CAETS sets out engineering's commitment to help governments achieve climate goals

The Glasgow Climate Pact, signed at the 26th UN Conference of Parties (COP26) by 197 countries, reaffirmed global ambitions to achieve the goals of the Paris Agreement and avert a global climate catastrophe.

The scale and pace of the transition required to meet these goals presents an immense challenge. To keep on track, the world needs to reduce annual emissions by an additional 28 gigatons (that's 28 billion metric tons) of carbon dioxide equivalent by 2030, *beyond* what has already been promised within unconditional Nationally Determined Contributions (NDCs)[1].

As governments, public authorities at all levels and businesses seek to address this challenge by scaling-up and accelerating strategies to mitigate and adapt, engineers and technologists are poised to play a uniquely valuable role. Beyond their role as innovators, designers and developers of sustainable and resilient solutions, and their professional duty to protect the public and the environment, engineers are trained to *think in systems* (analysing multiple over-lapping systems to derive suitable paths for action). This means they can help policymakers manage complexity, accelerate urgent, co-ordinated change across a wide range of interdependent socio-technical domains, and minimise unforeseen and unintended negative consequences.

CAETS, the International Council of Academies of Engineering and Technological Sciences, is an independent source of solution-focused expertise that policymakers everywhere can employ to help formulate the multi-disciplinary approaches required to respond to this crisis.

CAETS' view on the climate challenge

While over 130 countries have now committed to achieving "net zero" emissions by mid-century[2], recent evidence suggests that the reality of limiting global warming to 1.5ºC above pre-industrial levels may already be slipping away[3]. Rapid action and tough decisions must therefore be taken this decade to decarbonise society and avoid breaching dangerous and irreversible tipping points. Co-ordinated support and major investment must be prioritised to deploy available technologies imminently, rather than solely relying on future research breakthroughs and "magic solutions".

As a policy goal, decarbonisation is unique because of the breadth of policy areas that it links to and the number of stakeholders that must be engaged to work together towards the shared goal. It must also be considered within the context of global sustainability, as framed by the 17 UN Sustainable Development Goals (SDGs). These goals can only be achieved through co-ordinated action: policymakers, economists, businesses, investors, social scientists, engineers and other key professions must come together to build on fundamental scientific evidence and rapidly implement solutions that are affordable, efficient, equitable, respectful and inclusive for all.

Global thinking is also essential: to achieve the required outcomes, national decarbonisation strategies must be designed to enable other countries to also achieve the transition. For example, many countries currently import and export emissions through materials and waste products, including many developing

[1] https://www.unep.org/resources/emissions-gap-report-2021
[2] https://zerotracker.net/
[3] https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/

countries that inherit high-emission goods such as vehicles and machinery from more developed nations. International collaboration, and considering global society as a system, are vital for aligning all actions towards achieving the goals of the Paris Agreement and the UN SDGs.

The engineering systems approach

Working alongside other key professions, engineering has a crucial contribution to offer to climate mitigation and adaptation strategies. Engineers possess unique knowledge of transformative technologies, an understanding of the timescales and processes involved in developing, designing and building solutions, and, crucially, an ability to *think in systems* that positions them as a valuable partner to the authorities tasked with implementing the transition to a sustainable future.

The systems approach is used in engineering to address complex problems and involves integrating all relevant factors and wider contexts into decision-making processes. Such an approach has wide application: for example, it can help policymakers transform multiple interconnected socio-technical systems, or businesses set measurable and verifiable sustainability targets, by identifying interdependencies, trade-offs and points of greatest leverage.

The engineering systems approach can also help identify which actions to take first, and which are the best "quick-win" and "no-regret" solutions to pursue. For example, this approach can help identify how, when and where best to deploy available technological solutions at scale and at pace – which is essential to accelerate action within the next decade.

Climate targets and the UN SDGs cannot be achieved without engineers. We offer the collective convening power of CAETS, and its ability to bring together resources and expert thinking from around the world, to inform policy and decision makers in their efforts to urgently scale-up and accelerate strategies to minimise the impacts of climate change.

About CAETS

CAETS is an independent, non-political, non-governmental, international community of engineering and technological science academies representing the best expertise in these fields in over 30 major economies. Its objectives include the promotion of sustainable development and societal well-being throughout the world.

CAETS convened the global engineering profession at its Annual Meeting in September, *The Future of Energy,* to discuss many of these themes. Recorded presentations are available to view. **Contact CAETS**

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