

Industrial Sustainability and the Role of Research in Addressing the UK Industrial Strategy's Grand Challenges

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About the research

Industrial sustainability has been established as a core tenet of the UK's Industrial Strategy. The Government's Clean Growth agenda sets out a new narrative that embraces research and innovation to support the development of a regenerative, restorative and net positive economy.

This vision is supported by the new Intergovernmental Panel on Climate Change (IPCC) United Nations report 'Global Warming at 1.5 Degrees' which calls for immediate and extensive changes for industry.¹

In 2011, the EPSRC announced a £5.2m investment in Industrial Sustainability Research with a vision to explore how industry might "double output while only using 50%

of current resources and generating 20% of current CO₂", representing a new industrial revolution termed Industrial Sustainability.² This demonstrates the importance placed on research in addressing the Grand Challenges set out in the Industrial Strategy.

A better understanding of the academic field of Industrial Sustainability can direct research investment to areas most needed by policymakers. This study offers the first systematic review of industrial sustainability research from 1992 to 2014. 574 articles were reviewed from 62 peer-reviewed journals, providing the first opportunity to assess the realisation of these possibilities.



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Key Findings

- Three substantive scholarly conversations in industrial sustainability research focus on “productivity and innovation”, “corporate citizenship” and “economic resilience”.
- Research has been dominated by a focus on efficiency strategies that minimise negative impacts on industry, offering improvements to firm-level operations and production activities, and aiming to incrementally reduce negative impacts of industrial activity on society.
- 69% of the research sample examines product (re)design, material/resource utilisation and optimisation strategies, and rethinking what is meant by value creation. This has led to widely adopted approaches to innovation such as reducing harm, abatement, end of pipe solutions and doing more with less.
- Steady-state innovations have included revaluating energy consumption, substitution of material with high toxicity/ carbon emissions and recouping materials from production waste streams for re-use.
- 21% of the research sample focuses on wider business-in-society issues at organisational or extended enterprise levels, encompassing the business case and ideological issues of corporate citizenship.
- Only 10% focuses on the transformative potential of such ideas at an institutional level, exploring the notions of natural capitalism and sustainable industrial systems. Such ideas have an association to inclusive growth and prosperity; and a societal health, wealth and well-being productivity agenda.
- The strong efficiency and focus on operational excellence will need to be followed by wider institutional system level change that privileges scaling-up promising industrial practices and transition.

Policy Implications

- The Industrial Strategy Challenge Fund should build on efficiency gains to encourage complimentary efforts that support transformative long-term changes at the legal, regulatory and political levels.
- The applied sciences and applied social sciences currently lead interdisciplinary research on industrial sustainability. Greater engagement with the pure social sciences, arts and humanities will accelerate the adoption of innovation to generate civic value.
- Policy makers and funders must adopt a more holistic assessment of national productivity and innovation. The work of organisations such as Innovate UK/ESRC (Innovation Caucus), ESRC Productivity Insights Network NESTA and is vital in leading the way.
- The manufacturing and engineering sectors are pioneering practices to decarbonise supply chains/ networks. It is vital that research focuses on the diffusion of such practices and institutional impediments to mass change and industrial transition.
- The UK’s leadership role in Industrial Strategy research must be protected through increased R&D spending and a new Commission to champion a regenerative, restorative and net positive economy. The Government’s inter/transdisciplinary research agendas are vital in promoting porous university interfaces.

Further information

¹ www.ipcc.ch/pdf/session48/pr_181008_P48_spm_en.pdf

² CIS (2010), EPSRC Centre for Innovative Manufacturing in Industrial Sustainability: A Joint Proposal with Cambridge, Loughborough Universities, Cranfield, and Imperial College pp. 1-20.

Smart, P., Hemel, S., Lettice, F., Adams, R. and Evans, S., 2017. Pre-paradigmatic status of industrial sustainability: a systematic review. *International Journal of Operations & Production Management*, 37(10), pp.1425-1450.

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https://www.ipcc.ch/pdf/session48/pr_181008_P48_spm_en.pdf

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