

PREFACE

The increasing urbanization of cities worldwide has heightened the urgency for sustainable development practices, particularly in the realm of energy consumption. With the adverse effects of climate change becoming more pronounced, it is imperative that urban centres adopt renewable energy sources to mitigate environmental impact and enhance energy efficiency. Solar energy, harnessed through photovoltaic systems on rooftops, emerges as a viable and sustainable solution to meet the growing energy demands of urban populations.

This study, titled "Towards Sustainable Cities: Deep Learning-Enabled Assessment and Ranking of Solar Potential in Indian Urban Centres," aims to evaluate and rank the solar potential of various cities using advanced geospatial and deep learning methodologies. By providing a comprehensive Solar Roof Index for each city, this research seeks to highlight the progress and potential of urban areas in adopting solar energy solutions, thus contributing to the broader goal of sustainable urban development.

The integration of these models allows for a detailed assessment of solar potential, resulting in the calculation of a Solar Roof Index. This index quantifies each city's capacity to harness solar energy, reflecting their commitment to sustainability. By ranking cities based on their Solar Roof Index, this study provides valuable insights into the current state of solar energy adoption and highlights areas for improvement and investment.

The findings of this research are expected to serve as a crucial resource for policymakers, urban planners, and stakeholders, enabling informed decision-making and strategic planning for sustainable urban growth. Public access to the Solar Roof Index data will also empower citizens and businesses to participate in the transition to renewable energy, fostering a culture of sustainability.

Through this study, we aspire to contribute to global efforts toward achieving energy sustainability and resilience in urban environments. By leveraging cutting-edge technologies and comprehensive data analysis, we aim to pave the way for a future where cities can thrive while minimizing their environmental footprint.