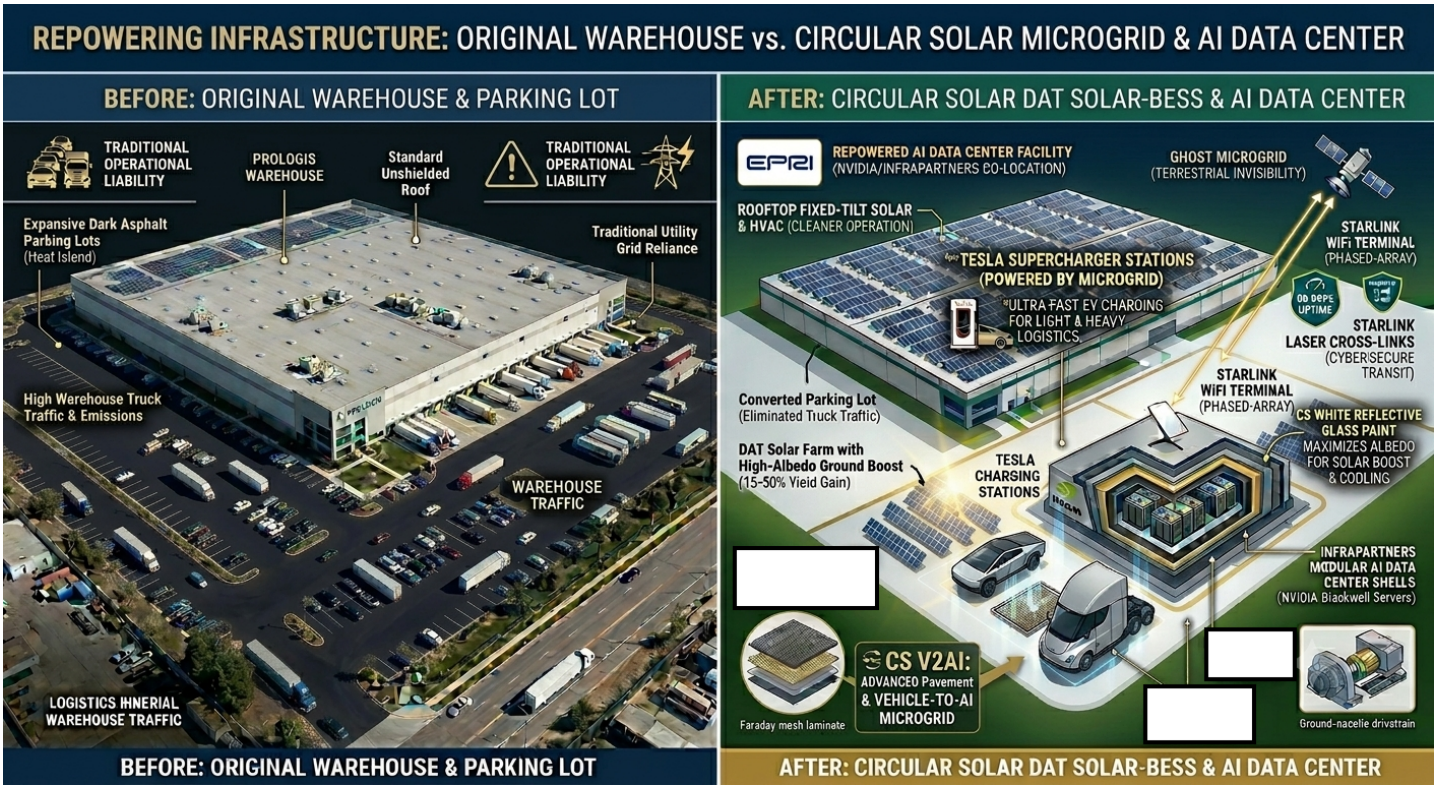
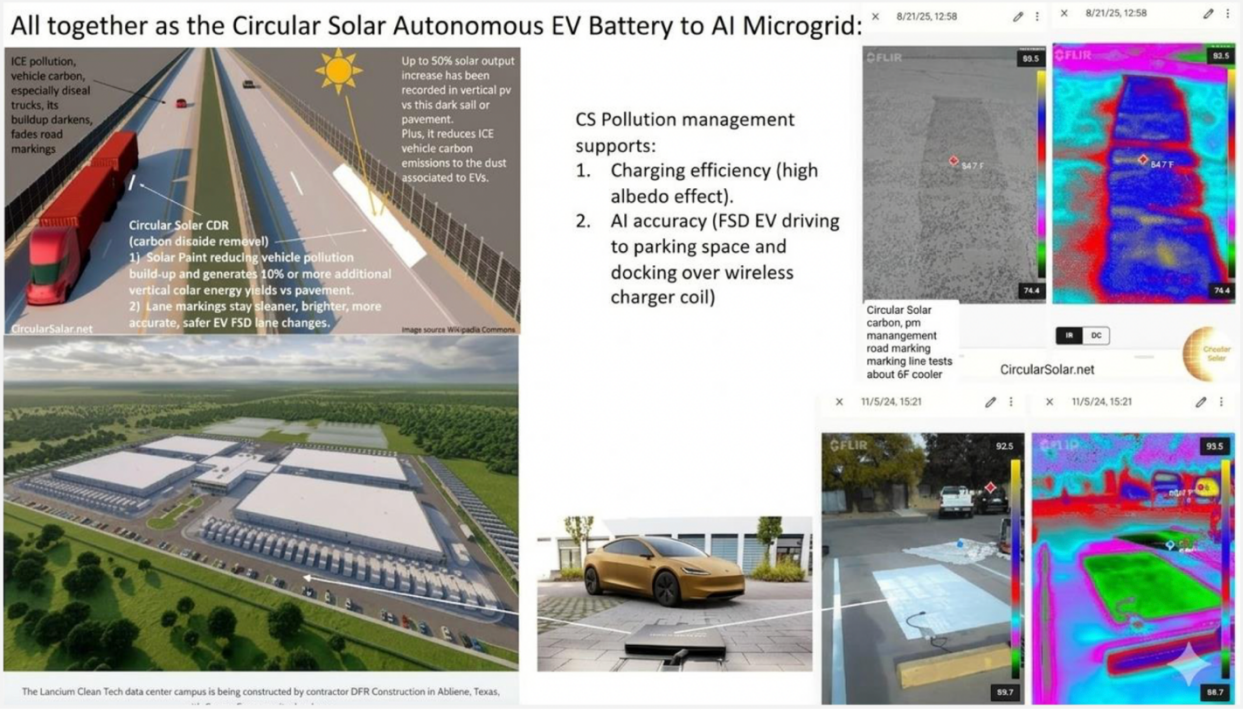
Whitepaper: Repowering Infrastructure—The Circular Solar Microgrid (DERs) DAT, SAT and EV Charging for Mobile EV BESS as V2AI

Visual Abstract: From Liability to Asset

The transformation of industrial infrastructure is visualized in **Circular Solar DAT MDC Prologis Image Example**, which contrasts a traditional, high-liability warehouse with a high-performance Circular Solar DAT (Data, Autonomous, Tech) facility.





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Executive Summary: The Infrastructure Pivot

The global demand for AI compute is currently colliding with the physical limits of the electrical grid. Traditional, centralized data centers are energy-intensive, environmentally costly, and increasingly slow to deploy. Our submission to the EPRI Open Power Challenge, **Circular Solar Micro Data-Centers (MDCs)**, offers a paradigm shift: decentralized, self-funding compute nodes that integrate directly into the existing grid fabric. By turning utility liabilities into AI-ready assets, we provide a scalable, bipartisan solution to California's infrastructure crisis, lowering costs for ratepayers and businesses alike.

Page 1: The Compute-Energy Paradox

Artificial Intelligence is the most significant technological leap of the century, but it is trapped by an archaic energy model.

- **The Grid Bottleneck:** Current AI growth is constrained by centralized power delivery, leading to long-haul transmission losses and unsustainable grid strain.
- **The Reliability Crisis:** High-value utility assets, particularly substations, are currently plagued by maintenance liabilities, fire hazards, and encampment-related security costs that drain utility budgets and raise rates for the public.
- **The Circular Opportunity:** We move compute to the power source. By co-locating NVIDIA-powered micro-datacenters with Circular Solar farms at the substation level, we eliminate the need for new long-haul transmission and leverage existing land assets.

Page 2: The "Best Brain" Architecture

Our solution is not just hardware; it is an intelligent orchestration layer designed to solve PG&E's and other utilities' most pressing operational hurdles.

- **Autonomous Optimization:** The "best brain" architecture manages the real-time interplay between localized solar generation, compute-load intensity, and grid-frequency regulation.
- **Dynamic Load Balancing:** Unlike passive infrastructure, our MDCs act as intelligent DERs. They can throttle compute intensity based on grid demand, allowing utilities to treat our clusters as a responsive Virtual Power Plant (VPP).
- **Hardening Assets:** By installing high-value NVIDIA compute infrastructure at substation perimeters, these zones receive enterprise-grade security and monitoring, effectively neutralizing encampment liabilities and ensuring continuous operation.

Page 3: Circularity and Bipartisan Macroeconomics

This model aligns with the "Self-Funding Macroeconomic Arc," proving that green infrastructure can be economically superior to legacy systems, as illustrated by the transition from a traditional "heat island" warehouse to a "Circular Solar DAT" facility in **Gemini Circular Solar DAT MDC Prologis.png**.

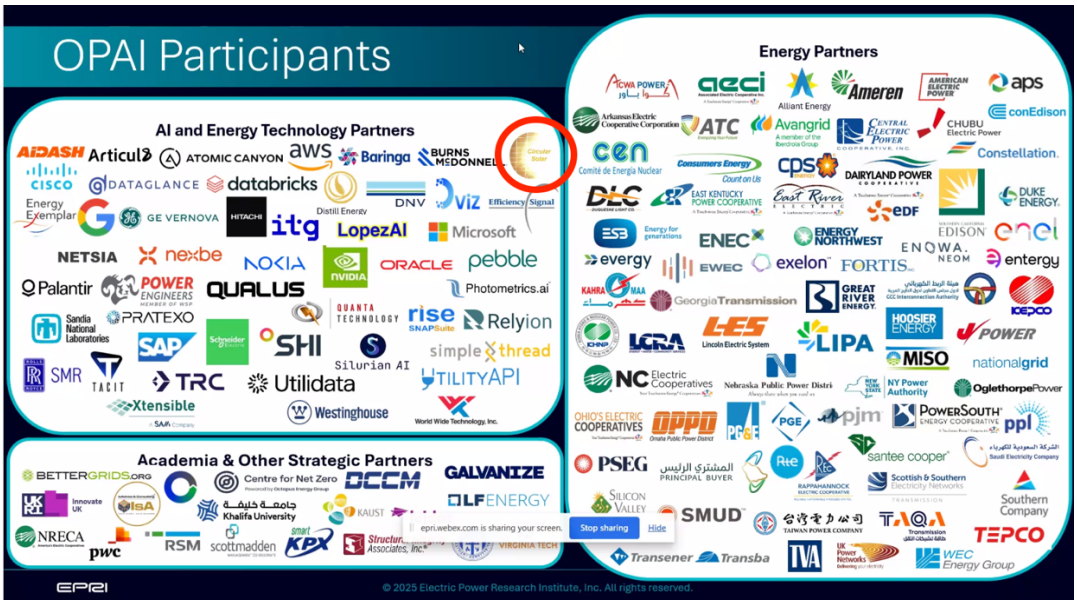
- **Fiscal Efficiency:** Our project replaces the reactive, tax-funded cycle of debris cleanup and site security with a productive asset that generates revenue through compute and grid services.
- **Bipartisan Win-Win:**
    - **Fiscal Responsibility:** Reduces public expenditures and lowers utility ratepayer costs.
    - **Grid Resilience:** Protects critical infrastructure from fire and sabotage through active site management.

    - **Green Jobs/Tech Leadership:** Establishes California as the global hub for circular compute and AI infrastructure, creating high-skill employment.
- **Decoupling from Volatility:** By generating localized energy, we insulate the local economy from global fossil fuel price swings, supporting the goal of achieving lower utility costs.

Page 4: Scaling the Future (The Action Plan)

Transitioning to Circular Solar MDCs is an engineering imperative that is ready for deployment.

- **The Regulatory Sandbox:** We propose regional pilots that leverage SB 673 cumulative impact frameworks to test the integration of MDCs as DERs within the utility footprint.
- **The Prologis Integration:** Beyond substations, we are targeting the vast underutilized parking and roof space of logistics real estate (e.g., Prologis sites) to expand our compute network into the heart of urban AV transit corridors.
- **The Path Forward:** The future of AI is not in distant, centralized server farms—it is in the intelligent, decentralized edge. By turning every substation and logistics hub into a self-funding AI node, we solve the infrastructure crisis, stabilize the grid, and ensure the computational power necessary for the next century of innovation.
- **Circular Solar Epri OPAI:** As an OPAI member, we are ready to supply esteemed AI and Energy Partners for both MDC's and large scale DCs.



Thank you!

Team Circular Solar