



**The transition to a low carbon world requires a transformation in the way we manufacture iron and steel. There is no single solution to CO<sub>2</sub> free steelmaking, and a broad portfolio of technological options is required, to be deployed alone, or in combination as local circumstances permit. This series of fact sheets describes and explores the status of a number of key technologies and initiatives**

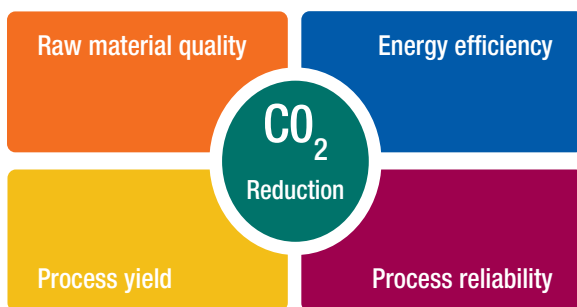
### What is step up?

In 2019, the worldsteel Board of Members agreed to a new industry wide initiative named 'step up'.

step up builds on worldsteel's rich resource of benchmarking data and analytics and provides a robust foundation for the immediate and urgent action needed by the steel industry.

worldsteel has developed a straightforward 4-stage efficiency review process, based on leading practice, for all mill operators to follow. The multistep process covers raw materials, energy input, yield and maintenance, and can be used to support improvements in mill operations to efficiency levels commensurate with the steel industry's top performers.

**Focus on operational efficiency will lead to reductions in costs and emissions.**



worldsteel 4-stage efficiency review process

step up is being supported by a specialist team of advisors available to all members. worldsteel completed nine site audits to validate the step up process and to quantify achievable improvement potential. The programme will be rolled out more widely through 2020-2025.

### What is the main aim of step up?

The successful implementation of the step-up methodology has the potential of lowering carbon emissions for the average steelmaking sites. All of worldsteel's members have been encouraged to participate in the step up programme, and broad adoption of the methodology across our industry will elevate the performance of all sites to levels commensurate with the very best performers. It represents a key initiative in our industry's journey towards net-zero emissions. Ultimately, it will help the industry meet the downward trend's expectation needed to meet the two degree scenario (as per the IEA report).

### What is the step up process?

Site performance is analysed in the following areas against top performers using data submitted for the past one or two years, with a focus on:

- CO<sub>2</sub> emissions: worldsteel has a global database of CO<sub>2</sub> performance covering all process routes. The core of the step up philosophy is to support underperforming plants to enable them to improve their efficiency to a level commensurate with top performers.
- Optimal raw materials selection and use: The quality of iron ore and coking coal has a direct impact on energy intensity and CO<sub>2</sub> emissions. Measures, such as beneficiation of ore and coal at the source, switching to carbon-lean or hydrogen-containing fuels, and increasing scrap use in the basic oxygen furnace are just a few of the measures that can significantly improve operational performance
- Energy efficiency and minimising waste: Energy efficiency is a crucial component of resource efficiency and there are several tested and proven improvement measures available: heat or energy recovery from solid and gas streams, coke dry-quenching, cogeneration units, electricity savings (aiming toward self-sufficiency), and many more.

- **Improving yield:** Improving yield leads to increased output from the steelmaking processes. It is directly linked to a reduction in energy intensity and raw material use.
- **Process reliability:** Improving a steelmaking plant's maintenance ensures process reliability, which reduces losses in quality and process time, thereby reducing energy use per tonne of steel.

Each participating site receives a draft report containing a summary of observations, findings and recommendations for improvement.

### **What results has step up achieved?**

The programme was tested across nine mills. The reviews show a huge potential of CO<sub>2</sub> savings between 0.2 – 0.5 t/t CS across the sites. The improvements not only result in environmental benefits but can increase efficiency and savings in material, energy and operational costs, assuming EU carbon price is the same across the globe.

The programme aims at rolling out the step up methodology much more widely until 2025. In the long term, the steel industry continues to work in partnership with governments, investing in major research and development programmes to invent radical new steelmaking technologies.

### **How can worldsteel members get involved in step up?**

In the first instance worldsteel members should contact Rizwan Janjua (janjua@worldsteel.org), Head, Technology, to discuss their potential participation in the step up programme.

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