# Seizing 'winds of opportunity', Rlys explores turbines along tracks

## Experts raise concerns over logistics, safety risks

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In an effort to help Indian Railways achieve net-zero carbon emissions by 2030, the Ministry of Railways is considering leveraging wind energy by installing wind turbines along railway tracks, according to sources familiar with the matter.

The issue was discussed at a high-level meeting in November, where the railways were tasked with exploring the feasibility of such a move, having conducted a pilot project in the past.

"Right now, the national transporter is in the preliminary stages of consultation with zones and other government departments. A similar feasibility check was done for installing wind turbines along the Delhi-Mumbai Expressway, and there have been past discussions with the Prime Minister's Office. More detailed planning will follow," a senior government official told *Business Standard*.

In 2023, Western Railway installed mini wind turbines along railway tracks as part of a pilot project. The vertical axis turbines are capable of generating 1-10 kilowatt of electricity. The zonal railway installed five such blades.

The concept has been used in global rail systems as an innovative measure to generate renewable energy. However, railway officials privately maintain that it may not be feasible to replicate at scale in India due to logistical concerns.

When a train passes the mini wind turbines at speeds between 50-100 kilometres per hour, the blades rotate due to the wind generated by the train's motion, using rotor shafts paired with copper plates and other metals.

**Windmills generate power when trains pass at speeds between 50 and 100 kmph, using rotor shafts and copper plates. The concept has been used globally, but experts claim scaling it in India faces may challenges**

IMAGING: AJAY MOHANTY

Queries sent to the Ministry of Railways and calls to a Western Railway spokesperson went unanswered by the time of publishing this report.

However, experts believe the project is unlikely to succeed for several reasons.

"Railway tracks are often not located in areas with consistent and high wind speeds, which are essential for efficient turbine operation. Turbines need optimal wind conditions, which may not align with the locations of railway corridors," said Lalit Chandra Trivedi, former general manager of East Central Railway.

"Turbines near railway tracks could pose risks during maintenance or in the event of equipment failure. Falling parts or blade failures could endanger trains and passengers. Installing and maintaining turbines along tracks is logistically complex and costly. This may not justify the limited energy generated," he added.

Moreover, wind turbines require considerable spacing to avoid turbulence and maximise efficiency. Railway tracks, particularly in densely populated or urban areas, do not provide enough space for such installations, experts say.

The Ministry of Railways aims to be a net-zero carbon emitter by 2030, which will require considerable investments in renewable energy and fuel-efficient rolling stock to reduce the carbon footprint of core operations. Instead, utilising available railway land for solar farms is a proven, efficient solution, Trivedi said, noting that this aligns with Indian Railways' ongoing efforts in renewable energy.

Railways could also partner energy companies to invest in large-scale offshore wind farms, where conditions are more favourable, he added.

"As of November 2024, approximately 487 megawatt (Mw) of solar plants (both rooftop and ground-mounted) and about 103 Mw of wind power plants have been commissioned. Additionally, 100 Mw of Renewable Energy–Round-The-Clock has also started flowing. Approximately 2,014 Mw of renewable capacity has been tied up," the Ministry of Railways said in December.