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Bengaluru: An Indian Institute of Science (IISc) study has found that Bengaluru’s 55-km Namma Metro Blue Line (Airport line) connecting Central Silk Board and Kempegowda International Airport can achieve 100% annual energy self-sufficiency through solar power using only BMRCL-owned land. The study estimates Rs 61 crore annual savings, with station rooftops alone enabling 36.5% energy offset and investment recovery in under two years.

The report, titled ‘Assessing the Potential of Directly Using Solar Power to Run the Operations of Blue Line of Namma Metro’, is being described as India’s first corridor-scale techno-economic analysis of integrating solar photovoltaic (PV) systems into a metro rail traction network. The study was conducted by the IISc Sustainable Transportation Lab between August 2025 and March 2026 in collaboration with BMRCL. The study was led by Prof. Ashish Verma along with four co-investigators.

According to the report, an installed solar capacity of 83.3 MWp (Megawatt-peak) across station rooftops, elevated viaduct parapets, station canopies and depot rooftops would be sufficient to meet the Blue Line’s estimated annual energy demand under full 21-train operation with two-minute headways. Researchers identified all 30 elevated stations as suitable for rooftop solar installations. The Phase-1 investment is estimated at Rs 48 crore to Rs 63 crore and is projected to generate annual electricity savings of Rs 36.4 crore from the first year itself, with a payback period of under two years.

The study projected significant environmental benefits, estimating that Phase-1 solar deployment alone could reduce carbon emissions by 44,526 tonnes annually — equivalent to removing nearly 19,000 petrol cars from Bengaluru’s roads. Full deployment could increase annual carbon savings to 77,900 tonnes, while the entire proposed 317-km Namma Metro network running on solar energy could potentially reduce emissions by 1.53 million tonnes annually.

The report stated that Karnataka’s existing net metering regulations already provide the regulatory framework needed for implementation, and no new legislation would be required. It recommended immediate tendering for rooftop solar installations across all 30 Blue Line stations. Calling the project “ready-to-tender infrastructure investment”, Prof. Ashish Verma urged BMRCL and the Karnataka government to move quickly towards pilot implementation, stating that the Blue Line had “exceptional solar potential” and offered a financially viable pathway towards a net-zero energy metro system.