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GOVERNMENT OF INDIA
MINISTRY OF POWER

ELECTRIC VEHICLE CHARGING INFRASTRUCTURE AND IMPACTS ON DISTRIBUTION NETWORK

GREENING THE GRID (GTG) - RENEWABLE INTEGRATION AND SUSTAINABLE ENERGY (RISE) INITIATIVE

A PARTNERSHIP BETWEEN USAID AND MINISTRY OF POWER, GOI

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Acknowledgements

USAID's Greening the Grid (GTG) is a five-year program implemented in partnership with the Ministry of Power (MoP), Government of India (GoI). GTG program aims to support the GoI's efforts to manage large-scale integration of renewable energy (RE) into grid. It is a key initiative under U.S. Government's Asia EDGE (Enhancing Growth and Development through Energy).

The central component of the GTG program is the Renewable Integration and Sustainable Energy (RISE) initiative, which involves design, implementation, and scaling of a series of prioritized innovation pilots that support RE integration. This white paper on 'Electric Vehicle Charging Infrastructure and Impacts on Distribution Network' is developed under GTG-RISE Initiative, in collaboration with BSES Rajdhani Power Ltd. (BRPL). The white paper focusses on India's swift transition towards introducing electric vehicles into its transportation fleet and to achieve these objectives, utilities and key stakeholders need to be prepared to address the bottlenecks that are likely to arise. GTG-RISE through this white paper shares its findings on various enablers which are is important in understanding the role that a particular regulator/ government/ utility can play in encouraging the deployment of EV charging infrastructure.

The GTG-RISE would like to thank BRPL for partnering with USAID, GTG-RISE team and NREL in this study. USAID and GTG-RISE team would also like to extend our sincere gratitude to Mr. Vibhu Kaushik, Director of Grid Technology & Modernization, Southern California Edison and Mr. Abhishek Ranjan, AVP, System Operation, BRPL for their valuable inputs and feedback on critical aspects of the white paper. We also thank Ministry of Power (MOP) for all their guidance and support to GTG-RISE team for this endeavour.

FOREWORD

The United States Agency for International Development (USAID) has a long and fruitful partnership with the Ministry of Power (MOP), Government of India (GOI) through several bilateral initiatives to modernize the energy sector. A key initiative under the U.S-India bilateral engagement is the Greening the Grid (GTG) program under the US government's Asia EDGE (Enhancing Development and Growth through Energy) initiative. This five-year program supports the GOI in its efforts to manage large-scale integration of Renewable Energy (RE) into the Indian power grid. The key component of the program, Renewable Integration and Sustainable Energy or GTG-RISE, validates technologies and solutions to support grid integration through pilots and demonstrations, while building a foundation for sound policy, capacity building in GOI agencies and incentivizing private sector engagement.

Globally, based on the available infrastructure and demand for additional electricity, renewable energy sources are offering a great opportunity to power Electric Vehicles (EVs), which can subsequently help reduce pollution, increase decarbonization and improve resource efficiency. It is exciting to see the evolving landscape for EVs. Government incentives, emerging technologies and declining prices are encouraging private sectors actors to invest in the future.

Like other countries, India aims to transition its transport system to electric vehicles to promote low carbon growth development. Transitioning to electric vehicles also allows for tackling one of the greatest environmental and public health challenges of modern India i.e. air pollution. The country has set aggressive targets for rolling out EVs and new commitments are being announced regularly, related to policy; technology; finance; or partnerships. One of the key enablers for the rapid uptake of electric vehicles is the development of a widespread charging infrastructure. While India focuses on achieving its commitments, the key stakeholders in the charging infrastructure landscape must be prepared and undertake several interventions to address the various challenges and gaps that currently exist. A White Paper "Electric Vehicle Charging Infrastructure and Impacts on Distribution Network" has been prepared under the GTG-RISE initiative, which reviews the current landscape of EV charging infrastructure in India and the key enablers and interventions required for its increased adoption, thereby accelerating electric vehicles adoption.

I would like to express my appreciation and gratitude to our bilateral partner, the Ministry of Power, for playing a key role in the effort to transform the EV market in the country. I would also like to express my gratitude to Mr. Vibhu Kaushik, Director of Grid Technology & Modernization, Southern California Edison and Mr. Abhishek Ranjan, AVP, System Operation, BSES Rajdhani Power Limited for their assistance in bringing international expertise and technical rigor to the framing of this important analytical document.

I would like to take this opportunity to acknowledge the excellent work done by the GTG-RISE team for their professional efforts in developing the white paper. And finally, I would be remiss if I didn't thank the USAID/India CLEEO Energy team, and the Senior Regional Energy Advisor and GTG-RISE Project Manager, Monali Zeya Hazra and her team for her tireless efforts in all respects. I hope the findings of the paper will be useful for all stakeholders concerned.

Thank you.

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