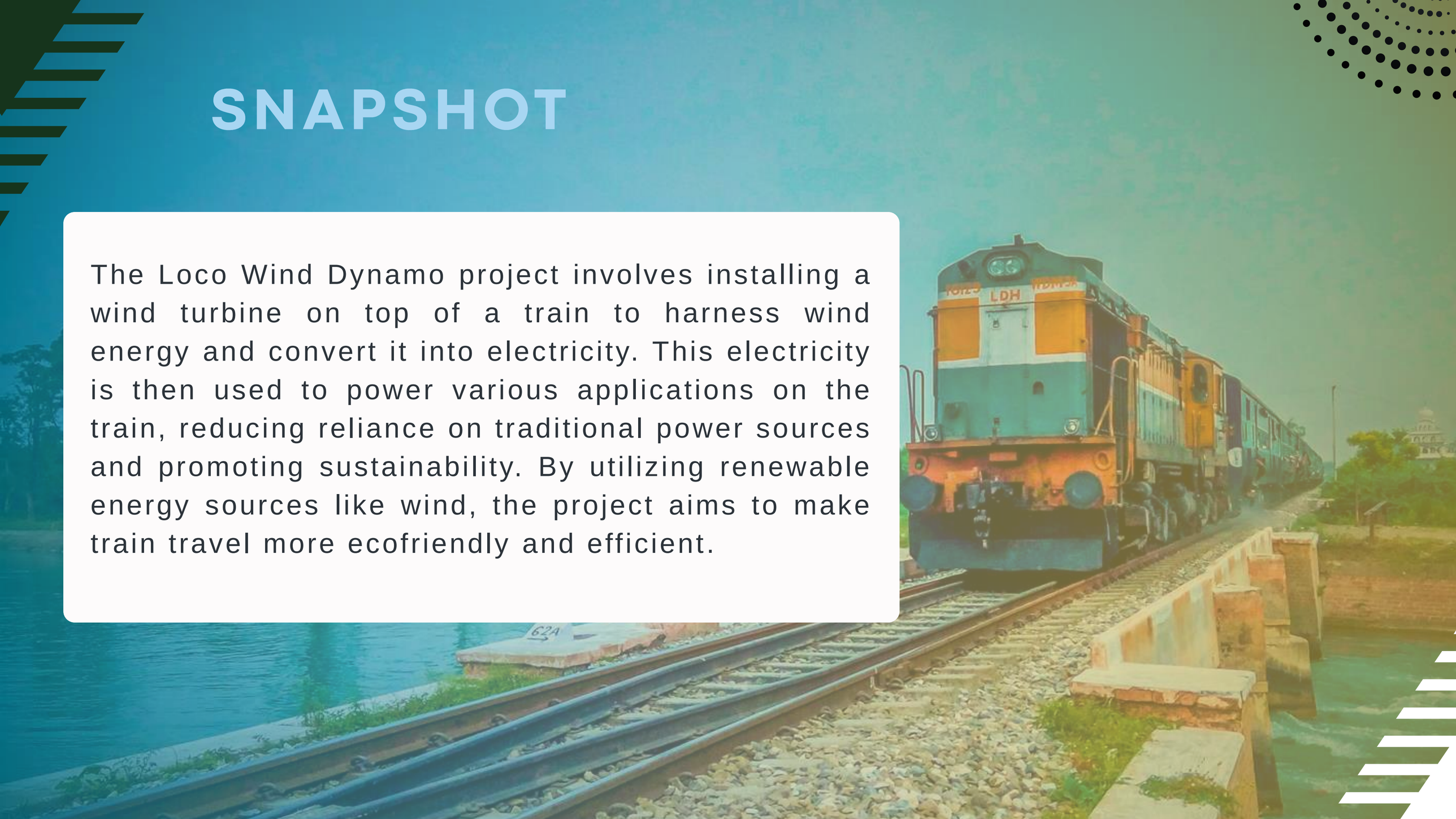
PRO TECHZ

LOCO WIND DYNAMO

"It's the beginning of Technology taking over the world"

SNAPSHOT

The Loco Wind Dynamo project involves installing a wind turbine on top of a train to harness wind energy and convert it into electricity. This electricity is then used to power various applications on the train, reducing reliance on traditional power sources and promoting sustainability. By utilizing renewable energy sources like wind, the project aims to make train travel more ecofriendly and efficient.



WHY?

"Experience the future of rail travel with the Loco Wind Dynamo project. By harnessing wind energy atop trains, this initiative promotes sustainability, reduces reliance on traditional power, and showcases innovative technology integration. It's a game-changer for eco-friendly transportation."

01

Wind has two important characteristics – direction and speed.

Utilizing wind energy for our project not only reduces carbon emissions but also taps into an abundant and freely available energy source

02

03

This project embraces wind energy to propel trains into a sustainable future, showcasing the potential of clean power in the transportation sector

WORKING

01

Wind turbine: Blades respond to wind pressure, capturing kinetic energy.

02

Generator: Kinetic energy transferred via shaft to generator.Generator converts kinetic energy into electricity.

03

Electromagnetic induction: According to Faraday’s law of electromagnetic induction,changing magnetic field induces an electric current in the coil of the turbine.

04

LiFePO4 battery: Electricity stored in a battery for future use, ensuring efficient energy management.

05

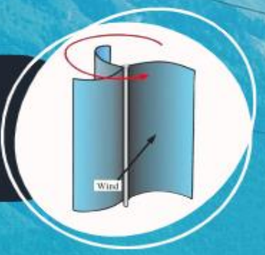
Sustainability: Harnesses renewable wind power, reducing reliance on non-renewable resources.

06

Energy preservation: Battery technology preserves generated electricity, enhancing grid stability and reliability.

BLOCK DIAGRAM

Savonius turbine



PM Generator

LiFePO4 Battery

Inverter

Load

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APPROXIMATION

Theoretical calculation
Assuming
- Train length: 250 meters
- Wind turbine height: 60 cm
- Wind turbine width: 40 cm
- Spacing between turbines: 1.5 meters

First, we need to convert the dimensions to meters:
- Wind turbine height: 0.60 meters
- Wind turbine width: 0.40 meters
- Spacing between turbines: 1.5 meters

calculate the available space for placing the turbines on the train:
Total available length = Train length - (2 * Wind turbine height)
Total available length = 250 meters - (2 * 0.60 meters)
Total available length = 250 meters - 1.20 meters
Total available length = 248.80 meters

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APPROXIMATION

we need to calculate the space required for each wind turbine plus the spacing between them:
Space required for one turbine = Wind turbine width + Spacing between turbines
Space required for one turbine = 0.40 meters + 1.5 meters
Space required for one turbine = 1.90 meters

Now, we can find out how many turbines can fit along the length of the train:
Number of turbines = Total available length / Space required for one turbine
Number of turbines = 248.80 meters / 1.90 meters
Number of turbines ≈ 130.95
approximately 130 wind turbines can be installed on the train. power
one wind turbine can generate 9.7912 kW

Total power generated = Power generated by one turbine * Number of turbines
Total power generated = 9.7912 kW * 130 turbines
Total power generated ≈ 1273.56 kW

So, the total power generated by all the wind turbines on the train would be approximately 1273.56 kW.

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SCALING

- Make the technology compatible with various trains.
- Increase production of necessary parts.
- Develop logistics for widespread deployment.
- Identify new customer markets.
- Establish maintenance protocols for ongoing performance.

Scaling up this project means making it work on more trains, in more places, and for more people. It involves improving the technology, making more of the parts needed to build it, figuring out how to get those parts to where they need to go, finding new customers who might want it, and making sure it keeps working well even after it's been installed.

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BENEFITS

The user need for this project could be providing a sustainable and reliable source of electricity for the appliances inside the train, thereby reducing dependency on traditional energy sources and contributing to environmental conservation efforts.

- Promotes sustainability
- Harnesses wind energy
- Used for various applications like Fan,Light etc..
- Enhances eco-friendliness of train travel

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CONCLUSION

The Loco Wind Dynamo project I**sn't just about transportation; it's a symphony of innovation reshaping our journey towards sustainability**. Picture a world where the gentle whisper of wind propels trains forward, painting the landscape with reduced carbon footprints and heightened energy efficiency. It's a testament to our commitment to Mother Earth, a dance of progress within the railway domain. With its scalable design, economic viability, and profound societal impact, this initiative is a guiding light towards a brighter, cleaner tomorrow. Joining hands in this endeavor isn't merely a choice; it's a harmonious call to orchestrate change, illuminating our path towards a more beautiful and sustainable horizon.

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THANK YOU

ROLES:

Pramoth S	-	Idea Designer
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Srinithi J	-	Theoretical Estimator
Sneha R	-	Presentation Editor