SMART MOBILITY & TRANSPORTATION

Charge on Foot

Presented by:-

AISHWARYA H R (23CSE004)
NAVYA N (23CSE086)
Aishwarya J (23CSE005)
Harshitha S (23CSE051)





Problem Statement

Urban centers face increasing energy demands and pollution due to rapid population growth and transpotation needs.

Challenges:

- **High dependence on non-renewable energy sources.
- *Limited EV charging infrastructure for widespread adoption of EV.
- *Insufficiency in utilizing human and vehicular Kinetic energy.





SOLUTIONS

energy harvestig walkways

install piezoelectric files on sidewalks in high-footfall areas(ex:used in streetlight,wifi)

EV charging roads

this reduces "range anxiety" and eliminates the need for frequent stops to charge vehicles.

resource

the system can help reduce CO2 level in high footfall areas, & capturing CO2 contributes to reduces the greenhouse effect.

Batteries

Batteries are ability to charge rapidly, withstand more cycles and operate effectively with smaller energy input.

Kinetic Energy Harvesting Technologies



Piezoelectric Sensors

These sensors convert mechanical energy from footsteps into electrical energy using piezoelectric materials.



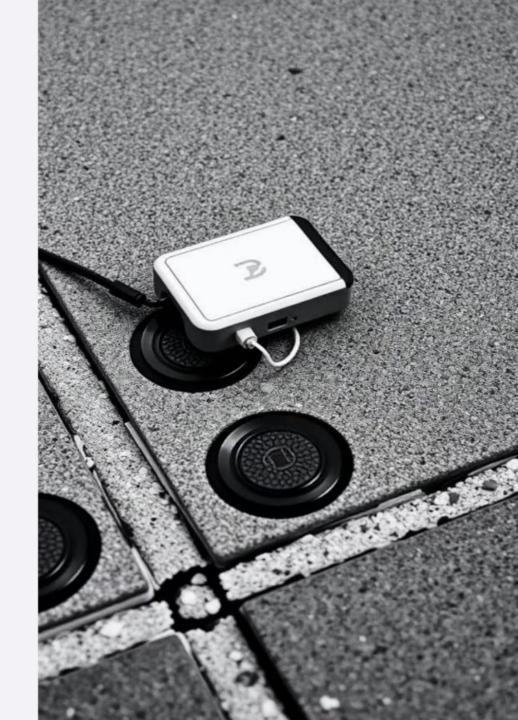
Electromagnetic Induction

This technology uses electromagnetic induction to generate electricity from the movement of pedestrians.



Triboelectric Nanogenerators

These devices utilize the triboelectric effect to produce electricity from friction between materials.



How it Works: Key Steps in Implementing Charging Roads

Road Installation Embedded coils are placed beneath the asphalt to create a magnetic field. **Vehicle Adaption** Electric vehicles need special receivers to pick up energy from the coils. **Power Supply** Electricity is sent through the coils, generating a magnetic field that charges the vehicles.



The Potential of Pedestrian-Generated Energy

Sustainable Energy Source

Pedestrian footsteps represent a vast and untapped source of renewable energy, offering a sustainable alternative to traditional power sources.

Reduced Carbon Footprint

By utilizing kinetic energy from pedestrians, we can significantly reduce carbon emissions and contribute to a greener environment.

Cost-Effective Solution

Harvesting kinetic energy can be a cost-effective way to power smart city infrastructure, as the technology matures and scales.



Integrating with Electric Vehicle Charging

1

Pedestrian energy harvested from sidewalks can be stored and used to power EV charging stations.

Wireless charging pads embedded in parking spots can provide seamless charging for electric vehicles.

Smart road infrastructure with integrated energy harvesting technology can provide charging as vehicles drive.

Emerging Battery Technologies

Sodium-ion Batteries

Sodium-ion batteries are a promising alternative to lithium-ion batteries, as they are cheaper to produce and use more abundant resources. They are expected to be used in large-scale energy storage applications.

Solid-state Batteries

Solid-state batteries have a solid electrolyte instead of a liquid one, making them safer, more energy-dense, and have a longer lifespan. This type of battery is expected to be used in electric vehicles.

Integrated Payment System & Green Credits

Smart Charging

Our system streamlines EV charging payments by integrating them into a user-friendly interface. Drivers can easily track their charging costs and manage their payments through a convenient app.

Green Credits

Pedestrians contribute to the grid by generating electricity through their movement. Our Green Credits system rewards pedestrians for their efforts, offering incentives for sustainable living. This creates a collaborative ecosystem where everyone benefits.

THANK YOU