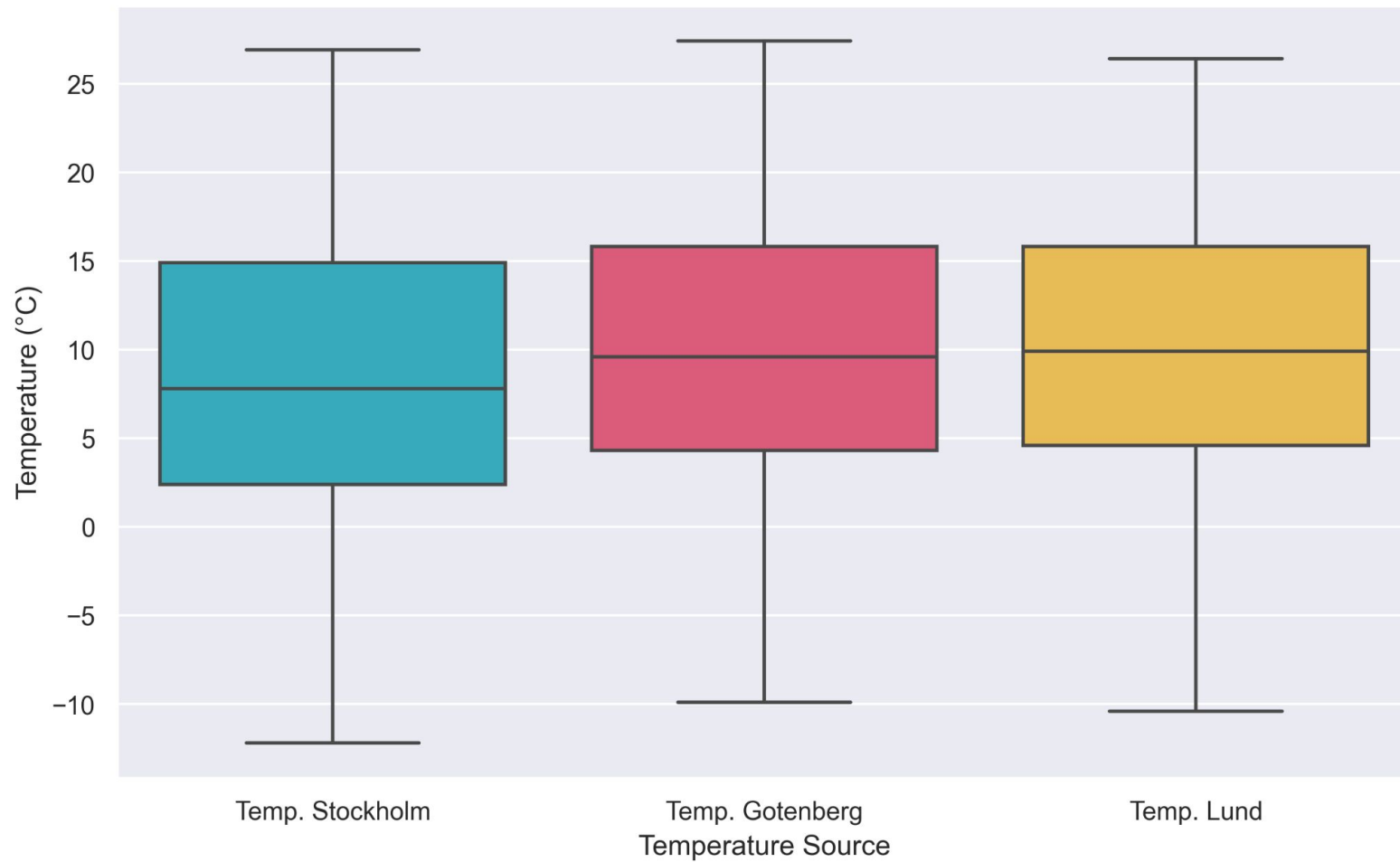


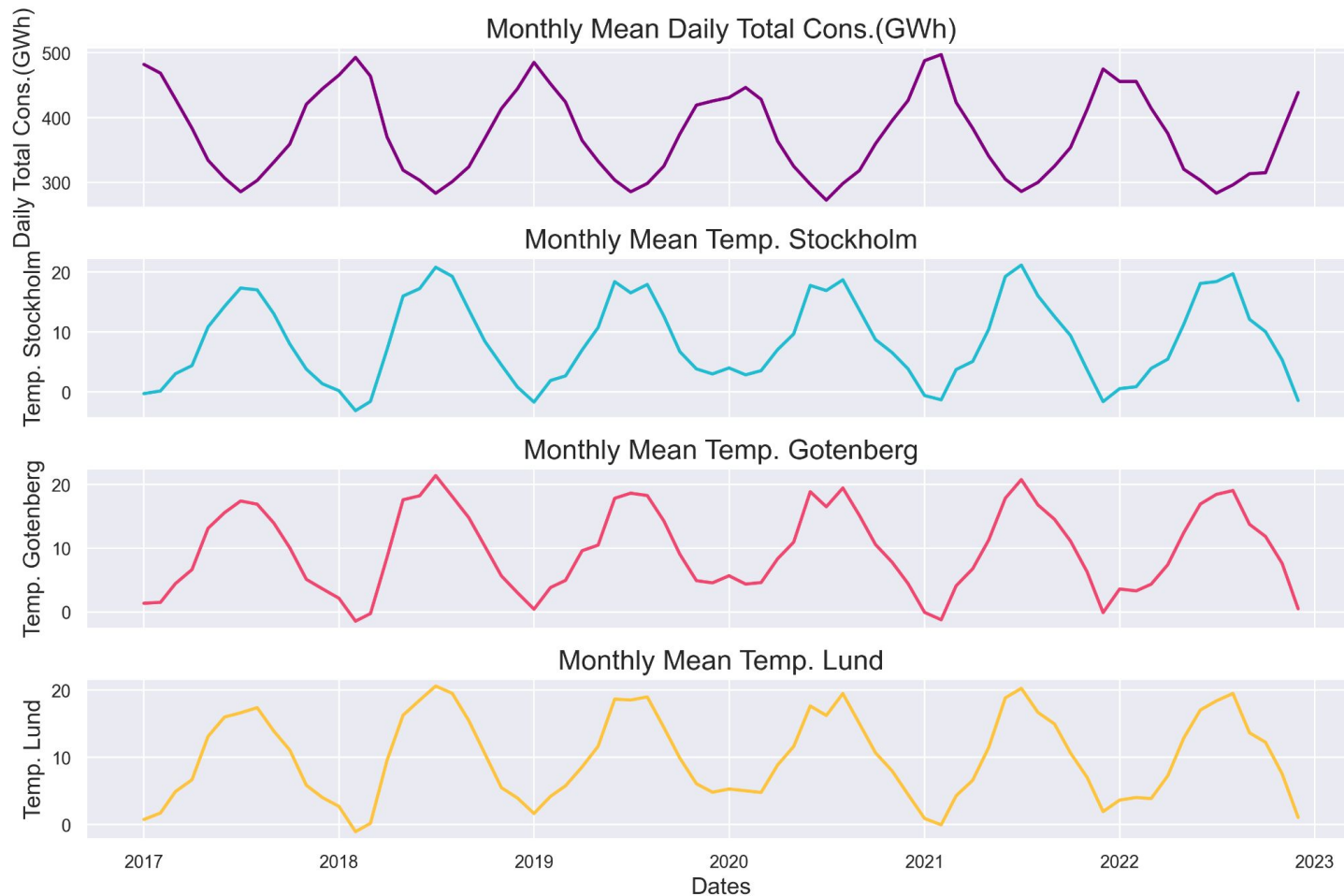
# Electricity Consumption Forecast

- **Objective:** Forecast **daily electricity consumption** in Sweden for 2022.
- **Potential Business Impact:** more **accurate budgeting** and potential **cost savings**.
- **Dataset:** ~2K rows × 8 columns.
- **Assumption:** Accurate forecast for the following day is available.
- **Features:** Temperature data (Stockholm, Gothenburg, Lund), Holidays, **GWh lags for 7 days**.
- **Source:** **Vattenfall** - Swedish multinational power company.

Temperatures in 3 cities



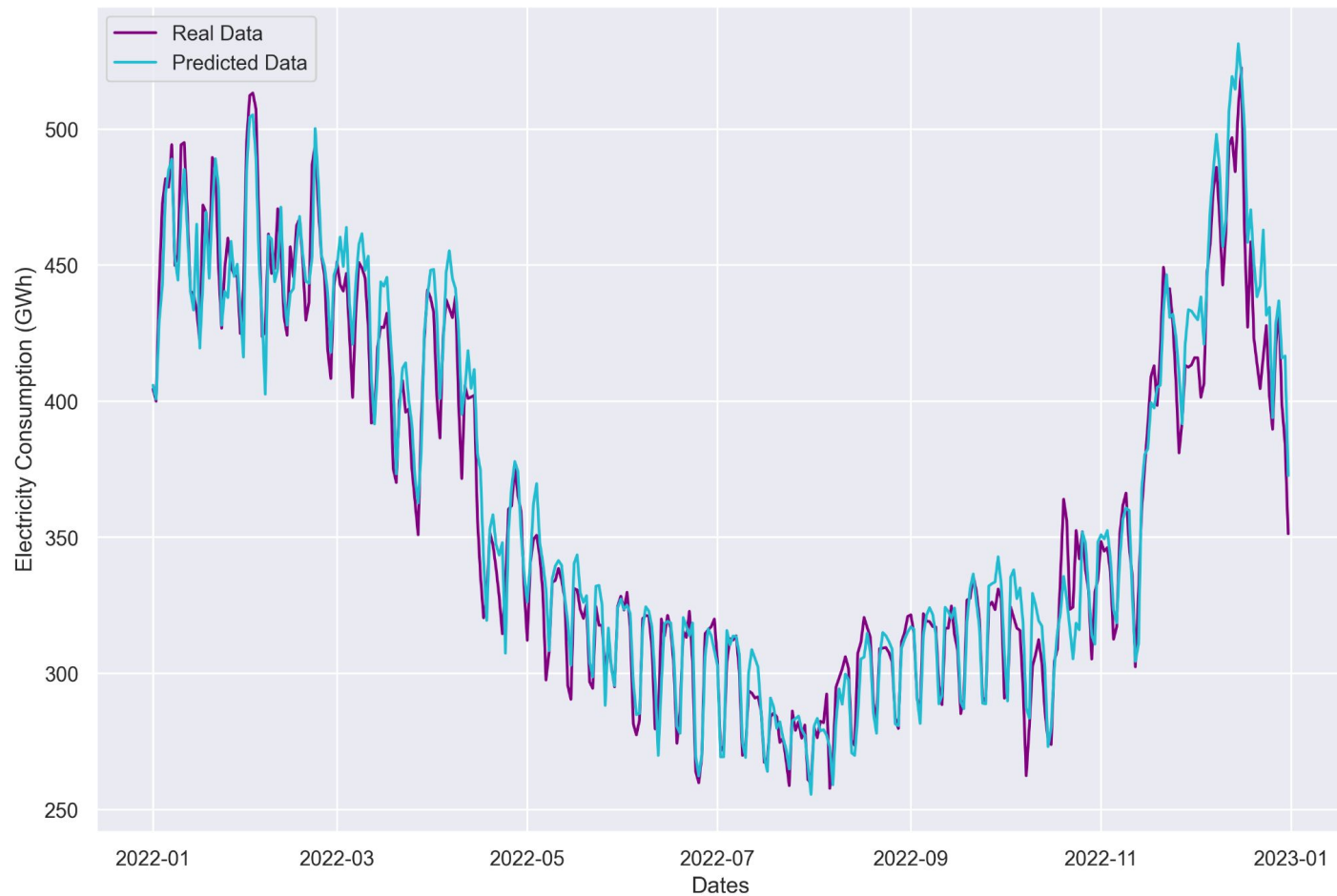
# Energy Consumption Matches Seasonality



## Final Model and Evaluation

- **Model Selection:** **GradientBoostingRegressor** with **MinMax** Scaling (out of **10** alt.).
- **Best Hyperparameters:**
  - Learning rate = 0.1,
  - max depth = 5,
  - n\_estimators = 150.
- **Evaluation:**
  - **R<sup>2</sup> Score:** **0.9636** (Good model fit),
  - **MAE:** **9.80** GWh (Acceptable given large values).

# Comparing Real and Predicted Electricity Consumption



## Conclusion and Next Steps

- **Achievement:** Developed an accurate forecasting model.
- **MAE Interpretation:** Predictions are off by **9.80 GWh** (acceptable given large values).
- **Business Impact:** a reduced MAE translates to more **precise budgeting** for energy resources, resulting in potential **cost savings**.
- **Next Steps:** Implement model for 2022 daily forecasting with day-ahead assumption.