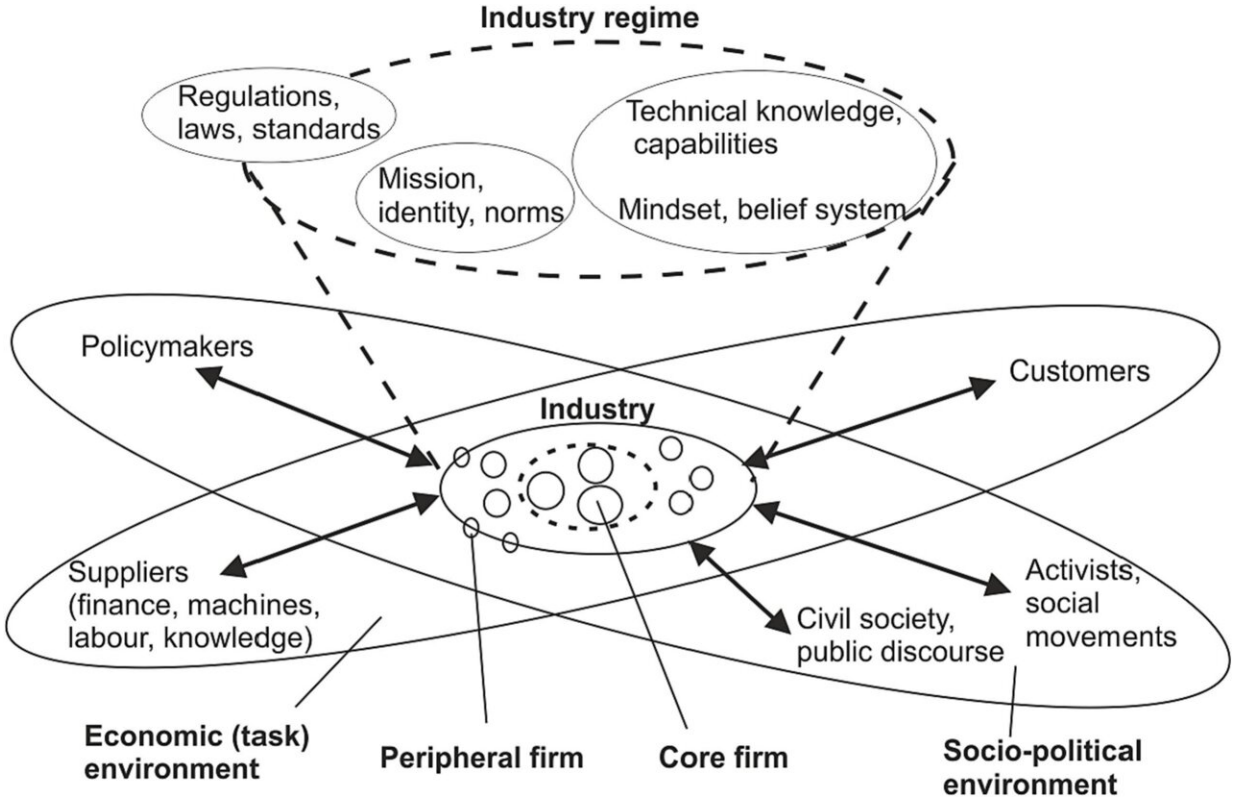


Low-carbon reorientation in the declining steel industry

January 23 2023, by Frank Geels and Julian Gregory



Triple embeddedness framework of industries. Credit: *Energy Research & Social Science* (2023). DOI: 10.1016/j.erss.2023.102953

MIOIR Researchers Professor Frank Geels and Dr. Julian Gregory conducted a longitudinal analysis of coevolving contexts and company strategies in the U.K. steel industry. While the existing literature makes

important analyses of the technical and economic dimensions of decarbonization pathways, it gives less attention to real-world implementation processes by the large energy intensive industries (LEIIs), such as steelmaking, who will actually have to make the investment decisions about the deployment of the low-carbon technologies.

This is particularly pertinent, as these same industries are facing challenging [economic conditions](#) because they operate within a global industries where the emergence of new firms has substantially increased competitive pressures on the U.K.'s established actors, leading to their declining output and increasing losses. This represents a gap in the decarbonization analysis which requires appreciation.

For the U.K.'s steel industry therefore, we assessed the speed and directionality of its low-carbon transition, by applying a longitudinal analysis of changing [external pressures](#) and company response strategies over the last 34 years. Applying the Triple Embeddedness Framework and a five-[phase](#) model of reorientation, our study finds that the steel industry's low-carbon reorientation strategies moved from inaction (phase 1 in our model) and incremental change (phase 2) in the 1988–1997 period, to hedging and exploration of technical alternatives (phase 3) in the 1997–2007 period, back to incremental change in the 2007–2015 period (phase 2), and then forward again to hedging and exploration of technical alternatives (phase 3) in the 2015–2022 period.

The reason for this oscillation pattern is that [economic decline](#) and successive retrenchment strategies reduced managerial attention and organizational resources for low-carbon orientation, especially after the 2007/8 [financial crisis](#) which led to a survival-focus. In recent years, U.K. steelmakers have started to explore three decarbonization pathways (carbon-capture-and-storage, electric arc furnaces using scrap feedstock, and electric arc furnaces using hydrogen direct reduced feedstock) but

have not yet committed to their deployment, which is why reorientation speed is limited.

New economic headwinds in 2021/2 threaten the implementation of low-carbon visions and roadmaps, leading steelmakers to ask for more government support. Future shifts to phase 4 (deployment and diversification) and phase 5 (full reorientation) in our conceptual model will depend on the outcome of currently ongoing political negotiations.

More information: Frank W. Geels et al, Low-carbon reorientation in a declining industry? A longitudinal analysis of coevolving contexts and company strategies in the UK steel industry (1988–2022), *Energy Research & Social Science* (2023). [DOI: 10.1016/j.erss.2023.102953](https://doi.org/10.1016/j.erss.2023.102953)

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