

Position on low-carbon electricity, electrification, and electrical infrastructure



Key messages

- LyondellBasell (LYB) will pursue electrification sourced from low- or zero-carbon electricity sources as one of the key levers to reduce scope 1 and 2 GHG emissions in our global operations.
- LYB supports multiple technologies to supply increased requirements for low- or zero-carbon electricity.
- In support of increased electrification requirements from low- or zero-carbon sources, LYB believes electrical infrastructure and capacity must increase in size, system management must be upgraded to meet growing demand, and infrastructure planning must be enhanced.
- Diverse types of renewable resources must also be balanced across the grid with adequate transmission capacity and energy storage to ensure reliability. Because of this, LYB supports the development of grid balancing mechanisms.
- Regulatory and permitting uncertainty as well as the lack of a competitive pricing structure can hinder the fast development of renewable electricity supply. Certainty and stability in both areas is key to enabling a stable low-carbon electrical supply.

Introduction

LYB is committed to reducing greenhouse gas (GHG) emissions from our global operations and value chain and to delivering solutions that advance our customers' climate ambitions and support society's transition to a low carbon world. Our goals are to 1) achieve net zero scope 1 and 2 GHG emissions from our global operations by 2050; 2) reduce absolute scope 1 and 2 GHG emissions 42% by 2030 (relative to a 2020 baseline); 3) reduce absolute scope 3 GHG emissions 30% by 2030 (relative to a 2020 baseline); and 4) procure a minimum of 50% of electricity from renewable sources by 2030 (based on 2020 procured levels).

Globally, our combined scope 1 and 2 annual emission footprint is approximately 23 million metric tons, with approximately 75% of these emissions from North American operations and 25% from Europe. Scope 1 and 2 emissions from other regions of the world represent less than 1% of our total. Our pathway to reach net zero scope 1 and 2 GHG emissions in our global operations includes four critical levers:

- **Energy efficiency:** optimizing our use of energy in all our manufacturing processes to lower our energy footprint, reduce GHG emissions, and reduce operational costs.
- **Renewable electricity and electrification:** sourcing electricity from renewable electricity projects primarily through power purchase agreements and electrifying processes to reduce our reliance on fossil fuels.
- **Hydrogen:** increasing the use of hydrogen in our fuel mix used onsite for energy to replace other more carbon intensive fuels.
- **Carbon Capture and Storage / Utilization (CCS/CCU):** reducing direct emissions by enabling the capture and storage or reuse of CO₂ from our operations.

This position document addresses key aspects of one of these levers, low-carbon electricity and electrification and electrical infrastructure.

Why does renewable electricity and electrification matter to LYB?

1. We have committed to reaching net zero scope 1 and 2 GHG emissions in our global operations by 2050 with ambitious interim targets defined in line with the latest climate science. Electricity is a major contributor to GHG emissions. Therefore, having the ability to secure competitive and reliable (24/7) low-carbon electricity is critical to a successful path to net zero.
2. As one of our key levers to achieve our climate goals, LYB will pursue electrification where technically and economically possible as it provides a higher energy conversion efficiency compared to other clean energy sources such as low-carbon hydrogen.
3. Electrification will only be a viable lever to decrease GHG emissions from our global operations if there is adequate supply of low- or zero-carbon electricity from various sources and if the electrical infrastructure is both adequate and sufficiently reliable to meet the increased demand.

What do we need? LYB's position.

To be a viable lever for reduction of GHG emissions, low- or zero-carbon electricity must be available from a variety of sources to support the capacity and reliability needed. Because of this, LYB supports a technology-agnostic approach to allow for flexibility in electricity sourcing and to enable adequate availability and storage from these sources. The different types of sources that could be utilized under a technology-agnostic approach are numerous, but can include the following:

- Renewable electricity from wind and solar generation provides low-carbon electricity when the resource is available.
- Batteries and other electricity storage systems allow low-carbon electricity to be stored and utilized as demand calls for it.
- Fuel cells are used to self-supply electricity reliably, and the modular design of this technology greatly reduces reliance on the grid for back-up supply. Fuel cells can be fueled by hydrogen or by natural gas in conjunction with CCS to provide a low-carbon solution.
- CCS for cogeneration facilities and natural gas production is needed in regions with low-cost natural gas supply to mitigate the economic impact of the transition and provide a durable supply system.
- The newest technologies for nuclear power provide low-carbon electricity that can be integrated as a utility within the grid or used to self-supply electricity reliably.

In support of increased electrification needs from renewable and low-carbon sources, LYB believes electrical infrastructure and capacity must increase in size, system management must be upgraded to meet growing demand, and infrastructure planning must be enhanced.

- The infrastructure system must increase in size to meet the growing demand and be upgraded to provide adequate information and controls to respond to the changing supply and demand balance.
- Infrastructure capacity must be increased to accommodate higher failures within the aging system.
- The infrastructure planning process must be upgraded to meet the growth in the energy transition as the current model for expanding/improving the electrical grid already has difficulty keeping up with growth in some regions.
- Updates to the infrastructure system should be forward-looking, transparent, and open to stakeholder consultation, which will allow for greater certainty in electrification investments by grid operators and industry.

Moving to a low-carbon electrical supply will be impacted by the availability or lack of availability of renewable resources in certain locations and a more dispersed supply system. Diverse types of renewable resources must be balanced across the grid with adequate transmission capacity and energy storage to ensure reliability.

Finally, LYB supports a regulatory environment and incentive structure that provides certainty for public and private-sector investment. For example, government programs should incentivize the use of Power Purchase Agreements (PPAs), which are key to securing procured electricity from renewable sources. Through PPAs, we can help create a more renewable energy supply system as they offer financial support for new renewable energy projects, conveying additionality. In addition, the energy transition will result in significant electrical demand growth, requiring robust long-range planning reaching out decades into the future. Close collaboration and supply-demand forecasting between energy producers and demand sectors should be incorporated in a long-range master plan. Governments must ensure planning and financial security so that investments can take place.

About us

We are LyondellBasell (LYB) – a leader in the global chemical industry creating solutions for everyday sustainable living. Through advanced technology and focused investments, we are enabling a circular and low carbon economy. Across all we do, we aim to unlock value for our customers, investors and society. As one of the world's largest producers of polymers and a leader in polyolefin technologies, we develop, manufacture and market high-quality and innovative products for applications ranging from sustainable transportation and food safety to clean water and quality healthcare. For more information, please visit www.lyb.com or follow [@LyondellBasell](https://www.linkedin.com/company/lyondellbasell) on LinkedIn.