





US Army Corps of Engineers®

### VOLUME 8, ISSUE 2 ~ DECEMBER 2022 — JANUARY 2023

# FROM THE PROGRAM MANAGER

Welcome to our December 2022 - January 2023 issue of the *Meter Data Management System Update (MDMS),* designed to keep you informed on the growth and latest developments of the Meter Data Management System and the Army Metering Program.

The MDMS Outreach Team continues to work with new Energy Managers (EMs) and Resource Efficiency Managers (REMs) in one-on-one sessions to help introduce and acclimate them to MDMS and the wealth of functionality that MDMS provides. With new modules and being rolled enhancements out continuously, such as the Energy Project Identification Tool, Stop Light Chart, and Scatter Plot Modeling Tool, we thought it would be good to provide an inventory or summary of the 40+ modules in MDMS.

Consider this a sort of primer if you will. We hope you will find this to be a valuable resource.

As always, our mission is to improve the MDMS experience for end users. Your input is valuable, and we welcome your feedback via the Army Meter Service Desk (AMSD) at: <u>cehncarmy-meter-help@usace.army.mil</u>



From the Program 1 Manager

Inventory of MDMS Tools 1-7

## INVENTORY OF MDMS TOOLS

The modules in MDMS are grouped by functional categories, which are synonymous with different web pages in MDMS and can be accessed via the main Home pulldown menu. We'll use this grouping to brief the tools here.

#### Home Dashboard

Once logged into MDMS, users are taken to the home dashboard, which by default shows the GIS Map, Total Energy Summary FYTD, Cumulative Usage with Degree Days, and Highest Buildings by EUI report widgets. The dashboard is intended to give users a quick-look assessment and status of certain aspects of their site, installation, region or command within MDMS. There are twenty report options which may be run, edited, rearranged, resized and removed from the dashboard. Graphs can be exported to image files to be used in briefings and status reports. Tabular reports can be exported to Excel.

#### Energy Management

This page contains all the usage, benchmarking, AEWRS, EUI and measurement & verification tools, as well as the asset metadata for buildings and meters. These are your primary energy analytic tools for doing detailed analysis of your data. Each tool is briefly described below under its corresponding sub-menu.

<u>Usage Summary (Your usage provided at various increments)</u>

 <u>Hourly Usage Report</u>: Tabular report of hourly usage for date range selected. Can be run for either buildings or meters, with option to add all for site and/or installation. If run for buildings, you can select Data can be exported to Excel (Continued on pg. 2)



and/or installation. If run for buildings, you can select the individual commodity desired or total energy in MMBtu. Data can be exported to Excel. (Continued on pg. 2)



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# INVENTORY OF MDMS TOOLS (CONT. FROM PG. 1)

- <u>Daily Usage Report</u>: Tabular report of daily usage for date range selected. Can be run for either buildings or meters, with option to add all for site and/or installation. If run for buildings, you can select the individual commodity desired or total energy in MMBtu. Data can be exported to Excel.
- <u>Monthly Usage Report</u>: Tabular report of monthly usage for date range selected. Can be run at the HQDA, Command, Region, Installation, Site or Custom Group organizational level. You can select the individual commodity desired or all commodities. Once the organization is selected, you can add buildings or meters with the option to add all. Data can be exported to Excel.
- <u>Custom Usage</u>: Graphical report of usage for year, quarter, month, or custom date range. Can be run at the HQDA, Command, Region, Installation, Site, Building or Custom Group organizational level. You can select the individual commodity desired or combined electric and gas. Graph can be exported to image. Data can be exported to Excel.
- <u>Usage FY Comparison</u>: Graphical report of usage compared by month for two fiscal years for one or all buildings at the site selected. Also shows/compares the cumulative usage for the two fiscal years. You can select the individual commodity desired or combined electric and gas. Data can be exported to Excel.

#### Usage Details

- <u>Interval Usage</u>: Graphical report of interval usage (kWh) over the selected Date Range for the Installation/Site, Building, and/or Meter selected. Query can be saved. Graph can be exported to image. Data can be exported to Excel.
- <u>Daily Comparison</u>: Graphical report provides a week's overview of the consumption data—in kwh—for each day of the week for the Site, Building or Meter, Commodity, and Date Range selected. This allows you to compare usage during known hours of occupancy to determine patterns, trends, or issues, such as off-schedule cycling of equipment. By clicking on the name of the week in the bottom key/legend, you can toggle one or more days on and off in the graph. Graph can be exported to image. Data can be exported to Excel.
- <u>Duty vs. Non-Duty Analyzer</u>: Graphical report displays energy consumption and highlights inefficiencies during nonduty hours for the selected building at a site over the last 7 days, if available. You can step backwards/forwards in one week increments or select a different start date. You can also use the Modify Building Setup to change the established duty hours for that building if the default hours are not applicable to that particular building.
- <u>Interval Usage Data Quality</u>: Graphical report showing the comparison of raw meter usage for the selected building at a site for the last 30 days. This report also shows the status of the usage and reading as valid or invalid, along with the status of the usage and reading indicator. The meter reading information is included to provide further insight because the usage values are calculated from the readings. You can step backwards/forwards in 30-day increments or select a different start date. *(Continued on pg. 3)*





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#### MDMS UPDATE

## **INVENTORY OF MDMS TOOLS** (CONT. FROM PG. 2)

#### **Benchmarking**

 <u>Interval kW</u>: Graphical report of calculated interval demand - average kW for that interval - over the selected Data Range for the Installation/Site, Building, and/or Meter selected, and auto-plots the base load at the average of the 300 lowest non-zero intervals. This base load is a fundamental building block for additional benchmarking and core to other tools you will use. You can set or change values for base load, air handling units (AHU), lights, chiller, and total chiller/AHU. If you click the calculate button you can get the calculated watts/SF values for base load, AHU, lights, chiller, and total chiller/AHU. This tool also allows you to set a base load threshold for email notification when parameters that you fixed are overridden in the future. Query can be saved. Graph can be exported to image. Data can be exported to Excel. This is one of your most used analytics tools.



- <u>Base Load Comparison</u>: Tabular comparison listing of the Base Load (kW), Watts/SF, 12 Months Consumption (kWh), Baseload as % of Consumption, 12 Month EUI (Electric) and Climate Zone for the buildings in the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, Site or Climate Zone). Data can be exported to Excel. This is one of your most used analytics tools.
- <u>Cat Code Performance Metrics (Electric)</u>: Tabular listing of category code performance metrics for the buildings in the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, Site or Climate Zone), with or without filtered category codes for buildings with electric meters that pass quality standards. Report includes Category Code, Category Code #, Building Count, Bottom 25th Percentile Watts/SF, Top 25th Percentile Watts/SF, Median Watts/SF, Bottom 25th Percentile EUI, Top 25th Percentile EUI, Median EUI, Bottom 25th Percentile Baseload as % of Consumption, Top 25th Percentile Baseload as % of Consumption, and Median Percentile Baseload as % of Consumption. Data can be exported to Excel.
- <u>Cat Code Performance Metrics (Gas/Water)</u>: Tabular listing of category code performance metrics for the buildings with gas or water meters in the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, Site or Climate Zone). Report includes Category Code, Category Code #, Building Count, Bottom 25th Percentile Watts/SF, Top 25th Percentile Watts/SF, Median Watts/SF, Bottom 25th Percentile EUI, Top 25th Percentile EUI, Median EUI, Bottom 25th Percentile Baseload as % of Consumption, Top 25th Percentile Baseload as % of Consumption, Data can be exported to Excel.
- <u>Energy Project Identification Tool</u>: Excel spreadsheet report for the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, or Site) that identifies the amount of energy being used for overrides of systems and for the major systems of air conditioning, fan pumps, and lights, as well as the associated cost for those systems over the previous 12 months. The report further prioritizes savings for a list of energy savings measures on those systems. This report if useful as a quick audit tool saving the energy manager many hours of work. (*Continued on pg. 4*)



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## **INVENTORY OF MDMS TOOLS** (CONT. FROM PG. 3)

- Scatter Plot Modeling Tool: Excel spreadsheet report that allocates the usage into energy subsets based on the time it occurs for plug loads, lighting systems, fan/pump systems, and air conditioning systems. This tool separates the duty and the non-duty energy for you by system. The scatter plot establishes a relationship between the Cooling/ Heating Degree Days (CDD/HDD) against the energy usage for the building, thus allowing a quick analysis for projections and/or comparisons. The analysis is applied per building for the electric commodity for the calendar year selected. This is a tool that performs a modeling for each building in a few minutes time and you can easily compare it over multiple years of operations.
- <u>Advanced Metrics Stop Light Chart</u>: Excel spreadsheet report for the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, or Site) which combines a series of three metrics (Watts/SF, Baseload as % Consumption, and 12 Months Extrapolated EUI (Electric)) together into a stop-light chart that is tied to a category code for all the category codes in the Army. The chart is color-coded for each of three metrics to show where buildings fall compared to their peers. There is also if-then logic for each category to tell if a meter is bad and where the building stands against other buildings (i.e., top 25%, bottom 25%, etc.).

#### <u>AEWRS</u>

- <u>Army AEWRS Report</u>: Tabular report of consumption values for the year selected by installation. The report shows the consumption and cost of each commodity, including total consumption and cost, as well as the Real Property Footage in thousands of square feet (KSF) and the KBTU/SF. Data can be exported to Excel.
- <u>AEWRS Compared to MDMS</u>: Tabular comparison of AEWRS values to MDMS values for the year selected by installation. The report shows the AEWRS consumption and cost of each commodity, including total consumption and cost, as well as the Real Property Footage in thousands of square feet (KSF) and the KBTU/SF. Additionally, this report shows the following comparison values:
  - AEWRS Electricity in KBTU/SF
  - AEWRS Electricity in Mph
  - AEWRS Electricity in Kwh/SF
  - AEWRS Electricity Cost/Kwh
  - MDMS Electricity in Mwh
  - % Electricity in MDMS versus AEWRS
  - MDMS Electricity in Kwh/SF
  - MDMS Electricity in MMBTU
  - MDMS Gas in MMBTU
  - % Gas in MDMS versus AEWRS
  - MDMS Total Electricity & Gas in MMBTU
  - % Total Electricity & Gas in MDMS versus AEWRS
  - MDMS Real Property Square Footage in SF
  - % SF in MDMS versus AEWRS
- This report provides tremendous value to the Energy Manager in comparing the data of the two reporting systems as a sanity check of values and for buildings where you are performing analysis. For example, the value of MDMS/ AEWRS Electricity (%) should compare to the value of MDMS/AEWRS SF (%) for your installation. If the value of MDMS/AEWRS Electricity (%) is significantly higher than the value of MDMS/AEWRS SF (%), you are most likely double-counting consumption from meters somewhere. If the value of MDMS/AEWRS Electricity (%) is significantly lower than the value of MDMS/AEWRS SF (%), you most likely have meters not working or the meter multipliers are off somewhere. Data can be exported to Excel.

#### Energy Use Intensity

- <u>Building EIA Benchmarking EUI</u>: Graphical report containing four quadrants which graphically compare the Energy Use Intensity (EUI) for a specific Site, Building, Commodity, Principal Building Activity and Time Period to the U.S. Energy Information Administration (EIA) benchmark.
- <u>GIS Dashboard</u>: Graphical report containing four quadrants which depicts the building's geographical location within the installation, provides color indicators depicting online/offline status, provides key metrics of the building's energy performance month-to-date and year-to-date and references against last year's same timeframe results, a 30-day time of use energy usage profile and cumulative usage comparison with degree days. Graphs can be exported to image. Tabular report quadrants can be exported to Excel. (Continued on pg. 5)

## INVENTORY OF MDMS TOOLS (CONT. FROM PG. 4)

- <u>Energy Use Intensity</u>: Graphical report showing the usage intensity of the selected commodity for the specified organization (Site or Custom Group) over the selected Date Range. The report displays the usage intensity for all buildings within a selection (by category code or all buildings at site). As buildings are selected in the Building EUI chart on left, the chart on the right updates to show that building's monthly EUI over the selected date range. Graphs can be exported to image. Data can be exported to Excel.
- <u>EUI Commodity Comparison</u>: Tabular report comparing the Building Square Footage, Category Code Name, Year Built, Total EUI, Electric EUI, Electric % of Total, Gas EUI, Gas % of Total, Steam EUI and Steam % of Total for each building for you to understand the relationship of commodities within the installation or site selected for the specified date range. Data can be exported to Excel.
- <u>Water EUI</u>: Tabular report comparing the Square Footage, Cat Code, 12 Month Consumption (gal), 12 Month Extrapolated EUI (gal/sf), % of Data Available and Climate for each building within the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, Site or Climate Zone) and date range. Data can be exported to Excel.

#### M&V

This project tool provides a method for Measurement and Verification (M&V) of electric, water, gas, and steam cost savings associated with Energy Conservation Measures (ECMs) over time.

#### Asset Metadata

These modules allow EMs to enter contextual information about the buildings and meters in MDMS. Many of these fields are utilized by the reports in MDMS. For example, entering the building benchmark details for baseload, air-handling unit, lights, and chiller within the Asset Metadata module will display these values on the Interval kW benchmark report module. And vice versa, entering those values on the Interval kW benchmark report will display them in the Asset Metadata for that building.

- <u>Buildings</u>: Tabular listing of asset metadata for buildings at the user's default organization. You have the ability to edit the building and/or benchmark details, such as building occupancy, primary function, primary space heating source, as well as view and/or edit the building's duty hours. The user can also edit/capture annual building budget information, in addition to building equipment data for cooling and heating, such as the cooling package, air distribution, or thermal source.
- <u>Meters</u>: Tabular listing of asset metadata for meters at the user's default organization. You have the ability
  to capture information regarding the meter manufacturer, make, model, service tag number, and designate
  whether or not it is a smart, master, virtual, pulse, or generation meter. Denoting substation meters, master
  meters, and sub-meters prevent the problem of over-reporting.

#### Network Status

This page contains modules for assessing the health and status of the meter network—the connectivity of the meters. Each tool is briefly described below.

- <u>Map</u>: GIS Map giving an immediate overview of the health and status of the meter connectivity at the site or installation. Color-coded icons represent metered buildings and their reporting status, based on the following thresholds:
  - Green: Meters last reported <= 36 hours.
  - Yellow: Meters last reported > 36 hours but < 1 week.
  - Red: Meters last reported > 1 week or never reported.

Clicking on any of the color-coded meter status icons will launch the building details in a pop-up window displaying the building name and number, RPA UID, CAT code, CAT code description, square footage (SF) of the building, climate code, built date, and a list of meters associated with that building, along with the date and time of the last meter reading received. The symbol to the left of the meter status icon indicates the type of meter commodity.

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### **INVENTORY OF MDMS TOOLS** (CONT. FROM PG. 5)

 <u>Meter Status Rollup</u>: Tabular report for meter network operations and maintenance (O&M) and provides visibility of meter network reliability metrics from the individual meter level to the rollup summary total for HQDA. Consistency in meter data is provided for the last 30 and 60 days. The longer a meter stays offline, the lower the consistency

percentage. Under the Organization column, clicking on the symbol allows the user to expand and drill down to the desired Region, Installation and Site, as shown below. Once at the Site level, clicking on the hyperlink site name will launch the site's Meter Status Details report in a separate browser tab. Data can be exported to Excel.

- <u>Meter Status Details</u>: Tabular report of meters for a site. It allows fast identification of which meters on which buildings (or other metered assets) have lost connection to MDMS. Consistency in meter data is provided for the last 30 and 60 days. The longer a meter stays offline, the lower the consistency percentage. It also shows quality metrics for the last 30 and 60 days. The quality metrics provide a clearer picture of the meter's status beyond the last reading received. A meter being online does not necessarily mean it is providing quality data to support energy management efforts. In order for the meter to pass the data quality, the following two criteria must be met:
  - No more than 35% estimated usage of the interval calculations fail the data quality algorithm, which considers repeated readings, missing readings, negative usage, excessive spikes, 0 meter readings, etc. We also refer to this as the smoothed rate.
  - The ratio of the difference in end-to-end readings divided by the sum of the interval usage is within 15% tolerance. This is a rating of the accuracy of the smoothing.

This is just an indicator of quality and further investigation should be done to assess the quality of the meter data. Clicking on the hyperlink meter name will launch the corresponding Interval Usage Data Quality report for that meter for the last 30 days in a new browser tab. Data can be exported to Excel.

- <u>Meter Reporting Trends</u>: Graphical report of meter reporting trends for the selected organization over time. This data
  is sourced from daily snap shots of the meter status rollup captured since October 2019. This report may be run at
  the HQDA, Command, Region, Installation or Site level. Any dips indicate network disruptions, regardless of whether
  they were planned or unplanned outages. Hovering the mouse over particular points in the graph will provide a
  popup with the actual percentage of meters reporting for that date. Data can be exported to Excel.
- <u>Historical Reports</u> → <u>Historical Meter Status Rollup</u>: Tabular report that generates a snapshot of the Meter Status Rollup (MSRU) as of the date selected. Data can be exported to Excel.

#### Meter Readings

Tabular report of raw meter readings, power factor, peak demand, and average demand for the selected meter(s) at the specified installation or site during the designated date range. Data can be exported to Excel.

#### Meter Counts

This page contains the following modules:

- <u>Meter Count Rollup</u>: Tabular report listing counts of All, Electric, Gas, Water and Steam meters, for each organization level of the HQDA, by the total number of meters within the Army Metering Program (AMP), and the number of meters designated by ownership (i.e., Government, Government-Hybrid, UP, UP-Hybrid) and communication path (i.e., Gateway, SFTP, MDMS Upload). Data can be exported to Excel.
- <u>Meter Count Details</u>: Tabular report listing counts of All, Electric, Gas, Water and Steam meters, for the selected MDMS organizational hierarchy (HQDA, Command, Region, Installation, or Site), by the total number of meters within the Army Metering Program (AMP), and the number of meters designated by ownership (i.e., Government, Government-Hybrid, UP, UP-Hybrid) and communication path (i.e., Gateway, SFTP, MDMS Upload). Data can be exported to Excel.

#### Self Service

**BUILDING STRONG®** 

This page contains the following modules:

- <u>Tagging</u>: Menu expands to display a sub-menu of modules which enables you to enter and maintain contextual data about buildings and/or meters.
- <u>Grouping</u>: Menu expands to display a sub-menu of modules which enables you to enter and (Continued on pg. 7)



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## **INVENTORY OF MDMS TOOLS** (CONT. FROM PG. 6)

maintain custom groups of buildings and/or meters for energy reporting. You might set up a group for your reimbursable tenants, for your central plant, etc. The following reports support the selection of Custom Groups as the Organization input parameter.

- Cumulative Usage FYTD (Home Dashboard)
- Monthly Usage Comparison (Home Dashboard)
- Monthly Usage Report (Energy Management → Usage Summary)
- Custom Usage (Energy Management → Usage Summary)
- Energy Use Intensity (Energy Management → Energy Use Intensity)
- Customer Billing
- <u>Email Notifications</u>: Menu expands to display a sub-menu of modules which enables you to sign up for daily email notifications for the following:
  - Offline Meters
  - Potential Water Leaks
  - Potential Energy Savings
- <u>User CSV File Upload</u>: Module allows users with the appropriate access to upload their meter data—for either Utility Provider or Government-owned meters not currently on the Army's NIPRNet—in the required .csv file format to MDMS.

#### Customer Billing

This page contains the following modules:

- <u>Billing Rate Setup</u>: Allows users to create both blended and complex commodity rates for applying to billable customer accounts.
- <u>Customer Billing Home</u>: Allows users to create billable customer accounts and generate bills. Bills can be exported to either PDF or Excel.

#### Library

This page contains the following modules:

- <u>Videos</u>: Provides access to play/view all the recorded 16 MDMS training videos.
- <u>Documentation</u>: Provides access to download the latest collection of MDMS documentation:
  - Authorizations to Operate (ATO) for all the active/approved EEDRS systems, as well as MDMS.
  - MDMS Standard Meter Data Format for EEDRS/UMCS
  - MDMS Standard Utility Provider (UP) Meter Data Format
  - MDMS User Manual
  - UP Data Submission Instructions
- <u>Newsletters</u>: Provides access to download the MDMS Newsletters, starting with Oct Nov 2015.
- <u>Presentations/Briefings</u>: Provides access to MDMS presentations and briefings, which include an introduction and overview of the Trail of Champions, instructions for joining WebEx training webinars, slides corresponding to the training webinars (if applicable), and a slide showing the MDMS network and areas of responsibility.
- <u>Cheatsheets</u>: Provides access to a list of functional tools, their location in MDMS and a brief description of each.
- MDMS FAQs: Provides access to a list of frequently asked questions (FAQs) and their answers.
- <u>Acronyms</u>: Provides access to a list of AMP MDMS acronyms.

