

IChemE position on Climate Change

November 2020



Climate science is established – we are in the midst of a climate emergency. Human activity is causing the climate to change, with significant adverse consequences. 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 extreme and irreversible 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 across industrial sectors to arrest and reverse the damage we humans are doing to the life support systems of our single, shared planet and to contribute to improving food security, energy and water availability and human health and wellbeing.

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

- means of combatting the causes of climate change through reducing the anthropogenic¹ 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.

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 principles listed in this position statement, and 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.



¹Anthropogenic refers to impact caused by humans or their activities. This may be direct or indirect.

Principles

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

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.

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 anthropogenic greenhouse gas (GHG)² emissions by at least 7.6% year on year³ to 2030 (as an interim target) or reducing total emissions by at least 50% each decade from now to 2050.

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 adverse impact and not shift impact elsewhere – either geographically, socially, economically, or environmentally.

Systems thinking

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

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 and implementing appropriate policies on taxation, carbon pricing and other policy tools.



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 they do not entrench the status quo but adapt to changing circumstances. Solutions must be designed to demonstrate the greatest positive outcomes for the environment and society and thus the economy and take into account longevity and operability in a changed environment over the life of the project (eg differing rainfall, temperature profiles).

Innovation

IChemE supports the development of new technologies and processes to deliver the transition to net zero emissions by 2050 at the pace required. Innovation⁴ will be needed and IChemE encourages research and development work to find the new best solutions to deploy.

Training and application of skills

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 application of skills of the current and future workforce.

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 accredited education and through continuous professional development.

² A greenhouse gas (GHG) is any gas in the atmosphere which absorbs and re-emits heat, thereby keeping the planet's atmosphere warmer than it otherwise would be. Carbon dioxide (CO₂) is the most common GHG produced by human activity. Carbon dioxide equivalent (CO₂e) is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

³ UNEP, Emissions Gap Report 2019, <http://bit.ly/UNEP-EGP19>

⁴ An innovation is a new idea, product, process, service or way of doing something that either improves performance, adds value or achieves a desired purpose in a new or better way.

Context and commitments

What do these principles mean for IChemE?

IChemE is a global professional membership organisation with a relatively small staff team and based on volunteer input. As such our direct operations have a limited impact on greenhouse gas emissions, although 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 carbon emissions and assisting businesses to adapt to a changing environment.

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, reverse and adapt to 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 emissions 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 emissions 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 and adaptation technologies.
- develop plans for achieving net zero carbon emissions⁵ 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, has a pivotal role to play in responding to and addressing the threats 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 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 greenhouse gas emissions and adapt to a changing climate, 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 and in climate change adaptation.
- develop design guidelines, tools and project evaluation techniques to assist practising 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 and a changed environment.

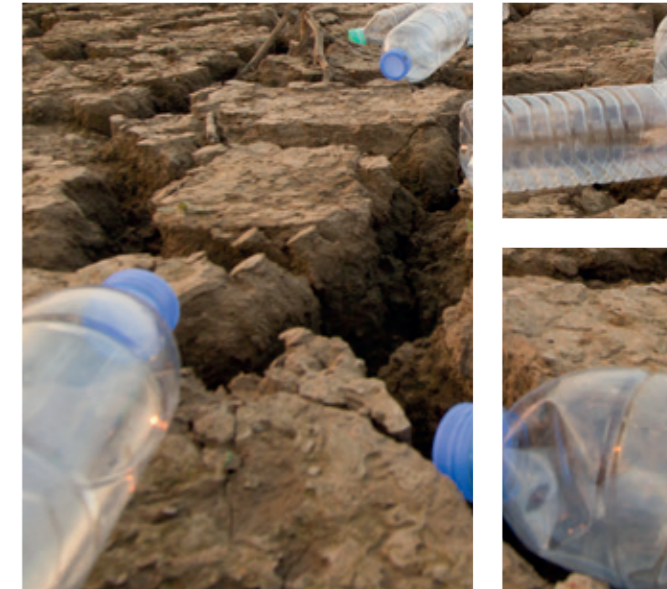
- encourage all regional member groups and special interest groups to hold webinars and seminars as part of the CPD programme to enhance skills and knowledge in pursuit of zero carbon futures and understanding of climate risks, and to engage with the wider membership.
- sponsor and promote research (academic 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 reaching the lowest level of) greenhouse gas emissions. Logically this extends to working with the sectors that employ its members to help them map emissions reduction, or net zero, pathways and operate in a changed environment.

IChemE commits to:

- develop detailed positions and action plans for economically sustainable and secure transitions 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 and adaptation measures.
- encourage all industrial sectors to embrace enabling technologies, such as digitalisation and real time monitoring, to bring about real reductions in carbon emissions and increased resilience to disruption through efficiency gains and new process control options.



⁵ Net zero carbon emissions includes scope 1 and 2 emissions. Scope 3 emissions are not included in this definition. For IChemE this would include the Kuala Lumpur, London, Melbourne and Rugby offices and staff business travel but would exclude member activities and rented office premises.

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