

Research impact: making a difference

Strengthening global regulation of emerging nanotechnologies

LSE research into international regulation of novel technologies has highlighted the importance of transparency and mandatory reporting for nanotechnology products

What was the problem?

Manipulating matter at the molecular level to produce novel 'nanomaterials' can bring potential benefits to commerce and to society as a whole. Nanotechnologies typically make it possible to manipulate matter at a scale of 100 nanometres or less, a nanometre measuring just one billionth of a metre.

Nanomaterials can improve food safety and storage, enhance battery performance, aid water purification and reduce environmental detriment, deliver drugs more effectively, reduce weight and power consumption in electronics, and produce stronger, lighter and more durable materials.

However, emerging technologies also create tremendous uncertainties and can pose unknown risks to health, safety and the environment. Maintaining public trust is vital, as the global furore over genetically modified foods so clearly demonstrates. This suggests that robust regulation and full disclosure should be required whenever nanomaterials and nanotechnologies are used.

What did we do?

Since 2002, LSE Associate Professor of International Relations Robert Falkner has investigated the regulatory mechanisms needed to manage the uncertain environmental and health risks of emerging technologies.

Until 2006, Dr Falkner's work focused on biotechnology and genetically modified foods. This early research revealed how persistent scientific uncertainty undermines the efforts of national governments to develop robust regulation and hinders international cooperation on regulating risk. His analysis of the Cartagena Protocol on Biosafety — the world's first international regime dealing with the safety risks of genetically modified foods — identified transparency, informative labelling and informed prior consent as key regulatory mechanisms, especially in developing countries.

More recently, attention has shifted to nanotechnologies. In 2008, Dr Falkner established the Nanotechnology Policy and Regulation programme at LSE. Drawing on his earlier work on food biosafety, the programme has conducted major research projects on nanotechnology regulation, focusing on how to strengthen regulatory capacity in a transatlantic and international context. As part of this project, Dr Falkner oversaw the work of two early-career researchers at the

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Department of International Relations (Nico Jaspers and Carmen Gayoso) and collaborated with LSE experts in related fields.

For one of the studies, the European Union commissioned Dr Falkner to lead the first comparative study of nanotechnologies regulation within the European Union and the US. This revealed that regulators on both sides of the Atlantic lack reliable, comprehensive knowledge about the presence of nanomaterials in internationally traded goods, despite estimates that over 1,000 such products are already circulating.

What happened?

Reaching out to the political community was a key aim of the comparative European and US study. This was achieved by engaging regulators, policymakers, business leaders and other stakeholders in the research process itself and by a targeted strategy for disseminating the results.

The project involved a survey of regulatory and policy experts and extensive one-to-one meetings and interviews throughout Europe and the US. Drafting and reviewing the project report also drew in key experts from regulatory institutions in London, Brussels and Washington DC, ensuring exposure for the report and trust in its findings.

The ground-breaking report was called *Securing the Promise of Nanotechnologies: Towards Transatlantic Regulation*. It was launched at a major international conference at Chatham House, London, in September 2009, attended by European and US policymakers, regulators and stakeholders from industry and civil society. Further events took the findings to policymakers and regulators in the key capitals of Brussels, Berlin, Paris and Washington DC, and to a conference in Brussels sponsored by the European Commission and attended by representatives from the Commission and the European Parliament.

Extensive coverage of the report in international media and trade publications drew attention to the report's call for a mandatory reporting system and registers of nano-enabled products.

In the UK, Dr Falkner was called to give written and oral evidence to the 2009 House of Lords Science and Technology Committee Inquiry into nanotechnologies and food, the only parliamentary inquiry to date dealing with nanotechnology regulation. Dr Falkner's evidence shaped the Committee's focus on issues of transparency and the disclosure of information about nanomaterials in food, and underpinned its call for mandatory reporting.

"Food Standards Agency accepts this recommendation and agrees that there are benefits in setting up a publicly accessible register of available food and food packaging products containing nanomaterials."

Food Standards Agency

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The Committee's concluding report relied extensively on Dr Falkner's testimony. It explicitly endorsed several of his research findings and policy recommendations, in particular the need to strengthen international coordination and information exchange, and to create a public register of foods containing nanomaterials. This latter recommendation has already fed through to government thinking. According to the UK Government's response to the Lords report, the Food Standards Agency has acknowledged the benefits of setting up a publicly accessible register of food and packaging products containing nanomaterials.

European and international discussions aimed at strengthening the regulation of nanotechnologies remain at an early stage. Active dissemination of Dr Falkner's research to policy audiences worldwide has nonetheless stimulated debate on the issues of transparency and suitable regulatory mechanisms. Several civil societies and science organisations have cited the research in support of calls to introduce mandatory reporting, and in a feasibility study on mandatory reporting, Germany's Environment Ministry has used it as evidence of growing scientific support for a register of nanomaterials.

There is now growing recognition that voluntary reporting is inadequate and the momentum is growing in Europe to introduce formal reporting requirements. In January 2013, France became the first EU country to establish a mandatory register of nanomaterials.

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