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Clean Secure Reliable Power

Revolutionizing Energy Management for Logistics EV charging

Executive Summary

A leading logistics company is transitioning its transport fleet to electric vehicles (EVs) to establish a cleaner and more sustainable intra-city delivery network. To support this shift, the company plans to develop an advanced EV charging facility featuring six EV chargers, integrated with distributed energy resources (DERs) and battery storage. The objective is to reduce dependence on the grid, lower operating costs, and ensure seamless charging for their EVs. DG Matrix provides a customized energy management solution[1] centered around its innovative Power Routers, **completing the project within one month** to achieve an IRR of over **18%** and a payback period of **six years.**

Challenges

The logistic company faces significant challenges in designing and deploying this EV charging facility for their smooth operations:

- **High Energy Demand:** Rapid charging of 6 vehicles simultaneously creates substantial peak loads, leading to elevated demand charges and stressing the local grid infrastructure.
- **Grid Dependency:** Reliance on the grid for peak energy requirements increases exposure to potential disruptions and elevated electricity prices.
- **Scalability Constraints:** Future expansion of chargers and integration of additional renewable energy sources requires costly infrastructure upgrades.
- **Sustainability Commitments:** The company must align with its environmental, social, and governance (ESG) goals by integrating renewable energy solutions.
- **Deployment Timelines:** Rapid commissioning is critical to meeting market demand and operational deadlines.

Requirements and Priorities

To address these challenges, the logistics company has identified key priorities:

- **Cost Optimization:** Minimize both capital expenditures (CapEx) and operational expenditures (OpEx) while maintaining profitability.
- **Resiliency:** Ensure uninterrupted fast charging services for EV owners, even during grid outages.
- **Sustainability:** Maximize renewable energy usage and reduces carbon emissions.
- **Scalability:** Future-proof the facility for easy integration of additional fast chargers and energy sources.
- **Operational Simplicity:** Implement a centralized energy management platform for seamless operation and monitoring.

[1] Project has not yet been deployed yet

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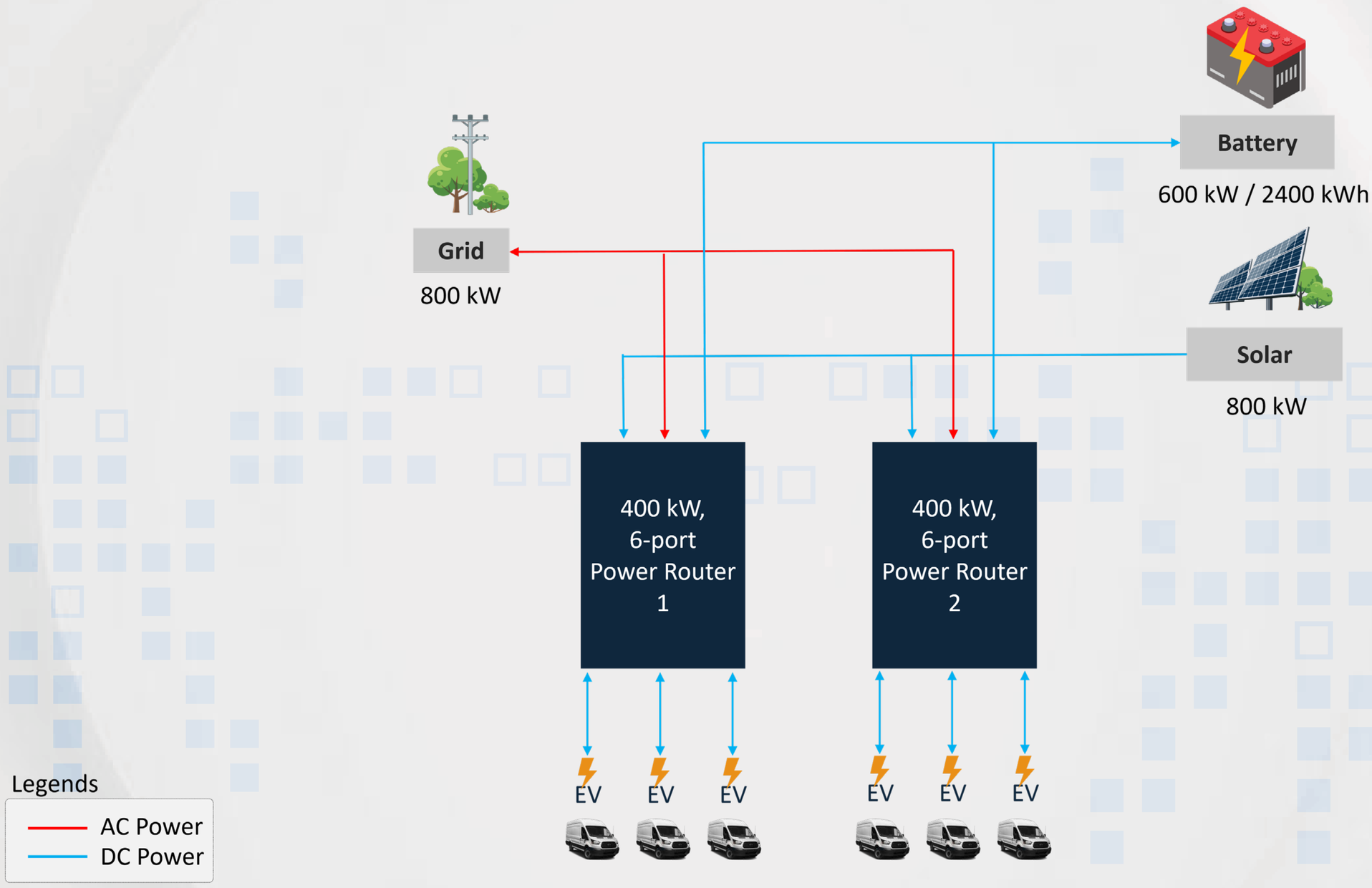
Proposed Solution: The DG Matrix Power Routers

DG Matrix deploys an advanced energy management solution at the logistics company's charging facility, leveraging its Power Router technology. The energy ecosystem includes:

- **EV Fast Chargers:** Two charging stations, each delivering up to 400 kW.
- **Battery Storage:** A 600 kW / 2,400 kWh system stores excess energy and mitigates peak demand.
- **Solar PV System:** An 800 kW solar array supplies renewable energy directly to the site.
- **Grid Interconnection:** An 800 kW utility service ensures a stable baseline power supply.



The DG Matrix Power Router provides distinct advantages over legacy systems:

- **Integrated Single-unit Power Router Technology:** Combines power conversion, protection, and energy management into a single, compact system—drastically reducing system footprint, simplifying deployment, and lowering equipment costs while increasing system efficiency to up to **98%**.
- **Dynamic Power Sharing with Ultra-high Granularity:** Balances power distribution among EV chargers and other on-site loads to maximize asset utilization and optimize energy usage.
- **Smart Energy Management Software:** Provides real-time monitoring, predictive analytics, and automated load shifting to reduce peak demand charges and enhance system efficiency.

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Results

CapEx Savings:

- **27%** lower infrastructure costs by consolidating power management hardware and reducing the need for grid upgrades.
- **35%** reduction in installation costs due to streamlined deployment and fewer components.

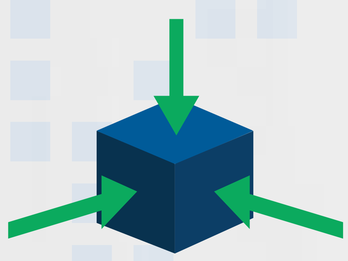
OpEx Savings:

- **33%** reduction in annual energy costs through demand charge mitigation and optimized energy utilization.
- **33%** lower maintenance costs due to a simplified architecture and advanced diagnostics.

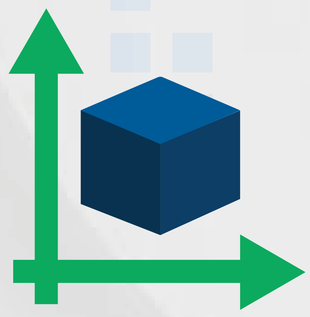
Financial Metrics:

- Payback Period: **6 years,** compared to 10+ years for traditional systems.
- IRR: **19%** (estimated based on operator data).

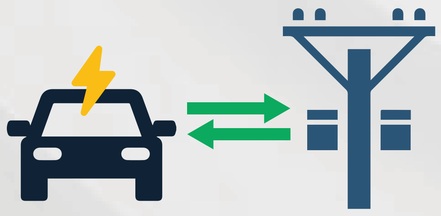
Value-Added Features and Additional Benefits



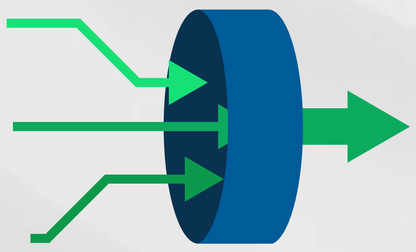
Enhanced Resiliency: Ensures reliability by maintaining operations during outages through a seamless transition to on-site DERs and EV chargers.



Future-Proof Scalability: Enables expansion with additional dispensers and new energy sources without requiring major upgrades.



Grid Support Services: Lowers costs and generates additional revenue by enabling vehicle-to-grid, virtual power plant, and demand response capabilities.



Operational Simplicity: Provides a unified control platform that reduces complexity and streamlines energy management across all sites.

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Conclusion

By deploying the DG Matrix Power Routers, the logistic company can create a flagship electrified fleet depot that sets a new standard for zero-emission logistics with a focus on modular scalability. The integrated energy platform can ensure reduced operating costs, enhanced resiliency, and alignment with sustainability goals, positioning it as a leader in the logistics sector's green transition.

To learn more about how the DG Matrix innovative Power Router solution can revolutionize your energy management, reduce costs, and future-proof your business, contact our team of experts today. We're ready to help you achieve your energy goals and stay ahead in the evolving market.

Email: info@dgmatrix.com