

FIBREFLECT

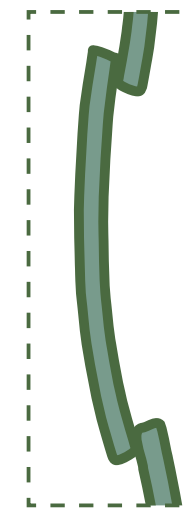
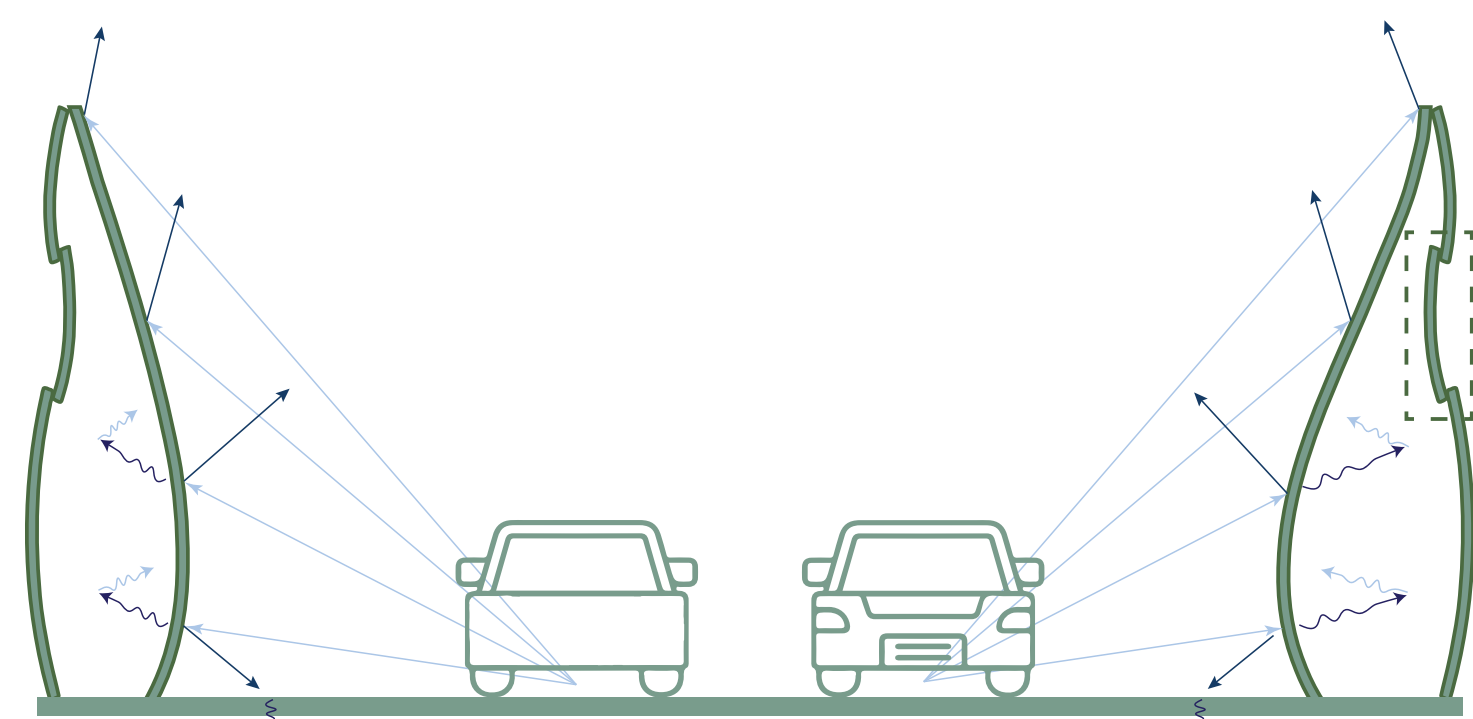
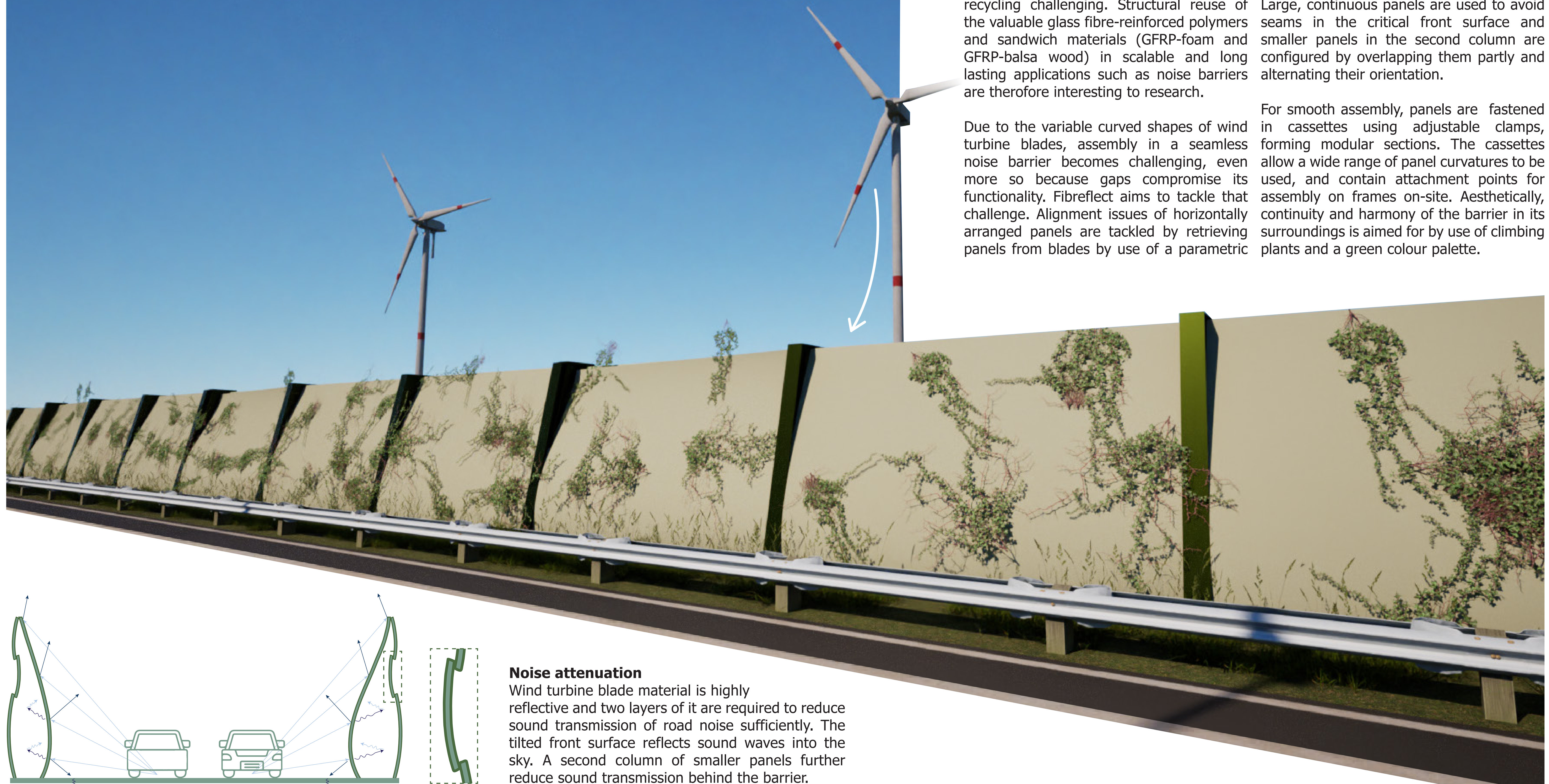
A Noise Barrier made from decommissioned Wind Turbine Blades

To address climate change challenges, wind turbines are increasingly being adopted. Their blades pose end-of-life problems, as their complex material composition makes recycling challenging. Structural reuse of the valuable glass fibre-reinforced polymers and sandwich materials (GFRP-foam and GFRP-balsa wood) in scalable and long lasting applications such as noise barriers are therefore interesting to research.

Due to the variable curved shapes of wind turbine blades, assembly in a seamless noise barrier becomes challenging, even more so because gaps compromise its functionality. Fibreflect aims to tackle that challenge. Alignment issues of horizontally arranged panels are tackled by retrieving panels from blades by use of a parametric

segmentation strategy that limits their curvature and deflection while also helping to determine how a blade can be segmented for reuse of a large part of it. Large, continuous panels are used to avoid seams in the critical front surface and smaller panels in the second column are configured by overlapping them partly and alternating their orientation.

For smooth assembly, panels are fastened in cassettes using adjustable clamps, forming modular sections. The cassettes allow a wide range of panel curvatures to be used, and contain attachment points for assembly on frames on-site. Aesthetically, continuity and harmony of the barrier in its surroundings is aimed for by use of climbing plants and a green colour palette.



Noise attenuation

Wind turbine blade material is highly reflective and two layers of it are required to reduce sound transmission of road noise sufficiently. The tilted front surface reflects sound waves into the sky. A second column of smaller panels further reduce sound transmission behind the barrier.

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Design of a noise barrier from decommissioned
wind turbine blades
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Integrated Product Design

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