

CHEMICAL ENGINEERING MATTERS



Andrew Furlong

The Institution of Chemical Engineer's Director of Policy & Communication, Andrew Furlong, talks about a new initiative that will highlight the role of the chemical engineer in delivering better quality of life.

IChemE issued a poster during the 1980s, extolling the virtues of chemical engineering. The narrative went something like this:
"If you don't wash, or use deodorant, shave, or wear cosmetics, eat, feed your pets, work on a farm, wear wellies, drive a car, play music, go on holiday – or stay at home, sleep on a mattress, take medicine, comb your hair, or wear a hat, go to the movies, watch television, listen to the radio, buy books, or read magazines, drink water, or breathe then... chemical engineering doesn't affect your life!"

The effectiveness of this promotional campaign was limited in an era when the best engineering graduates were all too frequently seduced by the prospect of a brick-sized mobile phone and evenings spent waving fifty pound notes in City of London wine bars. Nonetheless, the central message remains true – chemical engineering matters.

TALENT PIPELINE IN CRISIS

UK chemical engineering was facing a crisis by the mid-1990s. Applications to study the subject at first degree level were forecast to plummet and many departments were struggling to secure students with the good A-level grades that are a prerequisite for success on a demanding degree course. Urgent intervention was called for and a new campaign, dubbed *whynotchemeng*ⁱ, was launched in 2001 with

substantial backing from industry and from many UK universities. The campaign highlighted the product and lifestyle outcomes supported by chemical engineering. Based on careful market research, *whynotchemeng* was both focused and targeted; features that are often lacking in many STEM careers campaigns. *whynotchemeng* has triggered substantial growth in the number of young people applying to study chemical engineering in the UK. UCAS reported a record number of applications in 2011, with 2201 chemical engineering students commencing their studies last September. This increase represents growth of 234% since the launch of *whynotchemeng* and an improvement that surpasses other mainstream engineering disciplines. New programmes have been launched, or are under consideration, at Lancaster and Liverpool John Moores, adding to recent additions at Aberdeen, Bradford and Hull, while other departments have expanded intake numbers. Meanwhile, the quality threshold for applicants has soared and three A grades at A level is the entry requirement for many departments. At undergraduate level, the chemical engineering talent pipeline has never been in better shape.

PUBLIC UNDERSTANDING

Despite this positive backdrop, chemical engineering remains opaque to the wider

public, as well as amongst opinion formers and policy makers. Opinion research carried out for IChemE by IPSOS-MORI consistently reveals that less than a third of the public claim any real understanding of what chemical engineers do. Ignorance is never bliss, however, and IChemE continues to work through its 38,000 members worldwide to improve public understanding of chemical engineering and science and technology more generally. Engagement with others to promote the development and use of chemical engineering and the appreciation of its importance is a key component of the Institution's plan and one that is fully aligned with its Royal Charter obligation to act with integrity and in the public interest.

WHAT DOES SOCIETY NEED?

IChemE celebrated the 50th anniversary of the granting of its Royal Charter in 2007. This presented an ideal opportunity to take stock and to scope out the role of the discipline in delivering sustainable solutions to the challenges confronting humanity. IChemE published the *Roadmap for 21st Century Chemical Engineering*ⁱⁱ and this report, which was widely welcomed, addressed a simple compelling question, "What does society need; what are the desirable outcomes and how can chemical engineers work in partnership with others to make it happen?" The report set out

20 goals, underpinned by a series of action plans that would need IChemE support.

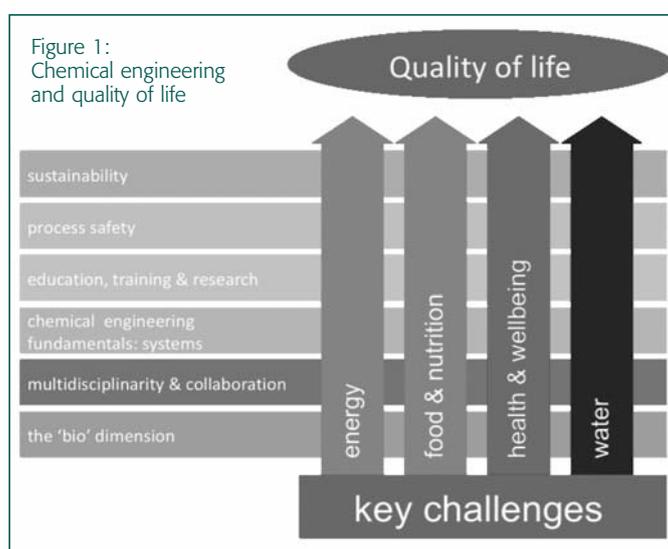
The report was written before the onset of the global financial crisis. Iraq was still under military occupation and the Arab Spring lay around the corner. The events at Fukushima and in the Gulf of Mexico were yet to unfold. The potential of shale gas was still not fully understood and concerns around access to rare earth metals and other strategically important resources had not materialised. Crystal ball gazing is a risky business, but despite the uncertainties of geopolitics and its impact on the world of chemical engineering, IChemE has made progress since 2007 and a good deal of the ambition set out in the report has been realised.

Predictably, some weaknesses were identified in the original report. Insufficient prominence was given to wealth creation. The essential role of the chemical engineer in food production and industrial biotechnology was understated and some stakeholders viewed the action plans as too narrow, or too vague. Further work was needed to build on the *Roadmap for 21st Century Chemical Engineering* and five years on, the time had come to re-evaluate the report, assess its fitness for purpose and outline new ideas for the next period.

CHEMICAL ENGINEERING AND QUALITY OF LIFE

IChemE's review of its technical strategy was published in January 2013. *Chemical Engineering Matters* ⁱⁱⁱ has moved away from the traditional roadmap approach in favour of a more open-ended look at options for progress. The new report, running to a very

digestible 26 pages, is an exploration of possibilities and a vivid illustration of the versatility and wide-ranging application of chemical process solutions to human challenges. It positions the discipline as a vital piece of the jigsaw that is the quest for sustainable living in the 21st Century. The work is organised around delivering solutions in four challenge areas: food & nutrition, health & wellbeing, water and energy (Figure 1). At the same time, attention is drawn to the need to embrace a



series of essential issues and concerns in every aspect of chemical engineering practice including: sustainability, process safety, education & training, fundamental science, collaborative working and the need to accelerate the transformation to a 'bio' economy.

The report contains four 'vista diagrams' – one for each challenge area. The diagrams seek to capture the current status and some specific challenges under each heading and propose some options for action by chemical engineers and others. External factors are also addressed in the context of the four challenges. The vistas represent the beginning of a

process, rather than an end. They are intended to provoke debate and stimulate target setting. *Science in Parliament* readers are invited to download the report, which examines a number of contentious issues, including shale gas, carbon capture, water reuse, food security and bioengineering.

REACHING A WIDER AUDIENCE

In addition to an analysis of the technical contribution that chemical engineers can make to

based and supported by the strongest possible input from the engineering community. The report commits the Institution to work with its members to develop coherent policy goals that will form the basis of engagement with opinion-formers and policy-makers. IChemE's work with POST and its financial support for the Ashok Kumar Fellowship is an example of its work in this area.

Chemical Engineering Matters also challenges IChemE to rethink its public engagement work. The chemical and process industries support many of the technological advances that have improved the lives of millions of people in the UK. However, lifestyle commentary and media reports present 'chemicals' as something that can be avoided or eliminated. The reality is very different. Everything is made of chemicals and people are often anxious without reason. IChemE will encourage its members to engage productively in the public conversation about the impact of chemical processes and products. The Institution will work with science media centres and other NGOs to address the disconnect between lifestyle commentary and chemical realities.

WHAT HAPPENS NEXT?

The recycling bags in the corridors of the Norman Shaw Building and Portcullis House are frequently the first destination for much of the printed material that is sent to parliamentarians. IChemE is keen to ensure that *Chemical Engineering Matters* does not suffer the same fate. MPs and peers will be heartened to learn that the Institution does not intend to add to already overloaded in-trays. During

secure, maintain and improve quality of life all over the world, the report also examines the relationship between the profession and policymakers and the public at large. The *whynotchemeng* campaign has already done much to raise the visibility of chemical engineering as a career choice, *Chemical Engineering Matters* seeks to continue that work by enhancing the reputation of the profession more widely.

IChemE is politically neutral. However, the Institution recognises that political decisions, including those that impact on funding and the regulatory framework within which chemical engineers must operate, should be evidence-

2014, the Institution's policy team will prepare a series of short briefing papers under each of the action headings highlighted in the report. These will be used to target engagement with Associate Parliamentary Groups, Select Committees and Members of both Houses who have expressed interest in specific issues where chemical engineering can make a difference. Given the international nature of IChemE's membership, this work will not be solely confined to the UK.

Chemical Engineering Matters should prove of interest to all those whose work is

connected with government policy-making at local, national or international level. IChemE is an advocate for solutions that will support a safer and more sustainable world. If you think that our members can be a useful addition to your contact book please get in touch. To continue the conversation please email chemengmatters@icheme.org or call Dr. Alana Collis at the Institution of Chemical Engineers on 01788 534484.

References

- i www.whynotchemeng.com
- ii www.icheme.org/roadmap2007
- iii www.icheme.org/chemengmatters

ABOUT IChemE

A member of the Parliamentary & Scientific Committee, the Institution of Chemical Engineers (IChemE) is the global professional membership organisation for people with relevant experience or an interest in chemical engineering. It is the only organisation to award Chartered Chemical Engineer status.

IChemE is also licensed to award the titles of Chartered Engineer (CEng), Chartered Scientist (CSi) and Chartered Environmentalist (CEnv) to suitably qualified members. Founded in 1922 as a professional institution for chemical and process engineers, IChemE has grown to its current status of 38,000 members across 120 countries. IChemE currently has offices in Australia, China, Malaysia, New Zealand and the UK.

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Dr Alison Todman FIKE
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Can organisations afford not to invest in innovation? All recent business surveys have identified innovation as an imperative for any business to compete and grow. In recent years, considerable effort has gone into exploring the theory and practice of innovation in an attempt to capture the elusive organisational culture that underlies the ability of some organisations to excel, and to gain a competitive advantage over their peers. Leaders of industry are united in calling for innovation to be prioritised, which in turn requires an appetite for risk, resilience and the ability to adapt to changing landscapes.



Professor Sa'ad Medhat CEng
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The Innovation Institute

At Innovisions 2012 conference, Jo Lopes, Head of Technical Excellence at Jaguar Land Rover said *"Innovation is a key part of any engineer's toolbox. Innovation is the soul of engineering – it provides an engineering company with a competitive edge"*. The East of England Development Agency claims that *"Innovation plays a critical role in economic development and growth."*¹

To NEF, innovation is not an abstract concept, but a vital process that develops new products and markets and improves business performance. It is the successful implementation of creative ideas that enables an organisation to survive, adapt, change and maintain its competitive advantage. This definition is very general so that it can be used throughout education and across

all sectors of industry. While our work builds on significant research by leading experts, it also challenges and blurs some of the traditional boundaries between disciplines that are often treated as being outside innovation.

NEF Investor in Innovations® is an industry standard that identifies organisations whose culture and