TIEC3.0 Principal Sponsor

SOLARMOVE FOR E-MOBILITY

Name: SolarMove: A Mobile Solar Energy Cart for Rural Empowerment

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Proposed Solution

SolarMove is a mobile solar-powered cart that delivers clean, off-grid electricity to rural communities. It is built with locally available materials and supports modular functions such as grain grinding, water pumping, phone charging, cooling for produce/medicine, and lighting. Its mobile design serves multiple users across farms, markets and clinics. SolarMove empowers youths to operate and maintain the solution, creating jobs while expanding energy where its needed the most.

Technical Design

Solar panel (200W–400W+) mounted on steel frame cart (probably wheelbarrow).
Deep-cycle battery (AGM/Li-ion) for nighttime use or low sun use (during the rainy season).
It delivers **direct DC output** for lighting, charging, small pumps and agro-processing tools.
The design is **DC first** for efficiency with an optional **inverter integration** for future AC powered devices. Modular ports include USB, 12V DC and 220V AC.

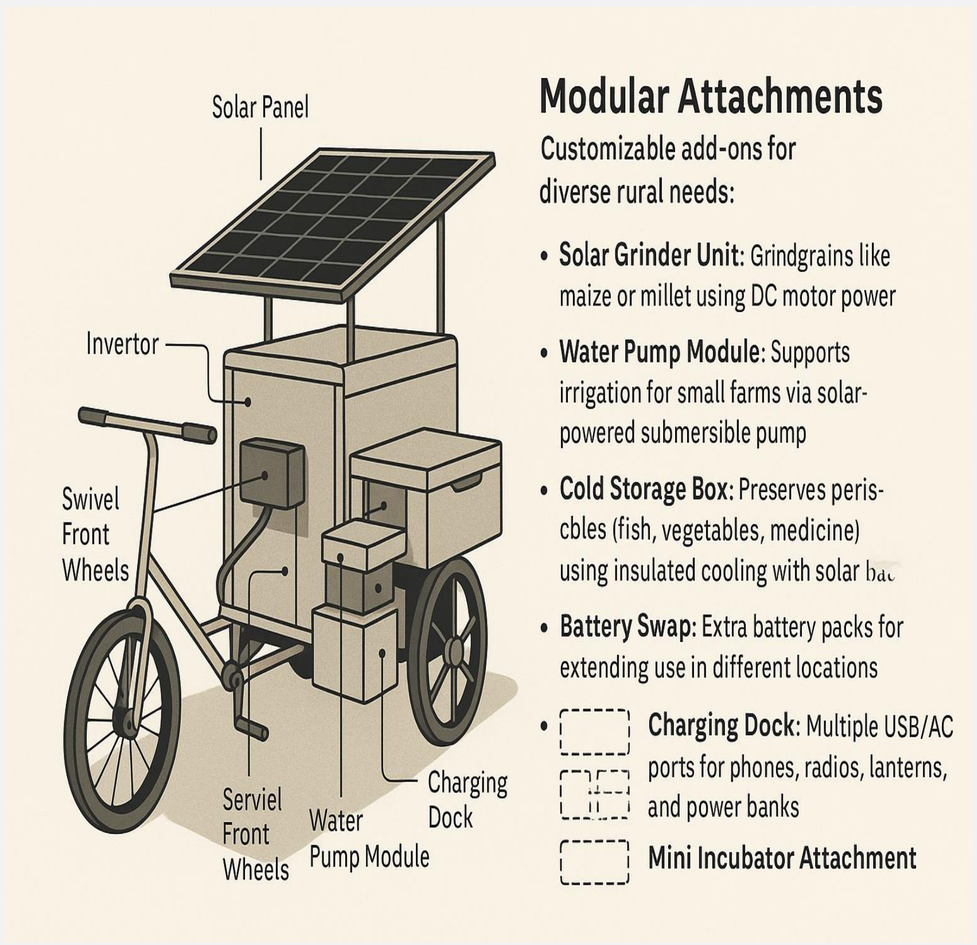

Figure 1: Concept illustration of the SolarMove cart design
Image generated from ChatGPT

Economic feasibility/Proposed Business Model

The SolarMove cart is to be built with low cost, locally available materials and an estimated prototype is about ₦250,000- ₦350,000. This system operates on pay-per-use model for services like phone charging, irrigation and agro processing. Ownership can be individual or cooperative and maintenance will be done by trained youths as local technicians. A cart can generate a steady revenue by daily transactions while reducing fossil fuel dependence. This model can also apply for carbon credit incentives.

Timeline for developing prototype/trial

June 2025: Finalize the concept design with detailed illustrations and power flow diagrams.

Late June 2025: Create a labelled visual mock model to demonstrate functionality, and use-cases.

July 8, 2025: Present visual mock-up and concept design at the TIEC3.0 Live Pitch.

Aug-Sept 2025: Refine technical design with mentor feedback and explore low cost prototyping options.

Q4 2025-Early 2026: Pilot deployment of physical prototype in selected rural communities (pending support).

Budget & Target User/Market/Scale

Budget: ₦250,000- ₦350,000 (prototype)
Users: Farmers, Vendors, Clinics
Market: 60% of rural Nigerians underserved
Scale: 1 cart = 50 to 100 users per week
Growth: Replicable via co-ops and NGOs

References

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[2] All On. Nigeria Off-Grid Energy Buisness Report. 2023. Available online: https://www.all-on.com/media/publications/all-on-Nigeria-off-grid-energy-business-report.html
[3] Rachid, N., Arnaud, B., & Ugochukwu, A. *Optimizing Solar Integrated Microgrid Design for Sustainable Rural Electrification:* The LEOPARD Project. IEEE Access, 2023. Available online: https://ieeexplore.ieee.org/document/10114341

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