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Accelerating Fleet Electrification for a Major Fleet Operator

Executive Summary

A major fleet operator managing a nationwide logistics network faces significant challenges in electrifying its fleet due to high-peak demand charges, grid limitations, and the need for scalable energy solutions. To ensure a smooth transition to fleet charging, DG Matrix proposes a concept[1], which incorporates six Power Routers for fleet electrification, on-site distributed energy resources (DERs), battery storage, and advanced energy management.

By deploying DG Matrix Power Router technology, the fleet operator can optimize power distribution, enhance resiliency, and reduce costs—achieving up to a **40%** reduction in installation expenses and **13%** in annual energy savings.

Challenges

The fleet operator faces mounting energy-related challenges, including:

- **Costly Multi-year Infrastructure Upgrades:** Deploying EV charging solutions for a fleet depot requires extensive permitting, significant capital investment, and the integration of DERs such as solar and battery storage.
- **High Peak Demand Charges:** The addition of **20 EV chargers (up to 350 kW each)** causes sudden spikes in power demand, leading to increased demand charges from utilities.
- **Resiliency Challenges:** Power outages can disrupt logistics operations, causing delivery delays and revenue losses.
- **Scalability & Future-Proofing:** The depot requires a modular solution that can scale as fleet electrification expands.
- **Sustainability & ESG Commitments:** To meet corporate sustainability goals, the fleet operator must integrate renewable energy sources while ensuring energy reliability.

Fleet Depot Requirements and Priorities

The fleet operator chain outlines several critical priorities for addressing these challenges:

- **Cost Optimization:** Reducing both CapEx and OpEx, with a focus on minimizing grid dependency and demand charges.
- **Resiliency:** Ensuring uninterrupted fleet operations through backup power solutions and seamless energy management.

[1] Project has not yet been deployed yet

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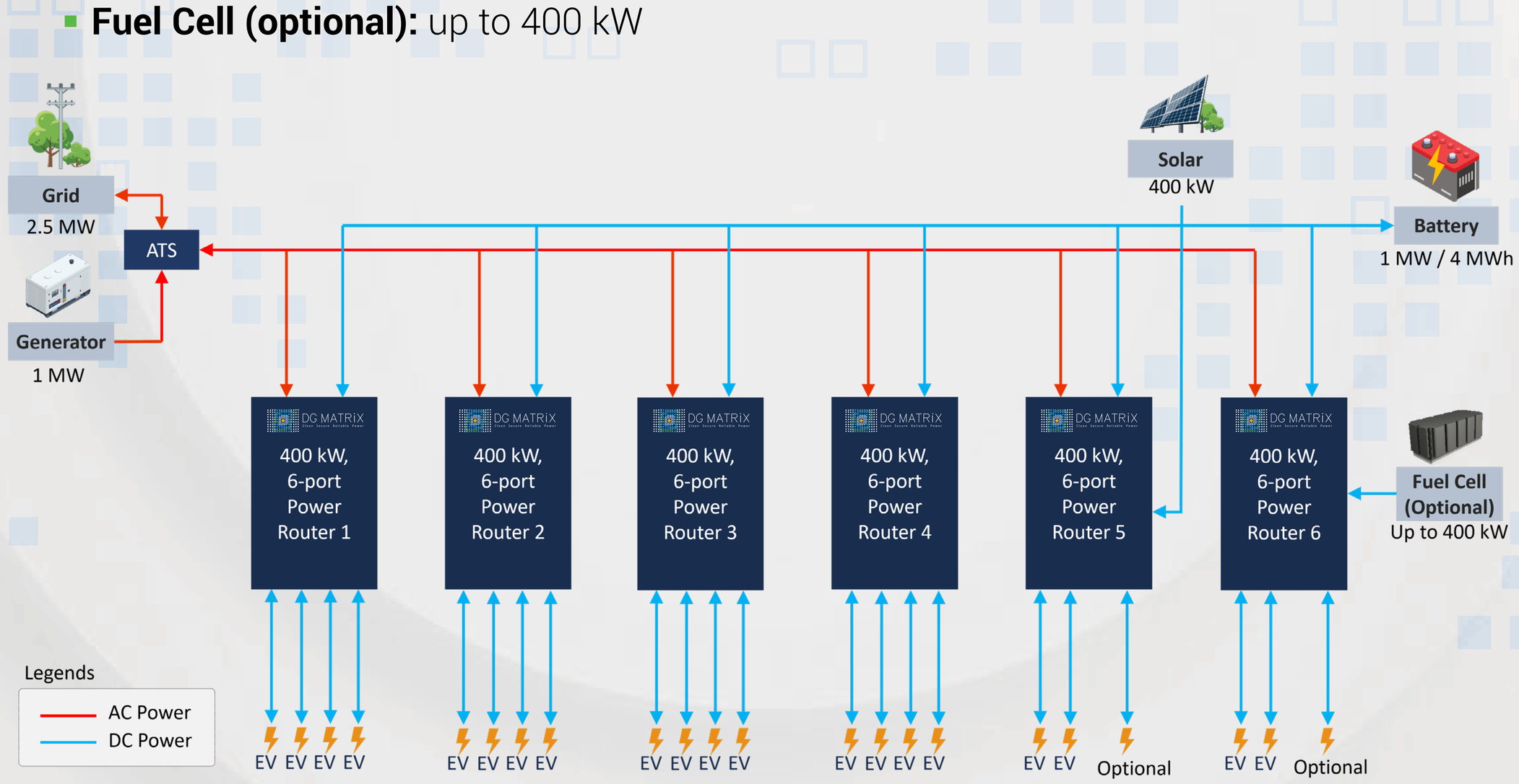
- **Scalability:** Deploying standardized energy solutions that can expand as fleet electrification progresses.
- **Simplicity & Speed:** Reducing installation time and avoiding prolonged grid upgrades to ensure uninterrupted fleet operations.
- **Sustainability Goals:** Aligning energy strategies with corporate ESG commitments by integrating renewable energy sources.

Proposed Solution: The DG Matrix Power Router

DG Matrix offers an innovative, **all-in-one 400 kW, six-port Power Router** designed to meet the fleet depot's needs. The Power Router seamlessly integrates various energy sources and loads through its ports:

- **EV charging dispensers:** 20 dispensers, up to 400 kW each
- **Solar PV system:** 400 kW
- **Battery storage:** 1,000 kW / 4,000 kWh
- **Backup generator:** 1,000 kW
- **Grid interconnection:** 2,500 kW from the utility
- **Fuel Cell (optional):** up to 400 kW



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:** Balances power distribution among EV chargers and other on-site loads to maximize asset utilization and optimize energy usage.

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- **Smart Energy Management Software:** Provides real-time monitoring, predictive analytics, and automated load shifting to reduce peak demand charges and enhance system efficiency.

Results

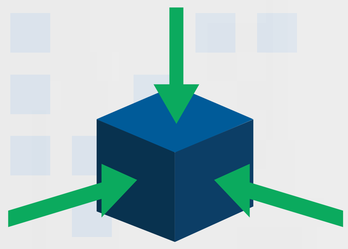
CapEx Reduction:

- Achieves **30% cost savings** compared to traditional solutions by consolidating multiple hardware components into a single unit.
- **Reduces installation costs by 40%** through simplified infrastructure and decreased reliance on grid upgrades.

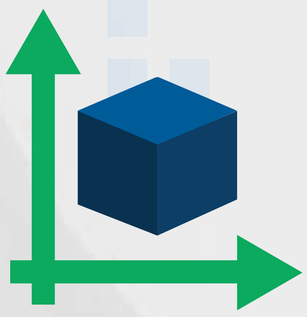
OpEx Reduction:

- Achieves a **13% reduction in annual energy costs** through demand charge mitigation, efficiency gains, and optimized use of distributed energy resources.
- Lowers maintenance costs by **10–15% due to fewer components** and advanced monitoring capabilities.

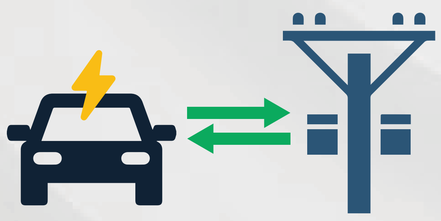
Value-Added Features and Additional Benefits



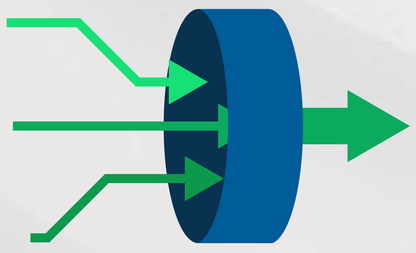
Enhanced Resiliency: Ensures fleet reliability by maintaining operations during outages through a seamless transition to on-site DERs and EV chargers.



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 solution, fleet operators can reduce energy costs, enhance resiliency, and position their business for future growth in fleet electrification. This scalable and cost-effective system ensures long-term sustainability and energy independence, enabling efficient fleet operations while meeting ESG goals.

As the transition to electric fleets accelerates, companies that invest in this technology will be well-positioned to ensure long-term business viability and growth. The DG Matrix Power Router provides a comprehensive solution that addresses current challenges faced by fleet operators while paving the way for a more sustainable and profitable future.

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.

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