

Annual Review 2015

Incorporating the annual report and accounts
of the Institution of Chemical Engineers



**Advancing chemical
engineering** for the
benefit of the wider
community

An evolving discipline in a changing world

I was recently asked to define chemical engineering in 100 words. That's a bit like describing an elephant – very hard to do, but you know one if it falls on you. So here goes.

"Chemical engineering enables us to create products and processes that improve quality of life. This involves the safe and sustainable design, construction and operation of complex process systems.

Chemical engineers identify problems and create solutions to deliver optimal outcomes. They work in diverse sectors, including, water, energy, food and pharmaceuticals, applying their skills across the full product life cycle from raw material extraction and processing, through to the manufacture of finished goods.

Chemical engineering is an evolving discipline in a changing world. Education, training and research play a central role. Chemical engineering matters to everybody."

The final sentence is important, because this is the proposition that shapes IChemE's role in the world. It's the reason why our Institution was formed in 1922. It's why we continue our work as an independent public benefit charity, committed to advancing chemical engineering worldwide. However, we couldn't do anything without the dedicated contributions from our 44,000 members, and the activities described in these pages are a testimony to their work. I am particularly pleased with the developments in Nigeria and South Africa. IChemE is making progress in a continent that has great promise, and one that is close to my heart.

Throughout my presidency, I have encouraged Council to focus firmly on developing a new strategy for the future. This has not been easy, due to the economic turbulence in many of the sectors where IChemE members work and its impact on our operations.

Nonetheless, significant foundations for the future have been laid in three areas. First, there is recognition that IChemE must take steps to internationalise its governance and its structures. Second, we must find new ways of inspiring and engaging the next generation. And third, we will need to undergo a significant digital transformation in order to make any of this possible.

The world is changing and IChemE must evolve too. It has been an honour to help this wonderful Institution on that important journey.



Andrew Jamieson OBE

IChemE president 2015–2016



Photo courtesy of Viva Energy Australia



The journey continues

Look into the window of any home and the impact of chemical engineering is everywhere – in the water we drink, the energy we use and the food we eat. Our profession makes a difference, and it's a profession IChemE is proud to serve.

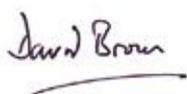
I'm pleased to report that your Institution continues to move forward and grow. Membership exceeded 44,000 at the end of 2015. This includes an increase in the number of Chartered Members elected, along with the success of the Professional Process Safety Engineer qualification allied to the expansion of the IChemE Safety Centre. Young people too continue to be attracted to chemical engineering, in numbers that other disciplines can only dream of.

We ran 14 *Chemical Engineering Matters* engagement events this year, evidence of how our discipline can help tackle some of the biggest global challenges. We also expanded our range of webinars, courses, conferences and events, from local meetings to major international gatherings such as *Hazards*.

The Chemical Engineer magazine has a fresh new look and IChemE's journal portfolio has expanded. Our established journals are highly regarded channels for communicating chemical and biochemical developments. Independent assessment of their influence shows a continuing increase in their Impact Factors.

All this has been against a background of a sustained downturn in the global oil price. I know many are feeling the consequences, and wherever possible we encourage companies to continue investing in people and skills in these difficult times. Inevitably the economic climate has hit some of IChemE's income sources, but we are confident that by prioritising projects that make the organisation more efficient and effective, we will recover.

Your Institution has been on a journey in recent years – a journey to a genuinely global, ambitious and innovative professional community that punches well above its weight and achieves real impact around the world. But the journey continues, and as our 2022 centenary begins to appear on the horizon we face new challenges and new opportunities. We will rise to them, so that IChemE continues to be relevant and valuable for chemical engineers of the next decade and beyond.



David Brown
Chief executive officer



Photo courtesy of Petronas



Building and sustaining a professional community

Accreditation, education and qualifications are the foundations of professional excellence

The Institution's commitment to advancing chemical engineering worldwide continued in 2015. Year-on-year membership growth remained robust at 5%, with membership now exceeding 44,000. IChemE members can be found in more than 120 countries. Australia (4,126), Malaysia (5,647) and the UK (24,246), maintained their positions as the top three domiciles.

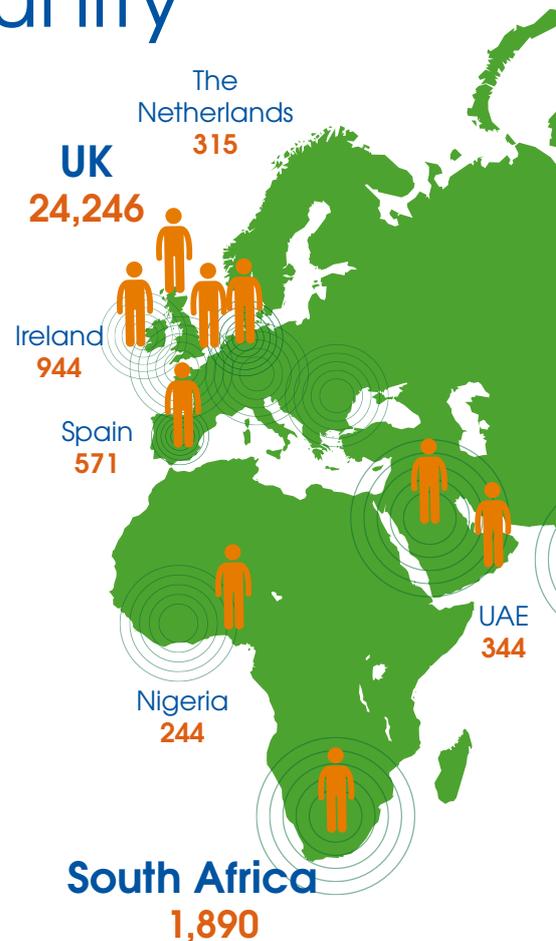
Members of the South African Institution of Chemical Engineers (SAIChE) were fully incorporated into IChemE membership during the year. South Africa is now home to the fourth biggest national IChemE community with 1,890 members at year end.

Other international developments saw the Nigerian Society of Chemical Engineers (NSChE) confirmed as an Affiliate Society of IChemE in August. In September, the Official College of Chemical Engineers of the Community of Valencia (COIQVC) became IChemE's first European Affiliate Society. IChemE also held the first in a series of collaborative events with the Thai Institute of Chemical Engineering and Applied Chemistry (TIChE) and Engineering Institute of Thailand (EIT).

Chartered Chemical Engineer status remains the membership 'gold standard' and a much sought-after qualification. 802 individuals were elected to the grade in 2015. In addition, a further 136 eminent chemical engineers were elevated to Fellow status.

In response to the demand for a broader qualification offer in the vital area of process safety, IChemE launched a new membership grade. Associate Member (Process Safety) was introduced in October. The new qualification offers an important stepping stone for those working towards becoming a Professional Process Safety Engineer.

At grassroots level, chemical engineering remains the fastest-growing engineering discipline in the UK, with more than 10,000 students at different stages of study in 2015. Interest in the discipline reached a record high, with a 16% increase in applications and a first-year intake of 3,775. This outcome is attributed, in part, to IChemE's *whynotchemeng* campaign. A large number of requests for school visits and careers information were fulfilled during the year.



UK student intake
3,775

New grade introduced
Associate Member
(Process Safety)

Membership
44,000



New Chartered Engineers
802

New Fellows
136

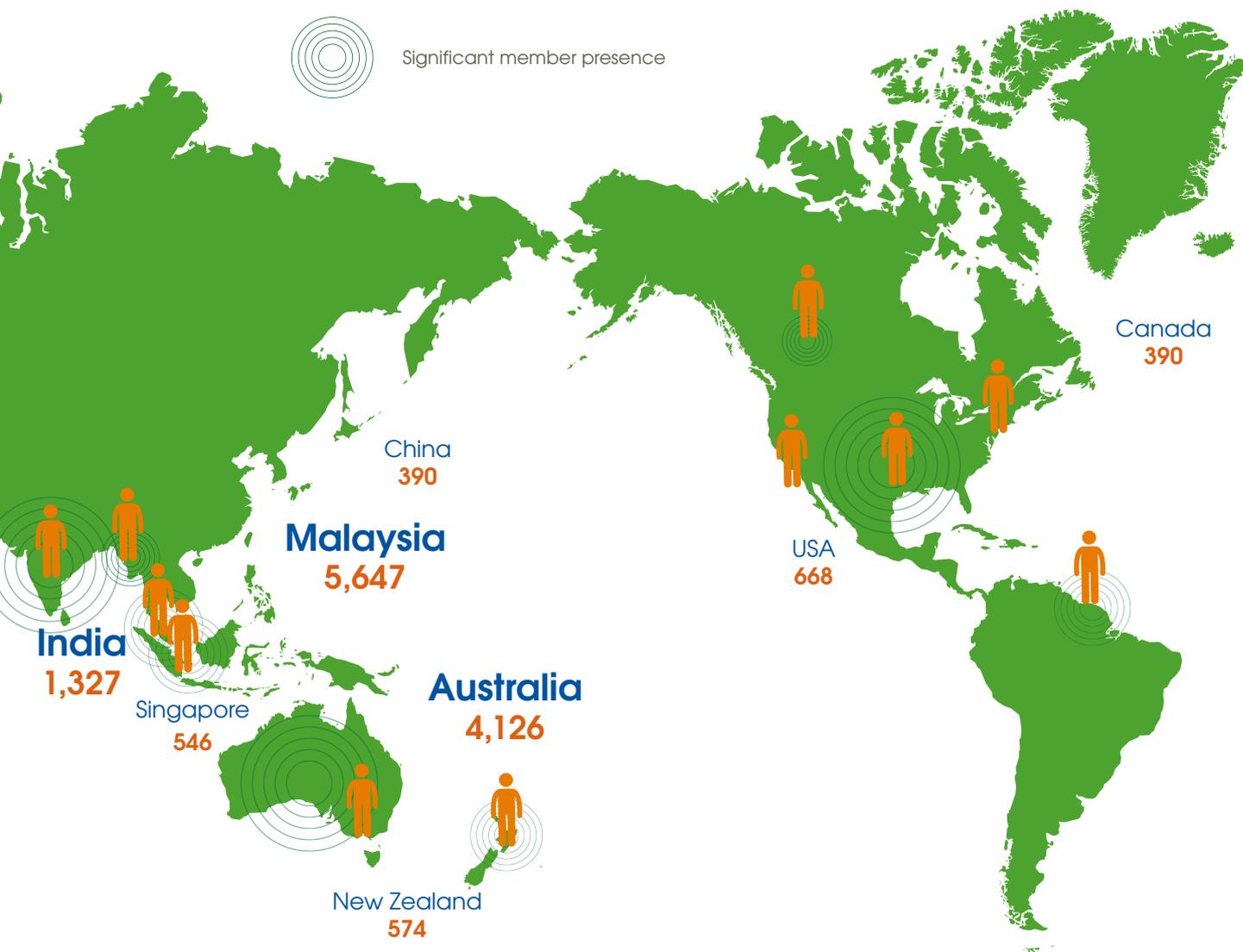
223 accredited chemical engineering courses in **13** countries



Territories with IChemE offices or senior ambassadors



Significant member presence



Elsewhere, the chemical engineering university intake in Malaysia exceeded 2,100. A further 825 and 110 students completed their studies in Australia and New Zealand in 2015.

IChemE's accreditation and qualifications processes ensure the highest levels of competence and professional commitment - to build trust in chemical engineers.

Progress in this area was driven by the activities of the Qualifications Commission. Significant work was completed on scoping a new Professional Learning Community capable of delivering world-class education, training and career development support. Initial developments included a detailed mapping of the training courses available to chemical engineers. It also included the rigorous, systematic revision of IChemE's Accreditation Guidelines for higher education programmes, which drew on the expert input of more than 30 university departments around the world. The revised guidelines will be implemented in 2016.

Universities receiving course accreditation for their Bachelor's programmes included Bradford University in the UK and, for the first time, Eindhoven University of Technology in the Netherlands.



New Affiliate societies

- Nigerian Society of Chemical Engineers (NSChE)
- The Official College of Chemical Engineers of the Community of Valencia (COIQVC)



Total income
£7.3m

Influencing and engaging

Partnership and policy development builds profile and reputation

IChemE continued to build on its *Chemical Engineering Matters* initiative to engage with stakeholders in Malaysia, the Netherlands, Qatar, Singapore, South Africa and in the UK. This included two workshops with a specific focus on process safety at the *Hazards 25* conference in Edinburgh, UK and at the *6th Regional Process Safety Seminar* in Kuala Lumpur, Malaysia.

One of the main outputs from *Chemical Engineering Matters* in 2015 was the launch of IChemE's Energy Centre. The Centre will develop new thinking and provide leadership on energy policy matters. Five priority topics were agreed in October, including energy efficiency and nuclear power generation. The Centre issued a *Climate Communiqué* in November before participating in the COP21 climate change talks in Paris, France.

In process safety, the IChemE Safety Centre (ISC) saw steady membership growth in its second year of operation, with 22 Operating and Industry Partners signed up. ISC also launched its first guidance documents, addressing industry challenges in the areas of competency management and process safety metrics. ISC speakers were welcomed to process safety conferences in Belgium, Turkey and the US.

The IChemE Frank Morton Sports Day, an annual event for chemical engineering undergraduates, took place at Birmingham's Barclaycard Arena. Hosted in partnership with the University of Birmingham, it was attended by over 2,700 students from the UK and Ireland.

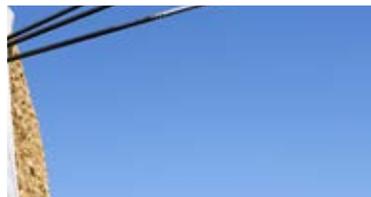
In June, IChemE joined over 3,500 exhibitors at the triennial ACHEMA trade show in Frankfurt, Germany. The event provided a valuable opportunity to engage with international partners, including the World Chemical Engineering Council and DECHEMA – Germany's pre-eminent society for chemical engineering and biotechnology.

Towards year-end, plans were finalised for a new bio-futures project. This initiative will enable IChemE to further diversify its work programmes and support new activity beyond the core oil and gas sector.

Salt Lake City, US was the setting for the November launch of IChemE's second technical Green Paper – *Getting to grips with the water-energy-food Nexus*. The paper calls for greater investment from funding agencies for systems thinking Nexus research.

IChemE recognises and rewards organisations that demonstrate a commitment to the profession through its Corporate Partnership and Accredited Company Training Scheme (ACTS) programmes. New additions in 2015 included Ingen-Ideas, who secured Gold Corporate Partner status. The list of bronze partners also grew to include Centrica, RDS, and WSP.

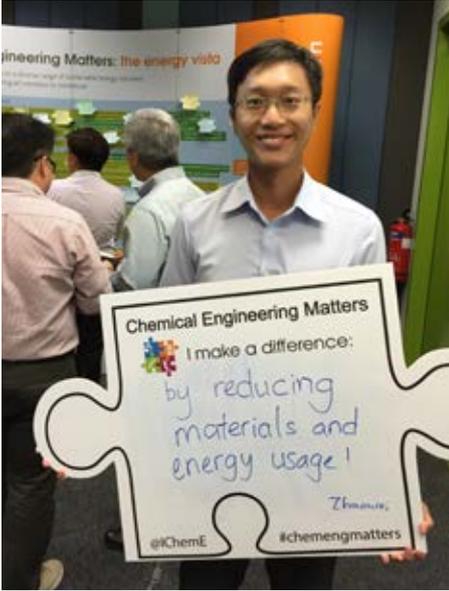
Training programmes at Eli Lilly, Jacobs Douwe Egberts, Lorien, and Penspen, were awarded ACTS status in recognition of their structured approach to the professional development of graduate chemical engineers.





New Corporate Partners
Gold – Ingen Ideas
Bronze – Centrica, RDS, and WSP

New ACTS providers
Eli Lilly, Jacobs Douwe Egberts, Lorient, and Penspen



iChemE Safety Centre

First guidance documents produced



Second policy Green Paper
Getting to grips with the water-energy-food nexus



iChemE Energy Centre

launched



Delivering content and services



Redesigned
The Chemical Engineer

New Jobs board **New** Mobile app



3 New publications launched

Professional Services Contract – The Silver Book

New journals

Sustainable Production and Consumption

Molecular Systems Design and Engineering



IT platforms and tools support professional development and knowledge transfer

The smooth and efficient operation of a global membership organisation depends heavily on state-of-the-art data handling. IChemE's membership database facilitates improved processing of member data and streamlined back-office functionality. Members now enjoy more control over their own personal information via 'MyIChemE', which is accessible on the home page of the IChemE website.

IChemE's *mycareerpath* is a popular online tool that members can use to plan their career development, record training and log personal goals. From 2017, IChemE will be checking a random sample of Chartered Members to assess their compliance with the requirement to undertake continuing professional development (CPD). This new CPD policy anticipates similar changes by IChemE's own regulators. A new initiative to help members achieve best practice in their CPD was announced in December 2015.

The Chemical Engineer magazine was once again rated as the preferred means of keeping in-touch with developments relating to the profession. The magazine underwent a complete makeover in December. The new slimline format, which continues to carry the same varied mix of news, business and technical features, was well-received by readers.

In response to the rapidly-changing media landscape, 2015 also saw developments on the digital front.

The Chemical Engineer went mobile and virtual, with the launch of a new mobile app. Members in most parts of the world can now access a fully-searchable version of the latest issue and an extensive archive of back copies, via their mobile phones and tablets. Recruitment advertising also moved onto the web with the launch of a new online jobs board.

IChemE's learned journals saw healthy increases to their Impact Factors, reinforcing their important role in communicating the latest research findings. *Process Safety and Environmental Protection* was the strongest performer, seeing a leap of 40% to 2.551; its highest ever score.

New developments on the journal front included the launch of two new titles; *Sustainable Production and Consumption*, and *Molecular Systems Design and Engineering* – in partnership with the Royal Society of Chemistry. In addition, the *South African Journal of Chemical Engineering* was added to the IChemE portfolio.

2015 also saw the arrival of a new addition to IChemE's *Model Forms of Contract*. In common with the other titles in the internationally acclaimed series, the *Professional Services Contract – The Silver Book*, is available in hard copy, PDF and editable document formats.

New interactions for chemical engineers



52 webinars hosted
4,150 participants

Training

110 courses
1,200 delegates



Inaugural Trevor Kletz lecture at Hazards 25



New member groups

- Calgary
- The Netherlands
- Trinidad & Tobago



20 SIGs with **15,813** members

Professional development is supported by IChemE's extensive international training programme. In 2015, training was delivered in locations including Abu Dhabi, Australia, Japan, Malaysia, New Zealand, Singapore, South Africa, the US and the UK. Highlights included the launch of new courses covering asset integrity, process safety key performance indicators and energy cost reduction. Henry Kister's *Practical Distillation Technology* training was delivered in Singapore for the first time. IChemE also joined forces with the Mary Kay O'Connor Process Safety Centre and The Keil Centre to break new ground and deliver its *Human Factors in Health and Safety* training in the US, with Houston and San Jose chosen as the initial venues.

The *Hazards* process safety conference series was hosted for the second time in Australasia with the venue switching from Perth to Brisbane. Kuala Lumpur, Malaysia hosted *Hazards AP* for the third time in succession. Meanwhile, the original *Hazards* meeting moved on from its spiritual home in north west England and crossed the border to Scotland. *Hazards 25* was delivered in a new partnership with the Mary Kay O'Connor Process Safety Centre. *Hazards 25* and *Hazards Australasia* also featured the inaugural Trevor Kletz lecture, delivered by Sam Mannan from Texas A&M University.

Working in partnership with Engineers Australia, IChemE delivered the *2015 Asian Pacific Confederation of Chemical Engineering Congress (APCChE 2015)* and *International Conference on Coal Science & Technology (ICCS&T)*.

IChemE's 20 Special Interest Groups (SIG) cover a wide range of industry sectors, technologies and specialisms. Driven by local demand, a Palm Oil Processing SIG was launched in Kuala Lumpur, Malaysia in August. Steps were also taken to expand the operation of the Education SIG to Australia and New Zealand.

SIG-sponsored webinars continued to prove popular. 52 online presentations were delivered in 2015, reaching more than 4,000 participants around the world. The Safety & Loss Prevention SIG captured the biggest online audience for a presentation on *Large Losses in the Hydrocarbon Industry - Analysis and Learning*.

Local and regional Member Groups continued to provide opportunities for chemical engineers to network, and share ideas with colleagues and peers. Spanning five continents and delivered predominantly by volunteers, 2015 saw the IChemE community expand further with the launch of new groups in Calgary, Canada, the Netherlands, and Trinidad and Tobago.

Global award winners

Global winner – Award for Outstanding Achievement in Chemical and Process Engineering (sponsored by Saudi Aramco)

Hot on the heels of success in the *Oil and Gas Award* category, Pacific Northwest National Laboratory in Washington, US, was the overall winner in 2015. The award recognised its outstanding work in developing a new type of hydraulic fracking fluid with greatly improved environmental impact.

Visit: www.icheme.org/globalawards2015 to view the full round-up and winners list.

IChemE Singapore Awards 2015

The National University of Singapore (NUS) took away three of the five awards presented: *Research Project of the Year Award* and the *Sustainable Technology Award* – for its work on developing innovative adsorbents for carbon capture made from waste biomass. NUS' Han Gan was named *Young Chemical Engineer in Research*.

Visit: www.icheme.org/singaporeawards2015 to view the full round-up and winners list.

IChemE Malaysian Awards 2015

PETRONAS was the victor in three of the eight award categories – the *Oil and Gas Award* for the development of a new low-viscosity drilling fluid, that operates at low temperatures with improved safety and environmental performance. Other awards included the *Sustainable Technology Award* and the *Young Chemical Engineer in Industry Award* which was won by PETRONAS' Ezmad b Ab Rashid.

Visit: www.icheme.org/malaysiaawards2015 to view the full round-up and winners list.

Sustainability Teaching Award

The department of chemical engineering at University College London, UK, won the inaugural Sustainability Teaching Award. The award is jointly supported by the Sustainability and Education Special Interest Groups to encourage the teaching of sustainability principles to undergraduate students.

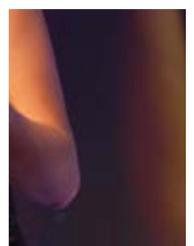
New Honorary Fellows:

- Beki Hlatshwayo – Past president of the South African Institution of Chemical Engineers
- Ian Swales – Former UK Member of Parliament and chair of the North East Process Industry Cluster
- Gordon Bateman – Past chair of IChemE Contracts Committee
- Professor Romeela Mohee – Vice chancellor, University of Mauritius

Ashok Kumar Fellowship:

The Ashok Kumar Fellowship, which provides funding for a three-month posting in the UK parliament, was awarded to Michael Jenkins, University College London, UK.





Medal winners

Outstanding achievement and exceptional work across all aspects of chemical, biochemical and process engineering

The Institution announced the following medal winners in 2015. Visit www.icheme.org/medals to view full details.

Council Medal	Ed Daniels, Shell, The Netherlands/ UK
Arnold Greene Medal	Keith Johnson, Sellafield Ltd, UK
Nicklin Medal	Colin Hare, University of Leeds, UK
MM Sharma Medal	Roger Sargent, Imperial College London (retired), UK
Sargent Medal	Costas Pantelides, Imperial College London and Process Systems Enterprise, UK
Donald Medal	Athanasios 'Sakis' Mantalaris, Imperial College London, UK
Hebden Medal	John Griffiths (formerly of Jacobs Engineering), and David White, D J White & Associates, UK
Bird Stewart & Lightfoot Medal	John Davidson, University of Cambridge, UK
Frank Morton Medal	Khairiyah Mohd Yusof, Universiti Teknologi Malaysia, Malaysia
Lees Medal	Fiona MacLeod, Unit Operations, UK
Chemeca Medal	Suresh K Bhargava, RMIT University, Melbourne, Australia
Senior Moulton Medal	Feriha Mugisha Mukuve and Richard A Fenner, Centre for Sustainable Development, Department of Engineering, University of Cambridge, UK
Junior Moulton Medal	Charles Cunaulta, INRA, Villeneuve d'Ascq, France and Henning Fosteb, Technische Universitat Braunschweig, Germany
Hutchinson Medal	K E Kakosimos, Department of Chemical Engineering, Texas A&M University at Qatar and Mary Kay O'Connor Process Safety Centre
Hanson Medal	Peter Gostomski, Chemical and Process Engineering Department, University of Canterbury, Christchurch, New Zealand
Ambassador Prize	Rachel Cooke, SABMiller, UK



Governance and leadership

IChemE Council members

Andrew Jamieson OBE FREng President	Director, Woodside Petroleum, Australia
Geoffrey Maitland FREng Immediate past president	Professor of energy engineering, Imperial College London, UK
Jonathan Seville FREng Deputy president	Executive dean of the Faculty of Engineering and Physical Sciences University of Surrey, UK
Ken Rivers Honorary treasurer	Chair, Midstream Oil Sector Government & Industry Task Force, UK
Bill Harper Vice president (qualifications)	Engineering Authority, Sellafield Ltd, UK
Paul Ellis Vice president (international)	Managing director, Schaefer Kalk, Malaysia
Jon-Paul Sherlock Vice president (technical)	Director, pharmaceutical innovation, AstraZeneca, UK
Rose Amal Vice president (Australia)	Scientia professor and ARC Laureate Fellow, University of New South Wales, Australia
Jarka Glassey	Professor of chemical engineering education, Newcastle University, UK
Lynn Gladden CBE FRS FREng	Shell professor of chemical engineering, University of Cambridge, UK
Steve Harrow	Manager process engineering, capital projects & asset management, Amec Foster Wheeler, UK
Iain Martin	Innovation and technology director, Process Technologies Division, Johnson Matthey, UK
Abdul Aziz bin Abdul Raman Deputy chair, IChemE Malaysia	Professor of chemical engineering, University of Malaya, Malaysia
David Platt	Managing director PDV Consultants, New Zealand
John McGagh	Chief digital officer, Snowy Hydro, Australia
Colin Webb	Professor of chemical engineering, University of Manchester, UK

IChemE senior management team

David Brown	Chief executive officer
Justin Blades	Deputy chief executive & chief operating officer
Neil Atkinson	Director of qualifications and international development
Jo Downham	Director of finance and business
Claudia Flavell-While	Director of publications
Andrew Furlong	Director of policy and communications
Peter Slane	Director, Australasia
Bakhtiar Talhah	Director, South East Asia

Financial results

During 2015, the Institution's financial performance was severely impacted by the fall in oil price, as companies cut their discretionary spending on training and event attendance. For the first time in 12 years, the Institution moved from a surplus on operating activities, to posting a deficit of £785,000 (2014: surplus £280,000).

Although a number of steps were taken to reduce costs, Council took the decision early in the year not to reduce or defer investment on existing or new projects.

This was on the basis that the level of free reserves held was sufficient to withstand the deficit, and to enable IChemE to position itself strongly for the future.

Total income for the year was £7,369,000 (2014: £8,542,000).

The Institution's wholly-owned trading subsidiary IChemE Ltd achieved an operating surplus of £171,000 (2014: £206,000) which has been gift aided to the Institution.

Statement of financial activities for the year ended 31 December 2015

	Unrestricted funds £000	Restricted funds £000	Total 2015 £000	Unrestricted funds £000	Restricted funds £000	Total 2014 £000
INCOME AND ENDOWMENTS FROM						
Donations & legacies	51	33	84	69	-	69
Charitable activities:						
Build & sustain an active international community	3,350	-	3,350	3,351	-	3,351
Engage with others to promote chemical engineering	258	-	258	267	-	267
Provide support & services to others	1,843	250	2,093	2,498	284	2,782
Enable chemical engineers to interact & communicate	1,166	-	1,166	1,522	-	1,522
Other trading activities:						
Trading operations	290	-	290	408	-	408
Other operating income	-	-	-	10	-	10
Investments	101	27	128	106	27	133
TOTAL INCOME	7,059	310	7,369	8,231	311	8,542
EXPENDITURE ON						
Raising funds:						
Trading operations	(119)	-	(119)	(212)	-	(212)
Investment management costs	(56)	(15)	(71)	(26)	(11)	(37)
Charitable activities:						
Build & sustain an active international community	(2,423)	-	(2,423)	(2,187)	-	(2,187)
Engage with others to promote chemical engineering	(1,244)	-	(1,244)	(1,041)	-	(1,041)
Provide support & services to others	(2,225)	(322)	(2,547)	(2,233)	(255)	(2,488)
Enable chemical engineers to interact & communicate	(1,858)	-	(1,858)	(2,303)	-	(2,303)
TOTAL EXPENDITURE	(7,925)	(337)	(8,262)	(8,002)	(266)	(8,268)
Net gains / (losses) on investments	81	23	104	51	19	70
NET INCOME / (EXPENDITURE)	(785)	(4)	(789)	280	64	344
Actuarial gains/(losses) on defined benefit pension schemes	426	-	426	(1,102)	-	(1,102)
NET MOVEMENT IN FUNDS	(359)	(4)	(363)	(822)	64	(758)
Fund balances brought forward at 1 January	4,156	1,991	6,147	4,978	1,927	6,905
Fund balances carried forward at 31 December	3,797	1,987	5,784	4,156	1,991	6,147

The results relate to the continuing activities of the Institution

Balance sheet as at 31 December 2015

	Group		Charity	
	2015	2014	2015	2014
	£000	£000	£000	£000
Fixed assets:				
Tangible assets	1,318	1,450	1,292	1,443
Investments	6,452	6,541	6,452	6,541
	7,770	7,991	7,744	7,983
Current assets:				
Debtors	1,140	1,533	1,271	1,680
Cash at bank and in hand	2,043	2,253	815	1,211
	3,183	3,786	2,086	2,891
Creditors: Amounts falling due within:				
one year	(2,544)	(2,521)	(2,043)	(2,081)
Net current assets	639	1,265	43	810
Total Net Assets before pension deficit	8,409	9,256	7,787	8,793
Pension scheme funding deficit	(2,625)	(3,109)	(2,625)	(3,109)
Total Net Assets after pension deficit	5,784	6,147	5,162	5,684
Income funds:				
Fixed asset reserves	1,318	1,450	1,292	1,443
Free reserves	5,104	5,815	4,508	5,359
Pension reserves	(2,625)	(3,109)	(2,625)	(3,109)
Unrestricted funds	3,797	4,156	3,175	3,693
Restricted income funds	1,987	1,991	1,987	1,991
	5,784	6,147	5,162	5,684

Council's statement on the summarised financial statements

These summarised financial statements are a summary of information extracted from the statutory Council's report and consolidated financial statements. They may not contain sufficient information to allow for a full understanding of the financial affairs of the Institution. For further information, the full consolidated financial statements, the auditors' report on those consolidated financial statements and the Council's report should be consulted.

Copies of these can be obtained from the finance department by email: jdownham@icheme.org

On behalf of the Council



Dr Andrew Jamieson OBE
President



Mr Ken J Rivers
Honorary treasurer

Get involved – Get in touch

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IChemE is a registered charity in England and Wales (214379) and a charity registered in Scotland (SC 039661)

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