Carbon Crunch

Assignment

You are an ESG analyst tasked with evaluating a manufacturing company's environmental performance over multiple reporting periods. Using the provided dataset—covering emissions, operational data, supplier details, and regulatory benchmarks—your goal is to clean, analyze, and interpret the data. You will then use your findings to propose a comprehensive sustainability strategy to help the company meet its Net Zero goal by 2050, while integrating Life Cycle Assessment (LCA) best practices.

Link to Excel Sheet - https://docs.google.com/spreadsheets/d/1a8qcWA0u_1d8shB5PQhgMoO1_yhFG0krnj96ZByRy58/edit?gid=1725352882#gid=1725352882

Dataset Details:

- **Sheet 1: Emission Data**
  Contains quarterly GHG emissions (CO_2, CH_4, N_2O) for 10 facilities over two years (2022–2023) across multiple scopes.

- **Sheet 2: Operational Data**
  Provides facility-level data on production volume, energy consumption, and waste, matched by reporting period.

- **Sheet 3: Supplier Data**
  Lists key suppliers with estimated carbon footprints, primary product categories and financial involvement with each company.

- **Sheet 4: Regulatory Benchmarks**
  Outlines the company's GHG reduction target, Net Zero milestone, emission reporting standard, renewable energy usage, and LCA integration goals.

Task Instructions:

Part 1: Data Preparation & Analysis (Excel)

1. **Data Cleaning & Validation:**
   - Import each table into separate Excel sheets.
   - Check for and resolve any data inconsistencies (e.g., mismatched facility IDs, duplicate entries, or missing values).

2. **Data Aggregation & Visualization:**

- **Pivot Tables:** Create pivot tables to summarize emissions by facility, reporting period, and emission scope. Extend your analysis to compare trends across the two years.
- **Charts & Graphs:** Build visualizations (e.g., line charts for quarterly trends, bar charts for facility comparisons) to highlight emission trends and operational performance.
- **Advanced Functions:** Use VLOOKUP/INDEX-MATCH to merge data between sheets (e.g., linking operational data with emissions) and employ conditional formatting to flag any outliers or unusual data points.

3. **Dashboard Development:**
   - Develop a concise dashboard that presents key metrics (total emissions, production efficiency, energy consumption trends) alongside visual charts.
   - Ensure the dashboard is clear and interpretable by non-technical stakeholders.

Part 2: Strategic Reasoning & Recommendations

1. **Identifying Key Challenges:**
   - Based on your data analysis, identify and explain **three critical challenges** the company faces in achieving its Net Zero target by 2050. Consider challenges such as:
     - High emissions in specific facilities or quarters.
     - Operational inefficiencies leading to increased energy use.
     - Supplier sustainability risks affecting overall performance.

2. **Research & Best Practices:**
   - Conduct brief research (using reputable sources) to identify industry best practices in GHG reduction, renewable energy integration, and LCA.
   - Summarize how these practices can be adapted to address the challenges you identified.

3. **Strategic Recommendations:**
   - Propose actionable strategies to overcome the challenges. Your recommendations should be data-driven and may include:
     - Process optimizations or operational changes.
     - Investment in renewable energy or energy efficiency improvements.
     - Enhanced supplier engagement and stricter sustainability criteria.
     - Steps to fully integrate LCA into product development and operational assessments.
   - Support your recommendations with key findings from your Excel analysis and external research.

Deliverables:

- **Excel Workbook:**
  Containing:
  - Cleaned and organized data across separate sheets.
  - Pivot tables, advanced formulas, and visualizations.
  - A user-friendly dashboard summarizing the key metrics.

- **Written Report (1-2 pages):**
  Summarize:
  - Your approach to data cleaning and analysis.
  - Key findings from the dataset.
  - The three challenges identified and their potential impact.
  - Your research insights and detailed strategic recommendations.

- **Submission Format:**
  Submit the Excel file and the written report as separate documents (preferably in PDF or Word format for the report).

Evaluation Criteria:

- **Technical Proficiency:** Accuracy and sophistication in data cleaning, pivot table creation, use of advanced Excel functions, and dashboard design.
- **Analytical Depth:** Clarity in identifying data trends, linking operational performance with emissions, and spotting critical challenges.
- **Strategic Insight:** Quality of research, practicality of recommendations, and integration of LCA insights into the proposed strategy.
- **Communication:** Clarity, coherence, and professionalism in both the Excel dashboard and the written report.

Link to Submit assignment: https://forms.gle/vmuzzz4Hkiwmyefx8

Best Regards
Team Carbon Crunch