DG MATRiX
Clean Secure Reliable Power

Revolutionizing Energy Management for a Major Gas Station Chain

Executive Summary

A leading national gas station chain operating over 800 locations commited to deploy EV charging across all locations though quickly ran into significant cost and utility constraints, including multi-year permitting delays. DG Matrix developed a concept, 1 leveraging its Power Router solutions to significantly reduce costs and deployment timelines while improving site performance and resiliency. By implementing the Power Router, we expect to achieve a **four-year payback period** with nearly **30%** CapEx savings and **20%** reduction in annual energy costs for a **28%** IRR.

Challenges

The customer faced mounting energy-related issues, including:

- **Costly Multi-year Infrastructure Upgrades:** Significant permitting requirements and capital expenditure required to increase utility power for large EV charging loads.
- **High Energy Costs:** Rising utility bills due to increasing energy consumption and peak demand charges, which are expected to grow with the addition of EV charging loads.
- **Resiliency Challenges:** Power disruptions that threaten business continuity and potentially turn away valuable customers.

Requirements and Priorities

The gas station chain outlined several critical priorities for addressing these challenges:

- **Cost Optimization:** Reducing both CapEx and OpEx while achieving >17% savings on utility bills.
- **Resiliency:** Ensuring uninterruptable 24/7 power
- **Scalability:** Deploying solutions that can be standardized across multiple locations and scaled to support future growth, including the addition of EV charging infrastructure.
- **Sustainability Goals:** Aligning energy strategies with corporate ESG commitments by integrating renewable energy sources.
- **Simplicity and Speed:** Minimizing project complexity, permitting timelines, installation timelines, and disruption to gas station operations.

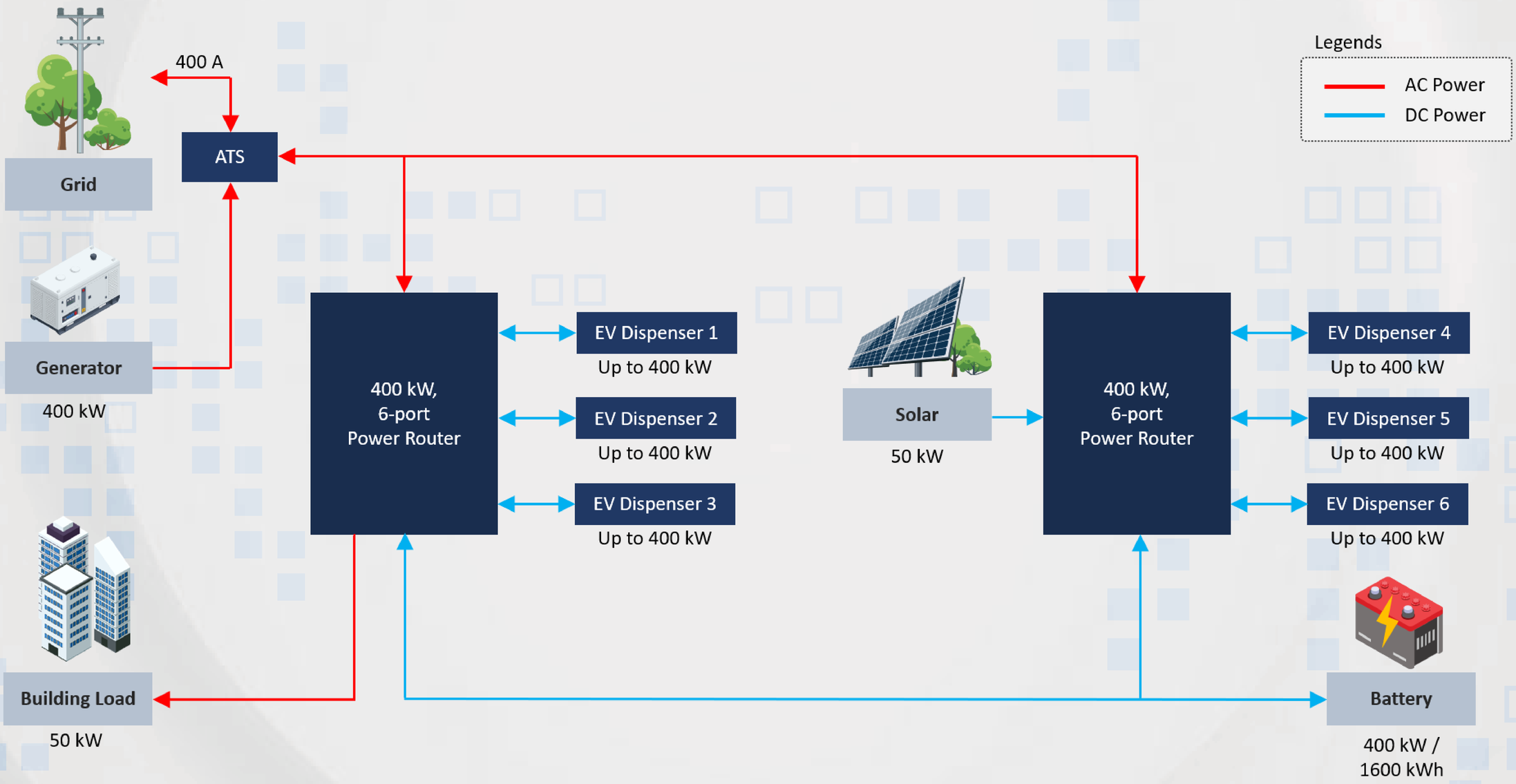
[1] Project has not yet been deployed yet

DG MATRiX
Clean Secure Reliable Power

Proposed Solution: Microgrid Enabled by the DG Matrix Power Router

DG Matrix provided each location with **two 400-kW 6-port Power Routers** designed to meet the gas station's needs. These Power Routers are at the core of the location-specific microgrid, seamlessly incorporating different energy sources and loads via their ports:

- **EV charging dispensers:** (6 dispensers, up to 400 kW each)
- **Solar PV system:** (up to 50 kW)
- **Battery storage:** (up to 400 kW / 1,600 kWh)
- **Backup generator:** (up to 400 kW)
- **Building power:** (up to 50 kW total load)
- **Grid interconnection:** (400 A service from utility)



The DG Matrix Power Routers provide additional differentiated benefits compared to legacy systems:

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

DG MATRiX
Clean Secure Reliable Power

Results

CapEx Reduction:

- **30% savings** compared to traditional solutions by consolidating multiple hardware components into a single unit.
- **38% lower installation costs** due to simplified infrastructure and reduced need for grid upgrades.

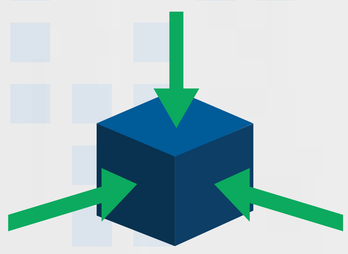
OpEx Reduction:

- **20% reduction in annual energy costs** through demand charge mitigation, efficiency gains, and distributed energy usage.
- **4-5% lower maintenance costs** due to fewer components and advanced monitoring capabilities.

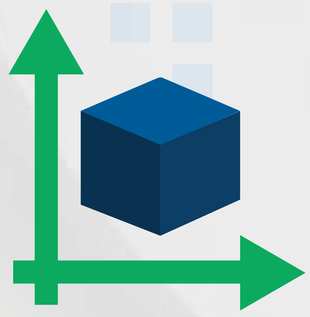
Financial Metrics:

- Payback achieved in **4 years,** compared to 7+ years for traditional DER solutions.
- IRR: **28%**

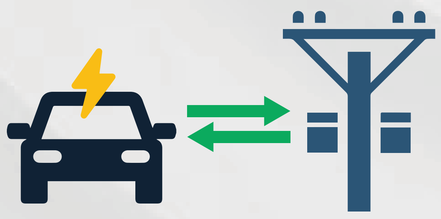
Value-Added Features and Additional Benefits



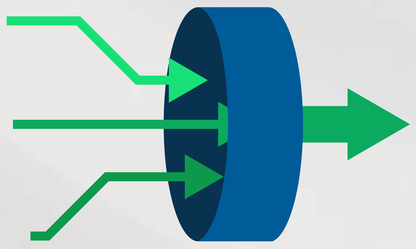
Enhanced Resiliency: Improved reliability during outages with seamless transition to on-site DERs and EV chargers.



Future-Proof Scalability: Ability to support expansion with potential additional EV chargers and integration of additional energy sources without additional major upgrades.



Grid Support Services: Additional revenue opportunities and cost savings by implementing vehicle-to-grid, virtual power plant, and demand response capabilities.



Operational Simplicity: Unified control platform reducing complexity and streamlining energy operations across all sites.

DG MATRiX
Clean Secure Reliable Power

Conclusion

By deploying DG Matrix's integrated energy platform, gas station owners can successfully reduce energy costs, enhance resiliency, and position themselves to meet future demands while aligning with sustainability goals. This scalable, cost-effective solution tailored to the unique operational needs of gas stations equips owners to lead in energy innovation and adapt to the changing automotive landscape.

As the transition to electric vehicles accelerates, gas stations that invest in this technology will be well-positioned to serve both traditional and EV customers, ensuring long-term business viability and growth. The DG Matrix Power Router offers a comprehensive solution that addresses the current challenges faced by gas station owners while providing a clear path to a more sustainable and profitable future.

To learn more about how DG Matrix's 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