

Implications of Steel Decarbonisation for Workers and Communities

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Challenge Statement

Steel is essential to everyday life. It is used in everything from house-building to surgical tools, from defence to energy systems, and as such is a strategically important industry for the UK. It is also an emission and energy-intensive industry, responsible for 8% of the world's carbon emissions¹ (2.4% of all UK emissions²). However, it is also a 'hard-to-abate' industry as decarbonisation potentially requires significant changes to production processes.

Steel decarbonisation can be seen as a phase of restructuring for the industry, in the context of previous phases of industrial change (Figure 1), which also has impacts for workers and communities where steel firms are located.

The development of the steel industry over the late 19th and early 20th centuries led to large concentrations of employment in some places, including communities across South Yorkshire. Those places grew around the industry and the industry often provided social and welfare

services to communities. Significant changes to the steel industry since the 1970s have changed its geography, resulting in a relative decline of steel production across Europe and North America. In 1970, 28.3 million tonnes of crude steel were produced in the UK. This declined to 17.8 million tonnes by 1990 and 9.7 million tonnes in 2010³. By 2022 production had fallen to 6 million tonnes, almost one-fifth of its 1970 peak⁴.

South Yorkshire, an historic heartland of steel production, was particularly hard hit. It is known worldwide for its cutlery production, and more recently specialist steel and advanced metals manufacturing. This is woven through the identity of the region: Sheffield is still known as the 'steel city'; its major sports teams carry this through nicknames 'The Blades' (football) and 'Steelers' (ice hockey). But the steel industry in South Yorkshire has undergone significant change over the last 40-50 years. In 1971, 140,000 people were employed in the steel industry in Sheffield alone. This accounted for half of all the city's jobs. In just over a decade this fell by more than half to 57,000

¹ IEA (2023) [Tracking Steel](#).

² Knight, L and Walker, A (2022) [Green Steel](#). UK Parliament POST Research Briefing Number 672

³ Rhodes, C (2017) [UK Steel: Decades of Decline](#). UK House of Commons Library

⁴ World Steel (2023) [World Steel in Figures](#).

***It uses loads of energy
and creates a lot of dust
and muck ... it's not
clean, there's nowt clean***

Stocksbridge steelworker

***...it's always been scrap
with the arc furnaces,
there's never been a blast
furnace here like there is in
Scunthorpe and Port Talbot
so that'll be why that's not
so much an issue.***

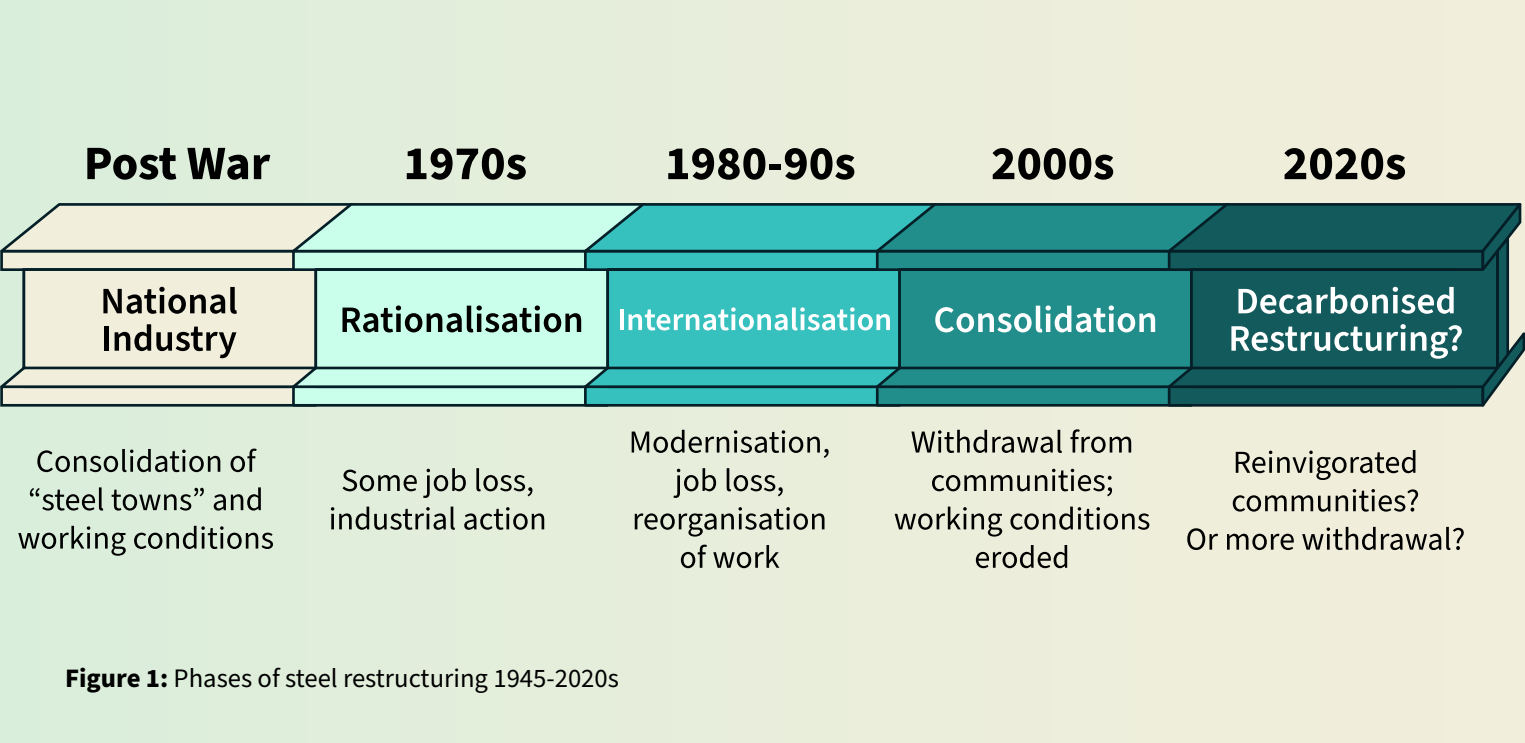
Stocksbridge steelworker

***There's a pride within the
community and the people
that work here that they're
associated with the steelworks
and the steelworks is
associated with Stocksbridge,
I think it goes hand in hand***

Steelworker and local resident

***So it's a bit of a
special place I think,
it started off as this
place attached with
the steel but it's got
a real beating heart
to it.***

Stocksbridge resident



in 1987⁵. This decline in employment numbers continued in the 1990s and 2000s. By 2024 metals production and manufacturing industries were estimated to employ around 15,000 people across South Yorkshire⁶. Despite the decline in the size of the South Yorkshire steel industry, it remains important to the local economy and to national strategic interests. As well as a wide range of metals supply chain and manufacturing businesses, South Yorkshire retains several steel production sites.

Each of these sites are energy intensive and require investment to decarbonise, or risk – in time – production moving elsewhere or ceasing entirely. Decarbonisation also potentially brings opportunities to firms and places that can adapt sooner. As such the low carbon transition brings risks and opportunities for local employment and communities.

To date there has been very little research on how decarbonisation will affect where steel is produced and what the implications of changes to steel production will have on workers and steel communities, despite understanding that previous rounds of industrial change had deep and long-lasting impacts. This was the focus of our research.

Research Response

Our research in South Yorkshire was conducted in collaboration with an international project investigating how steel decarbonisation is beginning to impact on where steel is produced and the implications of these changes for workers and communities⁷. The project included detailed case studies of steel communities in Sweden and the UK. In South Yorkshire we conducted research in Stocksbridge. This research provides detailed understanding of resident and worker experiences of change and perceptions about green steel futures. We sought to understand how present-day experiences and expectations are shaped by historic processes of change. As such our research delved into personal and place-based histories through using oral history techniques and archival analysis. In Stocksbridge we interviewed workers, residents, trade union representatives and other local stakeholders. We also analysed local policy documents, like the Stocksbridge Towns Fund strategy.

The study involved the following methods:

- Document review (company and industry websites, academic and grey literature on the history of UK, Sheffield and Stocksbridge steel)

- Two tours of the Stocksbridge steelworks (October 2023 and February 2024)
- Visit to Stocksbridge history society archives
- Archival research
- Six focus groups with **20 workers** in total (16 ‘shop floor’; 4 ‘management’; all men), and two interviews with senior managers (both men)
- Qualitative oral history interviews with **20 residents** (12 men; 8 women)

Interviews were recorded, professionally transcribed and manually coded using NVivo qualitative data analysis software. Resident interviews lasted approximately 1 hour; focus groups lasted approximately 1-1.5 hours.

Evidence and Outputs

Stocksbridge hosts a Liberty Steel site that has faced continual upheaval since the 1980s. Steel remains central to the town’s identity, though employment has fallen from 8–10,000 in the early 1980s to about 650 in 2023⁸. Liberty promotes a “Greensteel” strategy, branding South Yorkshire operations as green due to their reliance on Electric Arc Furnaces (EAFs). However, producing specialist steels at Stocksbridge remains highly energy-intensive, and decarbonisation options remain unsettled. This uncertainty is compounded by wider challenges, including high energy costs and competitiveness concerns for UK steel. Following several years of financial uncertainty, during which most of the company’s workers were placed on indefinite furlough, in 2025 Liberty Speciality Steels UK was placed in receivership, under UK government control.

Despite green branding, Stocksbridge’s processes—remelting, rolling, and alloying—remain energy and carbon intensive. Decarbonising EAFs might involve renewable energy supplied locally or – more likely given site constraints – via grid-based Power Purchase Agreements. Another challenge is replacing natural gas in reheating furnaces. There are plans to use hydrogen, seen as less capital-intensive than electrification and requiring

less reskilling. However, this depends on reliable hydrogen supply, which remains uncertain given that there is no clear timescale for development of ‘at scale’ hydrogen infrastructure locally.

Worker perspectives⁹

Implications of green steel restructuring were unclear to employees, as no concrete plans existed. Managers were broadly aware of options, but ‘shop floor’ workers less so. Some referenced job losses at blast furnace sites in Scunthorpe and Port Talbot, although some others believed Liberty’s use of electric arc furnaces insulated them from similar challenges. There was also uncertainty about what ‘green steel’ meant, with some cynicism about whether steel could ever truly be green.

Despite this, and wider challenges for the business, confidence in existing markets for the business remained strong. Participants highlighted demand from renewable energy sectors, such as wind turbines, alongside high-carbon industries like oil and gas and aerospace. This belief, coupled with perceptions that Stocksbridge either already produced green steel or that fully green steel was impossible fostered a belief that jobs would not be significantly affected.

For most research participants, green transition was not a pressing concern. Some managers noted potential challenges, such as reaccreditation for specialist aerospace products. However, ongoing financial uncertainty surrounding Liberty’s parent company overshadowed low-carbon transition issues. A few participants linked energy policy and carbon costs to this precariousness, while others cited cashflow problems as barriers to green investment. Moves toward electric steel production elsewhere were associated with job losses, reducing the industry’s appeal to new entrants.

Overall, workers viewed Stocksbridge’s future in the context of a long trajectory of economic change and job decline over decades. Yet, there was an underlying belief that the steelworks would endure, reflecting a sense of resilience despite uncertainty.

5 Hudson, R and Sadler, D (1989) The international steel industry: restructuring, state policies and localities. Routledge, Abingdon.
6 Office for National Statistics (2025) [Business Register and Employment Survey](#).
7 For more information [see here](#)

8 All the information and findings in this and subsequent sections are based on our underpinning empirical research. A summary of the Stocksbridge study [can be found here](#).
9 Worker perspectives from Swedish case studies can be found here: Eadson, W., Mukezinovic, D., van Veelen, B., Malmberg, S., Backius, S. (2025) [Worker experiences of green steel transitions](#). Lund University Centre for Sustainability Studies.

I'm not against new development or new ideas at all but I want it to be right for the community and who will be the people who'll work in the offices, are they the kids on the Stubbin estate who would have normally worked in the steelworks?

Stocksbridge resident



Community perspectives¹⁰

Stocksbridge retains a strong sense of identity, rooted in its steelmaking heritage. Residents described a close-knit community that persists today, with long-standing social connections particularly among those with historic or family ties to the steelworks. Historically, British Steel and its predecessors were central to both economic and social life of the town, providing welfare and community functions. Since the 1990s, this role has diminished, and respondents reflected on the steelworks' decline with mixed feelings. Some mourned its loss, while others highlighted regeneration and Stocksbridge's growing role as a commuter hub.

This shift is not wholly negative. Earlier eras of production reinforced strict gender roles, shaping social life around male workers. Today, reduced engagement by the steelworks and state welfare retrenchment has spurred community mobilisation, supported by strong local ties and the Town Council. These connections, forged through generations, underpin resilience and hope for the future.

Visions for a thriving Stocksbridge varied. Some residents expressed fatalism, while others focused on practical improvements such as housing retrofit, sustainable transport, better amenities, and restored rail links. A recurring theme was the desire for foundational services, connectivity and a future shaped by solidarity. Respondents saw community capacity to organise as vital, rooted in place identity and industrial history. Narratives of independence contrasted with feelings of

entanglement in external forces, limiting local control.

Recent developments include the fight to save the town's leisure centre, leading to community management, and a £20m Towns Fund grant in 2023. Official plans emphasise heritage, high street redevelopment, and mixed-use spaces, sparking debate over priorities. While diversification and commuter-town dynamics loom large, respondents stressed that one-off grants and activism cannot replace long-term coordinated efforts. Stocksbridge's future will depend on sustaining its spirit of solidarity amid ongoing economic and political challenges.

What does this mean for the region?

This research highlights a number of key challenges to achieve just transition for the region's foundational industries like steel:

- **Activities to bring about green industrial futures must be sensitive to the fact that industry is tied to worker and community identities**, and that change triggers emotions rooted in lived experiences of previous change. This is especially important when local industrial survival is also seen to be precarious.
- **Local institutions need to reconnect with citizens.** Residents and workers saw local government (Sheffield City Council; South Yorkshire Mayoral Combined Authority (SYMCA)) as distanced from the needs of Stocksbridge.
- **Local and regional stakeholders need to**

support industrial workers to become active stakeholders in achieving green industrial futures. This includes access to skills provision and job support where retraining is required, while more broadly providing open communication and engagement around the opportunities and challenges of green industrial futures. Trade Unions can play an important role within this, alongside businesses and policy organisations.

- **Green industrial futures need to encompass community renewal** to overcome fatalism and exacerbating potential 'green backlash'. In Stocksbridge, local community action is strong compared to many similar places but as we know from other research, community action also has its limits and can create challenges/ contestations too; it is not always inherently more 'just', and cannot alone fill the gaps of state and private sector retrenchment.
- **Steel communities' futures are entwined** (especially those directly connected to Liberty Steel at Aldwarke, Brinsworth and Stocksbridge). Changes to operations in Rotherham impact on Stocksbridge and vice-versa. As such it is important that policy solutions recognise these interconnections through a green deal for South Yorkshire steel. This should be at the heart of plans for regional inclusive economic futures.
- **Central government coordination will be critical to low carbon infrastructure**

provision and regulation; some of our participants also argued that as a critical industry, steel should be state-owned to provide a just transition and protect the industry. Tata and British Steel have received large subsidies and state intervention to support the conversion to EAFs but at the moment there is no similar offer to support specialist steel producers. The region's leaders need to press for investment in a 'green deal for South Yorkshire steel' or risk further decline and loss.

Next Steps:

We are now working with SYMCA to develop a broader approach to 'inclusive industrial decarbonisation' that seeks to set out a framework for delivering sustainable industrial futures across the region that also addresses key social, economic and cultural challenges. This builds from our work in Stocksbridge along with research on 'green and just' industrial decarbonisation in the UK and internationally^{11, 12, 13}.

In Stocksbridge, we see opportunity in the current situation of uncertainty for a new community-rooted taskforce to lead community and infrastructural renewal rooted in the town's heritage while working towards a sustainable future. Our research can support development of this. For Liberty Steel, we see an opportunity to work with key stakeholders to support planning for a sustainable steel future working in partnership with workers and communities.

¹⁰ Community perspectives from our Swedish case studies can be found here: van Veelen, B., Eadson, W., Melin, Å., Backius, S., Malmberg, S., and Mujezinovic, D (2025) [Green steel transitions: impacts on people and places](#). Lund University Centre for Sustainability Studies

¹¹ Eadson, W and De Leeuw, G (2025) [Path development politics: contesting regional hydrogen economies in Northern Europe](#). Geoforum 167

¹² Dawley, S., Mackinnon, D., Steen, M and Eadson, W. (2025) [State-orchestrated green path development? Industrial decarbonisation in Teesside and the Humber](#).

¹³ Eadson, W., Northall, P., Copeman, V. and Ahmad, Z (2023) [Humber Industrial Cluster Plan: Societal and Cultural Challenges and Social Innovation Study](#)

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