**📝 Report Summary: AI for SDG 13 – Climate Action**

**Project Title**

**Carbon Emissions Predictor Using Machine Learning**

**SDG Focus**

**SDG 13: Climate Action**  
*Take urgent action to combat climate change and its impacts.*

**Problem Addressed**

Climate change is largely driven by the burning of fossil fuels. Accurate prediction of carbon dioxide (CO₂) emissions from different fuel sources can help policymakers monitor and reduce greenhouse gas emissions. This project aims to create a data-driven AI model to forecast CO₂ emissions using historical fossil fuel usage data.

**Machine Learning Approach**

* **Type**: Supervised Learning
* **Algorithm**: Random Forest Regressor (from scikit-learn)
* **Input Features**:
  + Gas Fuel
  + Liquid Fuel
  + Solid Fuel
  + Cement
  + Gas Flaring
* **Target Variable**: Total CO₂ Emissions

**Dataset Used**

* **Source**: [Global Fossil CO₂ Emissions Dataset (GitHub)](https://github.com/datasets/co2-fossil-global)
* **Format**: CSV
* **Period**: 1950–2014 (Global and Country-Level)

**Key Results**

* **Model Accuracy (R² Score)**: ~0.97
* **Mean Absolute Error (MAE)**: ~50 million metric tons
* **Observations**: The model shows high reliability in predicting emissions, indicating the feasibility of using AI to support climate monitoring tools.

**Ethical & Social Considerations**

* **Data Bias**: Some countries may have incomplete records, risking unequal model accuracy across regions.
* **Social Impact**: Promotes transparency and informed decision-making in global emissions policy.
* **Sustainability**: Supports data-driven environmental governance and long-term climate strategies.

**Conclusion**

This AI-powered CO₂ emissions predictor demonstrates how machine learning can support SDG 13 by enhancing our ability to track and forecast emissions. It empowers global efforts to mitigate climate change through evidence-based insights.