dissemination of knowledge that underpins a license to operate across technologies both new and old.

I would like to thank all of those who have contributed to this truly collaborative endeavour. Through this collaboration we can be confident that technical resources delivered through the EI really are devised by industry, for the industry, and can pivot to support the challenges we face as we transition to a lower carbon world.

This last year has also seen great progress made on how we tell our story, and disseminate our work across the globe. Over 22,000 downloads of EI guidelines, and 130,000 separate users of our Learning from Incidents app, *Toolbox*, is testament to that. I'm delighted also to see how our technical committees continue to evolve: responding to the transition across all our content areas; diversifying their membership; and engaging younger professionals in a meaningful way. The benefits can be seen and felt by all.



“It is my privilege to work in collaboration with members of the EI, regulators and wider stakeholders, and to lead the development and delivery of technical resources which are used globally across our industry.”

I encourage all to read this review, to use the guidelines delivered through the STAC programme, and if not already engaged, to join us in our efforts to make industry more efficient, safer, and more sustainable.

**Lisa Rebora FEI, STAC Chair,
Head of Global Lithium, Equinor**

Our Technical Partners and Technical Company Members



Get involved

Join us

Membership can be tailored so that it is right for you and your organisation. There are two tiers of membership:

Membership packages

	Technical Partner	Technical Company Member
Govern our T+I work programme by participating in our Scientific and Technical Advisory Committee	Yes	No
Participate in specific development projects undertaken by committees on a collaborative basis	Yes	Selected work areas only
Free access to 750+ EI standards and good practice resources	Yes	Selected work areas only
Access to our professional membership services for your staff	Yes	Yes
Discounts on our training courses and events	Yes	Yes
Access to EI New Energy World digital magazine	Yes	Yes
Enable all your staff worldwide to engage as Associate Members and use AMEI post-nominal designation	Yes	Yes
Price per year	From £50,000	From £10,000 to £25,000 depending on topic area

Get involved

Be part of something amazing

The achievements highlighted in this report show the benefit of collaboration between our technical partners, regulators, trade bodies, academia and wider stakeholders. The opportunity to work with others, sharing intellectual resource and learning from the wider experiences of peers, is a powerful driver for membership of the Energy Institute. Nothing in this report would be possible without the support of our technical members, project sponsors and committee volunteers. On behalf of my colleagues at the EI, I would like to thank all for their support and commitment throughout 2024. For those of you in organisations that are not currently technical partners of the EI (page 5), with experience to offer across any of the topics included in this report, please do get in touch to discuss the benefits of engagement with the EI.



“The opportunity to work with others, sharing intellectual resource and learning from the wider experiences of peers, is a powerful driver for membership of the Energy Institute.”

To find out more and be involved, contact

Martin Maeso, Technical and Innovation Director

mmaeso@energyinst.org or technicalmember@energyinst.org



The year in numbers

150 

stakeholder organisations
collaborating with our
members

619 

technical committee
meetings held in the year
(520 online)

1,900 

technical specialists
inputting to our work

72 

technical resources
published

130,000

separate users of
Toolbox safety app
across 180 countries 

22,000 

publications
downloaded worldwide

1,700 

attendees at 40 EI-hosted
technical events

100 

presentations on EI
technical content at
stakeholder events

Our members in their own words



You Can Go So Much Faster

How does membership accelerate transition?

Lisa Rebora
FEI

Head of Global
Lithium, Equinor
STAC Chairperson,
EI Council member

We've created a series of short videos where our members share their thoughts on the value of membership. Click the link or scan the code below to watch and discover what it means to be part of a growing energy community.

 [watch now >](#)



2024 spotlight

Our work in 2024
can be framed
by three broad
themes:



2024 spotlight › Supporting industry

Continuing to support industry in the transition to net zero

Over 80% of project funding received from our members was focussed on developing guidance on transition technologies and on the production, handling and distribution of low carbon fuels.

We are delivering to help our industry address the transition to net zero by:

Understanding stakeholder needs in the hydrogen economy ›

Finding solutions to key technical challenges to facilitate the uptake of hydrogen technologies ›

Facilitating CCUS deployment globally ›

Informing risk management for CCUS operations ›

Supporting the safe uptake of sustainable aviation fuels ›

Supporting the safe uptake of green hydrogen ›

2024 spotlight > Facilitating collaboration

Facilitating collaboration in the pursuit of common goals

By facilitating collaboration between members, regulators and other stakeholders, we help to address common challenges to underpin safe, efficient and sustainable operations.

Supporting global initiatives to reduce emissions of methane by:

Collaborating with Methane Guiding Principles signatories.

Hosting 350 participants to showcase how working with others can identify and address methane emission reduction opportunities.

With OGCI, IOGP, and IPIECA, expanding recommended practices for detection, quantification and combustion efficiency.

[EI 3571 Recommended practices for CH4 emissions detection and quantification >](#)

Sharing learning through our Toolbox app:

Working with EPSC, IOGP, IChemE, Energy Safety Canada, and Safer Together Australia to reduce work-related injuries and ill health.

Partnering to enhance safety standards and broaden their reach.

Sharing key safety information with 130,000 different users in 2024.

Wider engagement on hydrogen:

Sense checking and building confidence in the EI Technical and Innovation programme.

Engaging with over 60 specialists from 50 organisations to define and calibrate the future direction for our work.

2024 spotlight › Underpinning global industry operations

Underpinning global industry operations and the industry's license to operate

We issued over 70 technical resources, setting the standards for safe, efficient and sustainable operations globally, for the benefit of all.

IE resources continue to underpin the industry's license to operate with key publications in 2024 including:

IE 3015 Model code of safe practice Part 15: Area classification for installations handling flammable fluids, fifth edition, with associated training. ›

IE 3076 Design, construction, modification, maintenance and decommissioning of filling stations, fifth edition including updated guidance on electric vehicle charging. ›

HM 50 Guidelines for cleaning of tanks and lines for marine tank vessels carrying petroleum and refined products, sixth edition. ›

IE 3577 Mental health framework, a practical tool to assist organisations establishing, maintaining and improving employee mental health programmes. ›

IE 3548 Human factors standards for facility design: Early design quick reference guide ›

IP Standard Test Methods for analysis and testing of petroleum and related products, and British Standard Parts. 2024 (3 books) underpinning product quality assurance including for new and low carbon fuels. ›

The value of membership

With over 100 years of industry knowledge we support innovation and drive operational excellence.

Our work areas

A year in review: our work areas



Our work areas ▶ **Ageing and life extension**

Asset integrity and ageing and life extension

Championing asset integrity and age and life extension across all technologies.



Championing asset integrity and age and life extension across all technologies

Key highlights:

- Provided a global focal point to develop and maintain a portfolio of key asset integrity and ageing and life extension publications, accommodating emerging and low carbon technologies.
- Developed guidance on corrosion management for late life (through to decommissioning) assets.
- Drafted guidance on corrosion management and wider integrity for assets handling hydrogen.
- Updated guidelines for the management of microbiologically influenced corrosion in oil and gas production to a second edition.
- Updated guidelines for caisson life cycle integrity management to a second edition.

Forward programme

Our focus in 2025 will include:

- Developing guidance on integrity assessment practices for composite piping.
- Developing guidance for extreme environmental loading of floating offshore structures.
- Developing guidance on governance of data and data discipline, to enable use of artificial intelligence in a secure environment.
- Developing guidance on corrosion management and asset integrity for CCUS operations.
- Developing guidance on supporting deferral decision-making in relation to asset integrity management
- Completing and publishing guidance on asset integrity for wind turbines.



Published in 2024

[EI 3551 Guidance on ALE for offshore structures supporting wind turbines ›](#)

[EI 3552 Guidelines for integrity management of the splash zone in offshore environments ›](#)

Our work areas ► **Aviation fuel handling**

Aviation fuel handling

Working with global aviation fuel handling and quality specialists to develop and maintain EI resources that underpin the safe and efficient handling of aviation fuels worldwide.



Managing aviation fuel – safety, efficiency and quality – from refineries to aircraft worldwide

Key highlights:

- Provided the global focal point for fuel quality/handling queries on ‘sustainable aviation fuel’ and completed a second edition of EI Standard 1533 *Quality assurance requirements for semi-synthetic jet fuel and synthetic blending components (SBC)*.
- Released a CGI animation: [Quality assurance for sustainable aviation fuel \(youtube.com\)](#) to encourage the global adoption of EI Standard 1533 and highlight the importance to flight safety of following its requirements.
- Progressed a process hazard analysis of battery electric vehicle use for aviation fuel handling at commercial airports to help support wider-scale deployment of EVs.
- Published EI 1542 *Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fuelling equipment*, tenth edition. This volunteered update incorporates new colour schemes for unleaded aviation gasoline, for synthetic blending components (for jet fuel) and for fuel system icing inhibitor.
- Published EI 1581 *Specifications and laboratory qualification procedures for aviation fuel filter/water separators*, seventh edition to include greater emphasis on sustainability and clarify testing requirements for one-stage coalescer/separator elements.
- Completed drafting of EI 1587 *Recommended practice for single cartridge filtration units for aviation fuel* (Feb 2025), to provide a guide for general aviation and business Jet stakeholders on the types of aviation fuel filter cartridge that are available to help with equipment selection and operation.

Forward programme

Our focus in 2025 will include:

- Completing work to prepare a third edition of EI/JIG Standard 1530 *Quality assurance requirements for the manufacture, storage and distribution of aviation fuels to airports*, to ensure the resource continues to provide the global benchmark for aviation fuel quality.
- Publishing a new approach to aircraft misfuelling prevention in EI 1597 third edition.
- Releasing a new animation explaining the co-processing of renewable feedstock with petroleum-based feedstocks to produce semi-synthetic jet fuel/SAF.
- Releasing a further four aviation fuel handling animations to encourage uptake of good practice.



Published in 2024

[EI 1533 Quality assurance requirements for semi-synthetic jet fuel and synthetic blending components \(SBC\) ›](#)

[EI 1535 Minimum criteria to determine acceptability of additives for use in multi-product pipelines co-transporting jet fuel ›](#)

[EI 1542 Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fuelling equipment ›](#)

[EI Specification 1581 Specifications and laboratory qualification procedures for aviation fuel filter/water separators ›](#)

Our work areas ▶ **CCUS**

Carbon capture, utilisation and storage (CCUS)

Addressing the scientific and technical challenges that need to be overcome to facilitate CCUS deployment globally.



Facilitating the expansion of carbon capture and storage operations

Key highlights

- Published *Good plant design and operation for onshore and offshore carbon capture installations*, second edition, supporting developer and operator in procurement and management of plant safely and providing guidance on the various elements of the CCUS chain.
- Published *Hazard analysis of onshore and offshore carbon capture installations and pipelines*, second edition, ensuring that hazards are appropriately identified, quantified, and mitigated.
- The complementary documents update first editions published in 2010 and 2013 and reflect major advances since original publication.

Forward programme

Our focus in 2025 will include:

- Publishing guidance on the measurement of carbon dioxide stream impurities.
- Updating the hazard analysis guide to include an expanded set of dispersion modelling examples.
- Investigating material degradation, corrosion and wider asset integrity associated with conveyance and storage of carbon dioxide.
- Validating equations of state for captured carbon stream composition through a laboratory campaign and thermodynamic modelling.
- Advancing understanding of running ductile failure and fracture propagation for onshore and offshore pipelines.
- Improving knowledge on CO₂ transportation and storage flexibility.
- Investigating hazards of working on new and repurposed offshore structures used for CO₂ streams.



Published in 2024

[EI 3553 Hazard analysis for onshore and offshore carbon capture installations and pipelines ›](#)

[EI 3554 Good plant design for onshore and offshore carbon capture installations and pipelines ›](#)

Speeding the energy transition

It's the biggest
challenge of our
time and it can
only be solved by
working together.



Our work areas ► **Environment and sustainability**

Environment and sustainability

Supporting the transition to
a low-carbon and sustainable
future for all.



Bringing together stakeholders to identify gaps in guidance and encourage cross-industry collaboration

Key highlights:

- Workshop held on managing water stress during the energy transition, working with stakeholders to identify knowledge gaps.
- Workshop held on diversifying and decommissioning North Sea oil and gas (O&G) facilities in line with global biodiversity targets.
- Reviewed existing circularity framework metrics to understand how O&G companies can measure circularity in their processes.
- Explored sustainable supply chain opportunities for offshore wind, focusing on circular materials, decarbonised technologies, and nature-enhanced design.
- Developed guidance on decarbonisation economics, and the economic benefits of greenhouse gas (GHG) emission reduction projects. Additional metrics beyond net present value were suggested for long-term benefits.
- Developed guidance on dismantling and implementing circularity across the lifecycle of assets, including wind, solar, nuclear, and O&G platforms.
- Worked in collaboration with OGCI, IOGP, and IPIECA on recommended practices for detection and quantification of methane emissions.

Forward programme

Our focus in 2025 will include:

- Developing a global offshore wind supply chain directory to support procurement teams with meeting internal net zero targets.
- Collaborating with CL:AIRE to highlight sustainable management practices in soil and groundwater site management which deliver circular and nature positive outcomes.
- Providing upstream O&G companies with guidelines on estimating lifecycle GHG emissions, aligning with expected scope 3 disclosure requirements.
- Developing energy and emissions management training, for non-energy management professionals, in line with ISO 15001.
- Evaluating where recycled effluent can be used as an alternative to fresh water to mitigate scarcity risks.

Published in 2024

[EI 3565 Review of available tools and methodologies to calculate CO2 emissions of soil and groundwater management activities ›](#)

[EI 3570 Circular economy indicators in the oil and gas industry ›](#)

[EI 3571 Recommended practices for CH4 emissions detection and quantification ›](#)

Our work areas ► **Fuels distribution**

Fuels distribution

Ensuring the fuel supply chain continues to operate efficiently and safely from refinery to forecourt, encompassing all fuels throughout the energy transition.



Supporting the fuels value chain

Key highlights

- Worked alongside the Association for Petroleum & Explosives Administration (APEA) and regulators to publish *Design, construction, modification, maintenance and decommissioning of filling stations*, fifth edition, including updated guidance on electric vehicle charging.
- Published revised edition of the Blue Book: Hydrogen Addendum, following significant stakeholder engagement, update and revision.
- Developed guidance on future vehicle technologies and implications for the safe loading and discharge of product in hazardous areas.

Forward programme

Our focus in 2025 will include:

- Completing the revision of guidance on fuel product identification, to include renewable diesel identification.
- Completing guidance on petroleum road tanker design and construction, fifth edition, which will include new fuels and technologies to aid compliance with ADR and the Safe Loading Pass scheme.
- Commencing a review of terminal infrastructure compatibility with biofuels.
- Completing a literature review on the design and construction of hydrogen road tankers.
- Completing guidance on the safe operation of road tanker workshops.



Published in 2024

EI 3076 Design, construction, modification, maintenance and decommissioning of filling stations (known as the Blue Book) ►

EI 3312 Guidance on hydrogen delivery systems for refuelling of motor vehicles, co-located with petrol fuelling stations (Supplement to the Blue Book) ►

PELG Petrol filling stations – Guidance on managing the risks of fire and explosion (The Red Guide) ►

PELG Petrol filling stations – Guidance on managing the risks of fire and explosion (The Red Guide) executive summary ►

Our work areas ▶ **Health**

Health

Harnessing the collective knowledge and experience of company doctors, hygienists, nursing and occupational health professionals.



Protecting worker health

Key highlights

- Published a *Mental health framework* to assist organisations in establishing, maintaining and improving employee mental health programmes.
- Presented at the *International Occupational Hygiene Association (IOHA) Scientific Conference 2024* on diesel engine exhaust emissions; wearable technologies and occupational health risks associated with decommissioning activities.
- Completed a literature review on the prevalence of acute coronary syndrome across the offshore energy sector, exploring correlations between job role, lifestyle factors, and demographic characteristics.
- Developed guidance on cost-effective noise reduction solutions and management strategies.
- Investigated the exposures to diesel engine exhaust emissions from fixed and mobile installations and equipment used across the energy sector.
- Finalised guidelines on occupational health assessment for wind turbine workers.

Forward programme

Our focus in 2025 will include:

- Developing guidance on control measures for minimising exposure to airborne particles during abrasive blasting and cutting.
- Developing guidance on biological monitoring for assessing worker exposure to metals during abrasive blasting, welding and grinding.
- Revision of manual handling and ergonomic guidance sheets for offshore installations, identifying musculoskeletal hazards and encouraging an ergonomic approach to managing risk.



Published in 2024

[EI 3576 Mental health framework ›](#)

Shaping talent

Empowering members with expert knowledge, tools, and training to shape the talent transition.



Managing risk by supporting human performance

Hazardous industries rely on human performance to improve safety and reliability. The EI develops resources on how people interact with plant, processes and each other, addressing fatigue, ergonomics, staffing levels, task analysis, and learning.



Managing risk by supporting human performance

Key highlights

- Published EI 3548 *Human factors standards for facility design: Early design quick reference guide* to help designers apply human factors and ergonomic principles early in a project.
- Published guidance to help organisations integrate human factors into their safety management system.
- Published guidance on incorporating human factors into task-based and frontline risk assessments, allowing risk managers, work controllers and supervisors to identify human factors during job planning.
- Updated guidance on implementing new technologies to include use of artificial intelligence (AI) and automation.

Forward programme

Our focus in 2025 will be:

- Developing guidance to help organisations assess the optimal placement and function of safety critical valves.
- Developing a method to assess whether organisations have the right number of managerial and assurance roles.
- Developing an illustrated guide for designers summarising the human factors and ergonomics requirements for human-machine interfaces (HMIs).
- Developing a new human factors online training course to support the EI Human Performance Pathway.
- Developing short human factors videos for frontline workers, focusing on human factors, task analysis and accident investigation.
- Revising guidance on learning from incidents.
- Finalising new guidance on human error probabilities in quantitative risk assessment.
- Revising our human factors briefing notes.



Published in 2024

[EI 3548 Human factors standards for facility design: Early design quick reference guide ›](#)

[EI 3558 Integration of human and organisational factors into the safety management system ›](#)

[EI 3579 Guidance on human factors in task-based risk assessment ›](#)

Our work areas ► **Hearts & Minds**

Hearts & Minds: Driving cultural change through better safety behaviour and performance

Hearts & Minds is a toolkit to help organisations improve their safety culture by involving the workforce in improving the way health, safety, and environment (HSE) is managed.

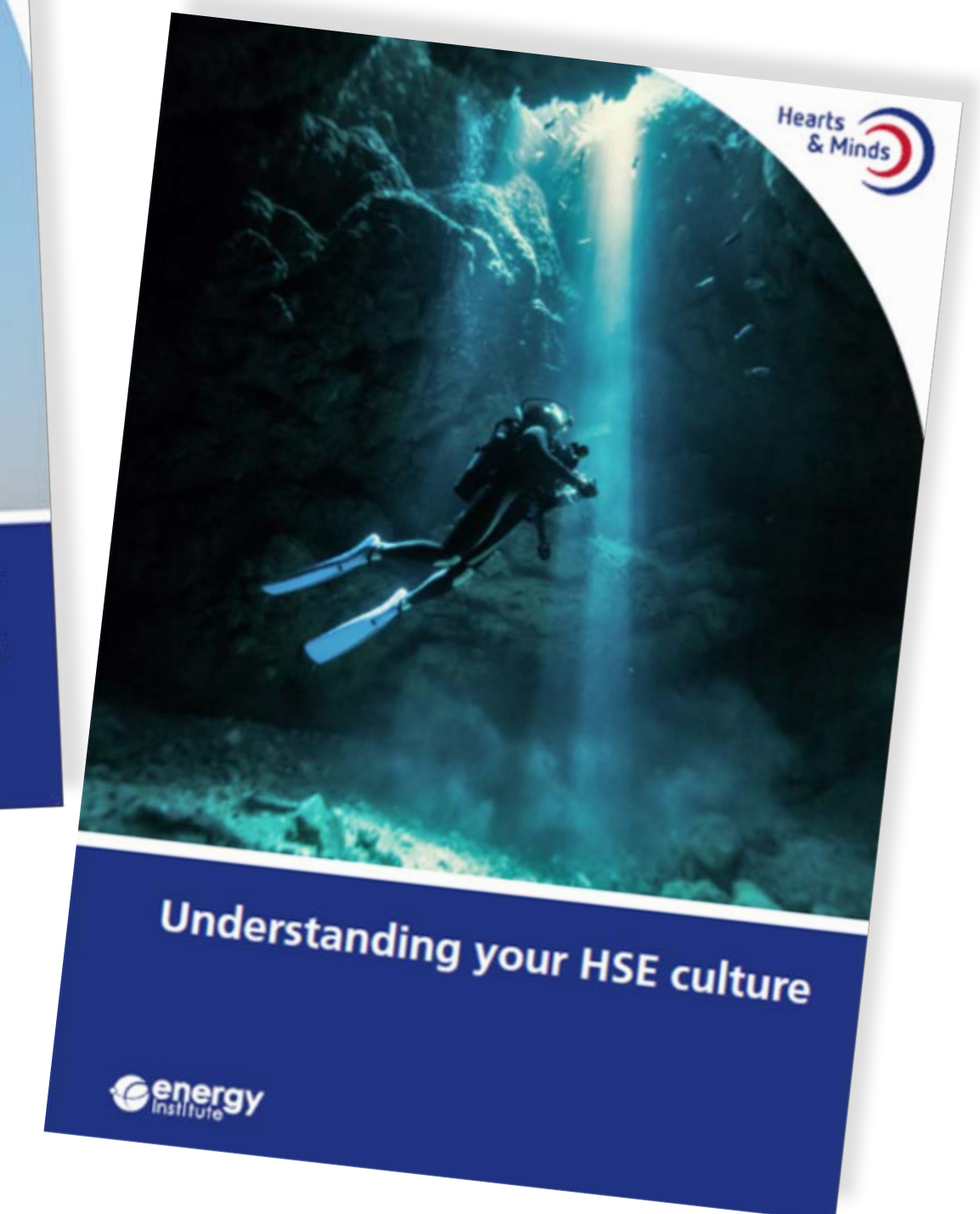
Key highlights:

- In 2025 we published Understanding your HSE Culture (sixth edition) in 12 new languages.

Forward programme

Our focus in 2025 will include:

- Developing resources to help companies improve safety leadership.
- Exploring further academic research opportunities.



heartsandminds.energyinst.org ➔

Our work areas ► **Toolbox**

Toolbox: Sharing lessons from incidents across industry

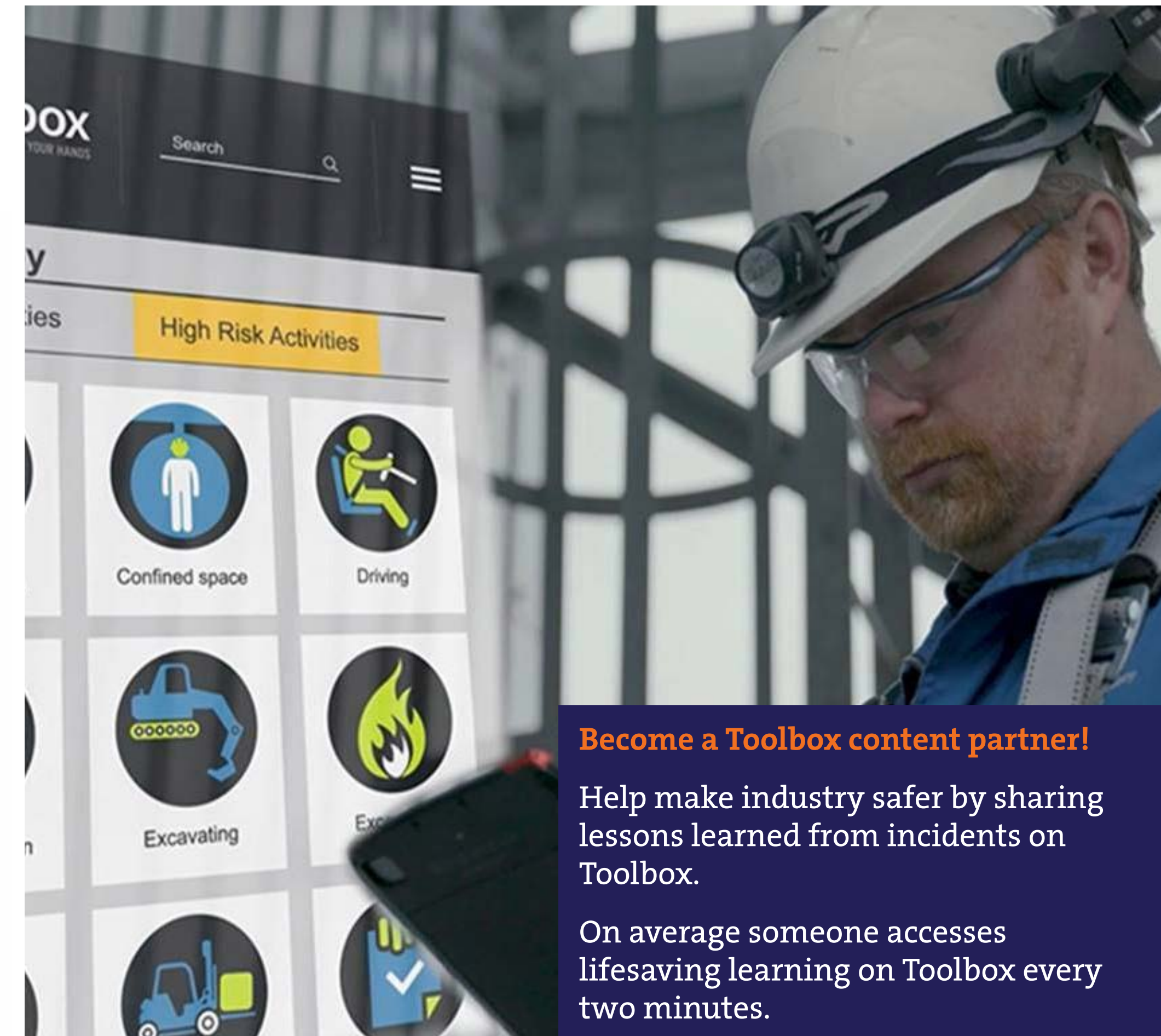
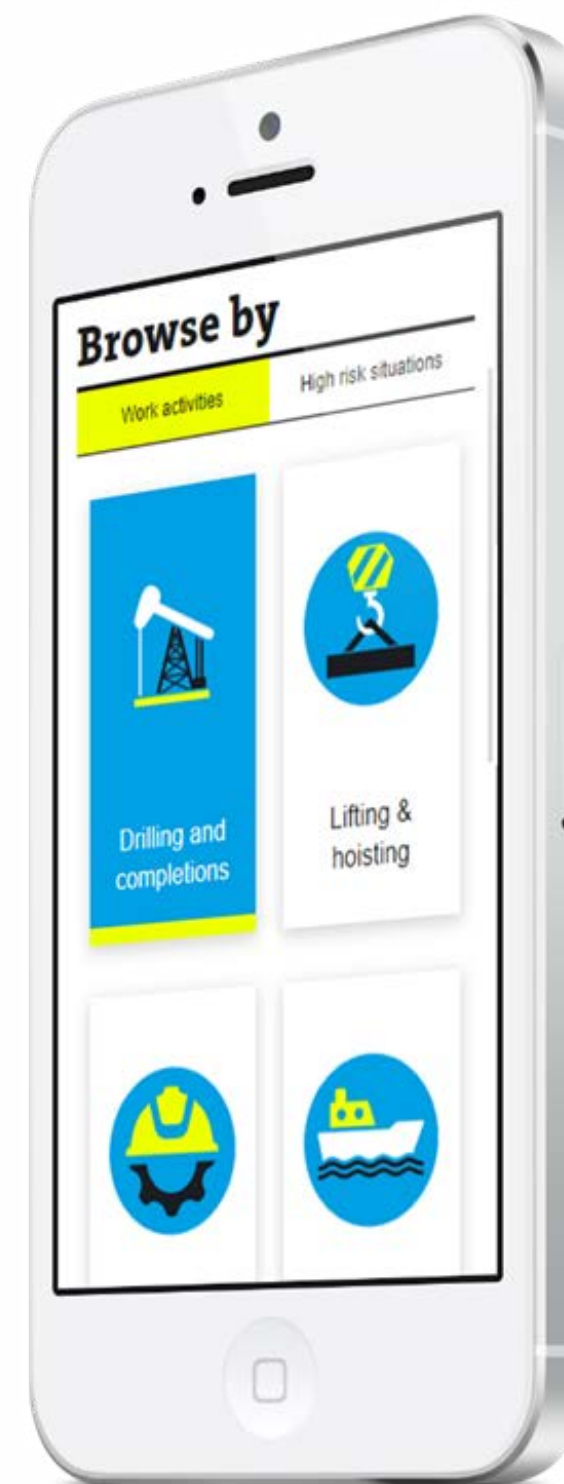


Toolbox is a free to use web app delivering just in time learning to frontline operators and supervisors. Containing over 900 learning resources and available in 11 languages.

Key highlights:

- 137 new learning resources published in 2024.
- Safer Together became a Toolbox content partner.
- 130,000 people visited Toolbox in 2024.
- Number of visitors to Toolbox nearly doubled in 2024.
- Developed an AI search engine to help users learn from multiple incidents.
- Progress made in embedding Toolbox into permit to work software.

toolbox.energyinst.org ➔



Become a Toolbox content partner!

Help make industry safer by sharing lessons learned from incidents on Toolbox.

On average someone accesses lifesaving learning on Toolbox every two minutes.

Tripod: Supporting organisational learning



In partnership with
the Energy Institute

It is the responsibility of organisations, leaders, supervisors and colleagues to make sure everyone gets home safely. The Tripod Foundation provides thought leadership, develops and ensures high quality delivery of proven methods to learn from events and sustainably embed learnings into organisations.

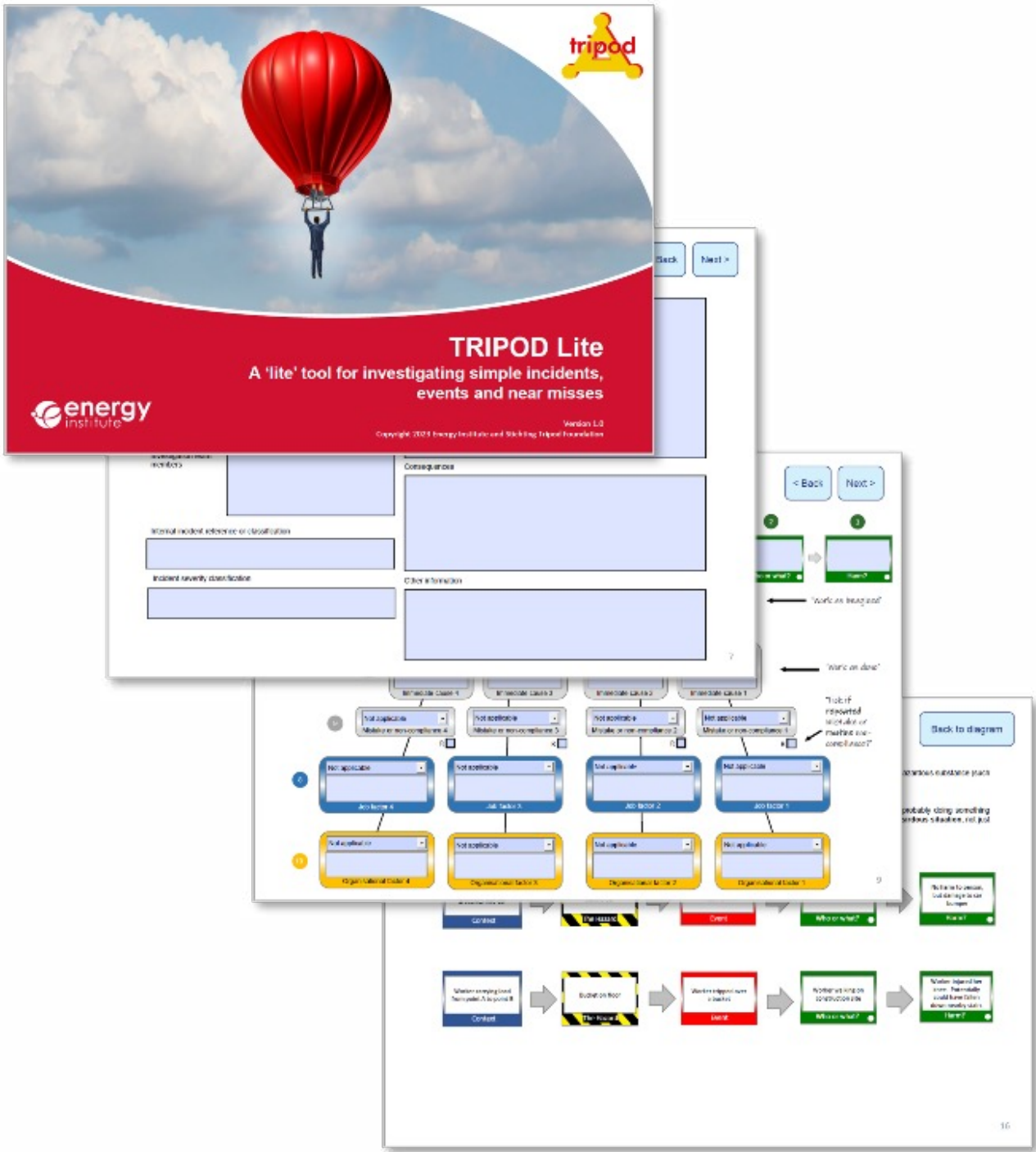
Key highlights:

- Launched our Tripod Lite short online training course, to teach new users how to use Tripod Lite to investigate simple incidents and near misses.
- Presented *Tripod Lite* and *Investigation Insights* toolkit at the Society of Petroleum Engineers HSSE conference in Abu Dhabi.
- Established a Tripod Scientific Sub-Committee to explore new approaches to learning from incidents and to inform future updates to the Tripod Beta methodology.

Forward programme

Our focus in 2025 will include:

- Supporting the EI to develop the second edition of its *Guidance on learning from incidents, accidents and events*.
- Continuing to promote EI 3521 *Tripod Lite* and EI 3494 *Investigation insights* and listen to user feedback.
- Learning from new approaches to learning from incidents to enhance the Tripod Beta methodology.
- Translating Tripod Lite into other languages.
- Supporting and presenting at the Flying Squad’s Investigation Insights 2025 conference (April 2025).



tripod.energyinst.org ➔

Published in 2024
Introduction to Tripod Lite online training course >

Our work areas ▶ **Hydrocarbon management**

Hydrocarbon management

Working with global measurement and fuel handling specialists to safely and efficiently manage products across the industry.



Measurement – the essential tool for management

Key highlights:

- Expanded the scope of hydrocarbon management activities to include alternatives to fossil fuels.
- Developed guidelines covering bio-origin grades, focusing on bio-feedstocks and biofuels.
- Published guidance on liquid metering, gas measurement and cargo inspection.
- Provided the secretariat for ISO Technical Committee 28 / Sub-Committee 2 – Measurement of petroleum and related products.
- Published HM50 – *Guidelines for the cleaning of tanks and lines for marine tank vessels carrying petroleum and refined products*, sixth edition.

Forward programme

Our focus for 2025 will include:

- Expanding our portfolio with new guidance to support the energy transition.
- Building our activities in the Asia region.
- Support the development of the newly established HMC-6 (bio-feedstocks and biofuels) recruiting new members and broadening the scope of work.
- Continuing to produce guidance with the American Petroleum Institute (API), International Organization for Standardization (ISO) and British Standards Institute (BSI).



Published in 2024

[HM 26. A guide to liquid metering systems ›](#)

[HM 27. A guide to gas metering systems ›](#)

[HM 29. Procedures for petroleum product cargo inspections ›](#)

[HM 50. Guidelines for the preparation of tanks and lines for marine tank vessels carrying petroleum and refined products ›](#)

[HM 52/API MPMS Chapter 17.11 Measurement and sampling of cargoes on board tank vessels using closed and restricted equipment ›](#)

Our work areas ▶ **Hydrogen**

Hydrogen

Working with global stakeholders to better understand and address technical challenges and to facilitate deployment of a hydrogen economy.



Understanding and addressing technical challenges for the deployment of a hydrogen economy

Key highlights

- Published EI 3575 *Research report: Gas compressors for 100% Hydrogen duty*, addressing the unique properties of hydrogen versus natural gas, and the impact on compressor design, size, safety, and performance.
- Published EI 3560 *Research report: Global activities in hydrogen development*, encompassing production, transportation, distribution, storage, and utilisation, to ensure the necessary infrastructure are ready and available for a seamless transition.
- Published EI 3561 *Research report: Understanding stakeholder needs and integration challenges across the hydrogen value chain*, to support understanding of stakeholder roles in advancing a hydrogen economy.
- Hosted a five-year planning workshop at DNV's Spadeadam site which sought views and input from stakeholders on the future of the EI hydrogen work programme.

- Hosted webinars on hydrogen compression transitioning to 100% hydrogen duty and evaluating the energy balance and efficiency of a whole hydrogen energy system.

Forward programme

Our focus in 2025 will include:

- Developing guidance on asset integrity management of change for operators considering repurposing their natural gas network to hydrogen service.
- Developing a position paper on competence, skills and training for the transition to a hydrogen economy.
- Contributing to revision of the Energy Essentials introductory guide to hydrogen, designed for everyday energy consumers.
- Developing quantitative risk-based guidance for determining safe separation distances associated with hydrogen storage and dispensing equipment.

- Organising a workshop during International Energy Week to bring together senior stakeholders to discuss hydrogen's current role and future potential.
- Developing a training course, tailored for individuals eager to enter the hydrogen industry.
- Continuing support for the SAFEN JIP on hydrogen and ammonia hazard data availability.
- Continuing to undertake research on large scale storage of hydrogen (and its liquid derivatives) for the import and export of hydrogen.

Published in 2024

[EI 3560 Research report: Global activities in hydrogen development ›](#)

[EI 3561 Research report: Understanding stakeholder needs and integration challenges across the hydrogen value-chain ›](#)

[EI 3575 Research report: Gas compressors for 100% hydrogen duty ›](#)

Share your company's expertise

Our Technical + Innovation
programme gives members
a direct voice in the future
of the global energy sector.



Offshore wind (G+)

The G+ is helping to create a safer and healthier offshore wind industry through collaboration with global operators, stakeholders and regulators, and through a data-led approach to improve safety for all.



Working to create a safer and healthier global offshore wind industry

Key highlights:

- Analysed and published [industry health and safety incident data](#) through the G+ website.
- Published an offshore windfarm transfer document, second edition, providing a scenario-based risk assessment for each method of transfer.
- Published guidance on unmanned aircraft systems, tailored to the wind industry.
- Published a paper on steel fabrication for the offshore wind industry to support developers in their relationship with fabrication yards.
- Published guidelines on arc flash and shock labelling and associated signage, providing a framework for developers, OEMs and national safety authorities.
- Published lifesaving rules for the offshore wind industry, with an accompanying implementation support guide.

Forward programme

Our focus for 2025 will include:

- Developing guidance on welfare provision, severe weather preparedness and H&S considerations for the deployment, maintenance and recovery of surveying buoys.
- Developing our data programme, exploring new metrics on injury severity, causality and leading indicators.
- Continue to build on and grow our presence in the Americas and Asia-Pacific region.

Published in 2024

[EI 3429 Good practice guideline – Offshore wind farm transfer ›](#)

[EI 3557 G+ Examining the impact of floating wind turbines on the human operator: A scoping review ›](#)

[EI 3563 Safe by design – Good practice guidance for the offshore wind industry ›](#)

[EI 3568 G+ Safe by Design workshop report: Material handling equipment ›](#)

[EI 3569 Good practice guidelines arc flash and shock labeling and associated signage in the offshore wind industry ›](#)

[EI 3572 G+/IMCA in partnership with Energy Institute walk to work workshop ›](#)

[EI 3573 Lifesaving rules for the offshore wind industry – Implementation guide ›](#)

[EI 3576 G+ Good practice guidelines for unmanned aircraft systems in the offshore wind industry ›](#)

[EI 3578 Steel fabrication in the offshore wind industry – A good practice guidance for developers ›](#)

Our work areas ► **Onshore wind (SafetyOn)**

Onshore wind (SafetyOn)

Bringing together stakeholders to tackle health and safety issues through incident data reporting, developing good practice guidelines, addressing safety in design, and sharing learning.



Our work areas ► **Onshore wind (SafetyOn)**

Leading health and safety for the onshore wind industry



Key highlights:

- Analysed and published industry health and safety incident data through the [annual health and safety incident data report](#).
- Published guidelines on mobile crane lifting for onshore wind farms.
- Published guidelines to raise awareness on wind turbine generator high voltage access.
- Published a Safe by Design workshop report on assessing the hazards and management of risk relating to ice throw and ice fall.
- Published a Safe by Design workshop report on the design of chain hoists and ancillary equipment, lift plans, permits, controls, training and competency across industry.
- Held the inaugural Stand Up for Safety Week (January 2024), an initiative dedicated to creating time to discuss the hazards of working onshore and measures to take to reduce risk to health and safety.

Forward programme

Our focus in 2025 will be:

- Examining the processes of design risk management and the Principal Designer role, in relation to CDM projects on both operational and construction sites.
- Developing understanding of the occurrence of ice fall and ice throw incidents, the associated conditions, and performance of existing control measures.
- Building the relevance and engagement of SafetyOn in the Republic of Ireland, including the collection of incident data, and hosting a stakeholder forum in 2025.



Published in 2024

[EI 3555 SafetyOn good practice guidelines: Mobile crane lifting for onshore wind farms](#) ►

[EI 3556 SafetyOn Electrical safety good practice guidelines: Wind turbine generator high voltage access awareness](#) ►

[EI 3464 Wind Turbine Safety Rules Procedure 7: Control and management of cross boundary safety precautions between the wind turbine safety rules and other safety rules](#) ►

[EI 3567 SafetyOn Safe by Design workshop report: To examine design of chain hoists and ancillary equipment, lift plans, permits and controls, and training and competency across industry](#) ►

[EI 3574 SafetyOn Safe by Design workshop report: Ice fall and ice throw](#) ►

The memory and the heart of our industry

Enhancing our
members' operations
and performance.



Our work areas ▶ **Power systems**

Power systems

Working with global stakeholders to facilitate the transition to a low-carbon power system.



Decarbonising power generation

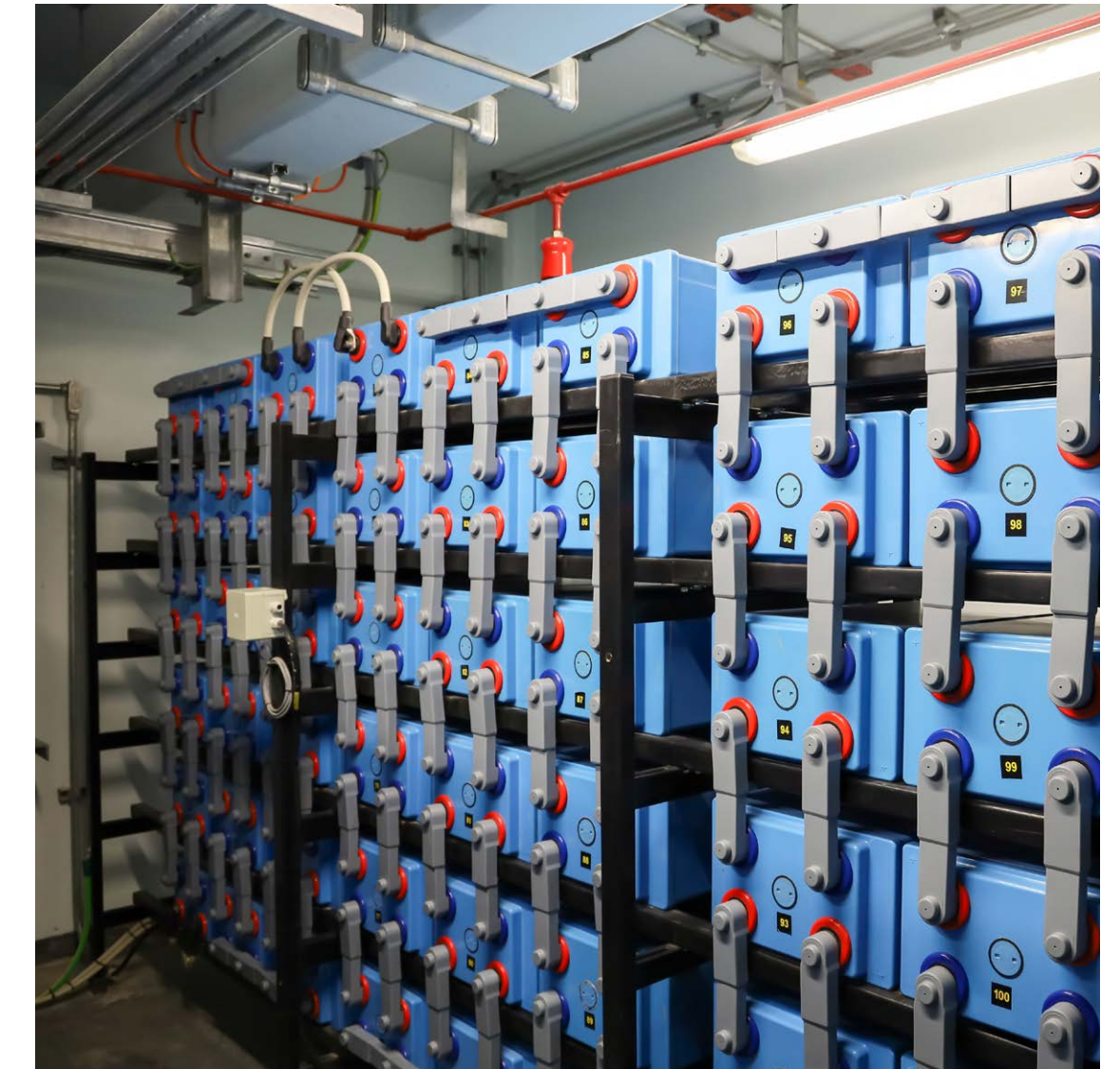
Key highlights:

- Published guidance on the design, construction, operation, and co-location of green hydrogen production plants.
- Published guidance for gas-fired power station operators to assess readiness to accept hydrogen-natural gas blends as fuel (2%, 20%, 100%).
- Published principles for a safe system of work for the energy sector, to help organisations manage mechanical and electrical safety.
- Developed guidance on the co-location of battery storage with renewable plant.
- Revised guidance on safe storage and handling of biomass.
- Revised and republished guidance on managing static electricity hazards.

Forward programme

Our focus in 2025 will include:

- Updating guidance on short-term closure and preservation of gas turbine power stations.
- Developing guidance on carbon capture and storage for thermal power stations.
- Developing guidance on preventing contamination of soil and ground water from fire water run-off and other contaminants from battery energy storage sites.
- Revising guidance on arc flash risk management.
- Report on replacement of SF6 switchgear with SF6-free switchgear.
- Updating guidance to help operators comply with cybersecurity regulations.
- Developing guidance for safe working practices on and around battery energy storage facilities.
- Updating guidance on safety integrity of electrical supply protection systems.
- Updating guidance on earthing, grounding and bonding.
- Updating guidance on inspection and maintenance of underground electrical cables.



Published in 2024

[EI 3021 Model code of safe practice Part 21: Guidelines for the control of hazards arising from static electricity ►](#)

[EI 3550 Guidance on adapting combined cycle gas turbine \(CCGT\) power stations for hydrogen combustion ►](#)

[E3559 Safe systems of work principles for the power generation sector ►](#)

[EI 3564 Guidance on green and low carbon hydrogen production: plant design, construction, operation and maintenance, co-location and other considerations ►](#)

Our work areas ► **Process safety**

Process safety

Enabling effective process safety management to control major accident hazards, protecting workers, the public, the environment, and assets.



Control of major accident hazards

Key highlights

- Published EI 3015 *EI Model code of safe practice Part 15: Area classification for installations handling flammable fluids, fifth edition*.
- Developed an area classification training course based on the new edition of EI 15.
- Hosted a cross industry workshop on the management of barrier health in relation to process safety hazards, to inform an EI project on barrier health management.
- Hosted a workshop on Layer of Protection Analysis (LOPA) risk targets, to inform development of guidance on the use of LOPA.
- Presented EI guidance at multiple international conferences.

Forward programme

Our focus in 2025 will include:

- Developing guidance on the process safety challenges of introducing new technologies into existing facilities.
- Developing guidance on ammonia safety, from production to end use.
- Developing guidance on upstream normally unattended facilities.
- Hosting a joint conference with IMechE, Cogent and other stakeholders on process safety competency.



Published in 2024

[EI 3015 EI Model code of safe practice Part 15: Area classification for installations handling flammable fluids ›](#)

[EI 3080 Guidelines for the design, installation and management of small bore tubing assemblies ›](#)

[EI 3268 Pipeline and riser loss of containment 2001 – 2020 \(PARLOC 2020\) ›](#)

Our work areas ▶ **Test method standardisation**

Test method standardisation

Standardising low-carbon fuels, developing analytical methods for hydrogen, ammonia and methanol, and maintaining a portfolio of methods critical to existing petroleum products.



Standardising low-carbon sustainable fuels analysis

Key highlights:

- Developed draft methods *IP-PM-FK (determination of the lubricity of methanol)* and *IP-PM-FI (determination of abrasive particles in methanol)*, for inclusion in the ISO specification for methanol as a marine fuel, ISO 6583.
- Developed IP-PM-FJ, a draft method for *determining contaminants in hydrogen using infra-red spectroscopy using Optical Feedback Cavity Enhanced Absorption Spectroscopy (OFCEAS) with Low-Pressure Sampling (LPS)*. To enable clean hydrogen to be delivered to PEM fuel cells.
- Completed development of IP 639, a method for a portable, rapid scanning infrared instrument to determine the amount of Fame (fatty acid methyl-ethers) in diesel fuel.
- Developed IP-PM-FL, a draft method for determining cumene in kerosene by multi-dimensional gas chromatography, to assist compliance with REACH regulations.

Forward programme

Our focus in 2025 will be:

- Completing studies and publishing *IP-PM-FK (determination of the lubricity of methanol)* and *IP-PM-FI (determination of abrasive particles in methanol)* as full test methods.
- Developing a test method to determine the presence of low carbon methyl esters in distillate fuels using super-critical fluid chromatography (SFC). This will enable FAMEs to be more readily detectable, using sustainable chemistry.
- Publishing the Aviation Fuel Survey (2018-2019).
- Undertaking a multi-method flash point study for diesel fuel, to examine the relationship between older methods and newer small-scale, rapid equilibrium methods with environmental and safety benefits.

- Publication of *Microbial impact studies relating to the feasibility assessment of Hydrogen and CO2 Subsurface Storage*.
- Publication of a literature review on the susceptibility of sustainable aviation fuel (SAF) to microbial spoilage.

Published in 2024

IP Standard Test Methods for analysis and testing of petroleum and related products, and British Standard Parts 2024 ›

Published in 2024

Asset integrity

[EI 3551 Guidance on ALE for offshore structures supporting wind turbines](#)

[EI 3552 Guidelines for integrity management of the splash zone in offshore environments](#)

Aviation

[EI 1533 Quality assurance requirements for semi-synthetic jet fuel and synthetic blending components \(SBC\)](#)

[EI 1535 Minimum criteria to determine acceptability of additives for use in multi-product pipelines co-transporting jet fuel](#)

[EI 1542 Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fuelling equipment](#)

[EI Specification 1581 Specifications and laboratory qualification procedures for aviation fuel filter/water separators](#)

CCUS

[EI 3553 Hazard analysis for onshore and offshore carbon capture installations and pipelines](#)

[EI 3554 Good plant design for onshore and offshore carbon capture installations and pipelines](#)

Electrical safety

[EI 3021 Model code of safe practice Part 21: Guidelines for the control of hazards arising from static electricity](#)

Environment

[EI 3565 Review of available tools and methodologies to calculate CO2 emissions of soil and groundwater management activities](#)

[EI 3570 Circular economy indicators in the oil and gas industry](#)

[EI 3571 Recommended practices for CH4 emissions detection and quantification](#)

Fuels distribution

[EI 3076 Design, construction, modification, maintenance and decommissioning of filling stations \(known as the Blue Book\)](#)

[EI 3312 Guidance on hydrogen delivery systems for refuelling of motor vehicles, co-located with petrol fuelling stations \(Supplement to the Blue Book\)](#)

[PELG Petrol filling stations – Guidance on managing the risks of fire and explosion \(The Red Guide\)](#)

[PELG Petrol filling stations – Guidance on managing the risks of fire and explosion \(The Red Guide\) executive summary](#)

Health

[EI 3577 The Mental health framework](#)

Human and organisational factors

[EI 3548 Human factors standards for facility design: Early design quick reference guide](#)

[EI 3558 Integration of human and organisational factors into the safety management system](#)

[EI 3579 Guidance on human factors in task-based risk assessment](#)

[Introduction to Tripod Lite online training course](#)

Hydrocarbon management

[HM 26. A guide to liquid metering systems](#)

[HM 27. A guide to gas metering systems](#)

[HM 29. Procedures for petroleum product cargo inspections](#)

[HM 50. Guidelines for the preparation of tanks and lines for marine tank vessels carrying petroleum and refined products](#)

[HM 52/API MPMS Chapter 17.11 Measurement and sampling of cargoes on board tank vessels using closed and restricted equipment](#)

Published in 2024

Hydrogen

[EI 3560 Research report: Global activities in hydrogen development](#)

[EI 3561 Research report: Understanding stakeholder needs and integration challenges across the hydrogen value-chain](#)

[EI 3575 Research report: Gas compressors for 100% hydrogen duty](#)

IP Test Methods

[IP Standard Test Methods for analysis and testing of petroleum and related products, and British Standard Parts 2024](#)

Offshore wind (G+)

[EI 3429 Good practice guideline – Offshore wind farm transfer](#)

[EI 3549 G+ White paper: Steel fabrication for the offshore wind industry – safety, practices, and opportunities](#)

[EI 3557 G+ Examining the impact of floating wind turbines on the human operator: A scoping review](#)

[EI 3562 G+ 2023 Incident data report](#)

[EI 3563 Safe by design – Good practice guidance for the offshore wind industry](#)

[EI 3567 SafetyOn Safe by Design workshop report: To examine design of chain hoists and ancillary equipment, lift plans, permits and controls, and training and competency across industry](#)

[EI 3568 G+ Safe by Design workshop report: Material handling equipment](#)

[EI 3569 Good practice guidelines arc flash and shock labeling and associated signage in the offshore wind industry](#)

[EI 3572 G+/IMCA in partnership with Energy Institute walk to work workshop](#)

[EI 3573 Lifesaving rules for the offshore wind industry – Implementation guide](#)

[EI 3578 Steel fabrication in the offshore wind industry – A good practice guidance for developers](#)

Onshore wind (SafetyOn)

[EI 3464 Wind Turbine Safety Rules Procedure 7: Control and management of cross boundary safety precautions between the wind turbine safety rules and other safety rules](#)

[EI 3555 Safetyon good practice guidelines: Mobile crane lifting for onshore wind farms](#)

[EI 3556 SafetyOn Electrical safety good practice guidelines: Wind turbine generator high voltage access awareness](#)

[EI 3566 SafetyOn 2023 Incident data report](#)

[EI 3574 SafetyOn Safe by Design workshop report: Ice fall and ice throw](#)

Power Generation

[EI 3550 Guidance on adapting combined cycle gas turbine \(CCGT\) power stations for hydrogen combustion](#)

[EI 3559 Safe systems of work principles for the power generation sector](#)

[EI 3564 Guidance on green and low carbon hydrogen production: plant design, construction, operation and maintenance, co-location and other considerations](#)

[EI 3576 G+ Good practice guidelines for unmanned aircraft systems in the offshore wind industry](#)

Process safety

[EI 3015 EI Model code of safe practice Part 15: Area classification for installations handling flammable fluids](#)

[EI 3080 Guidelines for the design, installation and management of small bore tubing assemblies](#)

[EI 3268 Pipeline and riser loss of containment 2001 – 2020 \(PARLOC 2020\)](#)

Share your company's expertise

EI technical membership provides unique opportunities to actively participate in setting the industry benchmark, to learn from peers and to forge relationships with other leading organisations and stakeholders.

