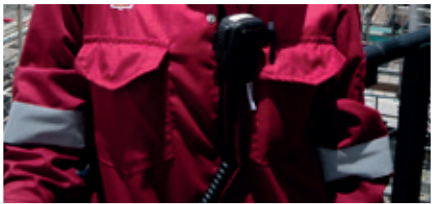
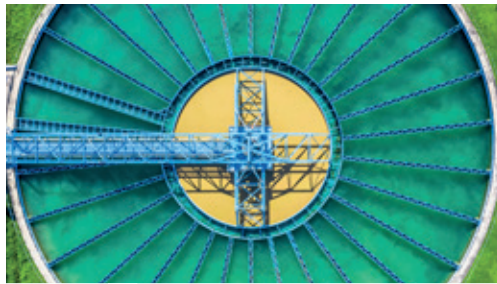


# Annual Review 2021



Led by members,  
supporting members  
and serving society

# Contents

IChemE in numbers	<u>3</u> >>
Achievements	<u>4</u> >>
A message from President Jane Cutler	<u>5</u> >>
A message from Chief Executive Jon Prichard	<u>6</u> >>
STRATEGY 2024 Aim 1 – Respected for professionalism and technical competence	<u>7</u> >>
Flexible pathways to professionalism	<u>8</u> >>
STRATEGY 2024 Aim 2 – Recognised as a vibrant learned society that materially impacts on the	
<i>Global Grand Challenges</i>	<u>10</u> >>
Sharing knowledge to advance chemical engineering	<u>11</u> >>
STRATEGY 2024 Aim 3 – Acknowledged as a peer-group leader in which an engaged membership	
receives and adds value	<u>14</u> >>
Enhancing understanding, engagement and recognition	<u>15</u> >>
Peer-recognised excellence	<u>17</u> >>
Medal winners	<u>19</u> >>
STRATEGY 2024 Aim 4 – Known as a high performing organisation delivering significant value	<u>20</u> >>
Driving forward capability and performance	<u>21</u> >>
Financial results	<u>23</u> >>
Membership statistics	<u>25</u> >>
Governance and leadership	<u>26</u> >>

# IChemE in numbers

Founded in 1922, the Institution of Chemical Engineers (IChemE) exists to advance chemical engineering's contribution for the benefit of society.

Led by members, supporting members, serving society.

Over **30,000**  
IChemE members



**58** accredited company  
training schemes



**10** editions of  
*The Chemical  
Engineer*



**122** countries  
where IChemE  
members  
are based

**31** corporate  
partners



**8** IChemE journals

**7** membership grades

**44** company members of  
the IChemE Safety Centre

**10,000+** items on  
the Knowledge Hub



Licensed to offer **10**  
professional registrations

**38** supporting  
partners of the  
IChemE Safety Centre



Over **300** resources  
in Knovel

**6** editions of the  
*Loss Prevention Bulletin*

Over **300**  
academic  
programmes accredited



**19** special interest groups

**35** members groups



Over **3,000**  
members in  
volunteer roles

# Achievements

In 2021, volunteer members and staff worked together to deliver a significant level of activity to support members with their professional development and to make an influential contribution to society's major challenges. Here are some highlights.

**69** Fellows elected

Member Engagement Committee launched



**2** new journals launched



**20** medals and prizes awarded



**11** climate change action plans developed



New careers resources launched

**15** global awards presented



**1,357** new Associate Members



**2.76 million** impressions on IChemE social media accounts



**New membership application portal introduced**



Over **2,800** responses to member engagement survey



**19,311** people attended technical webinars



**473** Chartered Chemical Engineers elected



# Relevant in a changing world

The anthropologist Margaret Mead once said, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." As we mark 100 years since the founding of IChemE, it is clear that we are part of something larger than ourselves. Today we live in a global society that is vastly interconnected, and in times of uncertainty we can feel the consequences. Life is challenging for many and although it may be hard at times to focus on others' needs, working together as IChemE to serve society can strengthen our own wellbeing and allow us to connect with others and the world around us. When faced with adversity and unexpected challenges, we chemical engineers can help the organisations we work for, and the communities in which we live, to respond in a way that is caring, connected and contributory.

Reflecting on this year's Annual Review I am delighted with IChemE's achievements during testing times. In June 2020 I was elected as Deputy President by members of this illustrious Institution, becoming President in June 2021. At that stage, the impacts of the pandemic were not fully understood, however I did not envisage that I would spend the next two years inside the borders of my home state of Western Australia. Despite the limitations of travel, I have been able to engage with my fellow members across the world easily and regularly due to the seamless transition to virtual events and meetings. I am excited by the progress that our Institution has made towards supporting our members, regardless of location and professional and personal constraints, through the many virtual activities and expanded access to resources which are more inclusive and accessible,

I was delighted to be joined by members near and far for my Presidential Address which was held at the University of Western Australia (UWA) in June. Members from the Western Australia Members Group and students at UWA joined me in person with many more members and invited guests watching live via *YouTube*. My address touched on my personal journey and the challenges and opportunities facing IChemE as we reflect on the 100-year anniversary of our founding, and I emphasised our determination to deliver on our goals as set out in *Strategy 2024*.

One of our aims is to be recognised a vibrant learned society, and work to embed the priority topics, as identified by the Learned Society Committee, continued throughout 2021. In November, the world's

leaders gathered at the COP26 conference in Glasgow to accelerate action on global climate change. Chemical engineers took part in the debate, demonstrating how we can and must play our part to create a sustainable future for us all, as shown by the climate change action plans developed by IChemE's special interest groups.

Elected by members to lead the Institution, the Trustees fully understand the importance of listening to members. We were delighted that many of you invested your time to tell us what matters to you most in the member engagement survey. From the research results, it is obvious that we must continue to work together to ensure that IChemE remains relevant in a rapidly changing world, which was a key theme of my Presidential Address. I am pleased to advise you that the Trustees have already taken action as a result of the survey and you can find out more in *The Chemical Engineer* magazine article.

Dedicated and enthusiastic volunteers working with our professional staff are critical to the success of IChemE. I want to acknowledge and thank each of you, and celebrate your contribution to the future of our profession and to the society we serve. Without your expert skills supporting other members and the generous sharing of your knowledge for the benefit of society we would not have achieved 100 years of chemical engineering. I am indebted to you all for making a real difference to the future of the Institution.

Working together as the IChemE community, we can continue to build and improve our Institution, the support for members and our contribution to society. Let us all share the value, benefits and relevance of IChemE membership with colleagues, employers and our networks. As a result, employers will value the importance of Chartered status, we will continue to attract new members, while current members will also get more from their membership and some that have yet to volunteer may consider doing so.

It has been an honour to lead our Institution during this globally challenging period and it is a particular honour to lead IChemE into its 100th year. I would like to thank my fellow members for your support throughout my Presidency and wish my successor all the best as we look forward to the next 100 years.



“Working together as the IChemE community, we can continue to build and improve our Institution, the support for members and our contribution to society.”



Jane Cutler  
President 2021–2022

# Building digital foundations to enhance membership services

Overall, 2021 was a year in which IChemE concluded a number of long running business change programmes that will provide the foundations for future success. At a headline level this included simplifying and broadening the qualifications processes, thereby ensuring that the Institution can welcome into membership chemical engineers working in fields beyond those traditionally associated with the profession, and implementing technical solutions that update and upgrade the Institution's information systems. These changes, particularly those relating to technical solutions, will also underpin the Institution's ability to provide targeted and focused knowledge products and services to those who need them most, whether it is members engaged in reducing society's impact on the planet or those improving the health and wellbeing of the global population.

2021 also illustrated that remote working is here to stay, with another year of Covid restrictions necessitating a continuation of the virtual operations that we commenced in 2020. This further highlights the importance of IChemE's investment in digital solutions, which enabled both staff and members to engage efficiently and effectively with colleagues and peers. I recognise that much of this work is effectively behind the scenes from a member perspective, however, now that the foundations have been laid, we can truly pivot from an internal focus towards external engagement and improving the member experience.

The Institution continued to align its annual business plan to the aims set out in *Strategy 2024*, making demonstrable progress across all four aims, as highlighted below.

Volunteers within our qualifications and learned society activities have once more supported the Institution to deliver a remarkable level of activity. The participation and engagement of members is fundamental to the delivery of IChemE's charitable objects and underpins the lifelong support that we can provide to the wider membership. I would like to thank all volunteers who get involved with our activities and hope that whilst volunteering for others, they also find the experience rewarding for themselves.

During the year we have adjusted our committee structure and created a Member Engagement Committee to support and facilitate member

groups and national boards as they deliver value to both society and the membership at large.

Recognising the need to continuously improve our operations and processes, significant progress has been made against our target of extending the scope of our existing ISO9001 certification, with all departments striving to ensure that they operate quality management systems that meet the internationally recognised and externally verified standard. We remain committed to gaining Institution-wide certification in 2023.

At the start of the year, we were grateful for a generous donation from IChemE Past President, Ian Shott. The donation was made to help us promote the role that every chemical engineer can play in delivering sustainable solutions to societal challenges as described in the *UN Sustainable Development Goals (SDGs)*. The donation has been used to develop the IChemE Sustainability Hub which provides free training modules for all members.

To enable the Institution to continue to make progress in the future, it is critical that we maintain financial strength and stability. We finished the year with a moderate operating surplus which puts us in a good position to deliver our ambition for 2022 and beyond. Our commercial activities, the majority of which remained virtual, provided a significant contribution to our income, which meant that we were able to continue investing in improving and increasing our member services.

In April, we were deeply saddened to learn of the death of our patron, HRH Prince Philip, Duke of Edinburgh. His Royal Highness promoted the importance of engineering throughout his working life and was a patron of our Institution for more than 63 years.

As we reached the end of 2021, plans were finalised to mark the Institution's centenary. I hope that you will join in with some of the activities taking place throughout the year, to celebrate the immense contribution that the chemical engineering profession has made, and will continue to make, towards serving society.

Thank you for your continued support.

“The participation and engagement of members is fundamental to the delivery of IChemE's charitable objects and underpins the lifelong support that we can provide to the wider membership.”



Jon Prichard  
Chief Executive



**Respected for  
professionalism and  
technical competence**



# Flexible pathways to professionalism

IChemE's focus remained on setting and upholding standards, while supporting professional and technical competence.

2021 saw the implementation of the [three-stage membership application process](#) for Chartered status which was introduced to offer flexible routes to professional qualification.

Stage 3: Professional Review was introduced in April, with Stage 1: Educational Base and Stage 2: Initial Professional Development (IPD) following in September. A phased roll-out of the new process caused the number of applications processed in the first half of the year to be lower than in 2020, however the number of applications processed in the second half of the year increased rapidly once the new process had been fully established. A new membership application portal was launched which enabled all grades of membership applications to be inputted into one system, providing a more efficient application process for members.

As part of the new membership application process, the Individual Case Procedure (ICP) route was introduced for Stage 1 to provide a flexible route to Chartered membership for those with a non-accredited degree in Chemical Engineering. A working group was set up and began developing an ICP route for Professional Process Safety Engineer (PPSE) status.

To support the new membership application process, the roles of volunteers required to peer review applications have changed significantly. The previous roles of assessor and interviewer were combined into one Professional Reviewer role. More volunteers have been recruited as well as retraining offered for current volunteers.

Mentor training to support members through their application for Chartered membership was enhanced with 10 workshops delivered for new mentors and resources added to the website.

IChemE successfully undertook licence reviews with the Engineering Council, Science Council, Society for the Environment and the Energy Savings and Opportunity Scheme. These reviews are undertaken every five years and allow IChemE to continue to offer the professional registrations these regulators control.

The Institution continued to support universities and training providers by accrediting educational programmes and fostering good practice.

Eight university accreditation visits took place internationally, which, due to Covid-19 restrictions, had to be carried out virtually. The University of Greenwich, UK, and Queen Mary University of London, UK, achieved accreditation of their programmes for the first time. Two benchmarking visits were undertaken at Brunel University, UK, and Canterbury Christ Church University, UK.

**1,357** new Associate Members elected



**69**

Fellows elected



**473** Chartered Chemical Engineers elected





Guidance for education providers seeking IChemE accreditation of chemical engineering programmes was updated in line with revised standards from the Engineering Council. Consultation on IChemE's updated guidance was undertaken widely and the final version was published in November. New guidance for the Accreditation of MSc (or equivalent) Process Safety Programmes was also published in November.

Senior leaders at IChemE and BOC gathered online to present the industrial, medical and special gases supplier with its Bronze Corporate Partner Award recognising the company's commitment to its chemical engineers' professional development.

As pledged in *Strategy 2024*, IChemE has continued to champion members' continuing professional development (CPD) by providing and recognising learning opportunities. Members voted to amend By-law 39 in relation to CPD which granted the Board of Trustees authorisation to remove those failing to comply with IChemE's CPD requirements from the Register of Members.

Members were supported with their CPD through the delivery of in-company, online and on-demand training courses. More than 70 live online training courses were delivered across different time zones to over 700 delegates. Over 40 in-company training courses were delivered to a diverse customer base including clients in the chemical, mining, utilities and construction sectors, as well as regulators and universities.

At the end of the year, IChemE's headline membership figure exceeded 30,000 with 39% being professionally qualified.

New application portal introduced



Representatives from BOC and IChemE



40 in-company training courses delivered

Recognised as a vibrant learned society that materially impacts on the *Global Grand Challenges*



# Sharing knowledge to advance chemical engineering

To achieve IChemE's ambition to be a vibrant learned society that materially impacts on global challenges, a focus for 2021 was further embedding the Learned Society Committee's priority topics. Three priority topics were identified in 2020 to prioritise activity within the learned society: responsible production, major hazards management and digitalisation.

Following the launch of IChemE's [position on climate change](#) in 2020, 2021 saw the creation of a working group to provide strategic direction and monitor progress to ensure that the Institution delivers on the commitments contained within the statement. Eleven [climate change action plans](#) were produced by IChemE's regional and special interest groups demonstrating how IChemE and its members can contribute to the transition to a net zero world.

One of the commitments within IChemE's position on climate change was to develop plans for achieving net zero carbon emissions from the Institution's direct operations globally by 2025. A working group was formed to determine how to achieve this and the criteria for measurement. Emissions data from 2019–2021 can be found on IChemE's [website](#). These emissions will be calculated and reported annually. In 2021, IChemE's emissions were 37.9 tCO<sub>2</sub>e, this is 44% lower than in 2019. The significant decrease is the result of homeworking during the Covid-19 pandemic.

\*tonnes (t) of carbon dioxide (CO<sub>2</sub>) equivalent (e)

\*\*Greenhouse gas emissions are divided into three categories. Scope one emissions are direct emissions from owned or controlled sources. Scope two emissions are indirect emissions from the generation of purchased/acquired electricity, heating and cooling. Scope three emissions are the indirect greenhouse gas emissions from sources not directly owned or controlled by an organisation.

Emissions from IChemE's direct operations:

- total scope one and scope two emissions\*\*  
2021: 37.9 tCO<sub>2</sub>e (2019: 67.5 tCO<sub>2</sub>e)
- emissions intensity: Total annual emissions per full time equivalent (FTE) employee: 2021:  
436 kgCO<sub>2</sub>e/FTE (2019: 758 kgCO<sub>2</sub>e/FTE)
- emissions intensity: Weighted average annual emissions per m<sup>2</sup> of office space: 2021:  
32 kgCO<sub>2</sub>e/m<sup>2</sup> (2019: 56 kgCO<sub>2</sub>e/m<sup>2</sup>)

To demonstrate how chemical engineers are addressing the climate challenge, IChemE launched a campaign to target delegates and policy makers at the 2021 United Nations Climate Change Conference of the Parties (more commonly known as COP26) in Glasgow, UK. Members and staff attended the conference and presented at sessions on climate engineering solutions, a just transition and national energy scenarios. *The Chemical Engineer* provided live updates from the conference and members shared their experiences in the social media [video campaign](#) "I am a chemical engineer who is working to address climate change" with the #ChemEngatCOP26 campaign gaining 136,490 social media impressions.



11  
climate change  
action plans  
developed



136,490 social media impressions for  
#ChemEngatCOP26 campaign



During the year IChemE produced, contributed to or endorsed 11 [policy reports](#). The *Designing infection-resilient environments* report was discussed by the Cabinet Office, Covid-19 Taskforce and the Department for Levelling Up, Housing and Communities in the UK, while the report *Decarbonising Construction* received widespread media coverage across the UK.

IChemE's UK policy work has continued to benefit from the Institution's active engagement with the National Engineering Policy Centre which has established itself as a hub for developing and disseminating engineering policy advice by working collaboratively with a cross section of the 43 professional engineering institutions in the UK.

Established to enable chemical engineers to inform the work of UK MPs and policy makers, IChemE member Amber Keegan was awarded the [Ashok Kumar Fellowship](#) which, in partnership with the Materials Processing Institute, funds a three-month placement with the UK Parliamentary Office for Science and Technology, where she will contribute to an area of public policy.

2021 saw the creation of IChemE's first-ever [Communities of Practice \(CoP\)](#) with interested members encouraged to join. The Energy CoP and Research & Innovation CoP both succeeded previously existing groups, namely the Energy Centre and several geographically focused research committees. The CoPs cover broad topic areas with the objective of producing outputs targeted at informing or influencing external audiences.

Two new journals were launched in 2021. [Digital Chemical Engineering](#) provides a platform for publishing new interdisciplinary research across the domains of chemical engineering and digital sciences and

technologies. [Carbon Capture, Science and Technology \(CCST\)](#) provides an important platform for the publication of research countering some of the challenges identified in IChemE's position on climate change.

All IChemE journals saw a rise in their Impact Factor, a quantitative measure of a journal in relation to its competitors. The seven wholly owned IChemE journals were supported by 276 volunteer editors from across 46 countries. The number of papers published in these IChemE journals in 2021 was 1,649, an increase of 68% in the last 5 years. The number of manuscripts submitted was 10,366, an increase of 138% in the same period.

*The Chemical Engineer* magazine published articles in line with IChemE's three priority topics with input from a wide spectrum of volunteers. For the responsible production priority topic, these included [the future of the oil and gas industry](#); [zero carbon electricity](#); [decarbonisation of end uses](#); and [materials utilisation](#); as well as a [series on technologies being developed to help tackle the climate crisis](#). For the major hazards management topic, a series of six articles on [safety lessons we can learn from the movies](#) was published. Two articles outlining [how chemical engineers can help improve digital security](#) and [how cloud computing impacts chemical engineering](#) kicked off a series on digitalisation.

Following the provision of unlimited access to the [Loss Prevention Bulletin \(LPB\)](#) for all members, page views increased by 77% to 62,471 in 2021 from 2020. A special edition of LPB was published to mark the 10th anniversary of the Fukushima Daiichi Nuclear Power Plant failure in Japan. The special issue also considers other natural hazards leading to technological (Natech) events.

2  
journals  
launched



10,366  
journal manuscripts  
received

2  
Communities of  
Practice launched



62,471  
views of Loss  
Prevention Bulletin



Amber Keegan

Members from IChemE's process safety community compiled a book showcasing the works of process safety pioneer Trevor Kletz containing new case studies and insights into latest practices. In partnership with Elsevier, the [Trevor Kletz Compendium: His Process Safety Wisdom Updated for a New Generation](#) was published covering topics that Kletz identified as the most important to process safety.

Members were able to access 25 new technical textbooks upon [Knovel](#), the online resource for books, technical information, interactive equations and analytical tools – with titles added in 2021 including new publications on digitalisation, major hazards management and clean energy.

To showcase chemical engineering research and its impact on society in energy, education, environmental sustainability, water, healthcare and food technology, members in Australia and New Zealand collated contributions from leading researchers for the *Chemical Engineering Impact* booklet.

To encourage knowledge transfer, the IChemE Safety Centre (ISC) published five [guidance documents](#) throughout the year on permits to work, good practice in virtual Hazard and Operability Study (HAZOP), undergraduate engineering education, delta HAZOP and alarm rationalisation. The ISC delivered 11 technical webinars and recorded a series of process safety podcasts in collaboration with *Chemical Processing* magazine which saw 36% more downloads than 2020 with the top rating podcast being *Lessons learned from the Fukushima Disaster, 10 years on*.

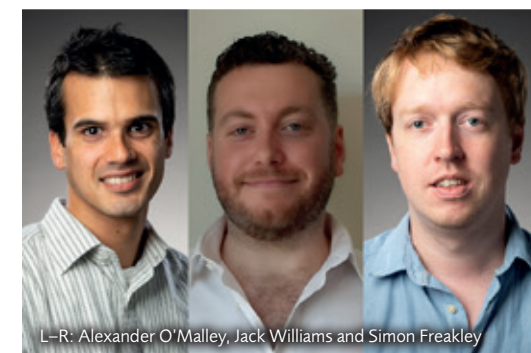
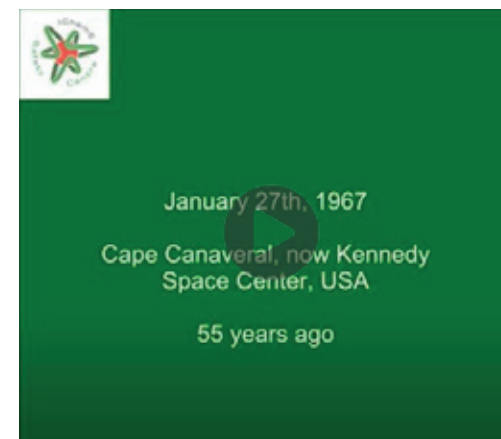
The ISC's social media campaign [#MinuteToLearn](#) shares one-minute videos of incidents and related learnings on their anniversaries. Fifty-two videos gained over 2,600 *YouTube* views during the year.

Knowledge-sharing and supporting CPD continued at the *Hazards 31* conference which was delivered online in November with 230 delegates attending. More than 80 technical presentations were given to process safety and loss prevention professionals showcasing good practice, new approaches and lessons learned. Plenary speaker highlights included Simon Wood from the UK Petroleum Industries Association discussing how the downstream oil sector responded to Covid-19, Peter Baker from the British Health and Safety Executive on what the chemical and process industries can learn from the building sector, and Atula Abeyskera from Imperial College London on managing "black swan risks".

Technical knowledge was also shared with over 250 registered delegates attending the virtual *Chemeca* conference in September and with attendees of the *Advances in Digitalisation of the Process Industries* conference in October.

Simon Freakley, Alexander O'Malley and Jack Williams were awarded the Andrew Fellowship. Established in 2012 the [Andrew Fellowship](#) commemorates the work of IChemE Fellow Syd Andrew and supports advances in the field of catalysis. The chemical engineering researchers were awarded the fellowship to develop new catalysts, materials that speed up chemical reactions needed to produce the everyday products and fuels that society relies upon.

Stephen Richardson, Past President of IChemE, and Honorary Fellow Dame Sue Ion were invited to give evidence to a UK [House of Lords Select Committee](#). They were invited to give evidence to the Risk Assessment and Risk Planning Committee regarding the resilience and risks within the oil and gas and nuclear sectors.



**5,200**   
downloads of process safety podcasts



Acknowledged as a peer-group leader in which an engaged membership receives and adds value



# Enhancing understanding, engagement and recognition

IChemE continued its activities to strengthen member engagement, support the member lifecycle and improve understanding of the profession.

75 members across the world joined IChemE's virtual Annual General Meeting in June, 60 of whom were voting members. A new Deputy President, three Vice Presidents and three Ordinary Trustees were elected and participated in activities to shape the strategic direction of the Institution. In addition, eight members were elected to Congress, the advisory body to the Board of Trustees.

Given IChemE's focus on member engagement as part of *Strategy 2024*, a new Trustee role of Vice President Member Engagement replaced the Vice President Regions role. A Member Engagement Committee was also formed to replace the former Regions Committee to support this work.

Jane Cutler was inaugurated as the 80th President of the Institution, delivering her Presidential Address from the University of Western Australia in Perth, the first to be hosted in Australia. Members and chemical engineering students attended the live event with many other members and invited guests watching the Address online. Entitled *IChemE: Relevant in a Changing World*, the Address focused on the need for chemical engineers to adapt and respond to the opportunities and challenges presented by the changing world. Ahead of IChemE's 100-year anniversary in 2022, Cutler pledged to build on the

work of her predecessors to ensure the Institution delivers *Strategy 2024* and remains relevant, contemporary and aligned with its Royal Charter.

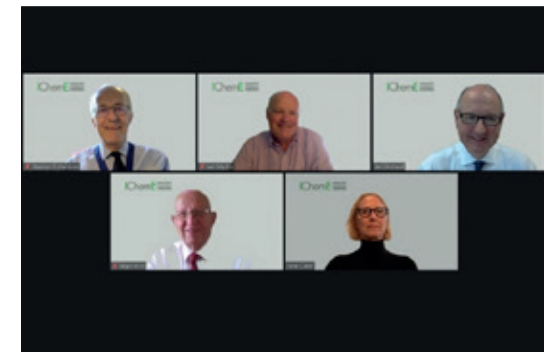
Over 70 volunteers finalised plans for marking IChemE's centenary in 2022 including the development of a new centenary website ([www.chemengevolution.org](http://www.chemengevolution.org)), designed to celebrate 100 years of chemical engineering's contribution to society. The team also developed a schedule for a series of centenary webinars to look at how chemical engineers will help to address global challenges over the next 100 years.

Over 2,800 members participated in the member engagement survey with a good representation across all membership grades. Key themes identified by members as priorities include the importance of IChemE fulfilling its role as a qualifying body and maintaining alignment to *Strategy 2024*.

The majority of members groups and special interest groups activities remained virtual which enabled members across the world to access networking and knowledge sharing opportunities. More than 19,000 people attended 269 technical webinars with over 800 people attending a webinar on hydrogen safety challenges run by the Safety and Loss Prevention Special Interest Group. Twenty-six On Campus presentations were delivered and were well received by the undergraduate community.



269 technical webinars



First presidential address hosted in Australia



To enable knowledge sharing and networking between members groups and special interest groups, new tools have been introduced, including a *Microsoft SharePoint*-based collaborative platform.

To support members at an early career level and those looking for career development, IChemE held a virtual careers fair over two days which was attended by 291 people. The Institution also hosted a series of eight Industry Insight webinars where members shared their career experiences across different UK regions and sectors.

A suite of [careers resources](#) was also released to highlight the broad range of careers available to chemical engineers and provide information for anyone considering transitioning to a new sector. With over 5,000 views by the end of the year, a [video series](#) featuring graduate engineers through to senior executives sharing their career journeys through different sectors was also produced.

*The Chemical Engineer* published feature articles which involved direct feedback from the community. For example, students and educators were surveyed and interviewed to understand how chemical engineering courses have responded to the pandemic.

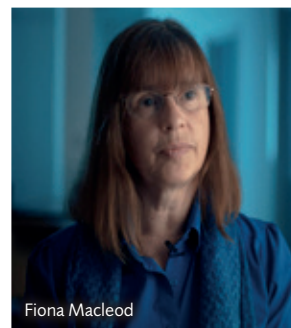
Engagement activities to support the development of chemical engineers in the workplace continued through working with employers on corporate partner programmes and Accredited Company Training Schemes (ACTS).

The [volunteer area](#) of the IChemE website was further developed alongside regular member communications featuring a variety of volunteering opportunities across all areas including Professional Reviewer, members groups' roles and special interest group task forces.

To improve societal understanding of chemical engineering, six IChemE members featured as experts in the second television series of [Disasters Engineered](#) on the *National Geographic* channel. Zsuzsanna Gyenes, Dame Judith Hackitt, Fiona Macleod, Geoffrey Maitland, Ken Patterson and Stephen Richardson shared their technical accounts and lessons that process safety and hazardous industry professionals have learned from several of the incidents in the 10-part series.

Engaging with members and sharing knowledge via the Institution's social media platforms, including [LinkedIn](#), [Twitter](#), [Facebook](#) and [Instagram](#), led to IChemE's posts being seen over 2.76m times as well as over 38,000 views of [YouTube](#) video content.

38,469  
views of videos on  
YouTube



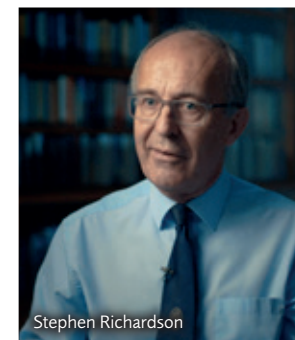
Fiona Macleod



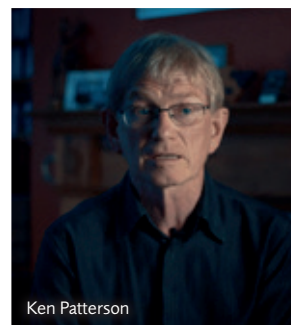
Geoffrey Maitland



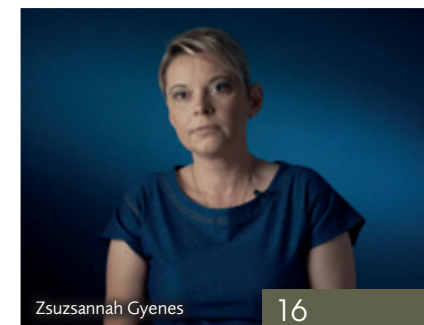
Judith Hackitt



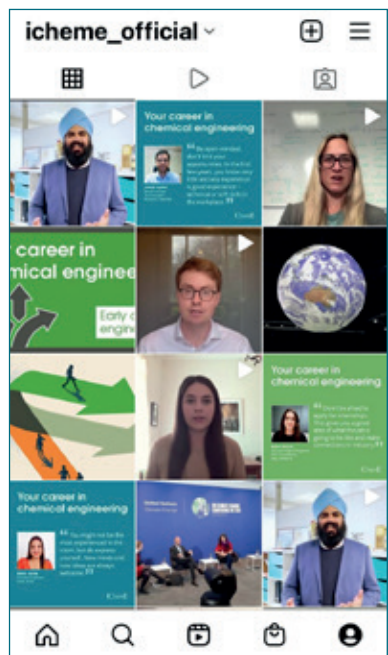
Stephen Richardson



Ken Patterson



Zsuzsanna Gyenes



New careers  
resources launched



Nikita Javale

2.76  
million  
impressions on  
IChemE social  
media accounts



# Peer-recognised excellence

IChemE Awards celebrate excellence in chemical, biochemical and process engineering and are a mark of peer-recognition across the world within industry and academia. More than 170 entries made it to the finals of the Global Awards and the Malaysia Awards.

## IChemE Global Awards 2021

Achievements were showcased across 15 categories in a three-week webinar series in October, where finalists presented their projects and took questions from the online audience, culminating in the winners' announcement.

Australian water treatment solutions provider, Clean TeQ Water, was commended for chemical engineering excellence for its project, Innovative Biological Technology for Nitrogen Removal. It won the *Biochemical Engineering Award* and was runner up in the *Innovative Project* category before receiving the top prize, the *Outstanding Achievement in Chemical and Process Engineering Award*.

Saudi Aramco, Saudi Arabia scooped awards in both the Oil & Gas and Sustainability categories for its project Carbon Capture Utilisation and Storage (CCUS) and CO2-Enhanced Oil Recovery (EOR) Demonstration Project. Imperial College London, University College London and University of Oxford, UK took the Team Award for their project UK Future Vaccine Manufacturing Research Hubs, and Wood plc won the Diversity & Inclusion Award for its initiatives increasing employee engagement and knowledge-sharing worldwide, supporting STEM-skill development and diversifying the way talent is identified and recruited.

[www.icheme.org/globalawards2021](http://www.icheme.org/globalawards2021)



IChemE Global Awards winners 2021

## IChemE Malaysia Awards 2021

Sustainable and digital innovations won top awards at the IChemE Malaysia Awards 2021 virtual ceremony in October.

Universiti Malaysia Sabah won the *Sustainability Award* for developing an integrated Membrane Distillation and Osmotic Membrane Distillation (MD-OMD) system using hydrophobic nanofibre membranes to produce clean water and energy simultaneously by utilising seawater and solar energy. PETRONAS Digital won the *Training and Development Award* for its training programme to upskill employees with analytics techniques, shifting to machine learning for a more dynamic and impactful way of harnessing and reporting on data.

Meanwhile the winner of the *Young Researcher Award*, How Bing Shen of the Swinburne University of Technology, Malaysia, went on to win the same category at the IChemE Global Awards later in October.

[www.icheme.org/malaysiaawards2021](http://www.icheme.org/malaysiaawards2021)



## National honours

In the 2021 New Year's Honours, IChemE Fellow Steve Bagshaw, who has been supporting the UK Government's Vaccine Taskforce, was awarded the Commander of the Order of the British Empire (CBE) for his services to the UK manufacturing and biotechnology sector.

In the Australia Day Honours, Chris Fell was awarded an Officer (AO) in the General Division of the Order of Australia for distinguished service to science and engineering, particularly to nanotechnology research and fabrication, and to professional networks. The late Graeme Paul was recognised with the Medal (OAM) in the General Division for service to the community of the Northern Beaches and to chemical engineering.

Kevin Marshall was made a Companion of the New Zealand Order of Merit for his services to food science and technology.



# Medal winners

The 2021 medal winners are listed below. For the full details, visit [www.icheme.org/medals](http://www.icheme.org/medals)

## Ambassador Prize

Professor Geoffrey Maitland, Imperial College London, UK

## Clean Energy Medal

Professor Yulong Ding, University of Birmingham, UK

## Davidson Medal

Dr William Herron, Dow Chemical Company, USA

## Donald Medal

Professor Gary Lye, University College London, UK

## Franklin Medal

Dr Phillip Carson, Retired, UK

## Geldart Medal

The late Professor John Grace, University of British Columbia, Canada

## Greene Medal

Professor Michael Cloke, Retired, Malaysia

## Guggenheim Medal

Dr Carolyn Koh, Colorado School of Mines, USA

## Hanson Medal

Anonymous\*

## Hutchison Medal

Ziho Kang, Syed Ali Mehdi Naqvi, Saeed Salehi and Catalin Teodoriu, University of Oklahoma, US

Muhammad Raza and Saima Ghazal, University of Engineering and Technology, Lahore, Pakistan

## Junior Moulton Medal

Joint Award

Dr Mai Bui, Dr David Danaci, and Dr Niall MacDowell, Imperial College London, UK

Dr Carmine D'Agostino, Luke Forster and Le Yu, The University of Manchester, UK

## Lees Medal

Michael Rantell, Novartis Grimsby, UK

## Morton Medal

Professor Nicky Eshtiaghi, Royal Melbourne Institute of Technology, Australia

## Nicklin Medal

Dr Fenwang Li, University of Sydney, Australia

## Sargent Medal

Professor Rafiqul Gani, PSE for SPEED, UK

## Senior Moulton Medal

Dr John Pérez-Calderón, Centro de Investigación y Desarrollo en Criotecología de Alimentos CIDCA, Argentina

Maria Victoria Santos, Instituto Andino Patagónico de Tecnologías Biológicas y Geoambientales CONICET, Argentina

Dr Noemi Zaritky, Universidad Nacional de La Plata, Argentina and Centro de Investigación y Desarrollo en Criotecología de Alimentos CIDCA, Argentina

## SIESO Medal

Lauren Averill, Michael Chu, Brady Durkin, Alex Reeves and Usaamah Ougradar, University of Bradford, UK

## Underwood Medal

Professor Huanting Wang, Monash University, Australia

## Warner Prize

Dr Salvador Eslava, Imperial College London, UK

\*The winner of the Hanson Medal elected to remain anonymous



Known as a high performing organisation delivering significant value



# Driving forward capability and performance

In 2021 IChemE continued with projects to modernise legacy systems and business processes to facilitate resilient operations that deliver value and enable better connectivity for members.

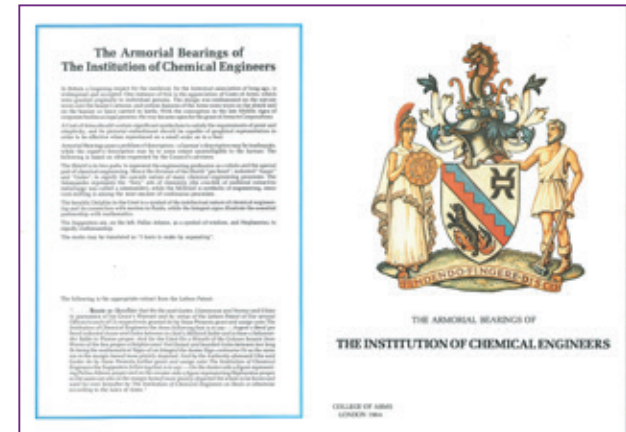
Minor changes to the Institution's Royal Charter and By-laws to increase the relevance in modern times were approved by the membership at the 2021 AGM and subsequently received formal approval from the Privy Council in July.

With a focus on providing a business architecture and governance structure to deliver long-term member value, the Regions Committee was replaced with the Member Engagement Committee, chaired by the newly elected Vice President Member Engagement.

Peter Slane, Regions Director retired in July after nearly ten years with the Institution and was succeeded by Andrew Foster, a Chartered Chemical Engineer and Fellow of IChemE.

A review began into the subscription rates' structure with a policy for setting rates being introduced incorporating a simplified approach to the subscription model which involved the standardisation of rates and the move to a single currency across all regions.

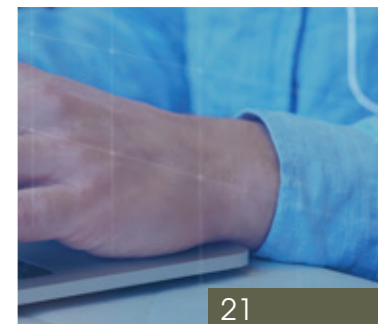
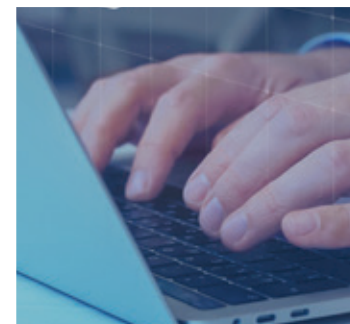
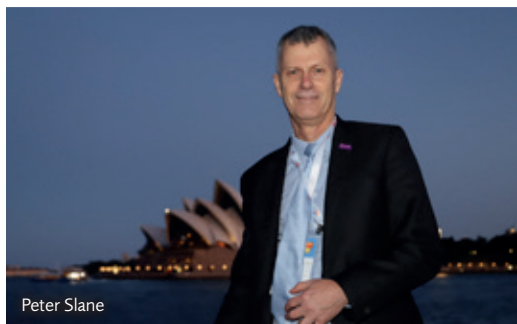
A new email marketing tool was introduced that is fully integrated with the Contact Relationship Management system (CRM), reducing system complexity and GDPR risks. New risk management software was also introduced to streamline processes and draw effectiveness gains and IChemE implemented a digital telephony solution via the Teams platform which provides greater support for remote working.



## New risk management software



## New Membership Engagement Committee



The Institution has continued to extend the scope of the ISO9001 quality management system with the UK elements of the Regions department and the Marketing and Communications department becoming compliant in 2021. Documenting these additional team processes provides the framework for continuous improvement so that the needs and expectations of members and interested parties can continue to be met. IChemE remains committed to the ISO9001:2015 standard aiming to extend certification across the whole organisation in 2023.

After another year of continued change due to ongoing Covid-19 restrictions around the world, the Institution has regularly reviewed and updated health and safety measures, and consulted with staff about the future ways of working that will allow the Institution to lock in the key benefits realised during the pandemic.

A staff survey was carried out in March with the intention to repeat this activity on an annual basis to provide staff with a key feedback channel. The promotion of resilience and wellbeing has remained a priority with a successful "step in the right direction" campaign where staff were challenged to record 1,922 km during the months of May and June; this distance was chosen as a reminder of the year when the Institution was formed. Staff embraced the challenge and went on to beat the target by over 300% with some 6,000 km recorded.

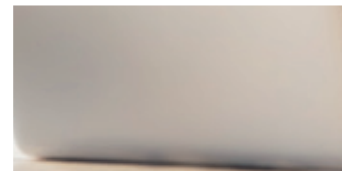
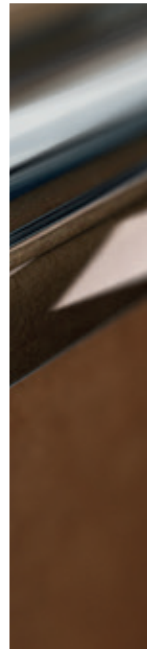
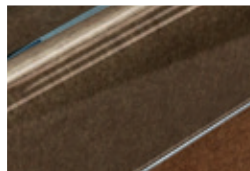
The end of the year saw the launch of a Managers Masterclass training programme, a significant investment in personal development for the Institution's line management to improve efficiency and drive performance across the organisation.



**6,000 km**  
recorded in "step in the right direction" campaign



Launch of Managers Masterclass



# Financial results

2021 resulted in a strong financial year for the Institution with income from unrestricted funds returning to pre-pandemic levels of £7.89m. Whilst membership income remained steady, IChemE's training course activity, which was severely negatively impacted by the pandemic in 2020, continued to recover.

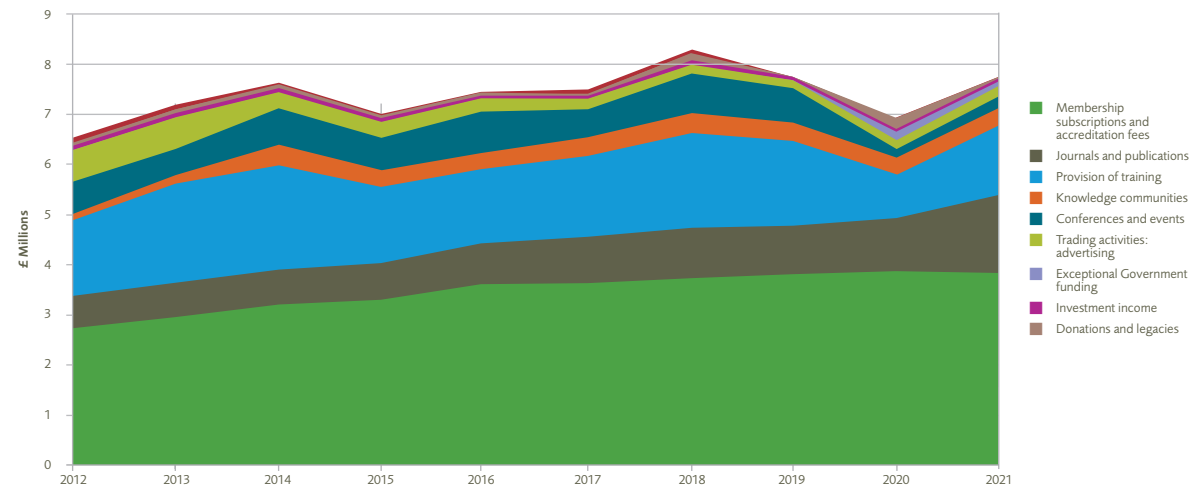
Total expenditure on unrestricted funds was £7.27m, resulting in a net operating income of £613,000.

Overall expenditure was lower than anticipated due to the continued reduced cost base associated with running training courses, events and committee meetings virtually. Although it is anticipated that some activity will return to physical events or meetings in 2022, the Board of Trustees want to ensure that the lessons that have been learnt during the pandemic are not lost, particularly where this has resulted in a more inclusive approach being followed.

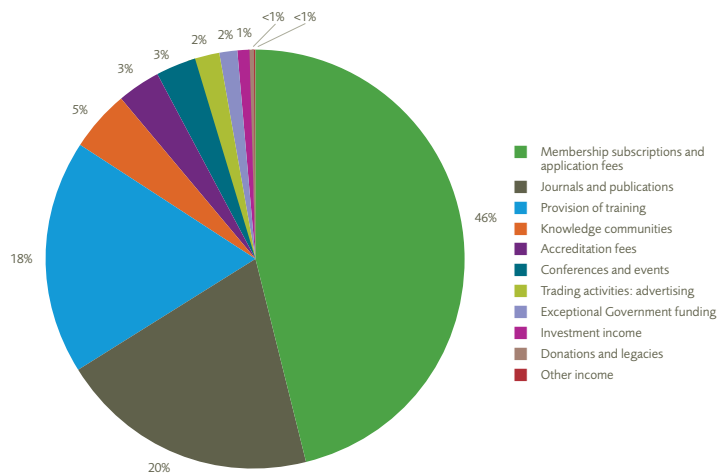
The net gain on IChemE's investment portfolio was £576,000. After taking into account other recognised gains and losses, notably the actuarial gain on the defined benefit pension scheme of £1.19m and an exchange loss of £110,000 from the retranslation of the balance sheets of the international branches and subsidiaries, the unrestricted fund balance increased by £2.27m.

Excluding the pension reserve deficit of £4.52m, the closing unrestricted fund balance for the year was £7.78m, of which £500,000 was classified as designated funds for future IT projects.

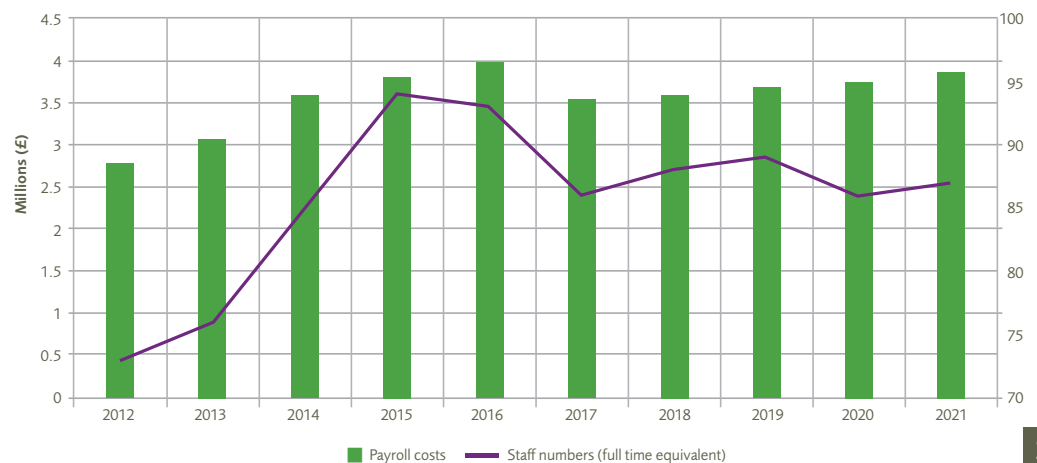
Total income (unrestricted funds) – last 10 years



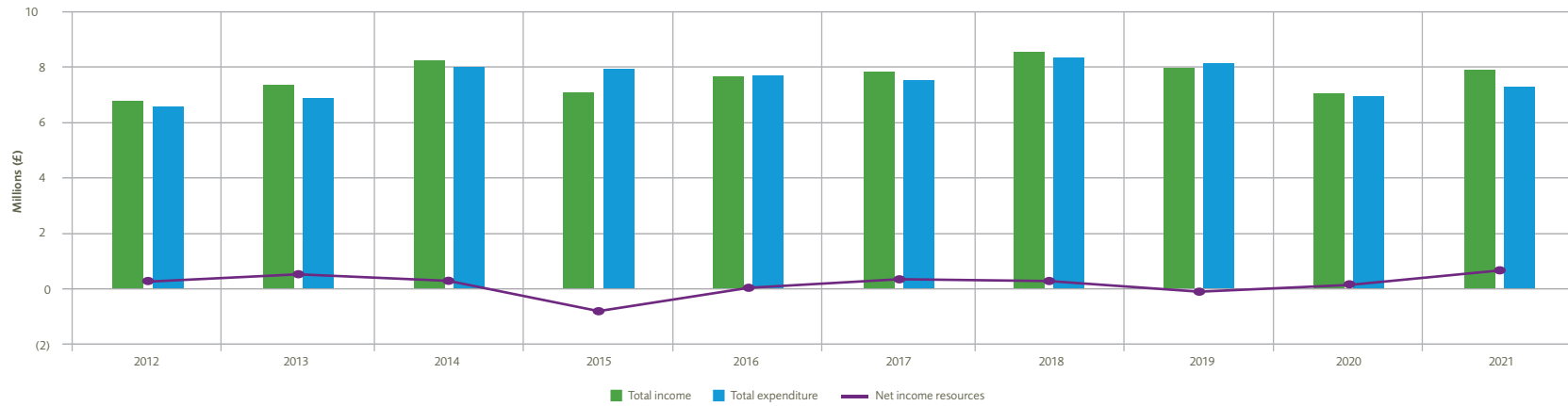
Total income (unrestricted funds) – 2021



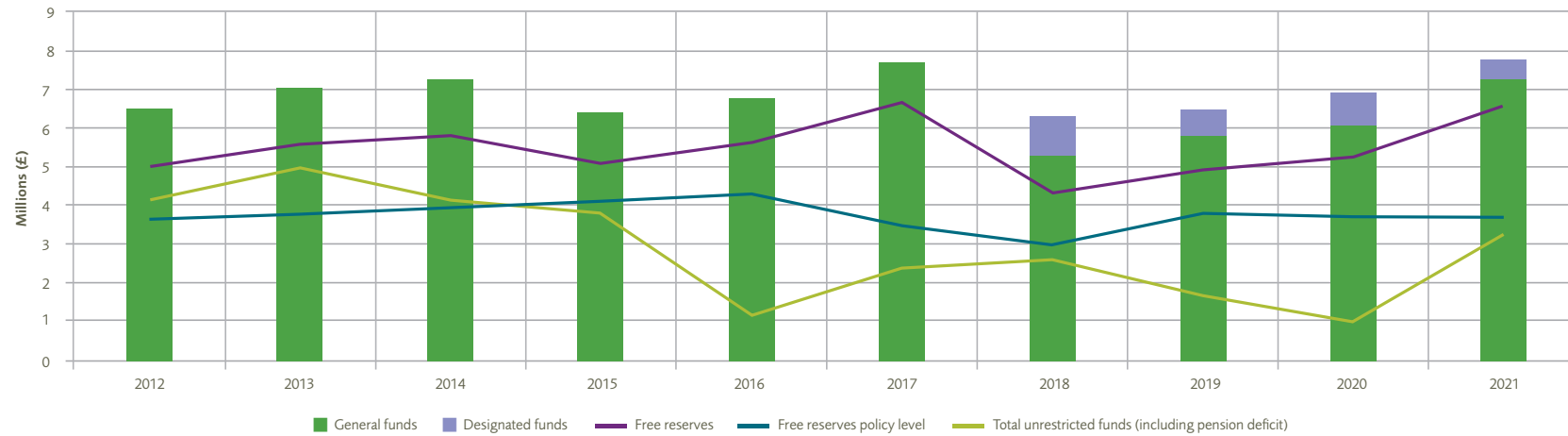
Payroll costs and staff numbers (full time equivalent) – last 10 years



### Operating income and expenditure (unrestricted funds) – last 10 years



### Reserve levels (unrestricted funds) – last 10 years



The full Trustees Report and Financial Statements for the year-ended 2021 can be viewed online at: [www.icheme.org/financial-statements](http://www.icheme.org/financial-statements)



# Membership statistics

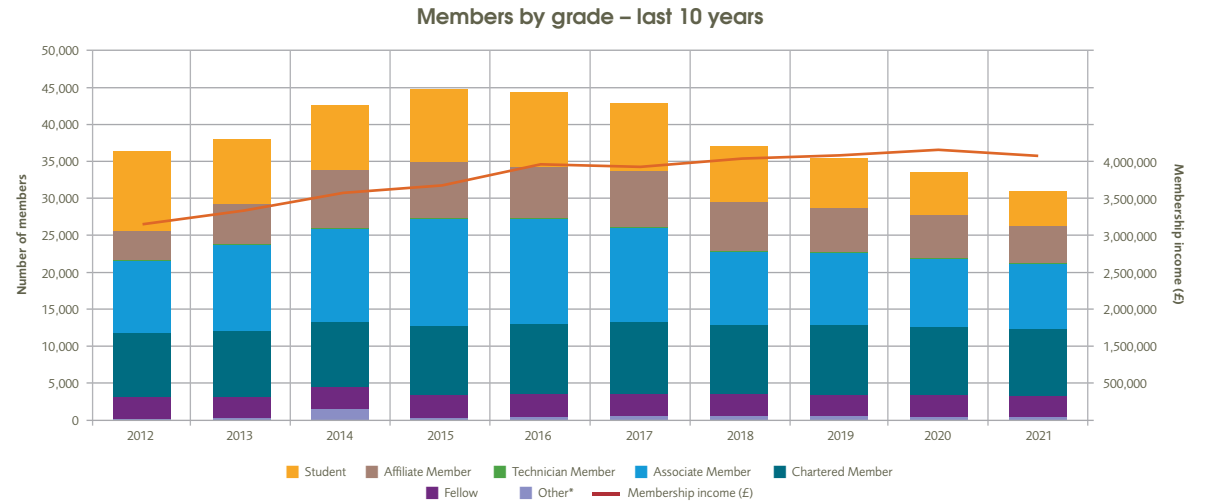
The total number of IChemE members as at 31 December 2021 stood at 30,865, of which 39% were professionally qualified.

In order to operate as a sustainable institution, IChemE needs to keep the ratio of professionally qualified and non-qualified members in balance. The critical threshold we aim for is 40% of the membership having achieved Chartered or Fellow status as this means that we can maintain a large enough pool of volunteers to mentor, train and assess the next generation.

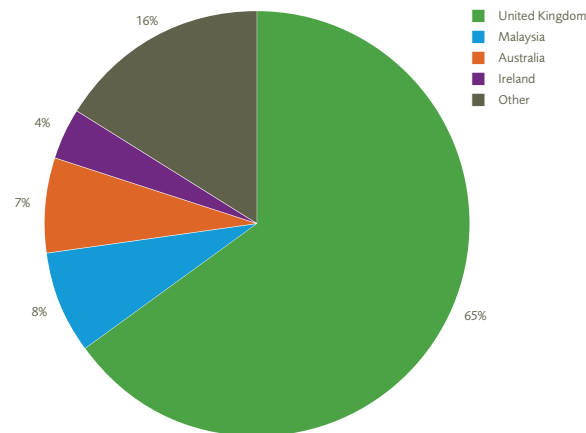
During the period 1960 – 2007 this threshold was consistently exceeded but by 2016 the figure had dropped to below 28% which put the Institution at risk of becoming unsustainable. Over the last six years, our overall membership numbers have fallen as our focus has switched from a strategy of growing the global student membership year on year, to one of ensuring sustainable growth and retention across all grades of membership.

As part of this strategy, the membership subscription and arrears process was improved in 2018 so that members who chose not to renew their membership were lapsed in year for non-payment of their annual subscription fees. This resulted in a larger drop off in numbers in 2018 but has meant that from that point forward, the data reflected active paying members, and has enabled IChemE to maintain the level of subscription income while concentrating on delivering services for truly engaged members.

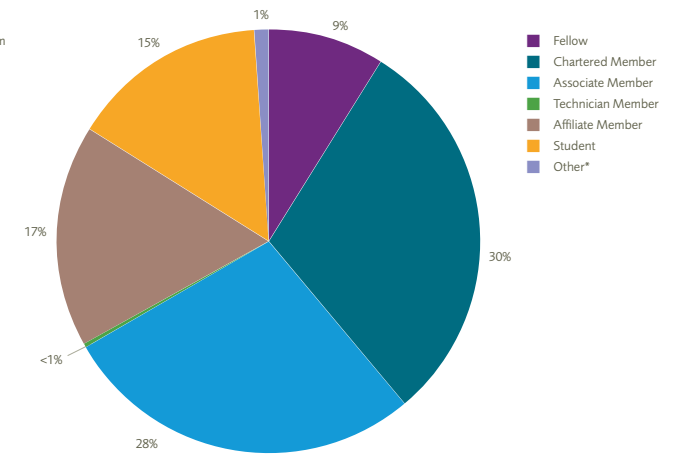
The chart entitled 'Members by grade – last 10 years' illustrates that the number of professionally qualified members and membership income have remained steady over this period.



**Members by country (31 December 2021)**



**Members by grade (31 December 2021)**



\*Associate Fellow/Process Safety (Associate/Member/Fellow)

# Governance and leadership

## IChemE Board of Trustees

### Stephen Richardson CBE

President (to 14 June 2021)  
Immediate Past President (from 14 June)  
Emeritus Professor of Chemical Engineering, Imperial College London, UK

### Ken Rivers

Immediate Past President (to 14 June 2021)  
Chair, COMAH Strategic Forum, UK

### Jane Cutler

Deputy President (to 14 June 2021)  
President (from 14 June)  
Councillor, Town of Cambridge, Australia

### David Bogle

Deputy President (from 14 June 2021)  
Pro-Vice-Provost, Doctoral School, University College London, UK

### Iain Martin

Honorary Treasurer  
Consultant, Freshwater Consulting, UK

### Ainslie Just

Vice President – Qualifications (to June 2021)  
Principal Advisor, Phronis Consulting, Australia

### Rob Best

Vice President – Qualifications (from 14 June 2021)  
Retired

### Tom White

Vice President – Regions (to 14 June 2021)  
Chief Executive, C-Capture, UK

### Andrea Hosey

Vice President – Member Engagement (from 14 June 2021)  
Operations Manager, Nuffield Group, Australia

### Jarka Glassey

Vice President – Learned Society (to 14 June 2021)  
Professor, School of Engineering, Newcastle University, UK

### Alexandra Meldrum

Vice President – Learned Society (from 14 June 2021)  
Facilitator in Charge, Australian Graduate School of Management, University of New South Wales, Australia

### Macsene Isles-Ahite

Ordinary Member  
Managing Director, Browns Wood Services, UK

### Keith Plumb

Ordinary Member (to 14 June 2021)  
Director, Integral Pharma Services, UK

### Mark Sutton

Ordinary Member  
Business Development Director, Johnson Matthey, UK

### Wendy Wilson

Ordinary Member  
Retired

### Peter Ashman

Regional member (Australia)  
Director (People and Infrastructure) Faculty of Engineering, Computer and Mathematical Sciences, University of Adelaide, Australia

### Jane Atkinson CBE FREng

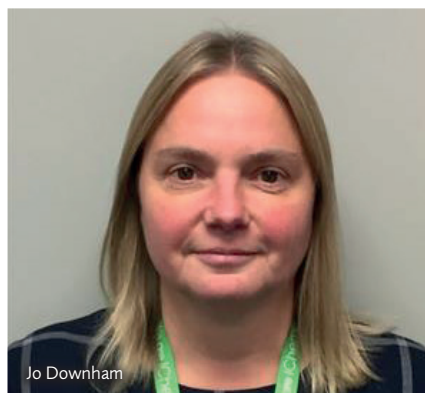
Regional member (UK)  
Executive Director of Engineering and Automation, Bilfinger UK, UK



# Governance and leadership

## IChemE Senior Management Team

- |                       |   |
|-----------------------|---|
| Jon Prichard          | Chief Executive                         |
| Jo Downham            | Director, Finance and Business          |
| Claudia Flavell-White | Director, Learned Society               |
| Andrew Foster         | Director, Regions (from September 2021) |
| Trish Kerin           | Director, IChemE Safety Centre          |
| David Lloyd-Roach     | Director, Qualifications                |
| Peter Slane           | Director, Regions (to July 2021)        |



Led by members, supporting members  
and serving society

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