

# Position paper on steel



Steel is an essential component of creating a sustainable and just economy in Scotland. Scotland needs a strategic plan for how it will retain and repurpose high-quality scrap steel from existing domestic sources and process it sustainably for use in the energy sector transition. Without such a plan, scrap steel will continue to be exported from Scotland and we will be reliant on carbon-intensive steel products from overseas.

## Why is steel important?

Without steel, Scotland's energy transition will not be possible. In January 2022, details of the ScotWind leasing round, one of the largest planned offshore wind pipelines in the world and a cornerstone of the Scottish Government's energy transition plan, were announced. Projects developed through the ScotWind process are expected to commission up to 25GW of energy capacity, and each megawatt of wind power requires 120-180 tonnes of steel<sup>1</sup> meaning this single development will require over three million tonnes of steel. The climate crisis demands a move away from fossil fuels towards a range of renewable energy sources and storage.



Figure 1. Examples of Scottish steel supply and demand <sup>2, 3</sup>

<sup>1</sup> <https://corporate.arcelormittal.com/media/case-studies/steel-is-the-power-behind-renewable-energy>

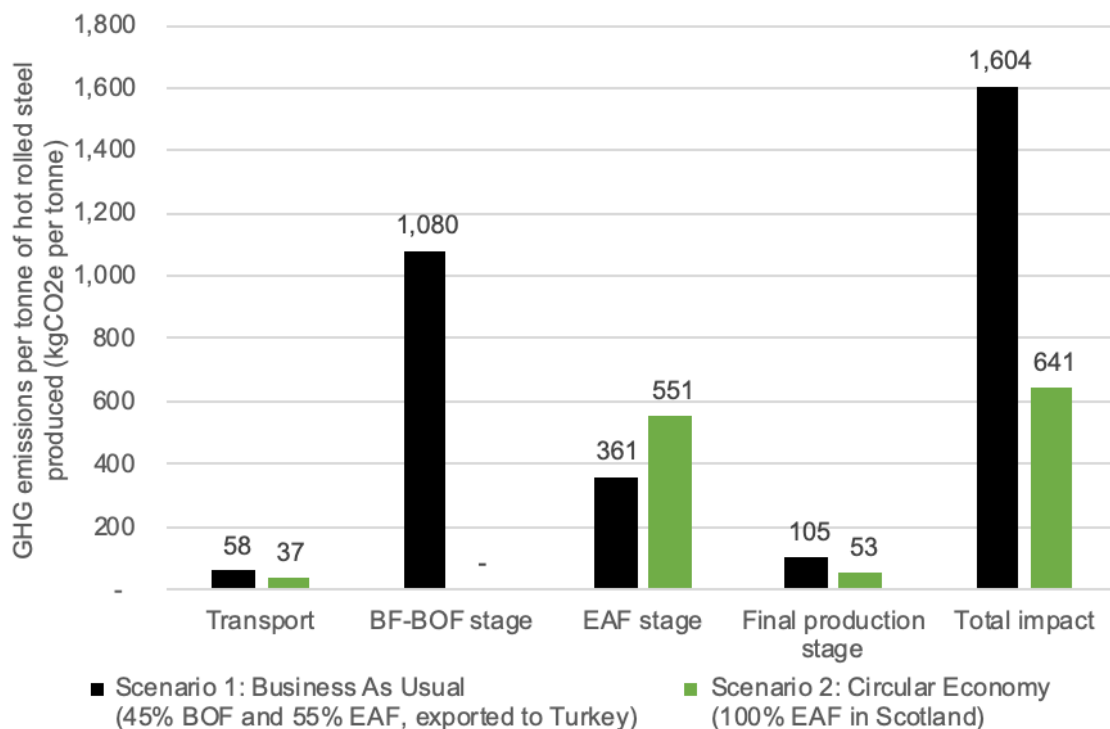
<sup>2</sup> ZWS (2021) [The future of onshore wind decommissioning in Scotland](#)

<sup>3</sup> OEUK (2021) [Decommissioning insights 2021](#)

## Our steel use today is unsustainable and unjust

Today, all of Scotland's 820,000t of scrap steel is exported for recycling<sup>4</sup>. This recycling can be done in a traditional blast furnace (BF) or a more modern electric arc furnace (EAF) to produce new steel products. BFs can only take up to 20% scrap steel<sup>5</sup> whereas EAFs can use up to 100% scrap<sup>6</sup>. EAFs melt steel using electricity, rather than coal, which greatly reduces their emissions, assuming that electricity is generated using renewables.

Whilst some Scottish steel will be recycled in EAFs abroad, a more circular solution would be to keep our scrap steel in Scotland and process it here. Unlike processing steel from new material, recycling high-quality scrap steel can be processed in EAFs without hydrogen<sup>7</sup>. A Scottish EAF has the potential to reduce GHG emissions by 60% compared to the way scrap steel is currently managed (Figure 2). The emissions from producing one tonne of steel would fall from 1,604 kgCO<sub>2</sub>e to 641 kgCO<sub>2</sub>e. Such a plant could create 180 direct jobs and 1,000 indirect jobs. As renewable generation grows and fossil fuel production declines, the greening of the electricity grid has the potential to reduce the carbon impact of EAF further still.



**Figure 2. Carbon impact of scrap steel production by life cycle stage**  
Replicated from ZWS (2021)<sup>8</sup>

Every year hundreds of ships and oil rigs are sold to shipbreaking yards in south Asia where they are cut apart by low-paid migrant workers. In 2020, Scotland

<sup>4</sup> Hall, R. (2020) Scottish Steel Sector Analysis, report commissioned by the Scottish Government

<sup>5</sup> Liu et al. (2020) Numerical Investigation of Blast Furnace Operation with Scrap Charging

<sup>6</sup> Based on World Steel Association (2020) World Steel in Figures 2020

<sup>7</sup> Unlike the production of new steel from iron ore, if high quality scrap steel is used as a starting material, there is no need for a reducing agent such as coking coal or hydrogen.

<sup>8</sup> ZWS (2021) [How should Scotland manage its scrap steel?](#)

exported 42,309 tonnes of decommissioned rigs and vessels to Turkey under notification controls<sup>9</sup>. The lack of regulation and workers rights means this is dirty and dangerous work. Scotland and the UK should be requiring safer, less environmentally damaging decommissioning practices and developing the skills and facilities, such as deep water ports, to do this at home.

## **Vision of a circular and just future for Scottish steel**

There is an opportunity for Scotland to create a more circular economy to shape the future of our energy sources. This would, in turn create new and just jobs, end the damaging consequences of offshoring decommissioning and reduce our unsustainable demand for new resources.

With a circular economy approach, scrap steel from Scottish decommissioned O&G rigs, wind turbines and other sources would be brought to domestic ports for disassembly. At the same location, scrap would be processed in an electric arc furnace (EAF) supplied by grid electricity. Once the steel was melted, it would be recast, in a continuous casting process, into the products required for wind turbine fabrication. Assembly would be in yards across Scotland, enabling the creation of new, skilled jobs in the green economy across decommissioning, steel and wind power sectors with significant opportunities for transferability of the existing skills and experience of workers in the fossil fuel industry.

## **Economic and carbon accounting barriers**

The Celsa EAF steel mill in Cardiff produces 1.2Mt of steel per year<sup>10</sup>. However, during the pandemic, an emergency loan was required from the UK Government to secure the company. The economic stability of EAF plants are tied to low electricity prices. The Scottish Government could secure a low electricity price by, for example, brokering a Power Purchase Agreement for EAF plants, in exchange for circular economy measures, such as a nationally suitable plant size, and just transition plans for workers.

Returning steel processing to Scotland would increase Scotland's domestic emissions making our territorial climate targets more challenging to achieve. However this would be a more realistic reflection of our carbon impact, and would be countered by the global carbon saving that could be made by developing a renewable powered EAF in Scotland. In addition to steel, other critical materials<sup>11</sup>, such as lithium and neodymium, are required to transform Scotland's energy sector. Like steel, it is essential that these are sourced in a sustainable and just way or we risk replacing one environmental crisis with another.

## **What is Friends of the Earth calling for?**

Friends of the Earth Scotland consider the follow steps essential to creating a sustainable steel sector in Scotland, based on domestic scrap steel supply:

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<sup>9</sup> Correspondence with Producer Compliance and Waste Shipment Unit, SEPA (2022)

<sup>10</sup> <http://www.celsauk.com>

<sup>11</sup> For example, the Montrose Port development off Angus will require 5,700 tonnes of materials in array cables alone, most of which will be copper. The £5.2 million investment plans to install 72 offshore wind turbines, supplying 1 GW of power by 2025.

1. The Scottish Government must **create a circular economy strategy for steel, within the next year**. This should prioritise retaining the materials and skills required for the energy transition in Scotland. Rather than being market-led, the transition can happen at a scale which is appropriate for Scotland and creates just, green jobs. This strategy should be developed in consultation with key stakeholders (prioritising steel and decommissioning experts, workers and their trade unions), and outline opportunities that could be made available to workers with transferable skills from high-carbon industries.
2. The Scottish Government should take steps to **reduce barriers** such as high electricity prices. Plans to deliver on climate targets need to be supported by evidence which reflect the global emission saving potential of these plans.
3. The Scottish Government should place an understanding of Scotland's global consumption impacts and a desire to reduce them at the heart of the Circular Economy Bill by **introducing consumption targets**.