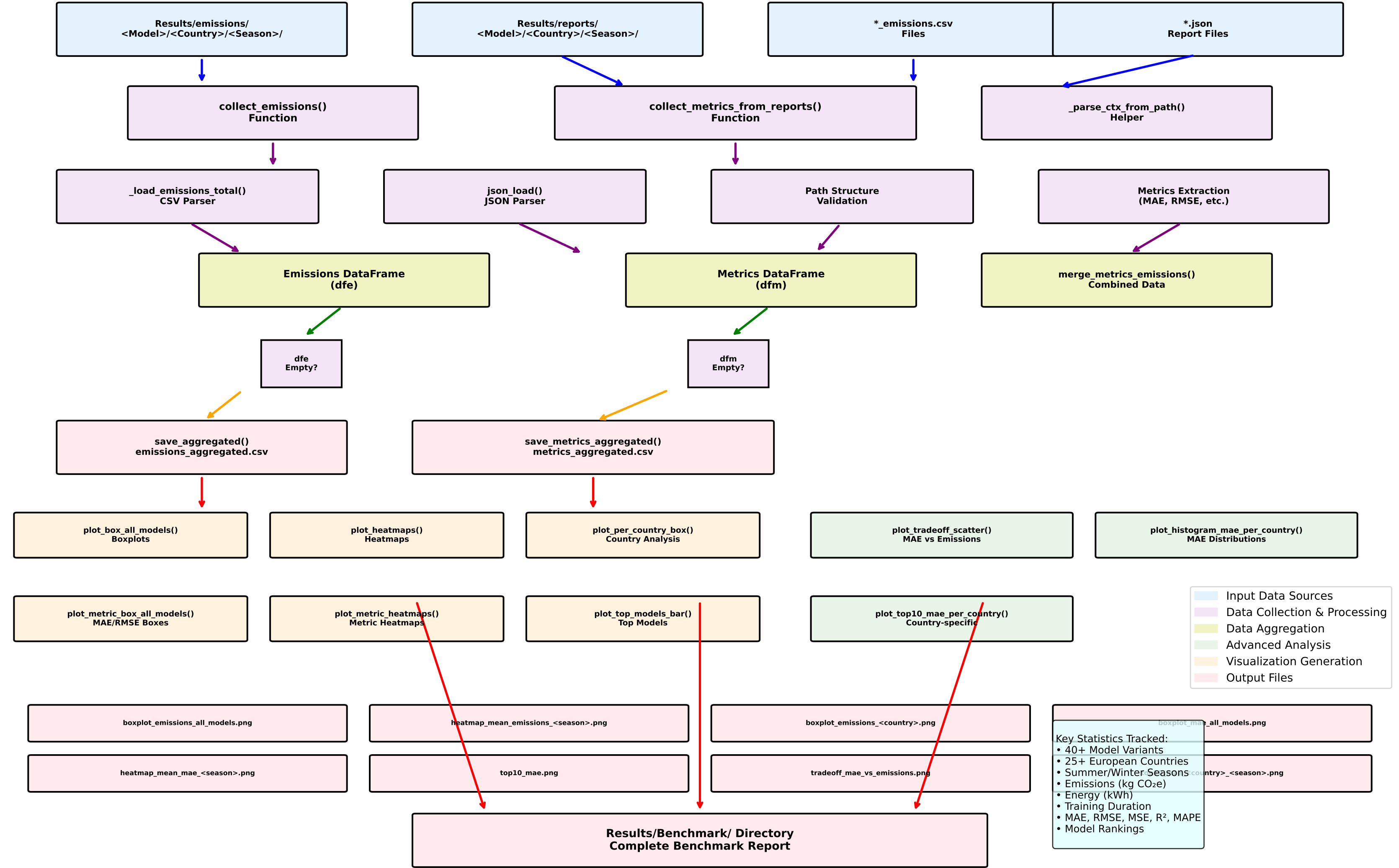


Benchmark.py Workflow: Model Performance Analysis



Benchmark.py Process Flow:

- Data Collection:**
  - Scans Results/emissions/ for CSV files
  - Scans Results/reports/ for JSON metrics
  - Validates file paths and structure
- Data Processing:**
  - Parses emissions data (CO<sub>2</sub>, energy, duration)
  - Extracts metrics (MAE, RMSE, MSE, R<sup>2</sup>, MAPE)
  - Aggregates by model/country/season
- Analysis & Visualization:**
  - Box plots for distribution analysis
  - Heatmaps for model x country comparison
  - Trade-off analysis (accuracy vs emissions)
  - Top performing models identification
- Output Generation:**
  - Multiple PNG visualizations
  - Aggregated CSV reports
  - Country-specific analyses
  - Season-based comparisons