

STUDENTS PRIZE

INNOVATE FOR THE CITY OF TOMORROW

GRATTERGOOD

THE VIBRATORY ENERGY OF TRAINS TRANSFORMED INTO ELECTRICITY

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HEAD OF PROJECT

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THEME

In the digital era, what would the city of your dreams look like?

NORTH REGION

Context

People living along railway tracks are not too aware of the annoyances generated by passing trains: shaking structures accompanied at times by strong gusts of wind. To transform these annoyances into benefits for society, could we not exploit this physical and airborne vibratory energy generated by trains to produce electricity? This is the question that two engineering students at Télécom Lille and Estei (School of electronic, information and infographics technologies) asked themselves.

Description

The two students imagined several systems for recycling the vibratory energy produced by trains. To transform ground vibrations into electricity, they decided to use piezoelectric sensors. Air-borne vibratory energy and air currents could be captured by vertical-axis wind turbines installed at regular intervals along the track. Two options are currently being examined: Savonius-type wind turbines fitted with scoops that would contribute to the train's aerodynamics, or Palmless-type wind turbines, which could be integrated into the same technical device as the ground vibration recovery system.

Benefits

The electricity generated by the piezoelectric sensors and the wind turbines could be used by a VINCI Group entity such as ETF (Eurovia), which carries out maintenance works on railway tracks. It could be fed into a local loop to power existing track equipment (signalling lights, etc.), more advanced systems such as GSM Rail or even elements of the railway of the future, such as connected objects or maintenance robots.

- 1 Air-borne vibratory energy could be captured by wind turbines installed along the tracks.
- 2 Once transformed into electricity, it could, for instance, be used to power signalling lights.

