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Advancing Energy Management for a Dubai Mosque

Executive Summary

A prominent Dubai mosque is adopting an advanced energy management solution to create a more sustainable, cost-efficient, and EV-friendly power infrastructure. To support this transition, the mosque is integrating solar energy, battery storage, EV chargers, and smart energy management to optimize power consumption, reduce reliance on the grid, and facilitate electric vehicle (EV) charging for worshippers and visitors.
DG Matrix provides a customized energy solution[1] powered by its innovative Power Routers, completing the project **within one month** to achieve an IRR of over **14%** and a payback period of **seven years.**

Challenges

The Dubai mosque faces significant challenges in designing and deploying its energy management system:

- **High Energy Demand:** Continuous operation of lighting, cooling, EV chargers, and other facilities creates peak loads, leading to high electricity costs.
- **Grid Dependency:** Heavy reliance on grid power increases exposure to rising electricity prices and potential supply disruptions.
- **Scalability Constraints:** Future expansion of power infrastructure and EV charging stations requires cost-effective, modular solutions.
- **Sustainability Commitments:** The mosque aims to reduce its carbon footprint by maximizing the use of renewable energy sources.
- **Operational Simplicity:** An automated, centralized energy management system is essential for seamless operations and monitoring.

Requirements and Priorities

To address these challenges, the Dubai mosque has identified key priorities:

- **Cost Efficiency:** Minimize both capital (CapEx) and operational expenditures (OpEx) while ensuring profitability.
- **Resiliency:** Ensure uninterrupted power supply for critical operations, even during grid outages.
- **Sustainability:** Maximize renewable energy usage and reduce carbon emissions.
- **Scalability:** Future-proof the facility for seamless integration of additional solar panels, battery storage, EV chargers, and other energy sources.
- **Operational Simplicity:** Implement a centralized energy management platform for efficient operation and monitoring.

[1] Project has not yet been deployed

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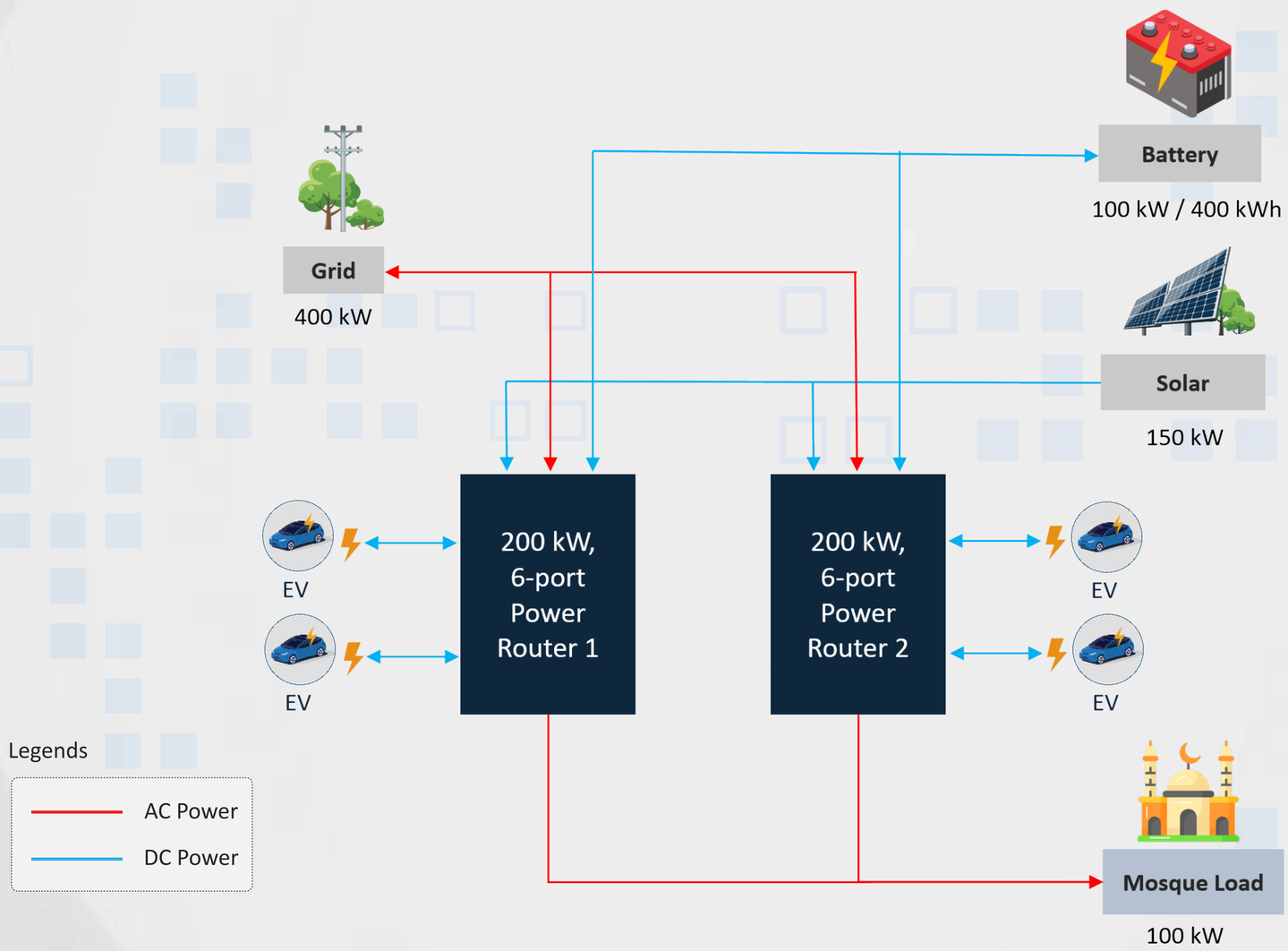
Proposed Solution: The DG Matrix Power Routers

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

- **EV Fast Chargers:** Two charging stations, each delivering up to 200 kW, supporting electric vehicle adoption within the mosque community.
- **Battery Storage:** A 100 kW / 400 kWh battery system to store excess energy and reduce peak demand.
- **Building Load:** A 100 kW facility load powering lighting, air conditioning, and essential operations.
- **Solar PV System:** A 150 kW solar array supplying renewable energy directly to the site.
- **Grid Interconnection:** A 400 kW utility service ensuring 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:

- **24%** lower infrastructure costs by consolidating power management hardware and reducing the need for grid upgrades.
- **13%** reduction in installation costs due to streamlined deployment and fewer components.

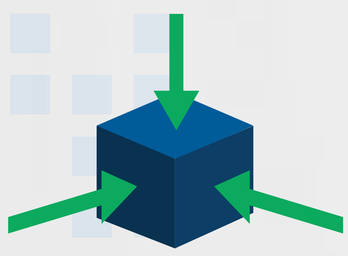
OpEx Savings:

- **143%** reduction in annual energy costs through demand charge mitigation and optimized energy utilization.
- **30%** lower maintenance costs owing to simplified architecture and advanced diagnostics.

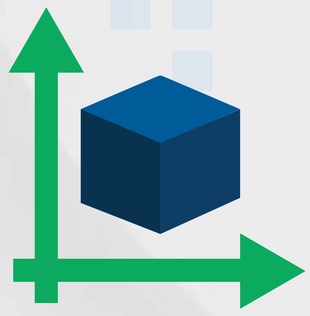
Financial Metrics:

- Payback period: **7 years,** compared to 11+ years for traditional systems.
- IRR: **14%** (estimated based on operator data).

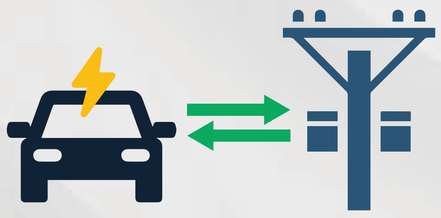
Value-Added Features and Additional Benefits



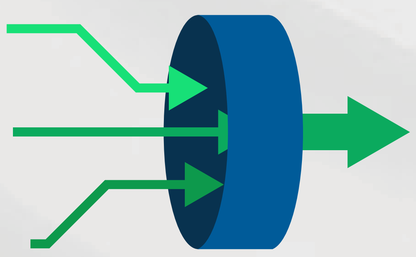
Enhanced Resiliency: Ensures reliability by maintaining operations during outages through a seamless transition to on-site DERs and EV chargers.



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 DG Matrix Power Routers, the Dubai mosque sets a new standard for sustainability, cost efficiency, energy resilience, and EV adoption. The integrated energy platform ensures optimized energy usage, reduced grid reliance, and long-term savings, aligning with the mosque's commitment to environmental responsibility.

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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