

# Making Sustainability Business as Usual for the World's Foundries

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**Abstract:** Sustainability and finding a path to net zero is crucial for our industry's future as well as the world's. This paper will discuss why foundries must put sustainability at the heart of their strategy, how they can start measuring emissions and set targets for reducing them, and the partners and programmes available to help them.

It will outline how the new EU legislation CSRD will influence companies globally, and reference relevant global standards like ISO 14001 and Ecovadis. It will cover scope 1, 2, and 3 emissions auditing, and explain how frameworks like the Science Based Targets initiative (SBTi) can help to comply with legislation and focus on carbon reduction efforts.

The paper will share what Norican has learned in the three years since its commitment to SBTi: its measurement initiatives, approved carbon reduction targets, ongoing global sustainability initiatives and partnerships with customers.

It will also tell the story of MAT Group that shows how foundries can exploit the latest digital technologies, efficient equipment and supplier expertise in order to measure and cut emissions across their supply chain.

**Keywords:** sustainability; emissions; SBTi; scope; energy; CSRD; MAT Group

## 1 Introduction

The world is facing the existential challenges of depleting resources and rising global temperatures. Climate science tells us we need to slow global warming urgently to prevent runaway global heating and irreversible damage to the planet. The economics of depleting resources means some will become so scarce as to be unaffordable to most.

Since the Paris Agreement in 2015, a global push towards binding emission reduction targets and stricter sustainability regulations has gathered pace, affecting all regions and making its way across supply chains.

## 2 Foundries in the spotlight

Foundries are of course energy-intensive, largely fossil-fuel-powered operations, and users of several diminishing resources. As such, our industry is part of the problem but, in turn, can be part of the solution.

The industry's most powerful customer segment, Automotive, is under pressure to decarbonize its own

production and, increasingly, its supply chains. This is happening fast and is starting to impact foundries, which will be asked to track and declare the carbon footprint of their castings and set emission reduction targets to be invited to tender.

Many people in the foundry industry recognize the transition to more sustainable operations as a moral duty. They are supported in pursuing it by increasing regulatory and customer pressures, but also by the simple fact that, in many cases, sustainable practices make business sense.

## 3 Regulations and frameworks

The regulations driving the adoption of more sustainable industrial practice and the frameworks helping companies work towards them are plentiful. Regional and local regulations are emerging around the world.

In Europe, the EU's CSR Directive (CSRD) has taken a central role. It directly impacts industrial businesses operating in Europe and those with a significant turnover in European markets. Its influence will ripple along global supply chains, and foundries selling into Europe should be aware of and prepared to meet key requirements.

The main purpose of CSRD is to enhance sustainability reporting as part of corporate reporting of non-financial information. The Directive expressly references existing reporting standards to look to when seeking to comply with the new rules. For companies looking to comply with these emerging rules, existing structures and frameworks are available, offering both a basis and a roadmap for their sustainability transformation.

For example, the **Science-Based Targets initiative (SBTi)** offers an emissions reporting framework and guidance tailored to businesses, including specific reporting advice for certain sectors. It helps businesses establish a baseline and set emission reduction targets rooted in climate science, with a clear pathway to achieving them.

**Sustainability assessment and scoring providers** help companies assess their sustainability performance, often by awarding an annual score with a progression path. Norican Group has experience using EcoVadis, a French company widely used around the world.

Frameworks like the above help foundries embed emissions tracking and sustainability reporting in their processes. Commonly used standards like ISO 14001:2015 for environmental management and ISO

ISO 50001 for energy management provide a good basis for both. So does, as we will see, having an IIoT system in place that already collects sustainability-related data.

#### **4 Sustainability in the foundry process**

In foundries of all sizes, we have seen a broad range of successful sustainability initiatives that unlock significant improvements in sustainability and business performance, with knock-on effects that help address the key challenges the industry is facing – from attracting talent to dealing with materials shortages and rising prices.

Important opportunities for sustainability progress we have seen are: radical scrap reduction through automation and use of new technology and data/AI; tight control of consumption ratios (through digital monitoring); increased use of recycled materials (from recycled sand to using less virgin metal); electrification and energy-efficiency upgrades (including lower-emission equipment such as pneumatic instead of thermal sand reclamation). Across all of these, digital monitoring and IIoT are often key, not least to identify opportunities for improvement – as shown in the following case study.

#### **5 Case study: MAT Group**

MAT Foundry Group is a specialist manufacturer of cast and machined parts for the automotive sector. The MAT team realized early on that the ability to track emissions and report environmental performance would be key to winning tenders from automotive companies. At their UK site in Poole, UK, MAT currently calculates a per-ton figure for embedded scope 1 and 2 carbon, based on its total casting output and energy consumption. Adding in product-specific metrics like weight and yield produces a carbon footprint for each individual casting.

Over the years, MAT Group has steadily created robust foundations for its progress on sustainability. All its facilities comply with ISO 14001 for environmental management and OE plants are all ISO 50001 certified for energy management. The team introduced comprehensive digital process optimization (using the IIoT platform Monitizer | DISCOVER) across several of its sites more than five years ago, which has made it easier to now get emissions data from the process.

Dashboards were initially set up to report energy consumption per ton in real-time. “What we’re aiming for

is a real-time carbon metric for every sub-process and a Monitizer digital dashboard that gives us a per-batch emissions figure for each product as it’s produced,” says Luke Batter, Process Development Manager at MAT Group. Measuring **scope 3 emissions** is the next big challenge. MAT is gathering data as fast as it can but, with data on only 10% of supplier emissions, it still doesn’t have quite enough to get an accurate figure. First, it wants to be ready to commit to SBTi.

The group’s commercial director, Shaun Lindfield, explains: “We haven’t signed up to SBT, we’re waiting so we can align our standards with our customers. But we’ve been measuring scope 1 and 2 emissions across the group for the last two years and already offer our customers a product carbon footprint based on that. We started measuring scope 3 emissions in our own supply chain this year [2022].”

The team also realize the **key role of scrap reduction** in improving sustainability performance. Shaun concludes: “Quality and emissions reduction are being linked like never before. When you start to reduce your scrap, there’s a significant reduction in scope 1, 2 and 3 emissions. There’s the melting energy but also all the other carbon emissions that go into producing scrap – the alloys, the energy to dry the sand, bentonite, the transport emissions and so on. There’s a complete shift in mindset coming over the next three to five years. **Getting to zero scrap** is going to be crucial because the effect on emissions will make you so much more competitive. If you are producing 3%-5% scrap, it’s going to cost you a whole load more to get to carbon neutrality. Again, it’s about process improvement leading to fewer emissions. It saves you money and makes you more profitable – so why isn’t everybody doing this?”

#### **6 Conclusion**

Fast progress is possible for foundries who want to produce more sustainably and retain access to increasingly sustainability-driven global supply chains. Frameworks are available to guide a foundry’s sustainability roadmap, with most foundries farther along on their journey than they might think. IIoT can deliver fast, cost-effective sustainability reporting and improvements, with significant business benefits.