



Why aim for manufacturing sustainability?

Manufacturing has a significant impact on the environment. From recycling waste to reducing energy consumption, it's our social and commercial responsibility to aim for manufacturing sustainability, which comes with a range of benefits. Sterling TT is a heat exchanger manufacturer. We wanted to examine why we should aim for sustainability and how we, and other manufacturers, can make our processes greener.

All text and images courtesy of Sterling Thermal Technology

Manufacturing sustainability is using processes that minimise the negative impact of manufacturing on the environment. It also should be economically sound. Sustainable manufacturing should help manufacturers maximise revenue while conserving the natural environment. We can take CNC machining as an example. CNC machines improve efficiency and reduce energy consumption; it takes less energy to produce the same product quantity than conventional machines. The other environmental benefits of CNC machinery include:

- Electronic communication, which reduces paper waste and travel
- Automating more processes. We can reduce materials that are wasted through human-error
- Making use of new technology that's less wasteful, like 3D printing

Environmental impact of manufacturing

The impact of industrial processes and manufacturing on the environment is profound. According to Our World in Data, direct industrial processes account for 5.2% of global carbon emissions. While energy use from industrial processes accounts for 24.2%. In total, industrial processes,

including manufacturing, account for almost a third of all global emissions.

The graph at the end of this article shows that greenhouse gas emissions from the manufacturing and construction sector have increased considerably in the last 15 years. It's the third highest contributor.

'Manufacturing and construction' is one of the sectors that has increased carbon emissions the most over the last couple of decades. They have increased by about 2 billion tonnes since 2000, roughly 50%.

It's worth noting that over the last few years, manufacturing has begun to stabilise and even slightly decrease its emissions. As the world becomes more aware of the impact of emissions on the environment, we make changes, and these start having an effect.

However, the positive impact of sustainable manufacturing goes beyond just helping the environment.

The benefits of manufacturing sustainably

Increasingly, companies are using manufacturing sustainability as a key objective for increasing growth, brand leadership, and global competitiveness. Beyond helping the environment, the benefits of sustainable manufacturing include:

- Improved efficiency, often reducing costs
- Reduction in waste, so fewer costs associated with waste management
- Improved brand recognition, increasing sales
- Improved employee retention and ease of hiring
- Reduced regulatory compliance costs
- Improved long-term business viability

Customers are looking to work with sustainable brands in order to meet their own sustainability goals. By making our manufacturing sustainable, we can drive business.

Achieving sustainable manufacturing

What can we do as manufacturers to achieve sustainability?

Long-term improvement

A long-term vision for manufacturing sustainability means change is more achievable.

Reaching manufacturing sustainability goals requires time and resources. Approaching it with a long-term vision helps to make change more approachable and more likely to be built into the day-to-day processes.

A coordinated approach

One challenge with improving the sustainability of manufacturing processes is the risk of them being ad-hoc and unstructured. This approach has good intentions but is harder to sustain, get stakeholders' backing and all teams involved.

To be successful, we need a coordinated, structured and formal approach. Management, operators and everyone in the business is more likely to implement change when it's structured.

This means starting with the data for the current processes, as well as working with stakeholders and key decision-makers on the primary goals. From here, a long-term plan should be put together with input from all the people involved, including on-the-ground operators.

Working with stakeholders

With any changes, it's crucial to get the support of stakeholders. By working collaboratively with those with an interest in the company, new initiatives are more likely to get financial funding and be successful. In order to do this, you need insightful data.

Analytics and data

A comprehensive and systematic approach to data is essential to successfully collaborate with different members of your organisation and get stakeholder backing.

It's typical for sustainability goals and strategies to be developed at a corporate level, with little input from operators or personnel. On the other hand, operators aren't always equipped with the right analytical software to provide the insight needed to make intelligent decisions regarding sustainability goals.

Many companies at the operator level use spreadsheets to process and analyse data. While functional, it can limit the insights the data can provide. Contextualising data, building models or signal cleansing can be very difficult or time-consuming. Therefore, getting valuable data from operations teams can be challenging, as can developing measurable sustainability KPIs.

This can lead to a dependence on regulation compliance as a measure of sustainability success, limiting the approach from the outset.

Selecting advanced software can be extremely helpful in creating a plan to move towards manufacturing sustainability and measuring its success.

For example, the right software can identify correlations between environmental performance and process parameters. Alternatively, software can build environmental models to aid understanding with how changes to processes will impact energy consumption or other environmental factors.

Going beyond compliance

Environmental compliance is, of course, essential for sustainable manufacturing.

To align practices with regulations, you need to understand the requirements of regulatory bodies in your industry and country. Breaching regulation can lead to fines or even legal action, depending on the situation. For example, serious chemical spills or breaches in toxic waste management.

However, managing sustainability solely for compliance can limit the scope.

Companies that only aim for compliance can find it harder to attract talent and maintain brand recognition as a sustainable organisation and don't reap the full benefits of sustainable manufacturing. We can miss opportunities to improve efficiency, reduce costs and reduce carbon emissions.

Going beyond compliance can help your company to get ahead in the sustainability journey, putting you in better standing with your customers than your competitors. Adopting a comprehensive approach to improving manufacturing sustainability is where the real difference lies and where real change and growth can happen.

Work with sustainable partners

For complete manufacturing sustainability, the approach must include the supply chain and post-manufacturing logistics.

By partnering with companies that also value sustainability, you can improve the carbon footprint of your product from beginning to end.

A well-known example would be McDonalds. Their advertising campaigns over the last few years have focused on a green supply chain. For instance, in 2020, they advertised that 99.6% of their primary guest packaging was sourced from recycled sources and supported deforestation-free supply chains. As a B2C company, they use their work with sustainable partners, including manufacturers, to promote their products.

Therefore, as B2B companies, we can promote ourselves to our customers who want to develop as sustainable brands by being sustainable manufacturers. By working with sustainable partners, we can also show our customers how the product journey from source to supply has taken steps to be more sustainable.

Reviewing and updating

A key part of working towards manufacturing sustainability is reviewing progress and adapting the approach. Over the coming decades, there will be new breakthroughs in sustainable technology that we can build into our processes. We can also assess the successes of our sustainable approach so far and learn from the less successful outcomes.

Sustainable manufacturing examples

Honda is an example of a manufacturer that has adopted a sustainable approach. They have integrated two wind turbines into their Ohio plant to generate 10,000 megawatt-hours of electricity per year, which powers 10% of the plant's energy requirements (source). It's a huge step in making their manufacturing process more sustainable

At Sterling TT, we aim to conserve natural resources and prevent damage and pollution to land, water and the atmosphere. Our staff work to help preserve these resources and avoid environmental damage in any form.

Our management and supervisors are responsible for assessing the environmental impact, including environmental protection features within our design, manufacturing, and construction activities. For instance, we segregate, sort or dispose of waste materials only by authorised, recognised and licenced means.

While manufacturing, we keep the noise, dust and fumes to a minimum. In addition, we constantly work at reducing our workplace risks and creating safer working conditions.



Furthermore, we work with sustainable partners and back renewable energy industries. Find out more about our heat exchangers for renewable energy. These are a short list of the actions we take to help build a more sustainable future.

Finally, as we want to be recognised for our good work and continuously improve, we have started our journey to get ISO 14001 and ISO 45001 certifications.

Resources for manufacturers

For more information on how to make your manufacturing process more sustainable, see the below resources:

- British Chambers of Commerce: Net Zero Hub
- Energy Saving Trust
- UK Business Climate Hub
- Make UK
- International Organization for Standardisation

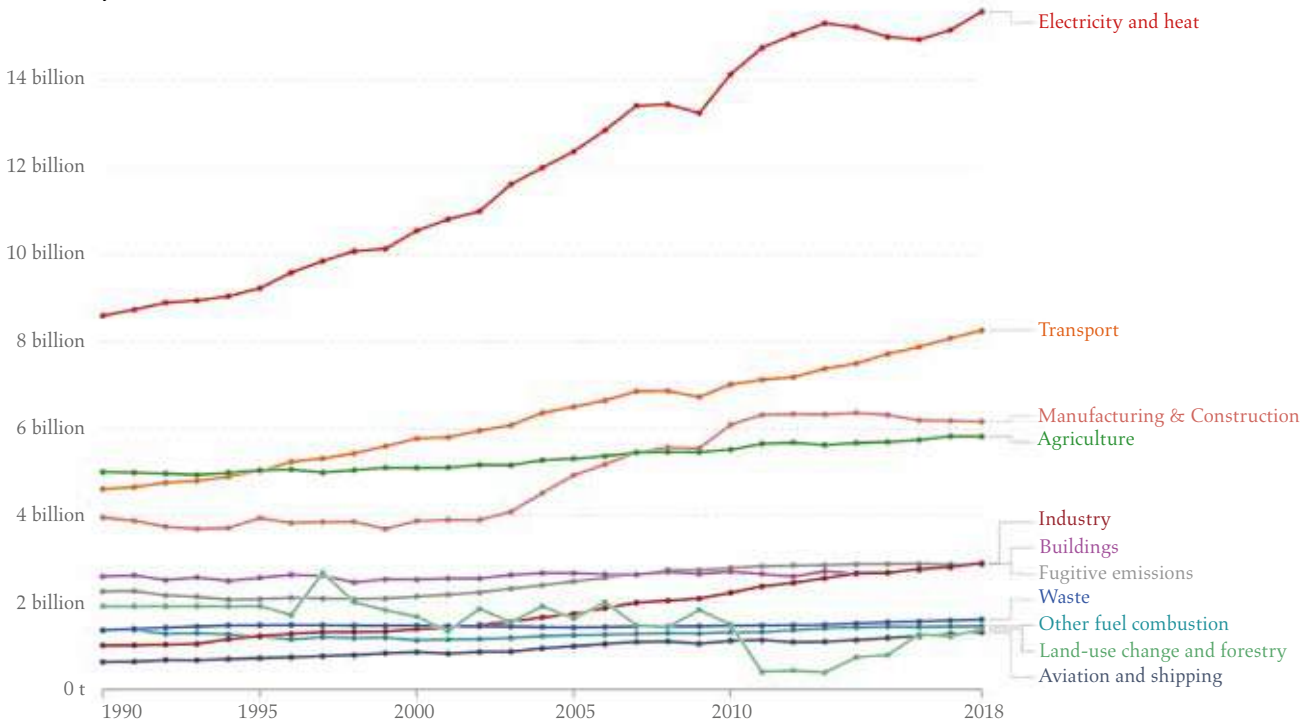
About the Company

With decades of experience providing heat exchangers for the defence industry, Sterling TT has the expertise required to work on submarines as well as surface ships. A submarine is an advanced and complex piece of military equipment. Being involved in making one is a unique challenge, one that requires decades of experience and engineering expertise. But it is a challenge that the company is proud to be a part of.

Greenhouse gas emissions by sector, World



Emissions are measured in carbon dioxide equivalents (CO2eq). This means non-CO2 gases are weighted by the amount of warming they cause over a 100-year timescale.



Source: GAIT Climate Data Explorer via Climate Watch [OurWorldInData.org/co2-and-other-greenhouse-gas-emissions](https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions) • CC BY
 Note: Greenhouse gases are weighted by their global warming potential value (GWP100). GWP100 measures the relative warming impact of one molecule of a greenhouse gas, relative to carbon dioxide, over 100 years.

Source: Our World in Data: <https://ourworldindata.org/emissions-by-sector> - interactive graph available