

IChemE position on Climate Change

Strategic Aims

Climate science is established – global climate change is upon us, exacerbated by human activities. IChemE accepts the veracity of the science and its conclusions published by the Intergovernmental Panel on Climate Change (IPCC). To avoid irreparable social, economic and environmental damage, it is essential that we accelerate our efforts to decarbonise our economic systems and stabilise the levels of greenhouse gases in the earth's atmosphere, if we are to have any chance of limiting the global average temperature rise to 1.5 °C, beyond which catastrophic consequences are more likely. Action needs to be global and fair, recognising the relative differences between regions, both in terms of historic contributions to emissions and vulnerability to the consequences of a warming planet. Chemical engineers are uniquely placed to take action in the industries that contribute to greenhouse gas emissions to arrest and reverse the damage we humans are doing to the life support systems of our single, shared planet.

Chemical, biochemical and process engineers are equipped to imagine, design and implement:

- means of combatting the causes of climate change through reducing the emissions of greenhouse gases
- means to mitigate against the effects of climate change through adaption and developing resilient and robust processes
- means of halting or reversing the effects of climate change by further developing carbon capture and storage processes, both technological and nature based.

The IChemE aims to take a lead role in tackling climate change, working with all stakeholders, from governments to communities around the world, to deliver a fair, safe and sustainable future in which we can all thrive. We commit to the actions listed in this position statement, not only to reduce our own organisational carbon footprint to net zero by 2025, but also to work collaboratively as members, through education, research and sustainable engineering practices, in contributing globally to the transition to a net zero carbon world by 2050.

Principles

IChemE's position on climate change is founded on these principles:

1. Net Zero

IChemE fully supports the aims of the Paris Agreement to pursue efforts to limit the global temperature increase to 1.5 °C relative to pre-industrial levels. Achieving this climate goal will require net emissions of carbon dioxide and other greenhouse gases to be reduced to zero.

2. Emissions reduction must start NOW

We agree that serious action to combat climate change is urgent and must start immediately and accelerate. IChemE will work with associated industries and governments to achieve the rate of change needed to remain below 1.5 °C. The IPCC articulates this as reducing global emissions by at least 7.6% per year, every year to 2030 (as an interim target) or reducing total emissions by at least 50% each decade from now to 2050.

3. Guided by UN Sustainable Development Goals

Climate change, its mitigation and adaptation to its impacts does not exist in isolation. The Institution endorses the UN Sustainable Development Goals (SDGs) to address climate change, end all forms of poverty and inequality while making sure that no one is left behind. This means that the actions of chemical engineers should minimise impact and not shift impact elsewhere – either geographically, socially, economically, or environmentally.

4. Systems thinking

To achieve the desired outcomes, a global systems thinking approach is essential. Full and robust assessment of life cycles and their emissions, together with the drive to a circular economy, is essential practice and must be encoded in industry standards for design, construction, operation and decommissioning.

5. Global mechanisms

IChemE endorses the view that governments must take responsibility for the total emissions of greenhouse gases from their economies and must work to meet the goal of net zero by 2050 by introducing appropriate policies on taxation, carbon pricing and other policy tools.

6. Best available techniques

IChemE believes that we should make use of best available techniques to mitigate and adapt to the effects of climate change. Technologies must be chosen to ensure that innovation occurs and the status quo does not determine the outcome. Solutions must be designed to demonstrate the greatest positive outcomes for the environment and society and take into account longevity and operability in a changed environment over the life of the project (eg differing rainfall, temperature profiles).

7. Innovation

IChemE supports the development of new technologies and processes to deliver the transition to net zero emissions by 2050 at the pace required. New innovations will be needed and IChemE encourages research and development work to find the new best solutions to deploy.

8. Training and reskilling

The transition to a net zero carbon economy will bring opportunities and challenges. IChemE will work with members and the industries they work in to support the education, training and reskilling of the current and future workforce. We will ensure that chemical engineers have access to gaining skills, knowledge and experience necessary to bring about and thrive in a carbon-constrained future, not least by proactively working to support the identification, development and promotion of the new engineering technologies and associated businesses that will emerge as the foundations of a worldwide net zero economy.

9. Education

IChemE will continuously work to ensure that the fundamental principles of sustainability, social responsibility and ethics are embedded in the education and training of chemical engineers. This will be mandatory in education and through continuous professional development.

Context and Commitments

What do these principles mean for IChemE?

As a global professional membership organisation with limited staff and based on volunteer input, our direct operations have a limited impact on greenhouse gas emissions, although the members work across many industries and can significantly influence global futures. It is our duty, as set out in our Royal Charter, to bring community benefit through chemical engineering and safeguard the public interest in matters of safety, health and otherwise. We recognise that the best way to bring about the urgent action required to address the challenges of climate change is to help facilitate opportunities between members and their employers in establishing pathways to net zero emissions

As a learned society, we are able to use our networks to promote the issues surrounding greenhouse gas emissions and offer education and informed scientific advice on solutions to combat, mitigate and reverse climate change.

IChemE commits to:

- provide policy advice to governments based on chemical engineering experience and expertise, consistent with our commitment to net zero carbon and the UN SDGs.
- proactively engage with research facilities, industry, government reviews, consultations and policy debates in a manner consistent with our commitment to net zero carbon and the UN SDGs.
- engage in public outreach activities with businesses and communities, to understand their concerns about the threats and uncertainties posed by climate change, before promoting technically- sound solutions that address these concerns and which emphasise the need to accelerate action.
- offer more training courses on-line and face-to-face that will help educate, reskill and promote key carbon reduction technologies.
- develop plans for achieving net zero carbon emissions from our direct operations globally by 2025 and publish greenhouse gas emissions data and progress against this target each year; this will include considerations of efficiencies, reductions and offsets.
- establish (practical) investment criteria that would enable the Institution's funds to be invested in alignment with our climate change goals
- align the medals and awards programmes to reward progress towards the zero-carbon economy and the UN SDGs
- monitor and report progress on all commitments annually
- review this position statement every two years to ensure the principles are robust and the commitments adequate to drive innovative action.

What do these principles mean for IChemE members?

Engineering in general, and chemical engineering in particular, have a pivotal role to play in responding to and mitigating the threat posed by climate change. The impact that a process has on the environment is established during design and delivered during operation. The impact of chemical engineers on all of

these decisions is profound. Chemical engineers hold positions of influence in many of the industries and sectors that are the biggest contributors to greenhouse gas emissions and we also have the unique knowledge and expertise to address the challenges represented by climate change. The challenge of climate change cannot be successfully addressed without the meaningful commitment and engagement of the chemical engineering profession.

IChemE commits to:

- update our Code of Conduct to include an obligation on all professional members to act in accordance with the principles of sustainability including the UN SDGs, prevent avoidable adverse impact on the environment and society, act to mitigate climate change, and protect, and where possible improve, the quality of built and natural environments
- develop training courses and mandate CPD to provide the knowledge and skills to support members in the transition to a net zero carbon economy
- develop design guidelines, tools and project evaluation techniques to assist practicing engineers to apply sustainable design principles.
- for accreditation of university degrees, enhance the requirements for the treatment of sustainability, energy efficiency, resource efficiency (the circular economy), climate change, environment and biodiversity, thus preparing graduating chemical engineers for their role in the transition to a zero carbon world.
- encourage all regional member groups and special interest groups to hold webinars and seminars as part of the CPD programme to enhance skills and knowledge in pursuit of zero carbon and to engage with the wider membership
- sponsor and promote research (academic and industrial) specific to tackling climate change and promote the sharing of knowledge on new developments through our range of publications and through UK and international contacts with other institutions.

What do these principles mean for traditional sectors within which members work?

These principles commit IChemE members to working towards minimising and ultimately reach the lowest level of greenhouse gas emissions. Logically this extends to working with the sectors which employ members to help them map emissions reduction, or net zero, pathways.

IChemE commits to:

- develop detailed positions and action plans to for economically sustainable and secure transition to net zero carbon emissions in all areas of chemical engineering practice and regions where members are active
- encourage companies employing members to adopt continuous and transparent monitoring and regular reporting of performance on emission reduction and other climate change mitigation measures
- encourage all industrial sectors to embrace enabling technologies such as digitalisation and real time monitoring to bring about real reductions in carbon emissions through efficiency gains and new process control options