

# **Governing industrial decarbonisation: Understanding the conditions for transformations in energy-intensive natural resource-based industry**

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## **Abstract:**

Climate change is currently being reframed from an emissions problem to an energy system problem. In the run-up to Paris the focus of climate governance is changing from mitigation options towards pathways for decarbonising societal structures and social practices that generate carbon emissions. So far climate policy efforts have predominantly been geared towards achieving set emissions reduction targets, while the decarbonisation of key socioeconomic sectors such as energy-intensive natural resource-based industry (ENRI) has yet not been addressed. In the GIST project we study the conditions for decarbonisation in ENRI industries and explore possible pathways for governing industrial transformations.

Sustainability transition research (STR) has over the last decade become a dominant influence setting the agenda for the study of sustainability transitions. However, the transformations of ENRIs have been largely overlooked in STR, although posing a number of characteristics and conditions that put distinct challenges for sustainability transitions. The ENRI sectors are, from a STR perspective, assumed to represent incumbent regimes with strong path dependencies and lock-ins. Considering the capital-intensive, large-scale and long-term investment cycles, it is unlikely to expect wide-spread nisch-cumulation of radical innovation in this industry. Thus, we need a better understanding of regime transformation and a broader set of conceptualisations of the dynamics of industrial transformation.

The objective of this paper is to explore alternative approaches to understand the conditions for governing system innovation, structural change and regime transformations. Our aim is to develop a multi-disciplinary approach for studying the dynamics of industrial transformations based on a review of different theoretical perspectives. We draw on insights from system innovation studies, energy system analysis, structural economics, political economy, institutional theory and policy studies considered in relation to the characteristics of Swedish ENRIs such as iron and steel, cement, petrochemicals and pulp and paper industry.

## **Keywords:**

Decarbonisation, Climate governance, Industrial transformation, Structural change, Multi-disciplinarity