

Cape Agulhas MEMS Tool Customisation

The purpose of this report is to outline how the Cape Agulhas Local Municipality expanded on the Municipal Energy Management Systems (MEMS) tool to create additional functionality and automation.



1. Background

The MEMS tool includes several different Microsoft Excel workbooks, including the following:

- An **ESKOM Large Power Users (LPU) Cleaner** that scrapes and cleans ESKOM LPU PDF bills
- An **ESKOM Small Power Users (SPU) Cleaner** that scrapes and cleans ESKOM SPU PDF bills
- An **ESKOM Billing Data Template** that provides a structured template for storing cleaned ESKOM billing data
- A **Municipal Billing Data Template** for storing cleaned ESKOM billing data
- The **Main MEMS Tool** that stores account information and imports and processes ESKOM and municipal data stored in the provided templates.

To use the MEMS Tool, a user typically follows the steps below.

For ESKOM Data

1. Every month, save PDF bills from ESKOM in a dedicated folder or drive that has separate folders for LPU and SPU bills.
2. Run the **ESKOM LPU Cleaner tool** and **ESKOM SPU Cleaner tool** to process the new PDF bills.
3. Save data from the **ESKOM LPU Cleaner** and **ESKOM SPU Cleaner** tools into new versions of the **ESKOM Billing Data Template**.
4. Run the import function on the **Main MEMS Tool** to import this new data.



For Municipal Internal Billing Data

1. Every month, save the Excel file from the Municipal Billing Department in a dedicated folder or drive for internal billing files.
2. Manually reformat this data so that it is in the same format as the **ESKOM Billing Data Template**.
3. Copy data to the **Municipal Billing Data Template**.
4. Run the import function on the **Main MEMS Tool** to import this new data.

The process is summarised in Figure 1. Once the ESKOM and municipal data is imported into the Main MEMS Tool, it is possible to do an analysis on that data for that particular month.

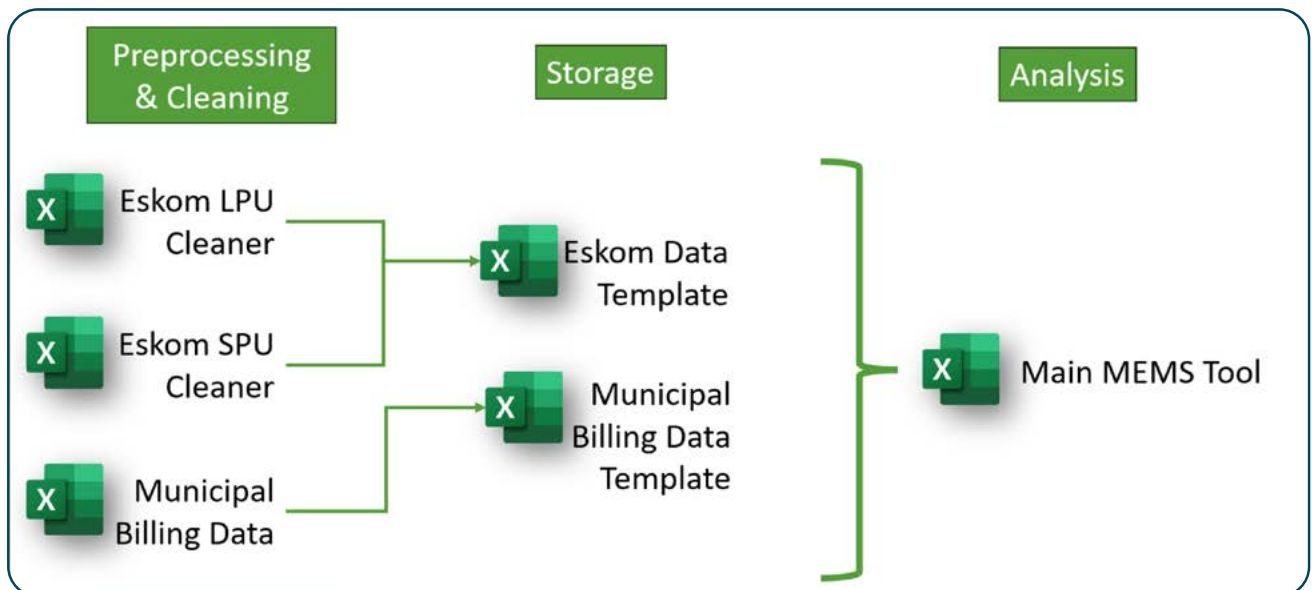


Figure 1: MEMS Tool structure and process flow diagram

From the above summary, it is evident that there are several repetitive, manual tasks that need to take place every month. These are:

1. Save the ESKOM PDF bills in a general folder
2. Separate the ESKOM bills into LPU and SPU folders
3. Run the ESKOM LPU and SPU tools to extract billing information from the PDF files
4. Copy the processed ESKOM data into new template files
5. Restructure and copy the internal municipal billing information into the correct template
6. Import this data into the MEMS Tool.

The Cape Agulhas Local Municipality developed several customisations in Outlook and work to automate and streamline these steps.



2. Customisations

2.1 Step 1: Saving PDF Bills

The first key automation is to save monthly PDF bills from ESKOM in a specific drive folder. This was achieved using a combination of rules in Outlook and a relatively simple Outlook Visual Basic for Applications (VBA) script.

Unfortunately, Outlook does not have a built-in function to save attachments to a Windows drive. However, it does have a function to move emails from a particular sender to a specific folder within Outlook. This rule was set up so that all emails from ESKOM billing (ESKOM Electronic Invoice <noreply@eskomstatements.co.za>) are moved to a specific folder within Outlook.

A macro¹ was then created that copies the bills to a specific Windows folder, which has shared access by other staff members.

The result of this automation is that when a bill arrives from ESKOM, it is saved automatically in a shared Windows folder for further processing by the MEMS Tool.

2.2 Step 2: Separating ESKOM Bills

The Cape Agulhas Local Municipality created a “Control Panel” Excel workbook, that is macro enabled to allow for custom code and automation.

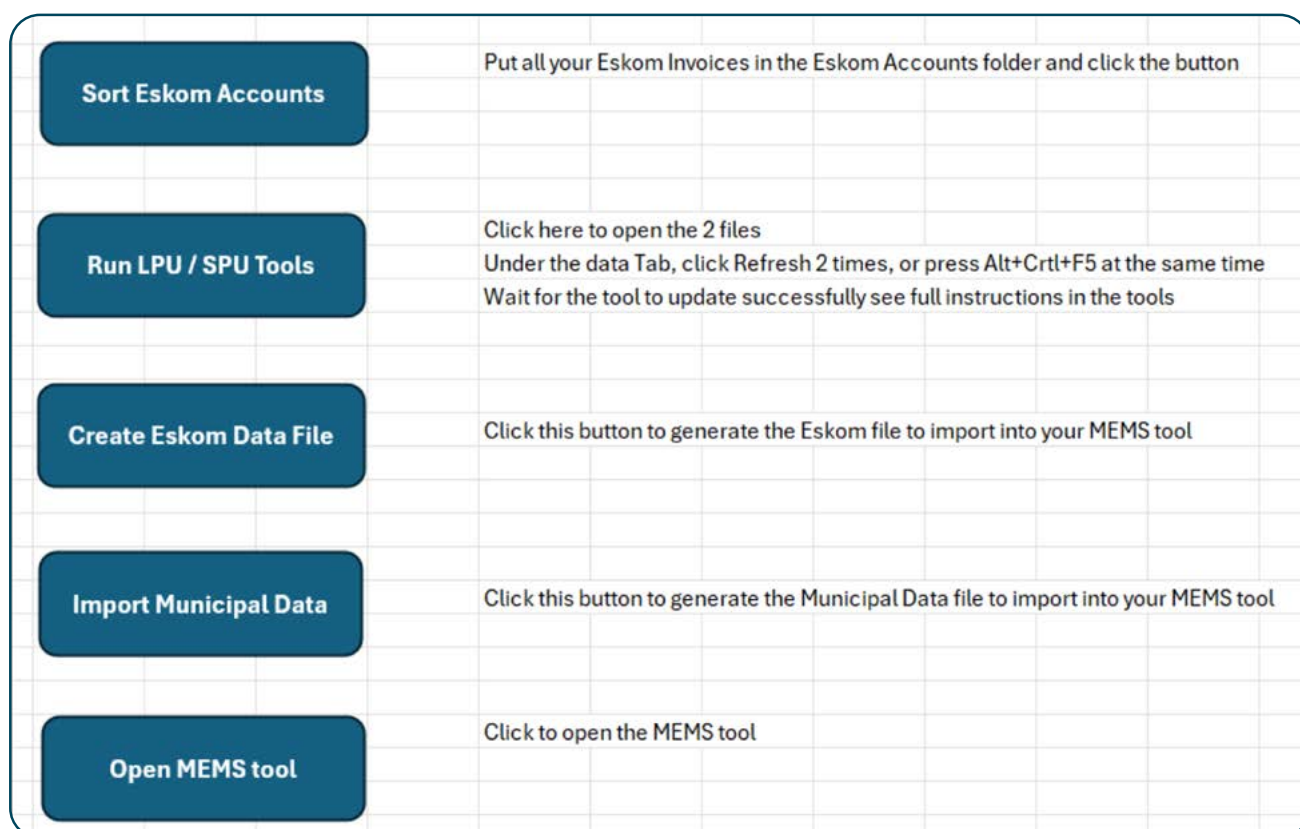


Figure 2: Cape Agulhas MEMS “Control Panel” Dashboard

¹. A macro is a custom code that performs a series of actions, such as automatically sorting your emails or sending a standardised reply.



2

Customisations

The first automation set up in the “Control Panel” is the ability to sort or separate ESKOM SPU and LPU PDF bills into different folders. To do this, tabs were created with a list of LPU and SPU account numbers. A macro was then created that takes the list of LPU accounts, searches through all the new monthly PDFs, finds matches, and then moves these LPU bills to a specific LPU folder. This is repeated for SPU bills.

The result of this automation is that all the new bills from ESKOM that are saved in a shared Windows folder are moved into specific SPU and LPU folders. This step greatly reduces the time the **ESKOM LPU Cleaner** and **ESKOM SPU Cleaner** tools take to run as they don't have to determine which bills to use or skip for processing.

2.3 Step 3: Clean ESKOM Bills

The next step is to use the existing functionality in the **ESKOM LPU Cleaner** and **ESKOM SPU Cleaner** tools to scrape and clean the ESKOM data. This automation allows users to click a button on the dashboard that automatically opens the LPU and SPU tools. Once these tools are open, it is possible to “Refresh” the two tools and import and clean the ESKOM data.

2.4 Step 4: Export ESKOM Data

The next step is to copy the data from the LPU and SPU Cleaner tools to an Excel file in the correct template that can be used by the main MEMS Tool. This is done by firstly creating a standard template as a separate tab within the Control Panel. A user then clicks a button on the dashboard called “Create ESKOM Data File”. The macro copies the data from the two cleaner tools into the correct template structure and then saves these files in the Windows folder.

The result from this automation is that data is copied from the **ESKOM LPU Cleaner** and **ESKOM SPU Cleaner** tools into templates that can be imported into the main MEMS Tool.

2.5 Step 5: Import Municipal Data

The next step was to automate the import and formatting of municipal data from multiple billing department source files. This was done by creating a macro that reads all Excel files from a specified folder where municipal internal data is saved.

A user provides information, such as folder paths and a tariff value, on the “Run” tab. The macro then processes each source file, filtering for specific rows that meet the required criteria. To prevent duplication, it checks each record against data that has already been processed. It then copies the relevant columns to a master template sheet, reformatting dates and calculating a new value based on the tariff.

The result of this automation is a single, clean data file saved to an output folder, containing all the processed municipal data in the correct format for the main MEMS Tool. The original source files are then moved to an archive folder.

2.6 Step 6: Load the Main MEMS Tool

The final automated step allows users to easily open the main MEMS Tool through a simple macro-linked button. Users save the file path and file name of the main tool into the Control Panel which launches the MEMS Tool.



3. Lessons

3.1 Implementation Considerations and Best Practice

3.1.1 Access and Collaboration

The current toolset implementation uses a shared network drive (rather than SharePoint), which enables all role-players to access the necessary files while connected to the municipality's network. This centralised approach facilitates collaboration and ensures that team members can work with the latest versions of documents.

Alternatively, setting up the toolset from a SharePoint environment is also feasible. To ensure access, all users must have the correct SharePoint folder synced to their devices. Using SharePoint or Microsoft Teams, user management is more straightforward and accessibility is enhanced, allowing team members to work from any location with an internet connection.

3.1.2 User Training and Support

It is essential that all role-players receive adequate training and support to ensure they fully understand how to use the tools. Proper training will help users understand the effectiveness of the automation and reduce the risk of errors during operation.

3.1.3 Data Preparation and File Management

For optimal performance, it is recommended to obtain a single file from the billing system that contains all relevant data required to populate the tool. Relying on multiple files can slow down processing and may complicate the data import process.

Additionally, it is important to ensure that LPU and SPU account numbers are listed correctly in their respective sheets within the Control Panel workbook. Proper organisation of account numbers helps with accurate data processing and reporting.

3.1.4 Network Configuration

When running the tool in a shared folder environment, users should verify that they are using the correct IP address or that the internal DNS is properly configured. Failing to do so may lead to access issues, preventing users from interacting with the toolset as intended.





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