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From compliance to leadership: The future of sustainability in manufacturing

Discussions about sustainability and related topics appeared in 29% of manufacturers' earnings calls in Q1 2024, according to IoT Analytics' quarterly coverage of keywords in corporate earnings calls. The attention that CEOs of industrial companies are putting on the topic has risen considerably in the last 5 years; for comparison, in Q1 2019 only 9% of CEOs at the same companies discussed sustainability in their earnings calls.

This is just one of several statistics that show climate change is transforming "sustainability" from a corporate buzzword to an imperative for manufacturers worldwide.

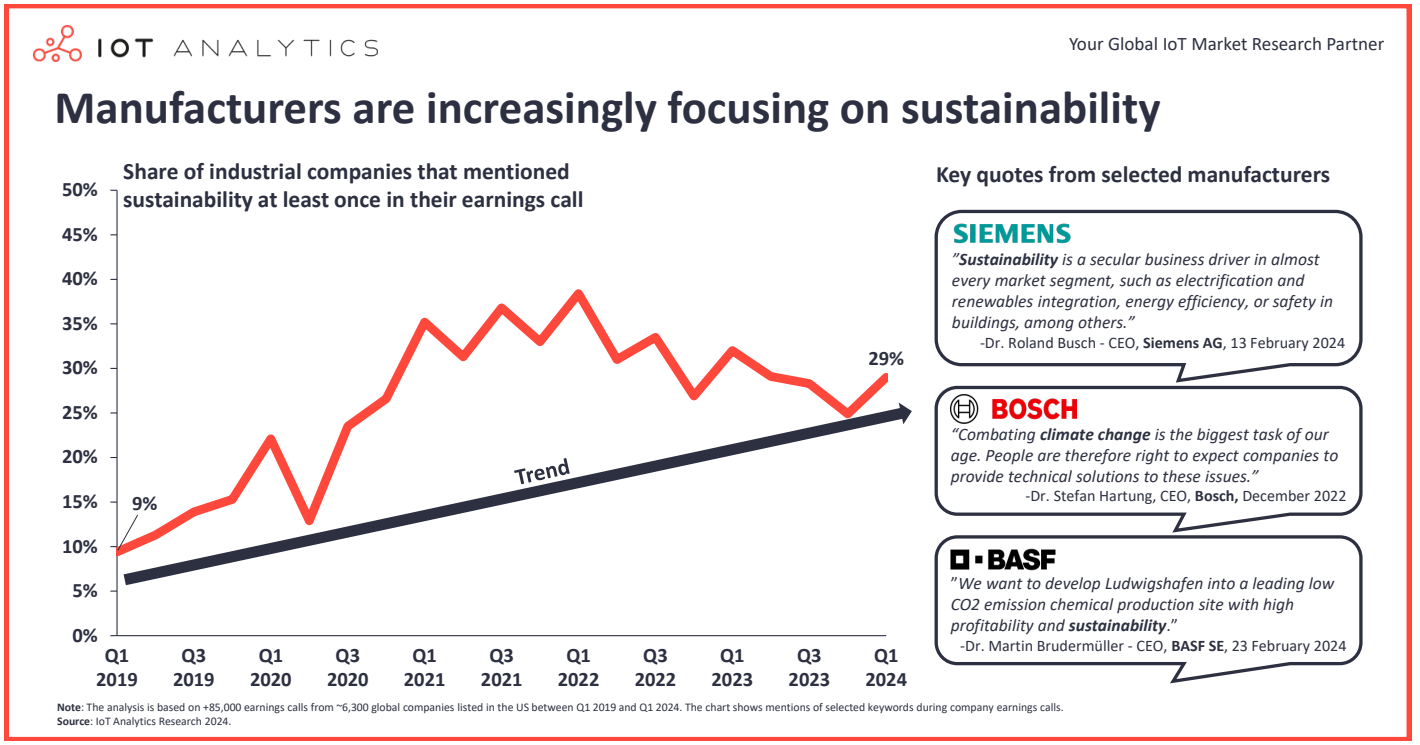


Figure 1. Tracking mentions of sustainability in earnings calls of manufacturers since Q1 2019.

In this article, we focus on sustainability in manufacturing, including what is driving manufacturers' sustainability initiatives, how the initiatives are currently tracking environmental impacts, and what manufacturers need to prepare for upcoming reporting and transparency requirements. But first, we will review why sustainability matters.

Why sustainability matters

Since the pre-industrial era (1850–1900), the average land surface air temperature has increased more than 1° C,[1] and the earth keeps getting warmer: February 2024 was the hottest February on record and marked the ninth straight month of record-high monthly temperatures.[2]

In short, the climate is changing, and for decades, researchers have attributed this change to pollution and emissions, primarily of greenhouse gases (GHGs), such as CO2.

These temperature increases may not sound like much, but their impacts are real. In 2022, the World Wide Fund for Nature's (WWF) Living Planet Report found a 69% decrease in monitored wildlife populations since 1970, attributing this loss of biodiversity to climate change and the unsustainable use of resources.[3]

If the loss of wildlife populations is not tangible enough, climate change's impact on the weather certainly is. Data from the Université catholique de Louvain's Emergency Events Database (EM-DAT) shows that the average number of natural disasters per year between 1980 and 1999 jumped 79% between 2000 and 2022, from 217 to 388, respectively.[4] While these numbers include non-climate-related disasters like earthquakes and volcanic activities, climate-related issues such as flooding and extreme weather events witnessed the steepest climbs since 1980 and outpaced other natural disasters. Everyone, including corporations, is impacted by climate change, and most are realizing more and more that the way we produce and consume is not sustainable.

Drivers of manufacturers' sustainability initiatives

According to Our World in Data, using the World Resources Institute's Climate Watch data, industrial manufacturing made up nearly one-quarter (24.2%) of energy-related emissions in 2020. Meanwhile, 5.2% of non-energy-related emissions come from manufacturing cement, chemicals, and petrochemicals.[5]

Manufacturers appear to be aware of these emission levels. Sustainability is a more common topic in industrial companies' earnings calls than for most other groups (29% of manufacturing earnings calls discussed it in Q1 2024 compared to 22% of overall earnings calls), with many executives discussing individual projects and corporate targets.

"Sustainability is a secular business driver in almost every market segment, such as electrification and renewables integration, energy efficiency, or safety in buildings, among others."

Roland Busch – CEO, **Siemens AG**, 13 February 2024

[1] "Climate Change: Global Temperature," NOAA, 2024, https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature
[2] "How Streak: Why February 2024 Was The 9th Consecutive Hottest Month On Record," Forbes, 7 March 2024, https://www.forbes.com/sites/davidrvetter/2024/03/07/hot-streak-why-february-2024-was-the-9th-consecutive-hottest-month-on-record/
[3] "Living Planet Report," World Wide Fund for Nature, 2022, https://livingplanet.panda.org/en-US/
[4] "Number of recorded natural disaster events," Our World in Data (from EM-DAT data), 2023, https://ourworldindata.org/grapher/number-of-natural-disaster-events
[5] "Sector by sector: where do global greenhouse gas emissions come from?" Our World in Data, 2020, https://ourworldindata.org/ghg-emissions-by-sector

Four aspects identified in our research drive these projects: cost savings, social pressure, corporate values, and, most of all, regulations.

1. Cost savings

Often the low-hanging fruit for manufacturer sustainability initiatives in recent years, immediate cost and resource savings have been a motivating factor for many manufacturers. An example of such initiatives is reducing and reusing material waste, which can cut disposal resource costs and let companies use more of the materials they already purchased.

2. Social pressure

This driver includes environmentally conscientious consumers and investors, who are more and more considering the environmental impacts of their spending decisions (often referred to as responsible investing or responsible consumption). Many consumers consider the environmental impact of the production or disposal processes when deciding to purchase a product. Meanwhile, many investors are looking at sustainability portfolios, which include companies that have sustainability initiatives, be it emission reduction or impact offset initiatives.

"The absolute emission reduction KPI was requested by many shareholders. To be included in our short-term incentive scheme. That's why we, in the first place, also put it in. It also perfectly fits our carbon emission reduction targets."

Markus Steilemann – CEO, **Covestro AG**, 27 October 2023

3. Corporate values

Research has indicated that companies are internalizing sustainability as a corporate value, helping to drive initiatives with full support from executives and other corporate leaders. In 2010, McKinsey shared that "Maintaining or improving corporate reputation" was the top reason for addressing sustainability issues.[6] However, in 2021, respondents to that year's sustainability survey from McKinsey marked "Align with our goals, mission, and values" as the top reason, highlighting a shift in why corporations address sustainability.[7]

"Combating climate change is the biggest task of our age. People are, therefore, right to expect companies to provide technical solutions to these issues."

Dr. Stefan Hartung – CEO, **Bosch**, 21 December 2022

6 "How companies manage sustainability", McKinsey & Company, 2010, https://www.mckinsey.com/capabilities/sustainability/our-insights/how-companies-manage-sustainability-mckinsey-global-survey-results
7 "How companies capture the value of sustainability: Survey findings", McKinsey & Company, 2021, https://www.mckinsey.com/capabilities/sustainability/our-insights/how-companies-capture-the-value-of-sustainability-survey-findings

4. Regulations

Our research has found regulations to be the biggest driver of sustainability initiatives at scale. To help cut GHGs and other pollution, many governments worldwide have adopted regulations and limitation mechanisms intended to encourage companies to adopt sustainability measures. Such actions force a large number to comply with the guidelines, helping to advance entire sectors rather than individual companies. Examples of key sustainability regulations that manufacturers have had to follow in the recent past include the following:

- **EU Emissions Trading System (ETS)**, which caps emissions by sectors and allows companies within them to trade emission allowances
- **EU Carbon Border Adjustment Mechanism**, which is a carbon tax on carbon-intensive goods imported into the EU and aims to prevent the relocation of carbon emissions from the EU to non-EU countries
- **US Clean Air Act**, which has served as the basis for the US Environmental Protection Agency's regulation of pollutants, including greenhouse gas emissions

Failure to follow these regulations has resulted in sizeable fines or the loss of a business's ability to operate in the country. For instance, in March 2022, Chevron Phillips Chemical Company agreed to take measures to ensure CAA compliance after it allegedly failed to properly operate and monitor its industrial flairs, resulting in excess emissions. The measures were estimated to cost $118 million, and the company settled on an additional $3.4 million civil penalty as well.[8]

While the aforementioned regulations have largely focused on limiting emissions and pollutants, there are recently enacted regulations that add more focus on precision in sustainability-related data and transparency. These will force many corporations, particularly manufacturers, to thoroughly collect relevant sustainability and emissions data and produce annual reports on environmental impacts, among other matters.

These regulations aim to enable investors and consumers to make knowledgeable, conscientious decisions in line with their sustainability priorities. Failure to follow these can result in hefty fines and bad press.

"[] ... sustainability pressures, driven by new regulations and consumer preferences, are driving unprecedented shifts in the [] market."

Emile Chammas – Interim co-president, co-CEO, and COO, **Sealed Air Corporation**, 27 February 2024

The two most notable regulations are:

1. The **EU Corporate Sustainability Reporting Directive (CSRD)**
2. The **US Securities and Exchange Commission (SEC) Climate-related disclosures**

	EU Corporate Sustainability Reporting Directive (CSRD)	**US Securities and Exchange Commission (SEC) Climate-related disclosures**
What it is	EU regulation for corporate sustainability reporting.	US regulation for corporate sustainability reporting.
Current status	Enforceable since January 5, 2023	Approved in March 2024, will be enforced starting in 2025.
What it covers	All dimensions of sustainability, including metrics and targets with both environmental and social impact.	Climate-related financial data and insights into GHG emissions.
Who it covers	Around 50,000 companies incl. all large companies and listed SMEs (approximately 75% of the EU's total company turnover)	Around 12,000 companies incl. every US publicly traded company, including foreign SEC registrants (approx.. 1,150 companies)
The approach	Stakeholder approach. Requiring reporting on the needs of a wide range of stakeholders. Companies need to disclose both the impact on sustainability matters and sustainability issues' impacts on the company's financials.	Investor-focused approach Requiring only disclosure of information that would influence investors' decisions.
Reporting standards used	Uses its own industry-specific reporting standard. Companies must report according to the European Sustainability Reporting Standards (ESRs), a set of multiple sector-specific standards with granular metrics and targets.	Re-uses existing standards to create a set of industry-agnostic, climate-related metrics. The approach appears largely based on existing frameworks by the Task Force on Climate-Related Financial Disclosures (TCFD) and the GHG Protocols.
First expected reports	2025	2026

8 "Chevron Phillips Chemical Company Agrees to Reduce Harmful Air Pollution at Three U.S. Chemical Plants," US Department of Justice Office of Public Affairs, 2022, https://www.justice.gov/opa/pr/chevron-phillips-chemical-company-agrees-reduce-harmful-air-pollution-three-us-chemical

Sustainability data collection and management

Whether the new reporting directives will present onerous additional requirements on companies depends on how well the companies are prepared to acquire and manage data and convert the data into the desired reporting formats in an understandable and automated fashion.

The struggle: Establishing the sustainability data foundation

Addressing sustainability begins with setting a data baseline: Tracking and estimating emissions, energy usage (e.g., electricity, fuel), and the overall carbon footprint. Specific methodologies and guidelines exist, such as the GHG Protocol, but these can vary between industries or even within an industry.

Many companies, especially small-to-medium enterprises (SMEs), struggle with collecting sustainability-related data. This often stems from a lack of the right collection tools, bad data quality, or companies not knowing what data they need to collect or even how to collect the data.

Faced with this lack of operational or IoT sensor data, many companies turn to estimating their GHG emissions using activity and financial data (e.g., utility bills or transportation logs) and multiplying by emission factors specific to the source, industry, or sub-sector. Worst yet, data are often tracked in spreadsheets, which lack robust data management and interpretation tools.

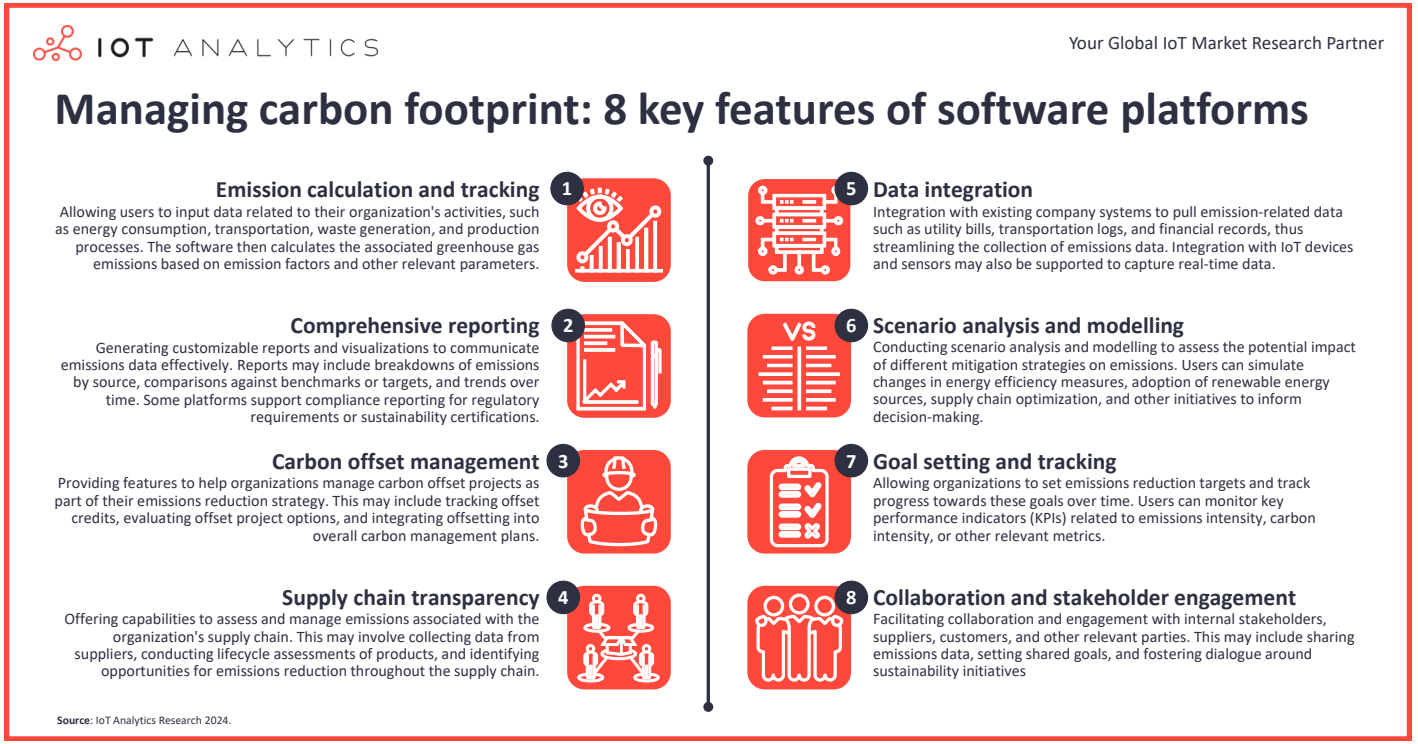
Considerations for impending reporting requirements

To prepare for upcoming regulations such as the EU CSRD, companies need to adopt tools that can address their industry-specific needs in terms of data collection—whether from IoT sensors or existing company financial or environmental health and safety reporting systems—data management and analysis, and automated reporting.

This need is giving rise to a new category of software: Carbon Footprint Management Platforms.

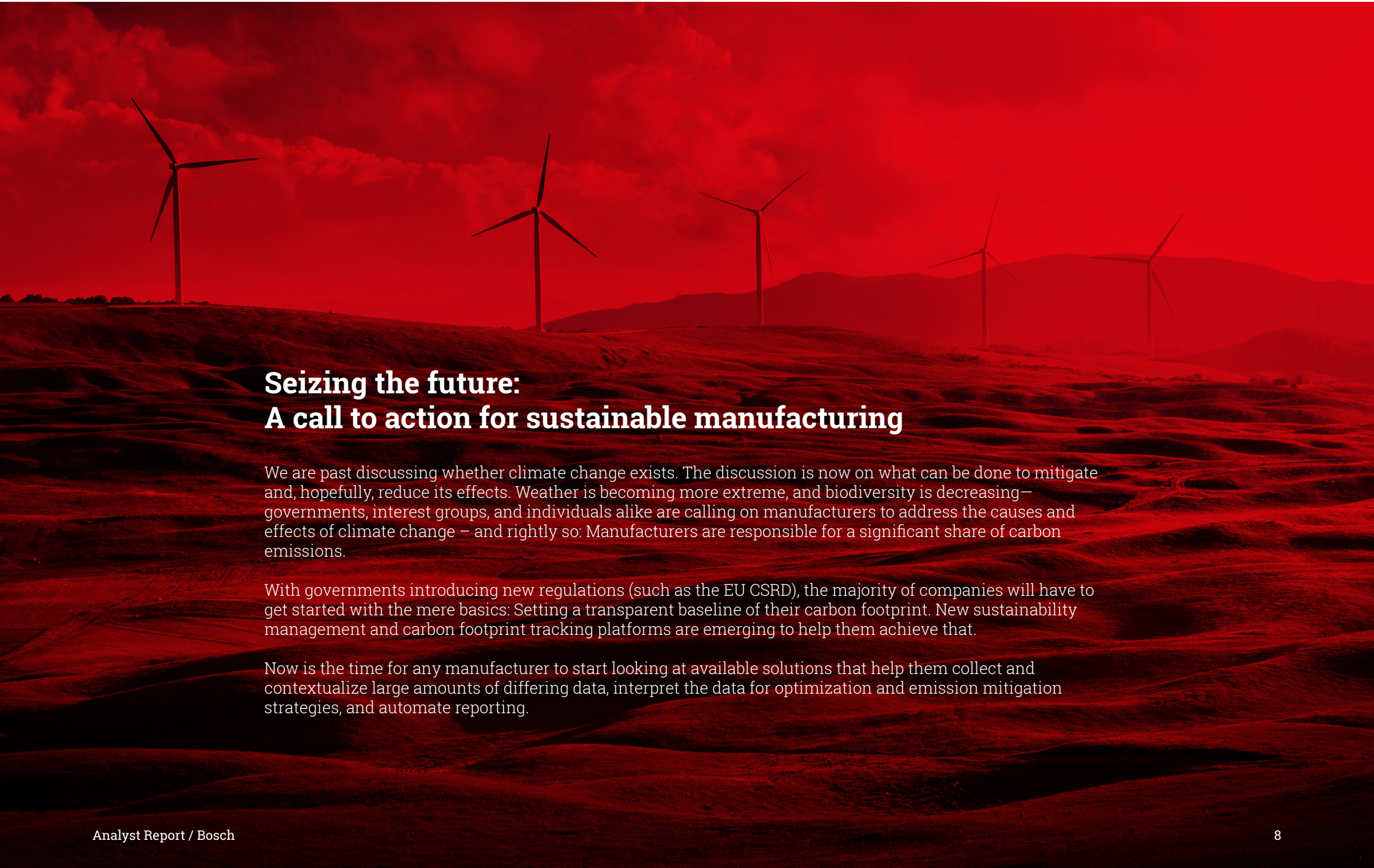
These platforms specialize in data collection, management, and reporting, including industry-specific calculation models – thereby addressing the requirements set by these new regulations.

Below are eight key features that an ideal Carbon Footpring Management Platform would offer.



At the core of the platform are data collection integration capabilities which are important for contextualization and analysis, providing a clear picture of a company's carbon footprint and impacts from climate and resource management issues.

These platforms should also be able to interpret the data and assess different scenarios before offering optimization and emission mitigation strategies. With data, reporting, and mitigation strategies in place, companies can meet regulation requirements and better engage with stakeholders to foster dialogue around meaningful sustainability initiatives.



Seizing the future:
A call to action for sustainable manufacturing

We are past discussing whether climate change exists. The discussion is now on what can be done to mitigate and, hopefully, reduce its effects. Weather is becoming more extreme, and biodiversity is decreasing—governments, interest groups, and individuals alike are calling on manufacturers to address the causes and effects of climate change – and rightly so: Manufacturers are responsible for a significant share of carbon emissions.

With governments introducing new regulations (such as the EU CSRD), the majority of companies will have to get started with the mere basics: Setting a transparent baseline of their carbon footprint. New sustainability management and carbon footprint tracking platforms are emerging to help them achieve that.

Now is the time for any manufacturer to start looking at available solutions that help them collect and contextualize large amounts of differing data, interpret the data for optimization and emission mitigation strategies, and automate reporting.