10Alytics

Energy Forecasting for Decision-Makers

Specialization: *Energy Forecasting | Data Analytics*

Business Focus

Forecast Renewable energy

Tools

Jupyter Notebook, Tableau

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Project Learning Opportunities

This project offers participants a well-rounded opportunity to develop both analytical and communication skills within energy analytics context.

Data Scientists will gain hands-on experience in time-series forecasting, model comparison, and interpreting environmental impacts on energy generation, as well as on designing insightful, interactive dashboards in Tableau that bring complex trends to life for decision-makers. The project promotes collaborative problem-solving, critical thinking, and end-to-end project execution—from analysis to visualization—preparing interns to tackle real business problems in data-driven energy and sustainability sectors.

Learning Skills

- Gain experience in multivariate time-series forecasting.
- Enhance Tableau skills for executive dashboard creation.
- Understand the impact of weather on renewable energy generation.
- Communicate data insights effectively

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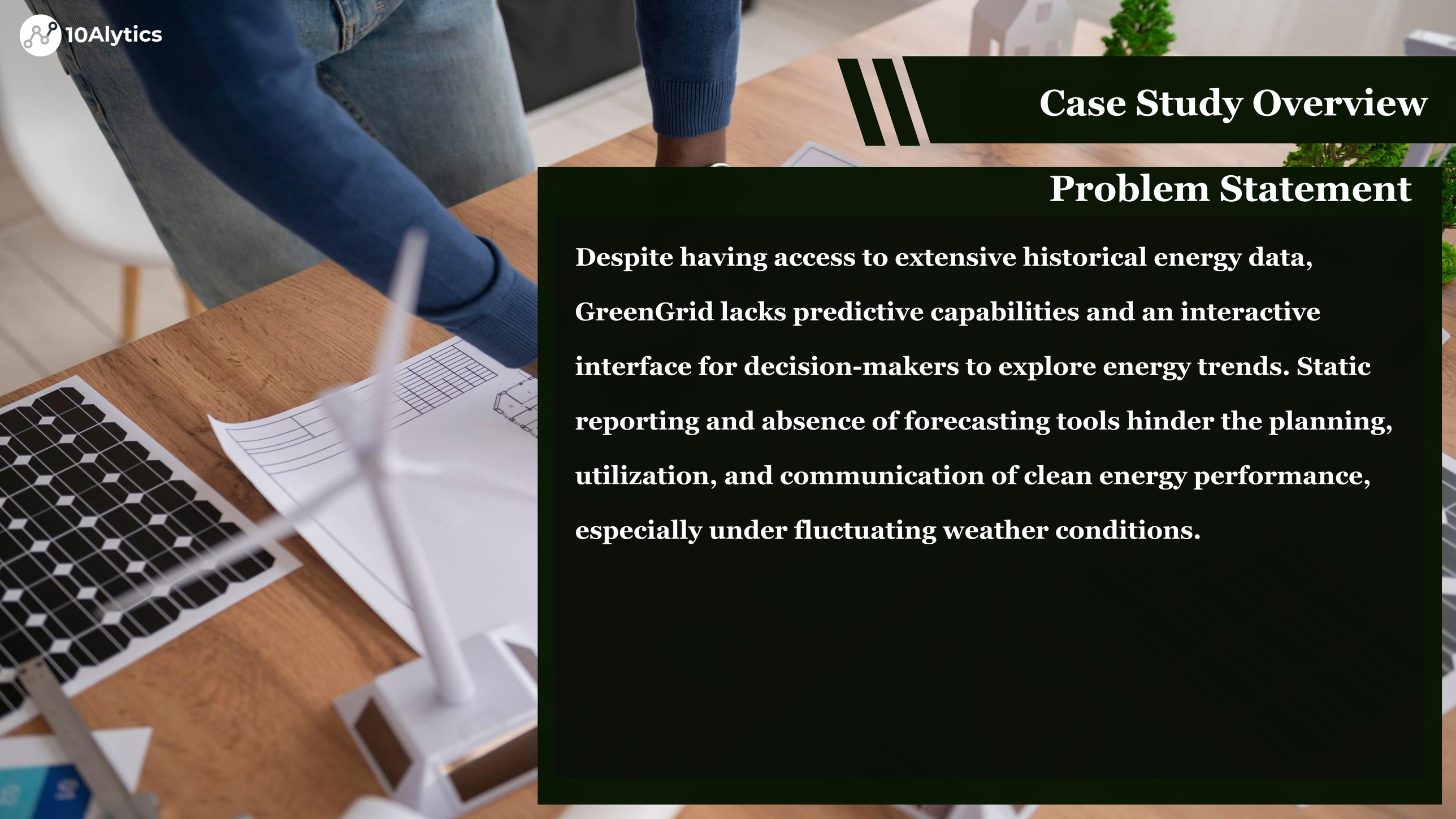
Case Study Overview

Introduction to the Business

GreenGrid Power Solutions is a leading renewable energy management company based in Oslo, Norway. Founded in 2014, GreenGrid specializes in managing solar and wind energy assets for municipalities and industrial clients. Its commitment to data-driven operations sets it apart, with a growing portfolio of over 100 distributed renewable energy sites across Scandinavia. GreenGrid is recognized for integrating analytics into energy planning, enabling smarter, more efficient energy usage.



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Case Study Overview

Problem Statement

Despite having access to extensive historical energy data, GreenGrid lacks predictive capabilities and an interactive interface for decision-makers to explore energy trends. Static reporting and absence of forecasting tools hinder the planning, utilization, and communication of clean energy performance, especially under fluctuating weather conditions.

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Rationale for the Project

The project aims to apply time-series forecasting to historical energy data and develop a real-time dashboard to visualize historical patterns, future forecasts, and key performance indicators. This tool will bridge the gap between data and decision-making by enabling proactive planning, improving forecast accuracy, and increasing data transparency for technical and non-technical stakeholders alike.

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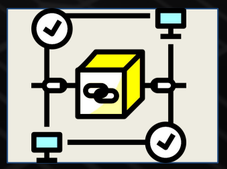
Case Study Objectives

Train forecasting models using historical energy data

Forecast daily energy generation for the next 30 days

Visualize historical and forecasted trends using Tableau



Highlight capacity utilization and enable filtering by energy type, season, and site

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Data Description

1. Datetime: Timestamp of the reading (datetime format)
2. Site: Energy generation site (categorical: Site_A, Site_B, Site_C)
3. Energy_Type: Type of energy generated (Solar or Wind)
4. Energy_Generated_MWh: Energy generated in megawatt-hours (continuous)
5. Temperature_C: Ambient temperature during reading (continuous)

6. Cloud_Cover_%: Cloud cover percentage, applicable to solar energy (continuous)
7. Wind_Speed_m_s: Wind speed in meters per second, applicable to wind energy (continuous)
8. Day_Type: Weekday or Weekend (categorical)
9. Season: Season during which the reading was taken (categorical)

Target Variable: Energy_Generated_MWh

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Tech Stack

Jupyter Notebook

Tableau

Power Point

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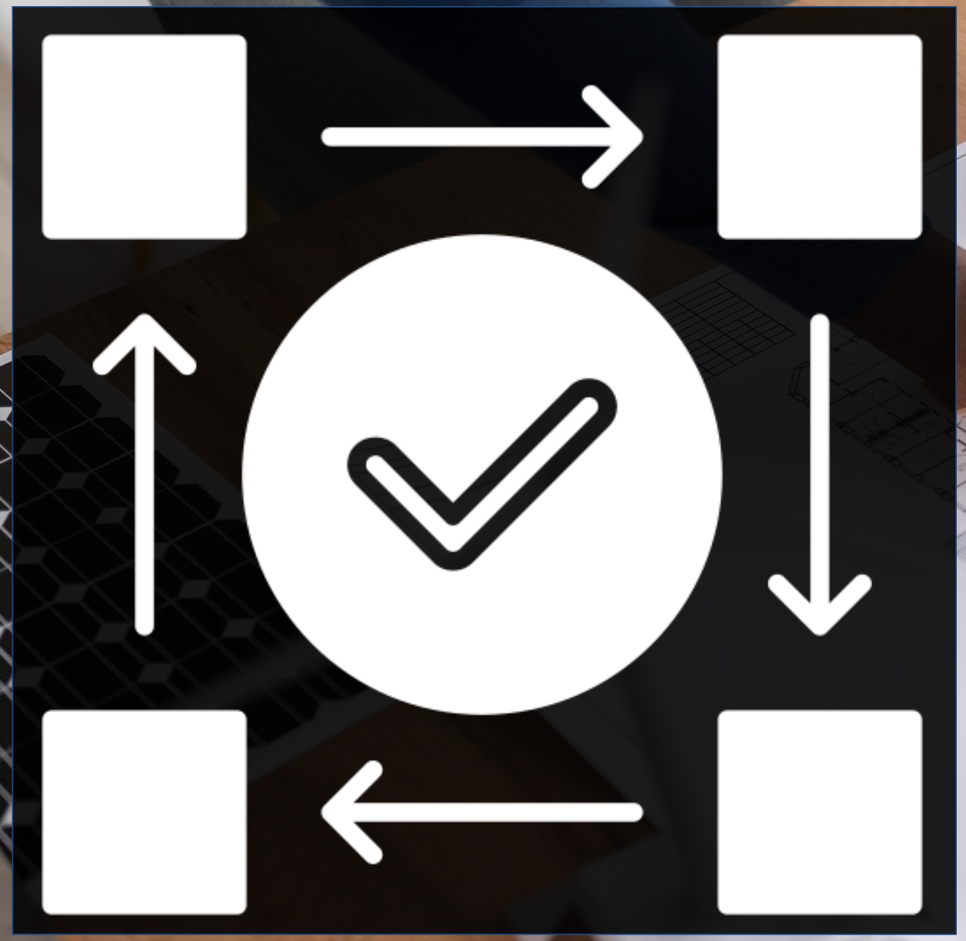
Project Workflow



Data Collection & Ingestion

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EDA

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Forecasting

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Dashboard Development

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Recommendations and Presentation