EXECUTIVE SUMMARY

EEIST

TEN PRINCIPLES FOR POLICYMAKING IN THE ENERGY TRANSITION:

LESSONS FROM EXPERIENCE

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Executive Summary

Meeting the goals of the Paris Agreement requires a rapid worldwide transformation of our energy and land-use systems. The Glasgow Climate Pact of the United Nations Climate Change Conference (COP26) in November 2021 not only reaffirmed the commitment to limiting the increase in global temperature to well below 2°C, 'keeping 1.5°C alive' and building resilience, but it also emphasised the importance of additional government commitments and action through the Nationally Determined Contributions (NDCs). The Breakthrough Agenda, also launched at COP26, and supported by more than 40 countries, seeks to accelerate progress towards the Paris goals by making clean technologies in each of the most polluting sectors the most affordable, accessible and attractive choice for all by 2030.

Achieving a structural transformation in all the energy-consuming sectors in a just manner requires a stronger and more coordinated policy response across multiple policy domains and levels around the world. Increased engagement with civil society, businesses, youth, labour, media, Indigenous Peoples and local communities is also essential.[1] Getting right the policy efforts aimed at accelerating the energy transition can unlock significant opportunities including new industries, net generation of employment, liveable cities, positive health impacts and opportunities to tackle justice and poverty challenges simultaneously.

Given the scale, speed and interdependencies of the energy transition being pursued, this action will require from governments the application of an additional set of tools and principles to support policy-making and appraisal. Many of the economic principles, models, and decision-making tools used by governments are designed for use within contexts of 'marginal' or incremental change, where technologies, markets and other economic structures are relatively stable. Different tools are needed when, as in the energy transition, the aims and context of policy include widespread innovation and structural change.

The ***Ten Principles for Policymaking in the Energy Transition*** outlined in this report are built on a wealth of experience and analysis gathered over the last three decades where policy has induced rapid innovation and growth in clean energy technologies. We set out five '*Policy Design*' principles, all of which complement each other, and five '*Policy Appraisal*' principles that relate to how policy options are compared, and decisions made. These are summarised in the following table, alongside 'traditional principles', which are stylised versions of principles that are sometimes used to guide policymaking in situations of marginal change. When describing each principle we outline the usefulness of those traditional principles in their appropriate domains, point out some of their limitations and explain the need to complement them with the Ten Principles.

About

The Economics of Energy Innovation and System Transition (EEIST) project develops cutting-edge energy innovation analysis to support government decision making around low-carbon innovation and technological change.

By engaging with policymakers and stakeholders in Brazil, China, India, the UK and the EU, the project aims to contribute to the economic development of emerging nations and support sustainable development globally.

Led by the University of Exeter, EEIST brings together an international team of world-leading research institutions across Brazil, China, India, the UK and the EU.

The consortium of institutions are UK: University of Exeter, University of Oxford, University of Cambridge, University College London, Anglia Ruskin University, Cambridge Econometrics, Climate Strategies, India: The Energy and Resources Institute, World Resources Institute, China: Tsinghua University, Energy Research Institute, Brazil: Federal University of Rio de Janeiro, University of Brasilia, Universidade Estadual de Campinas (UNICAMP) EU: Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna.

Contributors

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1 IPCC 6th Assessment Report. Working Group III. (2022). Summary for Policy Makers. www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf

	Traditional principle	Principle for the transition
1	***Policy should be 'technology neutral'***	**Technology choices need to be made**
	In a context of innovation and structural change, policies will almost always advantage some technologies more than others. It is better to choose deliberately rather than accidentally, supporting innovation in low-carbon directions. Some policies intended to be neutral can have a bias towards incumbents, and incremental change.	
2	***Government interventions raise costs***	**Invest and regulate to bring down costs**
	Well-designed investment and regulation policies can bring down the cost of clean technologies, by creating a 'demand pull' for innovation that complements the 'supply push' of research, development and demonstration, strengthening learning-by-doing feedbacks in technology development, deployment and diffusion.	
3	***Markets on their own optimally manage risks***	**Actively manage risks to crowd-in investment**
	Low-carbon transitions involve many sources of uncertainty. Efforts to reduce the risks of private investment in clean technologies, including public finance acting as a lead investor, can reduce technology risk and financing costs and greatly increase rates of investment and deployment.	
4	***Simply price carbon at a level that internalises the damages of climate change***	**Target tipping points**
	Well targeted interventions can activate tipping points in technology competitiveness, consumer preference, investor confidence, or social support for transitions, where a small input leads to a large change. This can inform the targeting and level of subsidies and taxes, as well as the stringency of regulations.	
5	***Consider policies individually based upon distinct 'market failures'***	**Combine policies for better outcomes**
	A combination of policies will be needed to drive each low-carbon transition. Since the effect of each policy depends on its interactions with others, assessing policies individually can be misleading. Assessing policies as a package can identify those that are mutually reinforcing, generating outcomes 'greater than the sum of the parts'.	
6	***Policy should be optimal***	**Policy should be adaptive**
	There are many paths along which economies can develop over time. It is often impossible in practice to identify which is 'best' in terms of public goals, or even 'least cost' economically, which implies there may be no single 'optimal' policy. Given also the potential to learn from experience, policy should be designed to be adaptive, so that it can more easily respond to unforeseen changes, exploit opportunities and manage risks.	
7	***Act as long as total benefits outweigh the costs***	**Put distributional issues at the centre**
	Low-carbon transitions inevitably involve transfers of economic resources. Distributional issues should be central to policy analysis, since they are important for environmental, economic and social goals, and are likely to have a strong bearing on social support for the transition.	
8	***Link carbon markets to minimise current costs***	**Coordinate internationally to grow clean technology markets**
	Countries should coordinate internationally to grow clean technology markets in each of the emitting sectors of the global economy. This can lead to faster innovation and larger economies of scale, accelerating the cost reduction of clean technologies, with benefits for all countries.	
9	***Assess aggregate costs and benefits***	**Assess opportunities and risks**
	Policy appraisal should consider risks and opportunities, not just costs and benefits, when unquantifiable or very uncertain factors are likely to be important. Where the aim is transformational change, appraisal should consider the effects of policies on processes of change in the economy, alongside their expected outcomes.	
10	***Policy models and assessment are neutral***	**Know your biases**
	The construction of economic models unavoidably involves many choices that will influence their outputs, in which there are no 'correct' answers. We should be aware of our biases, make model choices transparently and, where possible, use a range of models instead of a single one.	

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Economics of Energy Innovation and System Transition

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