Study Shows Rhythmos.io Grid-Edge EV Charging Optimization Could Cut Transformer Upgrade Costs by Up to 60% in High-Demand Areas

- *Passively managed charging could reduce utility costs by approximately 30% compared to unmanaged charging while optimizing charging systemwide could reduce those costs by a further 30% of the total, maximizing utility and ratepayer savings.*
- *Rhythmos.io estimates that grid-edge optimized managed charging for an average utility serving 250,000 customers could save $7.3 million in avoided and deferred transformer upgrades.*

[BOULDER, Colo., Feb. 18, 2025] — To help ensure grid reliability with electricity demand on the rise, Rhythmos.io has collaborated with leading consulting firm Energy and Environmental Economics (E3) to assess the impact of optimized managed electric vehicle (EV) charging on existing grid infrastructure. The study findings, detailed in a comprehensive white paper by E3, reveal that for the utilities modeled, optimized EV charging could reduce distribution transformer upgrade costs by approximately 60% compared to unmanaged charging.

The study examined various charging scenarios—unmanaged, passively managed, and optimized charging—across utility service territories in two different regions of the country to provide an outlook on potential impacts and savings opportunities. The results show that when compared to alternative EV charging strategies, Rhythmos.io's optimized managed charging consistently demonstrated the lowest grid-edge capacity costs for the municipal utility studied across all seasonal peaks within the year. Grid-edge optimization, like Rhythmos.io's, is also well suited for combining with systemwide optimization strategies to provide even greater cost savings to utilities and ratepayers.

"Without proactive management, rising EV adoption could strain local grids, forcing expensive infrastructure investments and higher rates for consumers," said Eric Cutter, Partner at E3. "Our research highlights how solutions like Rhythmos.io's Cadency EdgeAI can optimize charging at critical grid points to reduce distribution upgrade costs and maintain reliability and affordability."

Rhythmos.io estimates utilities will be required to spend between $14-19 billion on grid-edge service transformer upgrades nationwide to support projected EV growth by 2030. However, implementing the Rhythmos.io Cadency EdgeAI℠ platform could help utilities across the United States save between $7-9 billion in avoided and deferred transformer upgrade costs through grid-edge optimized managed charging. Rhythmos.io's internal analysis concludes that optimized managed charging could enable utilities to accommodate more than twice as much EV adoption as is feasible with unmanaged charging without incurring incremental costs to the utility system. Further analysis at the distribution level shows 20% of service transformer upgrades can be avoided, and

another 20% can be deferred, leading to average utility system savings of more than $7 million.

“We are tackling one of the most pressing challenges in the energy transition—helping utilities unlock the full potential of decentralized energy resources while maintaining grid stability,” said Ken Munson, CEO of Rhythmos.io. “Our optimized managed charging solution helps utilities reduce costs and defer infrastructure upgrades, which has the potential to save billions of dollars nationwide and minimize consumer rate impacts while supporting electrification goals.”

The Rhythmos.io Cadency EdgeAI platform enables utilities to better understand when and where new loads and distributed energy resources (DERs) appear on their systems. This insight allows utilities to optimize against localized distribution constraints at the service transformer level, where it has the most impact. Cadency EdgeAI can prevent failures before they happen by enabling dynamic EV charging based on grid-edge capacity. This differs from passive managed charging, where time-of-use (TOU) rates or demand response programs are used to shift EV loads at a system-wide level.

The E3 study also notes the challenges utilities face in adopting grid-edge optimization strategies, including data integration and operational complexity. Rhythmos.io addresses these issues through its scalable end-to-end platform, designed to integrate with existing utility operations to reduce costs while improving service reliability.

For more information about Rhythmos.io’s grid-edge optimization solutions and to read the complete white paper, visit rhythmos.io.

About Rhythmos.io
Rhythmos.io is revolutionizing grid management through AI-powered data analytics for utilities and EV fleet operators. Our platform enables utilities to seamlessly integrate more EV charging capacity without expensive infrastructure upgrades, while providing granular insights into charging patterns and grid impacts. By orchestrating EV charging alongside other distributed energy resources (DER) like solar, battery storage, and demand response, Rhythmos.io helps utilities reduce costs, protect assets, and maximize energy usage while helping utility customers cost-effectively meet their needs. We're building the foundation for a more resilient, sustainable grid. Learn more at Rhythmos.io and connect on LinkedIn.

About E3
Energy and Environmental Economics (E3) is an analytically driven consulting firm focused on the transition to clean energy resources with offices in San Francisco, Boston, New York, Calgary, and Denver. Founded in 1989, E3 delivers analysis that is widely utilized by governments, utilities, regulators, and developers across North America. E3 completes roughly 350 projects per year, all exclusively related to the clean energy transition, across our three practice areas: Climate Pathways and Electrification, Integrated System Planning, and Asset Valuation, Transmission, and Markets. The diversity of our clients – in their questions, perspectives, and concerns – has provided

us with the breadth of experience needed to understand all facets of the energy industry. We have leveraged this experience and garnered a reputation for rigorous, unbiased technical analysis and strong, actionable strategic advice.

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