

A stylized world map in dark blue with glowing yellow nodes and connecting arcs, set against a dark blue background. The map shows the continents of North America, South America, Europe, and Africa. Several glowing yellow nodes are connected by curved, glowing blue arcs, suggesting global connectivity or data flow. In the top left corner, there are concentric, glowing blue circles.

EEIST

THE NEW ECONOMICS OF INNOVATION AND TRANSITION: EVALUATING OPPORTUNITIES AND RISKS

POLICY BRIEF:

FULL REPORT AVAILABLE AT [EEIST.CO.UK/DOWNLOADS](https://eeist.co.uk/downloads)

Meeting the goals of the Paris Agreement requires unprecedented, policy-led transformations in multiple technologies and sectors. The greatest successes achieved so far in the low-carbon transition happened in ways that few people expected, using approaches that were not those recommended by standard economic analysis. To replicate these successes, we need to learn the lessons and think differently about the dynamics of change in our economies. Rather than seeing the challenge as one of managing difficult trade-offs between the pursuit of economic growth and the cost of cutting greenhouse gas emissions, we must improve our understanding of transformational change to appropriately include the potential for accelerated innovation, technology cost reductions, job creation, and significant economic benefits. This means also changing how we appraise relevant policies. We need a new approach, to supplement traditional cost-benefit appraisal with new techniques, to understand the risks and opportunities of transformational changes.

The EEIST project, engaging researchers across Europe and major emerging economies, tackles this challenge by developing a framework to support decision-making through **Risk-Opportunity Analysis (ROA)**. Our flagship report *The New Economics of Innovation and Transition: Evaluating Opportunities and Risks* reviews evidence and theory to explain the limitations of traditional appraisal methods and the rationale for the ROA, illustrating the framework across a series of historical and forward-looking case studies.

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Recent transitions to clean energy technologies have succeeded beyond expectations

- Since 2010, wind energy has grown from under 1% to 10–15% of electricity in Europe and Brazil, with continuing cost reductions including dramatic progress offshore. Solar PV has expanded to similar capacities globally as costs have plummeted by 85%, driven initially by policies in Germany and the emergence of Chinese manufacturing. Similar cost reductions were secured from LED lighting in India through bulk government procurement programmes for affordable energy access. All three now offer the cheapest ways of producing electricity, and light, across much of the world.
- These successful cases involved a range of policies. However, the policies that played the most critical role were neither public R&D, nor not the instruments that economists typically recommend as the 'most efficient'. Instead, they were policies that targeted resources directly at the deployment of these technologies – through subsidies, cheap finance and public procurement.
- The most widely used economic framework for public policy appraisal, cost-benefit analysis, did not recommend the use of any of these critically important policies. In general, these policies were implemented despite, not because of, the predominant economic analysis and advice.

The traditional processes for economic appraisal are not always appropriate

- Adding up costs and benefits presumes they are reasonably predictable and quantifiable with some confidence. But many of the most important benefits of a low-carbon transition – like the creation and development of new technologies, supply chains, business models, jobs, and new markets – are not knowable with confidence. Omitting these elements from the calculation creates a bias towards inaction.
- A focus on current knowledge of costs and benefits overlooks the effects that policies can have on processes of change in the economy. This can neglect risks and opportunities, ignore the potential for policies to have self-amplifying or self-limiting effects, and miss the potential to trigger 'tipping points' and cascading changes.
- Policies that create change in the economy affect societies' interests in many ways. Jobs, air quality, climate change risks, energy costs, and many other factors can be affected by low carbon transitions. When all these are converted into a single metric (money), the decision about their relative importance risks being made implicitly; this can undermine transparency, trust and political robustness of decision-making.

Risk–opportunity analysis (ROA) offers a new way of assessing options

- Instead of only counting identified costs and benefits, ROA involves mapping both risks and opportunities. That means considering all the potential effects of a policy that might be important, even if a number cannot be put on them.
- Instead of only comparing the expected outcomes of policies at a moment in time, ROA also considers processes of change in the economy. This includes drawing attention to feedback loops – relationships that reinforce or oppose change – and how they can be strengthened or weakened. It can include looking for ‘sensitive intervention points’ where modest actions can have large effects.
- Instead of converting different kinds of outcomes into one metric, each in its own right can be assessed, so that the weighing up of different interests can be done transparently and deliberately by decision-makers accountable to society.

Putting theory into practice: reflecting on the past and looking forward

- From its historical case studies, the report finds that appreciation of the potential for reinforcing feedbacks to drive down the costs of clean technologies could have supported a strong case for investing in the deployment of those technologies, even when their costs were high.
- The historic transitions all involved an evolving mix of policies, and interactions of domestic with international developments
- Looking forward, the report demonstrates how these new ways of thinking can inform low carbon strategies for other sectors. For the transition to zero-emission vehicles, ZEVs, mandates may have the greatest impact by reducing multiple uncertainties throughout supply chains, but combinations of policies are likely to offer more than the sum of their parts. In the early stages of the transition to low-carbon steel, targeted deployment policies such as subsidies or public procurement are likely to be more effective than carbon pricing, but both together could be more effective still.

The international dimension is important

- Historic assumptions that emission reduction would necessarily involve net economic costs framed the diplomacy of climate change as a problem of burden-sharing.
- Undoubtedly, low-carbon transitions do involve costs and difficulties. But well-designed policies for innovation and transition also have potential to yield net economic benefits. The diplomacy of climate change can be transformed into a ‘positive-sum game’.
- The new economics of innovation and transitions highlights opportunities for positive-sum collaboration. Coordinated action can create faster innovation, larger economies of scale, stronger incentives for investment, and level playing fields where they are needed.
- Some of these coordination gains are evident in the report’s historical case studies, even though they may not have been pursued intentionally. With informed and targeted efforts, domestically and internationally, society could greatly accelerate progress in each of the emitting sectors of the global economy.



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Economics of Energy Innovation and System Transition

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.



Find out more at:
eeist.co.uk



Scan here for the full report:

**'The New Economics of Innovation and Transition:
Evaluating Opportunities and Risks'**

