

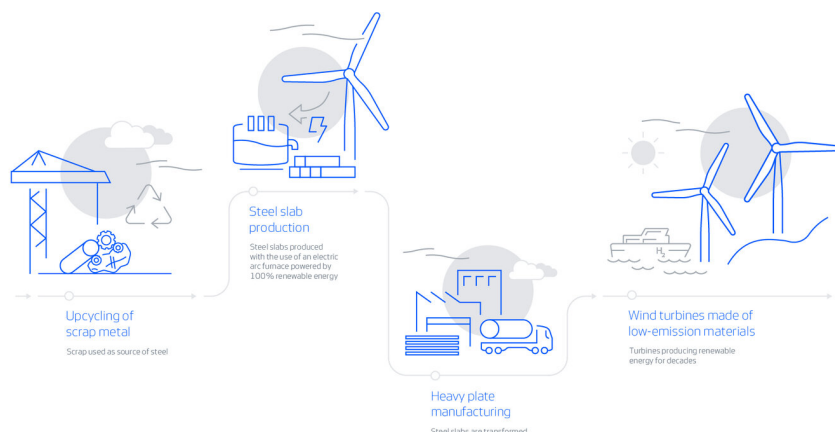


Low-emission steel

Wind. It means the world to us.™

Vestas®

Decarbonising wind turbines through the introduction of low-emission steel



Pulling the wind industry's greatest lever for emission reduction

The wind industry plays an undoubtedly pivotal role in the mitigation of climate change, but has the potential to have an even greater impact by reducing its own emissions. The pressure to realise this potential is being put on developers as decarbonisation is increasingly important evaluation criterion in tenders.

With steel constituting 80-90 percent of a wind turbine's material mass, and responsible for approximately 50 percent of its total lifecycle emissions, it is the single most decisive lever to enable the wind industry in achieving its emission reduction targets. Finding ways to decarbonise the emissions produced during the raw material extraction and refinement of steel is vital for us and the industry.

Activating the supply chain for decarbonisation

Vestas has partnered with its European steel supplier ArcelorMittal to offer low-emission steel for Vestas wind turbines. Currently, the offering is available for the entire tower of onshore wind turbines and the top two out of four tower sections of offshore wind turbines.

The low-emission steel is produced using 100 percent steel scrap which is melted in an electric arc furnace powered by 100 percent wind energy at the ArcelorMittal steel mill, Industeel Charleroi, in Belgium and can achieve a 66 percent decrease in emission intensity per kg steel compared to steel made via the conventional steelmaking route.

Unleashing customers' sustainability potential through continuous innovation

While delivering the same trusted quality and product longevity, with this offering, Vestas enables industry pioneers to:

- Significantly reduce the carbon footprint of their wind farm assets.
- Promote circularity.
- Drive the transition of the growing iron and steel industry which is currently responsible for 7 percent of global emissions.¹

Capacities have already been formally reserved. Vestas is committed to upscaling and continuing to improve this solution in collaboration with its suppliers to also offer entire offshore turbines made of low-emission steel in the future while further decarbonising the process.

Benefits of low-emission steel

- Focusing on the material with industry's largest environmental impact and promoting circularity.
- Reduced scope 3 emissions using upcycled material and renewably-powered electrification.
- Unchanged design, quality, and installation process.



CO2e reductions through use of low-emission steel

	Onshore* (entire tower)	Offshore** (top two tower sections)
Scope 3 per kg steel	66 percent	66 percent
Tower-level	52-55 percent	25-26 percent
Turbine level	23-27 percent	9-10 percent
Wind plant	17-20 percent	4-5 percent

*based on V1.62 LCA

**based on V236.15MW LCA

Sidenote: Due to size and weight requirements, cost and energy-intensive welding is needed for the larger bottom tower sections, rendering this solution of low-emission steel unsuitable. We are collaborating with steel mills to develop larger low-emission plates, aiming for their use in all turbine sections soon.

¹ Source: IEA. (2020). Iron and Steel Technology Roadmap. Towards more sustainable steelmaking.

Vestas Wind Systems A/S
Hedeager 42 . 8200 Aarhus N . Denmark
Tel: +45 9730 0000 . Fax: +45 9730 0001
vestas@vestas.com . [vestas.com](https://www.vestas.com)

© 2024 Vestas Wind Systems A/S. All rights reserved.

This document was created by Vestas Wind Systems A/S on behalf of the Vestas Group and contains copyrighted material, trademarks and other proprietary information. This document or parts thereof may not be reproduced, altered or copied in any form or by any means without the prior written permission of Vestas Wind Systems A/S. All specifications are for information only and are subject to change without notice. Vestas Wind Systems A/S does not make any representations or extend any warranties, expressed or implied, as to the adequacy or accuracy of this information. This document may exist in multiple language versions. In case of inconsistencies between language versions the English version shall prevail. Certain technical options, services and wind turbine models may not be available in all locations/countries.

02/2022-EN