📘 User Manual: OPTARIFF Tool

📙 Overview

The **OPTARIFF Tool** is an application designed to help electricity utilities and analysts determine optimized tariffs using real-time insights. Users can choose to run the tool for:

- **Individual Consumers** or

- **Clustered Groups of Consumers**

The tool enables visualization of smart meter data, configuration of time-of-use (ToU) bins, selection of model parameters, and execution of the tariff optimization engine.

⏱️ 1. Getting Started

When you open the tool, you are greeted with a **landing screen** featuring two main options:

- 🔵 **Individual Tariff**

- 🟢 **Cluster Tariff**

Clicking on either option routes the user to a separate configuration flow, starting with the **Individual Tariff** pathway described below.

👤 2. Individual Tariff Workflow

📁 Step 1: Upload Smart Meter Data

- Upload your smart meter Excel or CSV file using the upload widget.

- A **sample file** is available for download as reference.

- The tool extracts hourly consumption data from the columns named Consumption_Hr_1 through Consumption_Hr_24.

📊 Profile Visualization Area

After uploading:

- Use the **Category**, **Sanctioned Load**, and **Consumer No.** dropdowns to filter the data.

- The **graph updates dynamically** to show daily or hourly consumption.

- Optionally, view a **representative profile** (e.g., median profile) across selected consumers.

💾 Step 2: Select Output Directory

- Choose the folder where all model outputs, plots, and logs should be saved.

- This ensures model results are persistent and easy to retrieve.

⏰ Step 3: Select ToU Bin Cuts

- Define **time-of-use bin edges** by entering the **hour numbers**.

  - For example: to capture **solar hours** between 6 AM and 5 PM, enter 5 and 17 (as hours are zero-indexed).

🔁 Step 4: Choose Bin Continuity

- Choose whether **non-solar bins** should be:

  - ✅ **Continuous** (e.g., 6–17 and all remaining hours grouped into a second bin), or

  - ❌ **Split** into **three separate bins** (e.g., 1–5, 6–17, 18–24).

- This impacts how the model interprets consumer behavior across different parts of the day.

📥 Step 5: Upload Model Parameters

- Upload a parameter file (Excel) containing:

  - Cost and benefit assumptions

  - Tariff structure constraints

  - Policy preferences

- A **sample parameter file** can be downloaded to understand the format.

▶️ Step 6: Run the TOU Model

- Once all inputs are provided, click **Run Model**.

- Internally, the tool:

  - Creates ToU bins

  - Processes daily demand

  - Runs the optimization engine

  - Writes output files (tariffs, savings, plots) to the selected folder

- Progress and logs are shown at the bottom of the screen.

📈 Step 7: Visualize Results

- Once the model finishes, output graphs will be displayed:

  - Daily demand vs. optimized demand

  - Cost savings per consumer

  - Tariff structure comparisons

- Users can export plots or inspect detailed Excel outputs from the output directory.

🛠️ Tips & Troubleshooting

- Ensure the **date format** in the uploaded file is consistent (e.g., DD-MM-YYYY).

- All 24 hourly columns (Consumption_Hr_1 to Consumption_Hr_24) must be present.

- If a column is missing or an error is shown, check the logs area for more information.

- If the plots are too faint, increase line **opacity** or **thickness** via the graph controls (or ask your admin to tweak in code).

📁 Outputs

The tool generates the following outputs in the selected directory:

- 📊 outputs.xlsx

- 📈 graphs.png

📘 User Manual: Clustered Tariff Model

The **Clustered Tariff** path in the Optariff tool allows you to group similar consumers and analyze tariffs at a group level. Below are the step-by-step instructions for using this functionality:

Step 1: Upload Smart Meter Data

- Upload the smart meter data for **all individual consumers** using the file upload component.

- A sample file is available to guide the format.

Step 2: Select Output Directory

- Choose the folder where all outputs (intermediate and final results) will be saved.

- This directory will store the clustered profiles, model outputs, and logs.

Step 3: Visualize and Configure Clustering

In the **right panel** (graph screen), two tabs are provided:

Tab 1: Distribution Overview

- Visualizes the **frequency distributions** for the following attributes:

  - **Consumer Category**

  - **Sanctioned Load (kW)**

  - **Monthly Consumption** (auto-derived from the uploaded data)

This helps in understanding the data spread before clustering.

Tab 2: Clustering Settings

- Configure the logic for consumer segmentation using the following options:

✅ **Clustering Level Options**:

  - Cluster all consumers together (no segmentation)

- o Cluster separately within each **Category**

- o Cluster within each **Category + Sanctioned Load bin**

- o Cluster within each **Category + Sanctioned Load bin + Monthly Consumption bin**

✅ **Distance Metric**:

- o Choose the metric to define similarity.

- o Default: **Euclidean**

✅ **Number of Clusters**:

- o Let the algorithm automatically determine the **optimal** number of clusters

- o OR manually specify a **fixed number of clusters**

- Once settings are finalized, click **"Generate Clusters"** to perform clustering.

- Cluster profiles and metadata will be saved to the selected output directory from Step 2.

Step 4: Select ToU Dynamicity

- Choose the level of **Time-of-Use (ToU) dynamicity** as required (e.g., solar/non-solar hours).

- This step mirrors the dynamicity selection in the **Individual Tariff Model**.

Step 5: Configure First and Last Bin Logic

- Option to keep **first and last bins continuous**.

- If enabled: two bins are created (e.g., solar and non-solar).

- If disabled: three bins are created (e.g., early morning, solar hours, late night).

Step 6: Upload Model Parameters

- Upload the **model parameter Excel file**.

- A sample file is available to help users understand required inputs.

Step 7: Run OptaTariff for Clustered Data

- Run the OptaTariff model using the prepared cluster profiles and parameters.

- This step computes the optimized ToU pricing for each cluster.

Step 8: View Results

- Navigate to the **results tab** to visualize model outputs.

- Results are also saved in the output folder specified earlier.