

Revitalizing Solar Insights: A Dashboard for West Tennessee Solar Farm

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ABSTRACT

UPDATED—September 11, 2023. This project will focus on creating an interactive dashboard for displaying solar irradiance data collected at a photovoltaic power station. Given a recent push by the University of Tennessee Research Foundation toward revitalizing its use, the West Tennessee Solar Farm will serve as a template. This location is of particular interest due to its proximity to Blue Oval City (the site of the new Ford manufacturing plant, near Stanton, TN). With the farm's existing dashboard being non-functional, there is a demand for a solution, which we will achieve through MySQL, Python, Google Drive API, R-Shiny, Shinyapps.io, and Google Cloud Console. MySQL serves as our data hub, efficiently organizing solar energy data by sensor location. Python, coupled with the Google Drive API, simulates real-time data collection. The core of the project is an R-Shiny dashboard offering real-time data visualization, interactive maps, detailed sensor information, and access to historical data and analysis. Users can select their desired time frames, making it user-friendly. Shinyapps.io hosts the dashboard, ensuring broad accessibility. To further fortify data security and enhance user convenience, Google Cloud Console safeguards our API information. Our dashboard incorporates an export function, enabling users to extract data. We aspire to craft an easy-to-use webpage that is accessible across various major operating systems. This approach ensures that our project is widely available and caters to a diverse audience; thus, making valuable solar irradiance data easily accessible to all. This project aims to provide researchers, policymakers, and the public with real-time insights into solar irradiance data at the West Tennessee Solar Farm, supporting sustainable energy solutions. We are committed to innovation, data accessibility, and practical technology application to address real-world challenges.

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