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Key takeaways

1	Industrial gas manufacturers have a reputation of being among the largest emitters of carbon .	2	Linde is one of the oldest and largest industrial gas manufacturers with business operations spanning gas, engineering, procurement and construction.
3	Linde's story shows the importance of looking beyond the numbers and adopting a system-wide perspective on emissions data accounting and reporting.	4	Linde makes a compelling case on why deepening our understanding of a company through fundamental research and thoughtful engagement is critical.

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Industrial gas manufacturers have a reputation of being among the largest emitters of carbon. Linde is one of the oldest and largest of these manufacturers, with business operations spanning gas, engineering, procurement and construction. To investors, companies such as Linde may appear problematic in the context of the net zero transition and what it could mean for long-term business and stock price performance. We think otherwise. We believe the company is challenging this narrative by demonstrating how its products help clients decarbonize their supply chain and keep millions of tons of carbon from being released into the atmosphere.

Linde's story shows the importance of looking beyond the numbers and adopting a system-wide perspective on emissions data accounting and reporting while also pursuing workable solutions in the journey to net zero. The transition will be complex, nonlinear and multifaceted, and investors must understand this as they look at companies, or they will open themselves up to additional risk and missed opportunities. Linde makes a compelling case on why deepening our understanding of a company through fundamental research and thoughtful engagement is critical.

To investors, emissions reporting plays a vital role in the transition away from carbon, and reporting on Scope 1 and 2 emissions (*i.e.*, direct emissions from owned or controlled sources and indirect emissions from the generation of purchased power) is crucial. There is also increasing regulatory scrutiny of the emissions data reported by companies: Many jurisdictions are now legally required to report on carbon emissions as well as other environmental and social impacts. However, for business stakeholders demanding greater transparency on environmental and social impacts, these metrics do not always tell the whole story. For example, they may not capture the entire scope of a company's environmental impact, including the indirect impacts of the company's products and activities on emissions across the value chain.

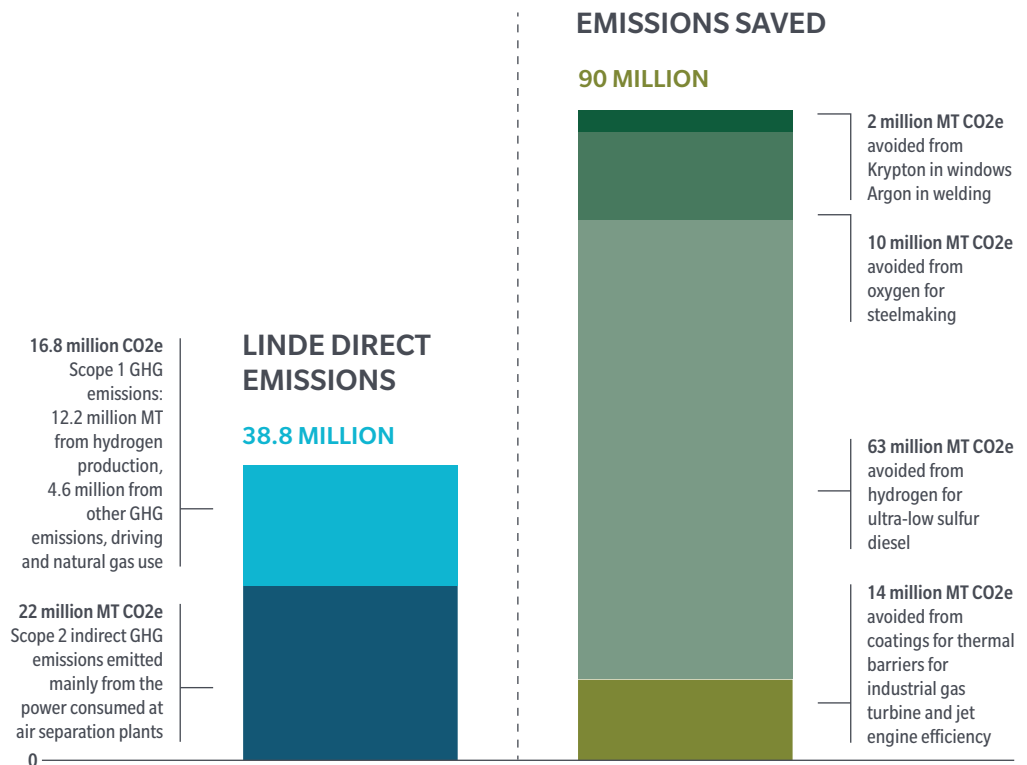
Emissions reporting: Intensity complexity

SCOPE 1 emissions	SCOPE 2 emissions	SCOPE 3 emissions
Direct emissions from sources owned or controlled by the organization	Indirect emissions from purchased heat, electricity and steam	All other indirect emissions that occur in a company's value chain

We believe that the context in which you look at a company's carbon footprint and its effect on the broader value chain is important when assessing its progress toward achieving net zero emissions and its attractiveness from a valuation perspective. When viewed in isolation, Linde's emissions data appear to paint a picture of an industrial giant belching out harmful greenhouse gases while creating products that serve as inputs for other large carbon emitters. However, when these data are viewed in the context of Linde's value chain and the markets the company serves, we get a very different picture.

Linde emissions footprint & benefit

In 2022, a subset of Linde applications enabled more than twice the GHG benefit than was emitted in all global operations.



Source: Linde 2022 Sustainable Development Report.

For example, in 2022, Linde emitted 38.8 million metric tons of CO2, but that is not the whole story. During engagements with the company, we were reminded by management of the role Linde's products play in the overall economy. Those products include medical oxygen for hospitals, nitrogen for semiconductors, liquid nitrogen for food freezing, krypton to insulate windows and hydrogen to produce

In our view, these avoided emissions are relevant in our valuation of Linde, particularly as we examine the company's long-term success in the context of the transition to net zero.

cleaner fuels. Air gases improve energy efficiency, increase shelf life and help to eliminate or reduce greenhouse gas (GHG) emissions. Overall, its products and technologies helped keep 90 million metric tons of carbon emissions (more than two times Linde's own emissions in the same year) from being released into the atmosphere by other players along the value chain. So, a good way to think about the absolute emissions metric in this context is that it not only takes into consideration carbon released from sources directly owned and controlled by the company but also accounts for the impact that the company's activities or products have on the total emissions across the supply chain.

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Embracing complexity: Simplifying solutions

To reach carbon mitigation goals, it is particularly important that we gain a clearer understanding of the impact in absolute terms of players across their respective supply chains. To do this, we must look beyond the analysis of Scope 1 and 2 data and adopt a more holistic view of the impact of some of the largest carbon emitters, including lower emissions brought about by their products or services.

The process of decarbonizing the value chain and reaching net zero will be complex. Among other measures, it will involve

- changes to how governments and companies report direct and indirect emissions and how company activities affect the environment
- changes to the energy mix and the prioritization of long-term environmental stability
- investing in infrastructure to reengineer the energy grid in order to reduce the overall dependence on fossil fuels
- radical changes to consumer behaviors and attitudes toward energy consumption
- harmonizing policy at the international level to incentivize sustainable behavior by companies and consumers

Taking these considerations into account when seeking to understand Linde's transition goals can help us form a more comprehensive view of the company. For example, in 2022, oxygen produced by Linde helped steel makers achieve more energy-efficient industrial production while preventing the release of 10 million metric tons of carbon emissions. The hydrogen it produced also helped oil refiners make ultralow-sulfur diesel, which prevented 63 million metric tons of CO₂ emissions from being released. Additionally, it conducted the first-ever commercial scale trial for using hydrogen as fuel for low-carbon steel heating and is currently building the world's largest polymer electrolyte membrane (PEM) electrolyzer, a device which uses electricity to break water down into its constituent elements of hydrogen and oxygen in a process called electrolysis. PEMs could potentially allow the large-scale use of hydrogen — a cleaner alternative to fossil fuels such as coal — in the manufacture of carbon-intensive industries such as steel making. If the energy used to create hydrogen from this process is sourced from renewable sources, then the carbon footprint of the steel manufactured using hydrogen supplied by Linde will be substantially reduced.

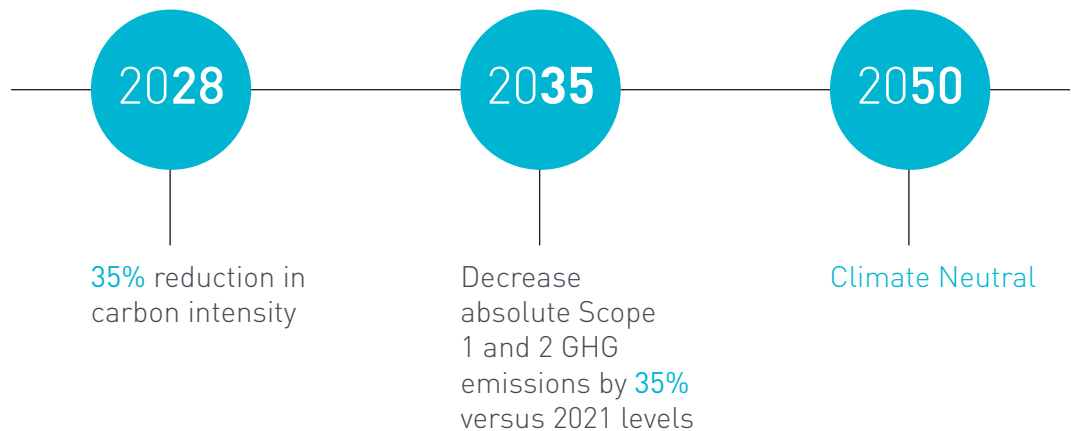
Digging deeper

Understanding the complexities of the energy transition puts us in a better position to evaluate Linde. To some investors, the company may appear, as we have said, to be an emissions giant posing serious risks to their portfolio decarbonization goals and performance returns. However, we believe the reality is different. Linde has begun to take environmental leaps that could put them in a favorable position as the transition to net zero progresses.

Emissions target summary

Linde has ambitious carbon emission reduction targets and appears to be on course to deliver. Although sector guidelines are not available for the chemicals industry yet, the company is committed to setting a science-based target within the next two years. Linde has joined the stakeholder advisory group to develop the sector guidance that will help bring this about. Its other targets include these:

Linde's emission reduction targets timeline



Source: Linde 2022 Sustainable Development Report.

Looking ahead

Because the industrial gas industry ranks among the world's largest emitters of CO₂, there is a risk that by looking solely at standard data, investors could miss some of the positive underlying environmental attributes of the company. In our view, Linde has set ambitious and achievable targets and helped decarbonize client supply chains, thus preventing millions of tons of CO₂ from being released. This case study highlights the power of active ownership and engagement and the value that fundamental research provides in understanding both the opportunities presented and the risks posed by climate and other sustainability factors. We believe the energy transition will allow Linde to support its growth profile while improving its climate credentials through lower GHG intensity. As the transition to net zero unfolds, we will continue to work closely with Linde.

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