PQSynergy™ 2015

Energy Management using Automated Meter Reading Data

By

Er. Edward Low

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An Introduction

Er. Edward Low

Mr Edward Low Kah Loong, Engineering Director

- A Singapore-Registered Professional Engineer
- Graduated from the University of Tennessee, with a Bachelor of Science in Electrical Engineering (B.Sc.)
- Twelve years with SP PowerGrid Ltd. as a Deputy Director and an authorised switching engineer, operating (up to 66kV voltage level).
- An ASEAN Chartered Professional Engineer.
- Represented Singapore in the ASEAN's Heads Of ASEAN Power Utilities/Authorities (HAPUA) as the Chairman of HAPUA Working Group that focuses on Distribution and Power Reliability & Quality.
- Was instrumental in formulating many SP PowerGrid standard operating procedures as well as maintenance standards, especially in the area of predictive maintenance.

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Why eMetering and eMS

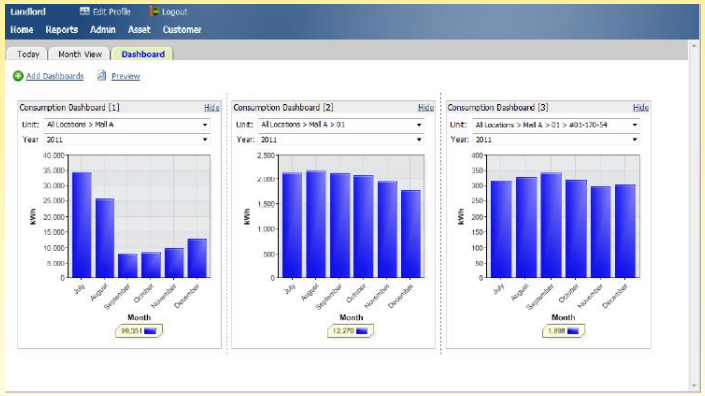
What is Automated Meter Reading (AMR) – eMetering?

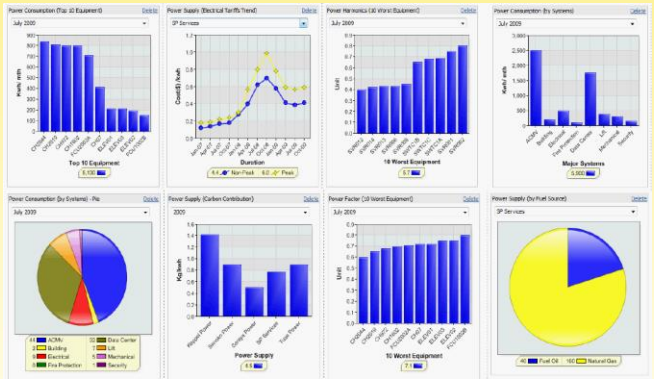
AMR is the technology of collecting meter reading automatically over a predefined period (e.g. 30 minutes interval)

Why AMR?

AMR provides an organization with the convenience of being able to have close to real time energy consumption for analysis/decision making

eMS provides the value added features to allow for detail analysis of energy consumption trend patterns over pre determined periods e.g. months for a tenant unit level or aggregated up to a landlord level. Benchmarking is also available from unit level, to floor level, to building level or across buildings of the same group





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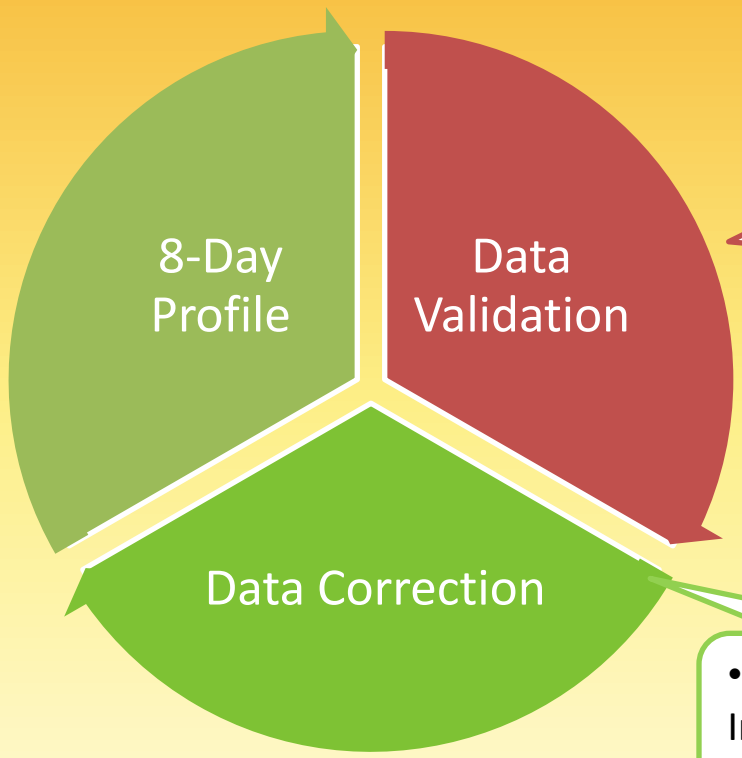
Key Features of MDMS



- Generate 8-day profile
- Historical vs business type profile
- Tenant Provision

Validate
- Missing data
- Negative values
- vs historical trends
- vs 8-day profile

- Automated Data Interpolation
- Manual Data Correction

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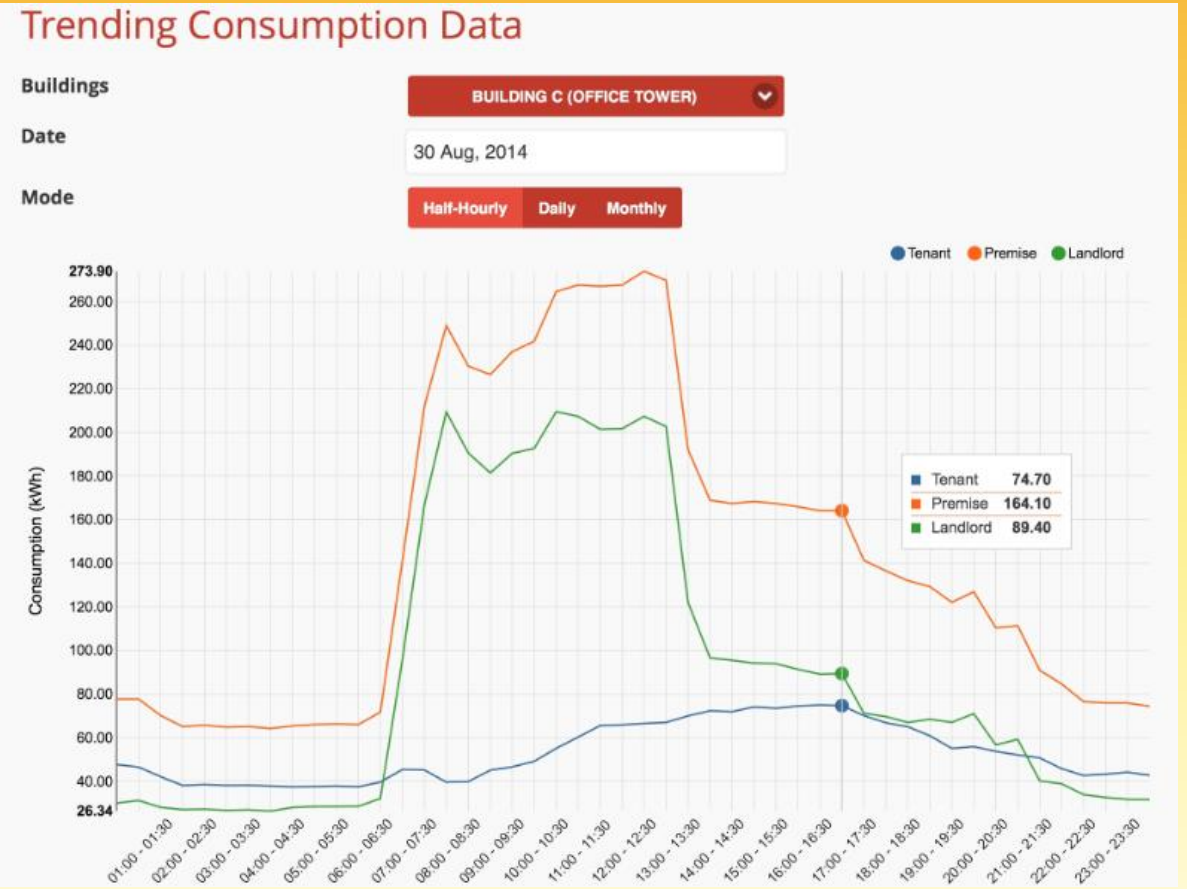
KWh Half Hourly / Daily Monthly Trending

- Provides the Building Management with detailed half hourly readings for detailed analysis

- Able to zoom in out to daily/monthly



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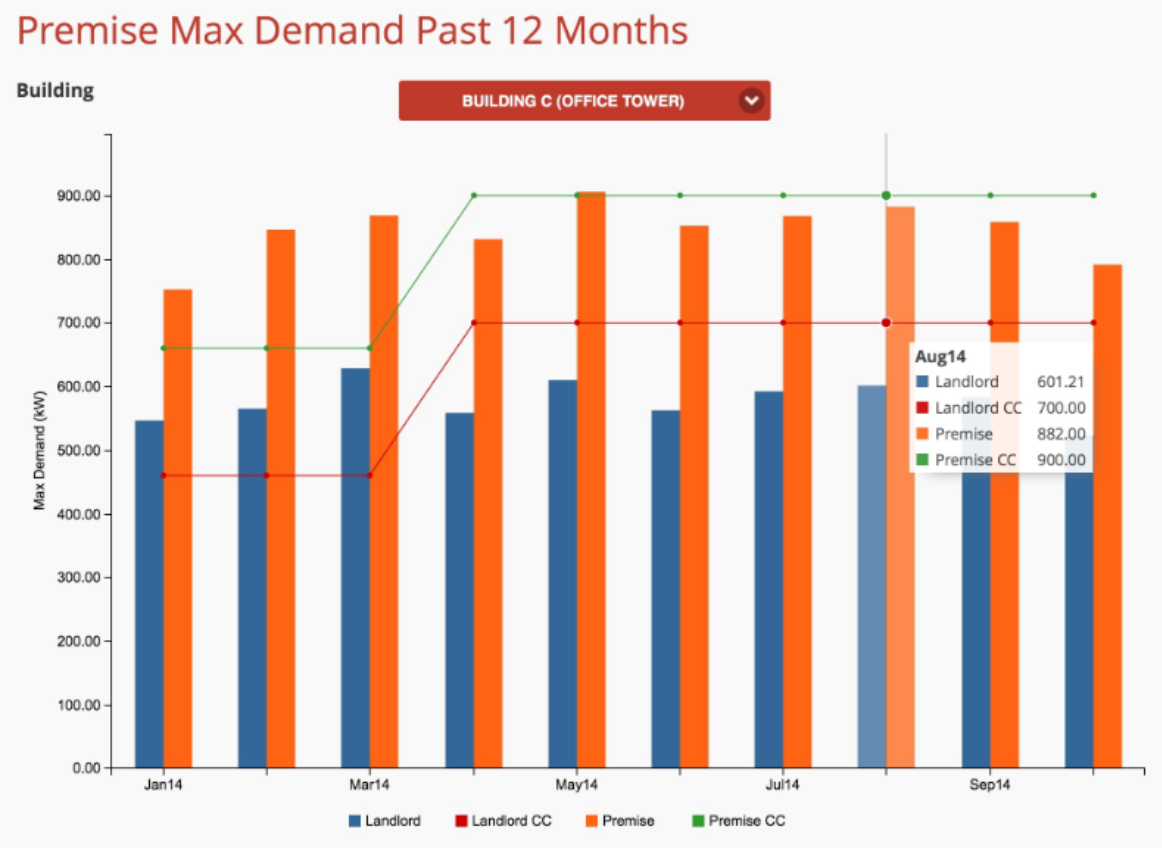
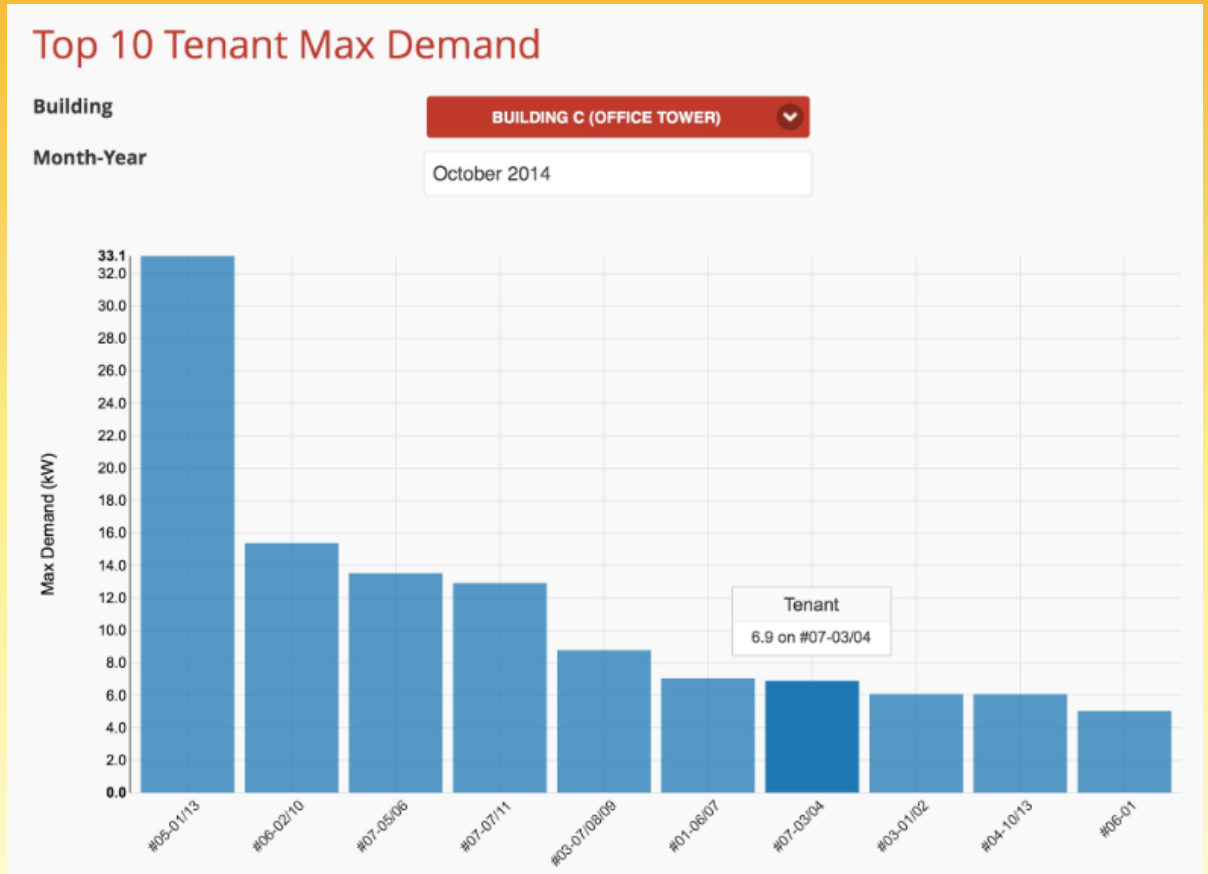
Past 12 Months Premise Max Demand

- Max Demand charts plotted with Contracted Capacity
- Provides the Building Management with detailed statistics to negotiate for better energy contracts
- Provides alerts/ emails when Max Demand exceeds Contracted Capacity

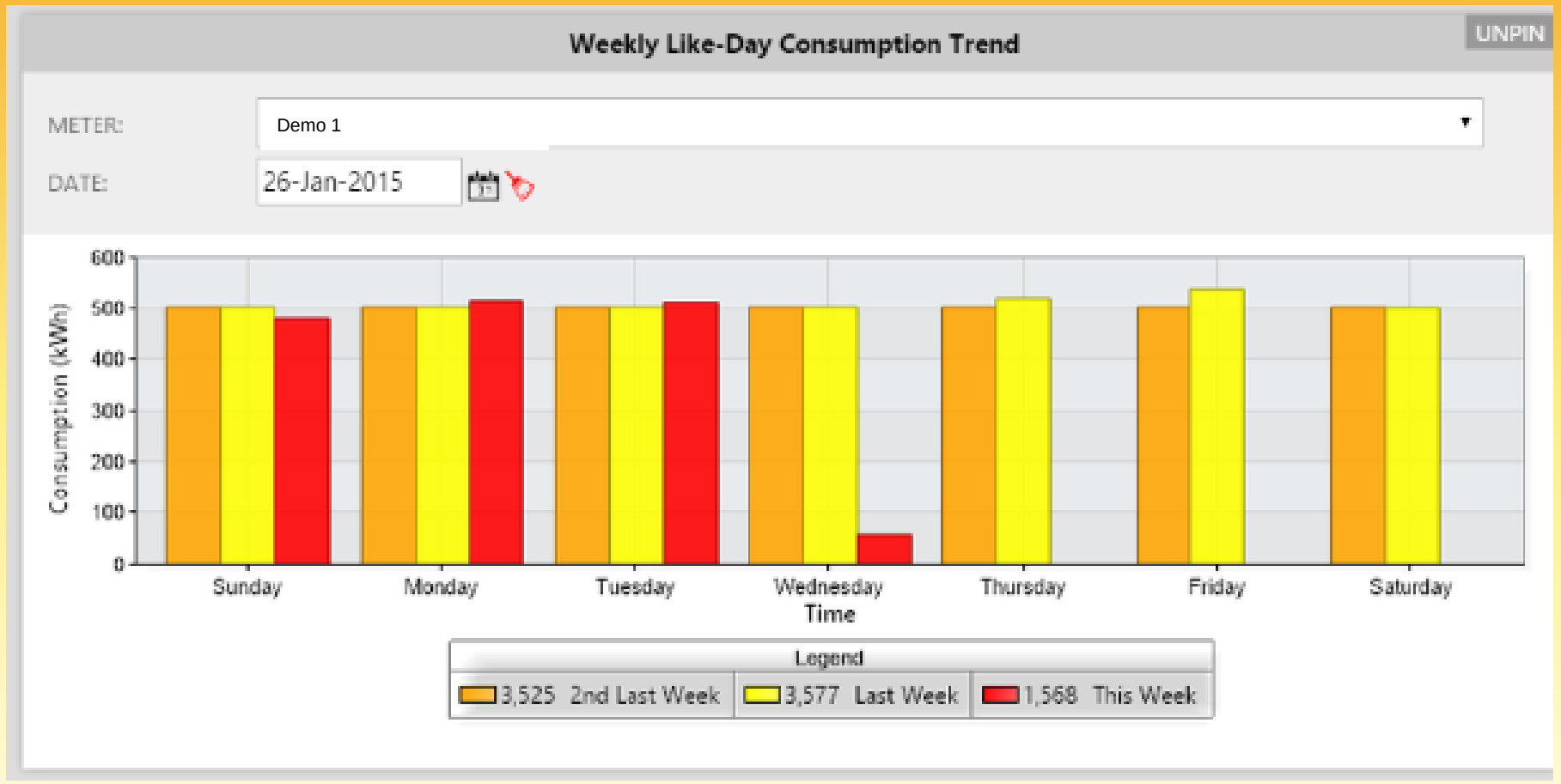


Past 12 Months Premise Max Demand

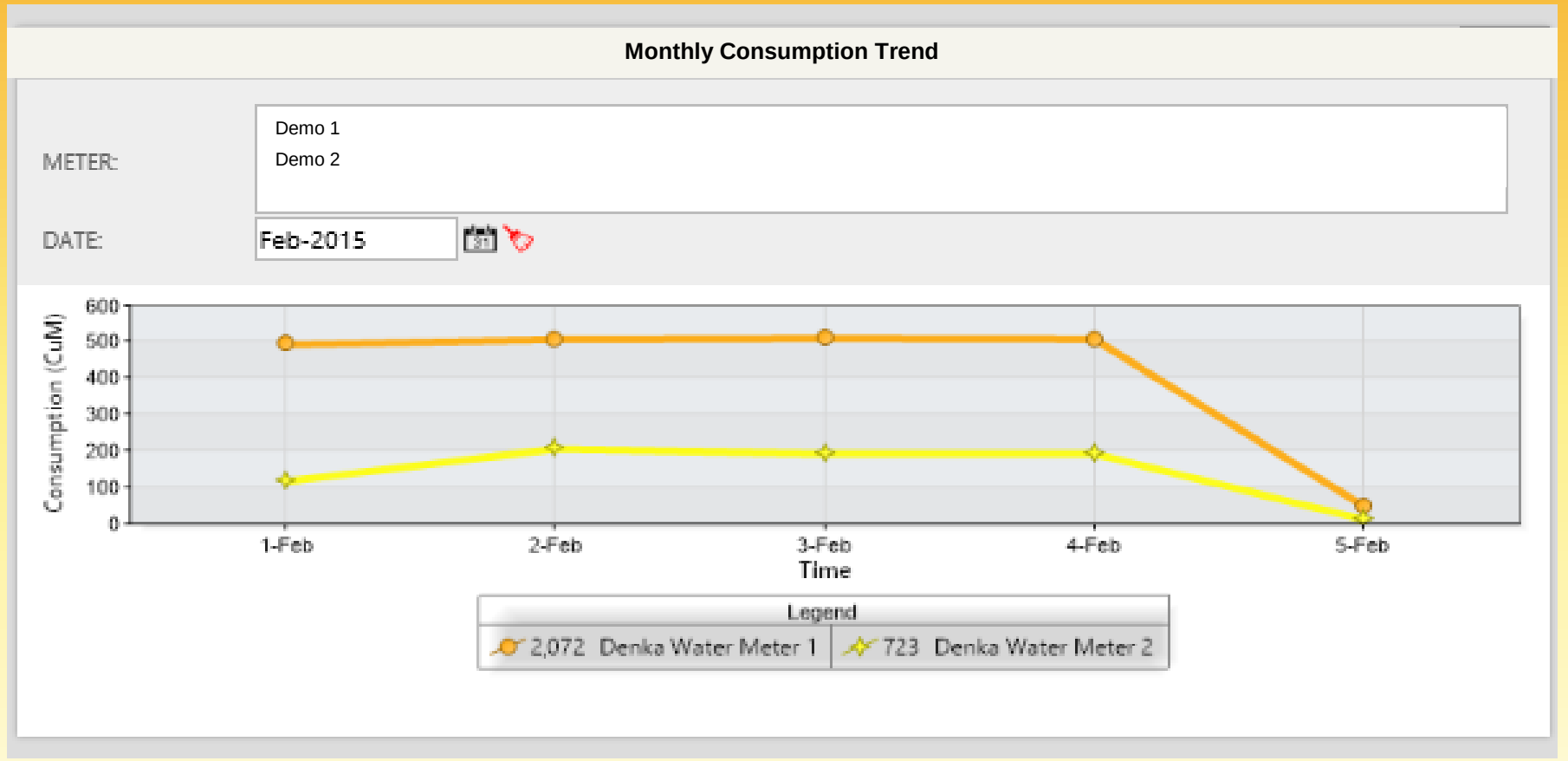
- Identifies the Top 10 Tenants that could have contributed to the Max Demand
- Provides the Building Management with details to work together with their tenants to schedule equipments operational schedules so as to prevent Max Demand



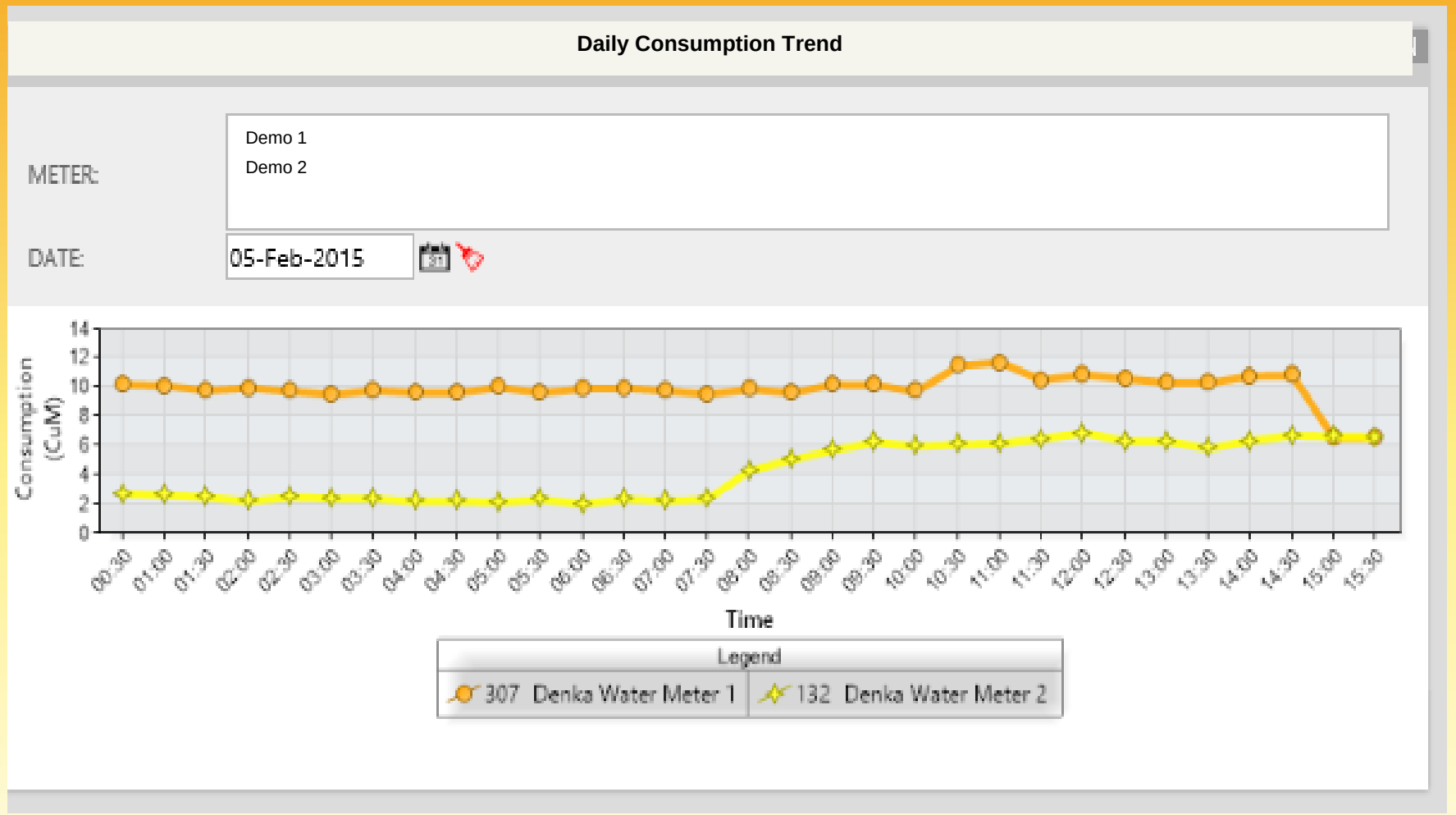
Weekly Like Day Consumption Trend



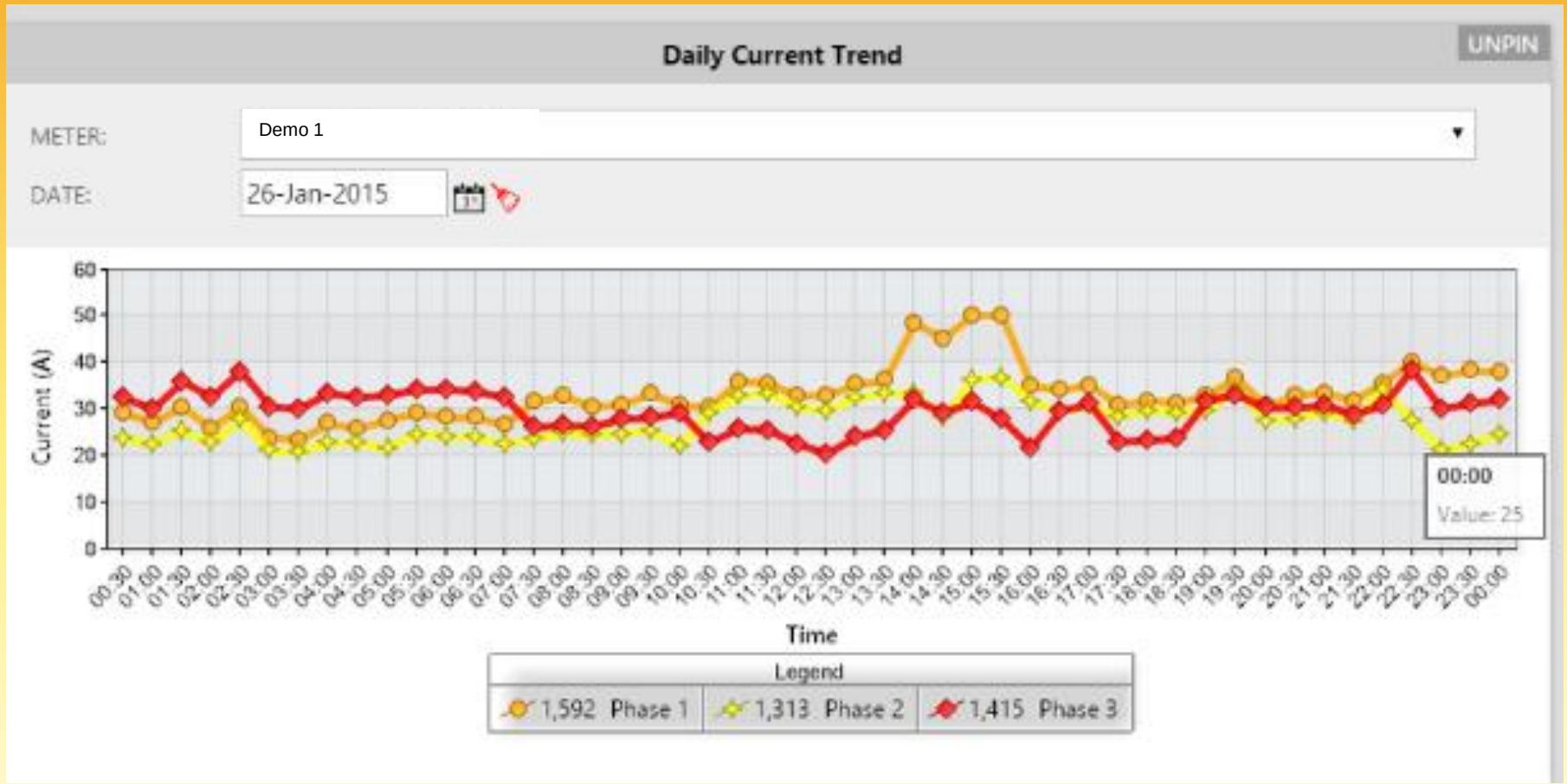
Monthly Consumption Trend Comparison



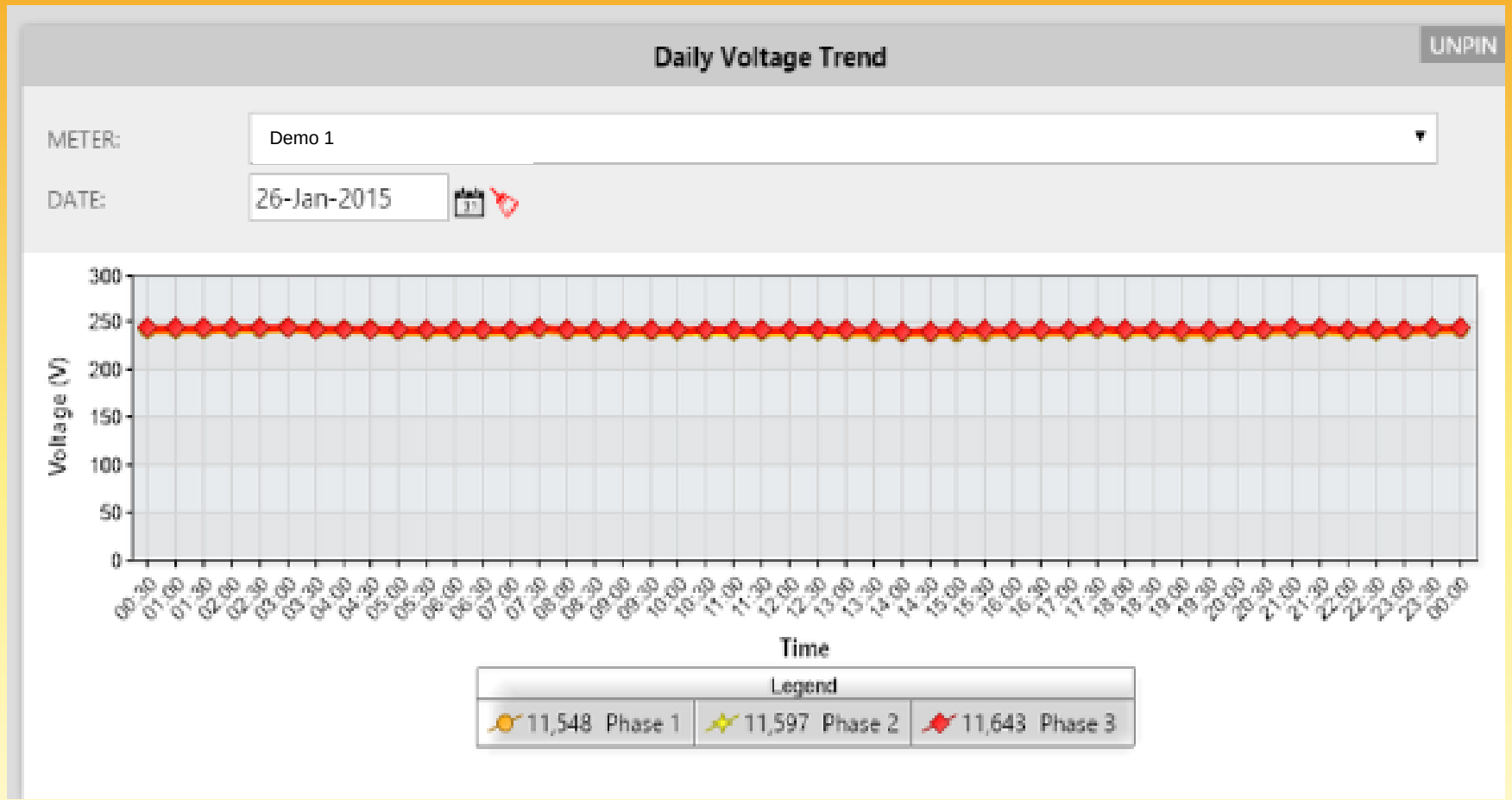
Daily Consumption Trend Comparison



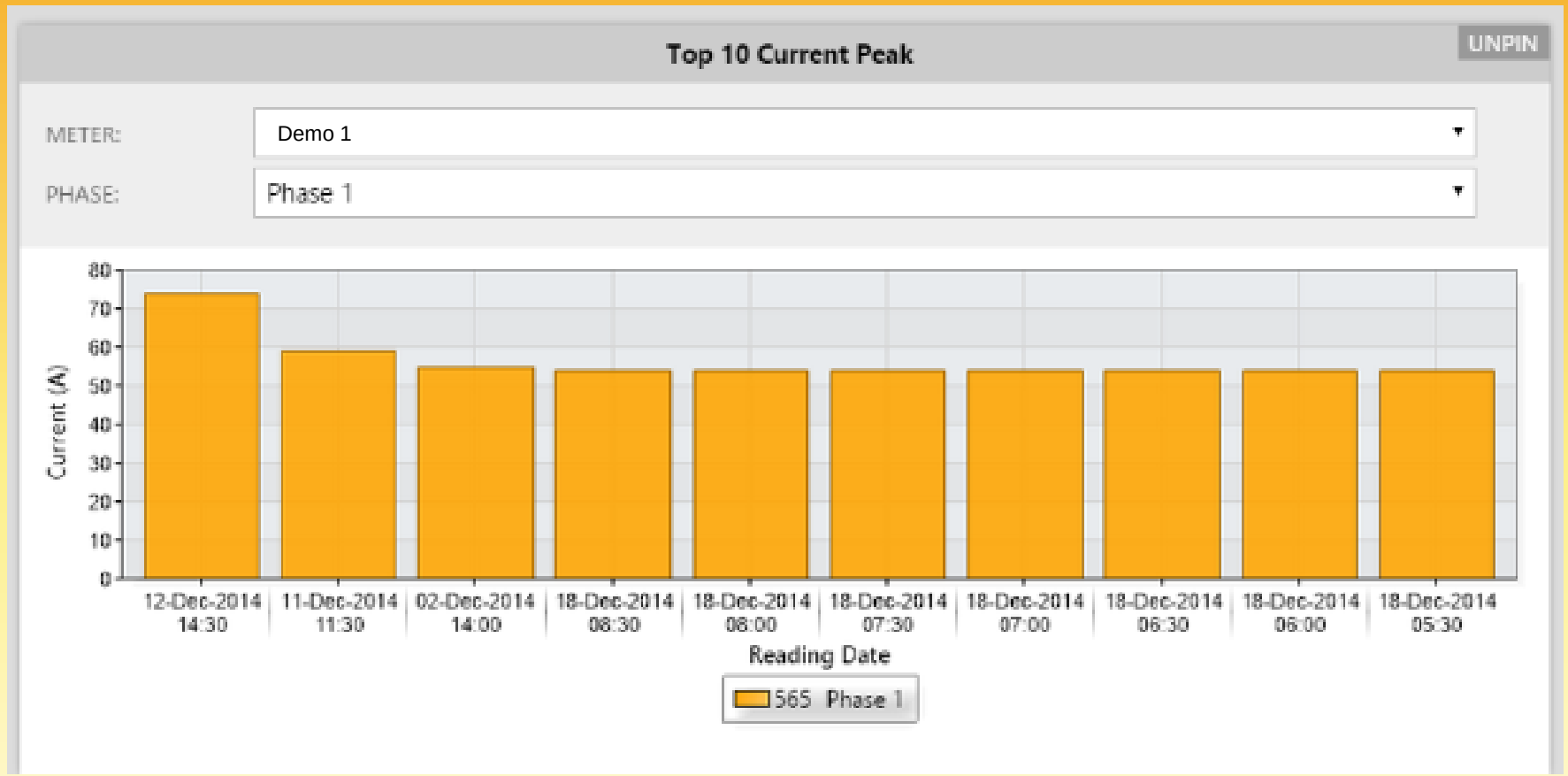
Daily Current Trend



Daily Voltage Trend

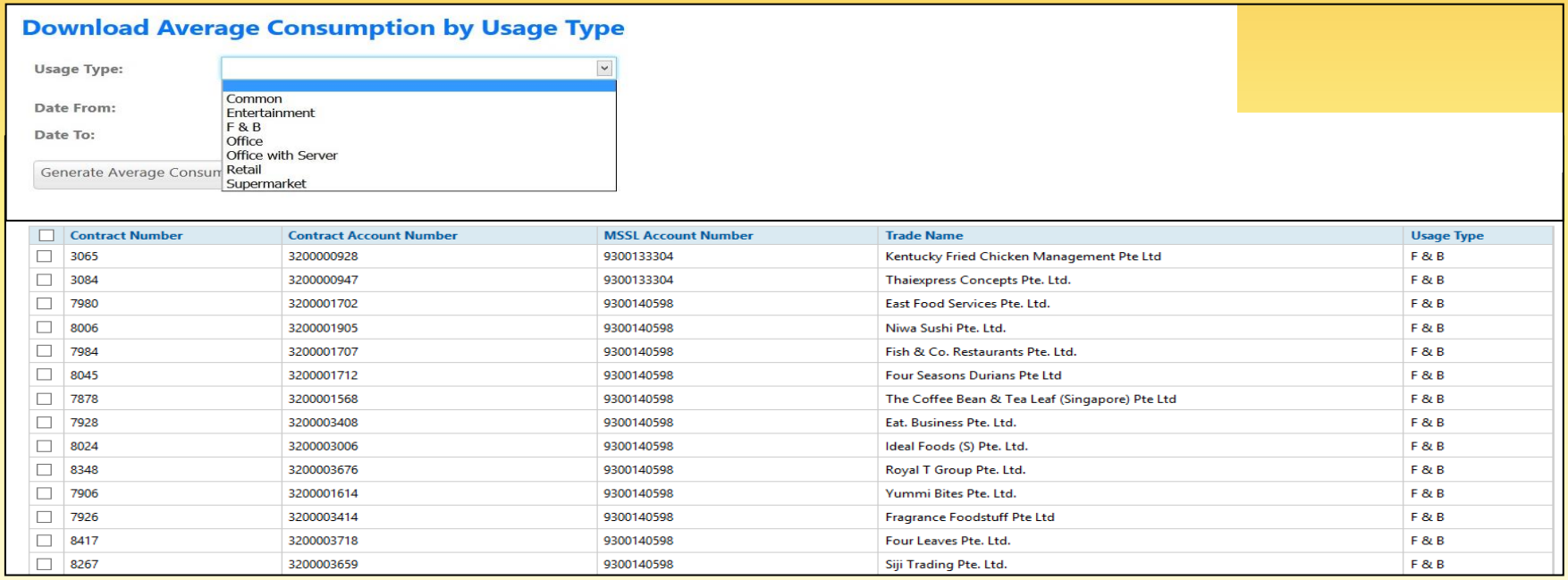


Top 10 Peak Current



Average Consumption / Tenant Provision By Unit Type

Better gauge of incoming Tenant's Provision using the unit type historical consumption/ usage



Download Average Consumption by Usage Type

Usage Type:

Date From:

Date To:

Generate Average Consum

- Common
- Entertainment
- F & B
- Office
- Office with Server
- Retail
- Supermarket

Contract Number	Contract Account Number	MSSL Account Number	Trade Name	Usage Type
3065	3200000928	9300133304	Kentucky Fried Chicken Management Pte Ltd	F & B
3084	3200000947	9300133304	Thaiexpress Concepts Pte. Ltd.	F & B
7980	3200001702	9300140598	East Food Services Pte. Ltd.	F & B
8006	3200001905	9300140598	Niwa Sushi Pte. Ltd.	F & B
7984	3200001707	9300140598	Fish & Co. Restaurants Pte. Ltd.	F & B
8045	3200001712	9300140598	Four Seasons Durians Pte Ltd	F & B
7878	3200001568	9300140598	The Coffee Bean & Tea Leaf (Singapore) Pte Ltd	F & B
7928	3200003408	9300140598	Eat. Business Pte. Ltd.	F & B
8024	3200003006	9300140598	Ideal Foods (S) Pte. Ltd.	F & B
8348	3200003676	9300140598	Royal T Group Pte. Ltd.	F & B
7906	3200001614	9300140598	Yummi Bites Pte. Ltd.	F & B
7926	3200003414	9300140598	Fragrance Foodstuff Pte Ltd	F & B
8417	3200003718	9300140598	Four Leaves Pte. Ltd.	F & B
8267	3200003659	9300140598	Siji Trading Pte. Ltd.	F & B

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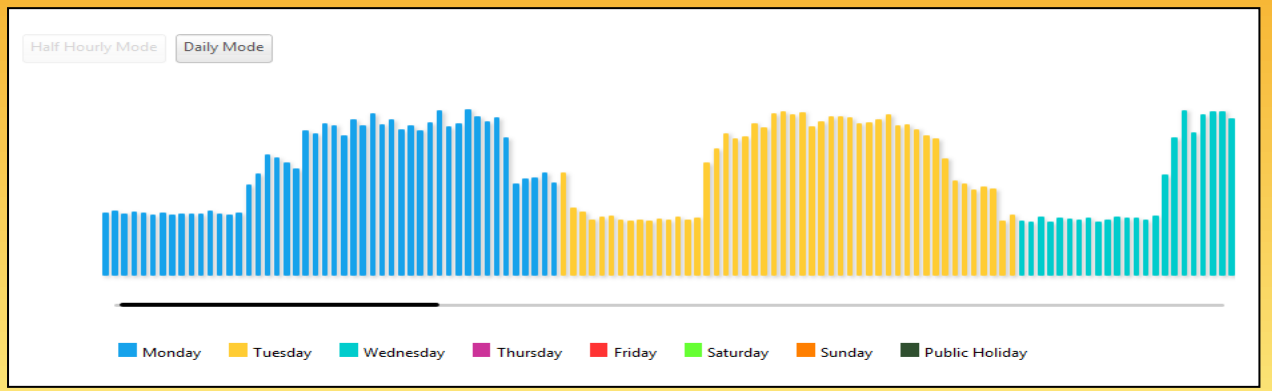
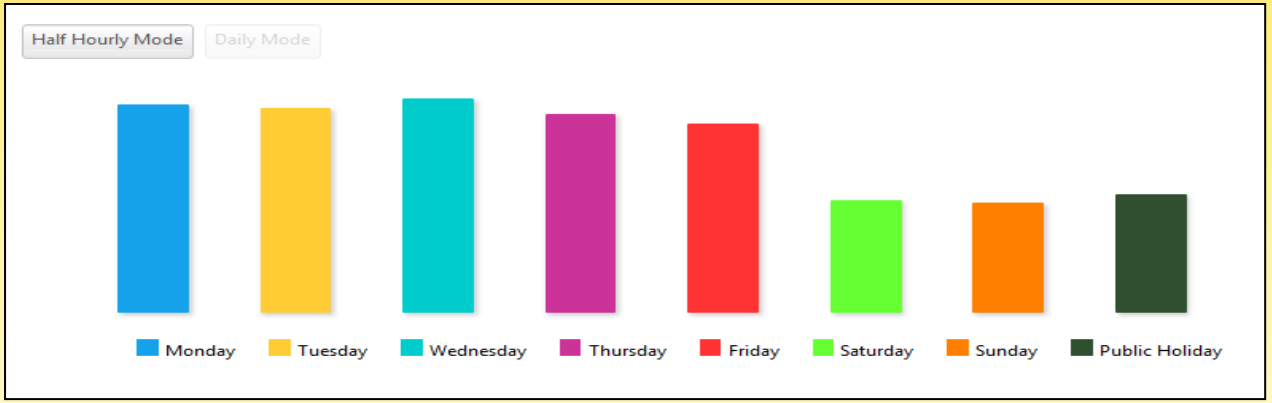
8 Day Profile

8 Day Profiles

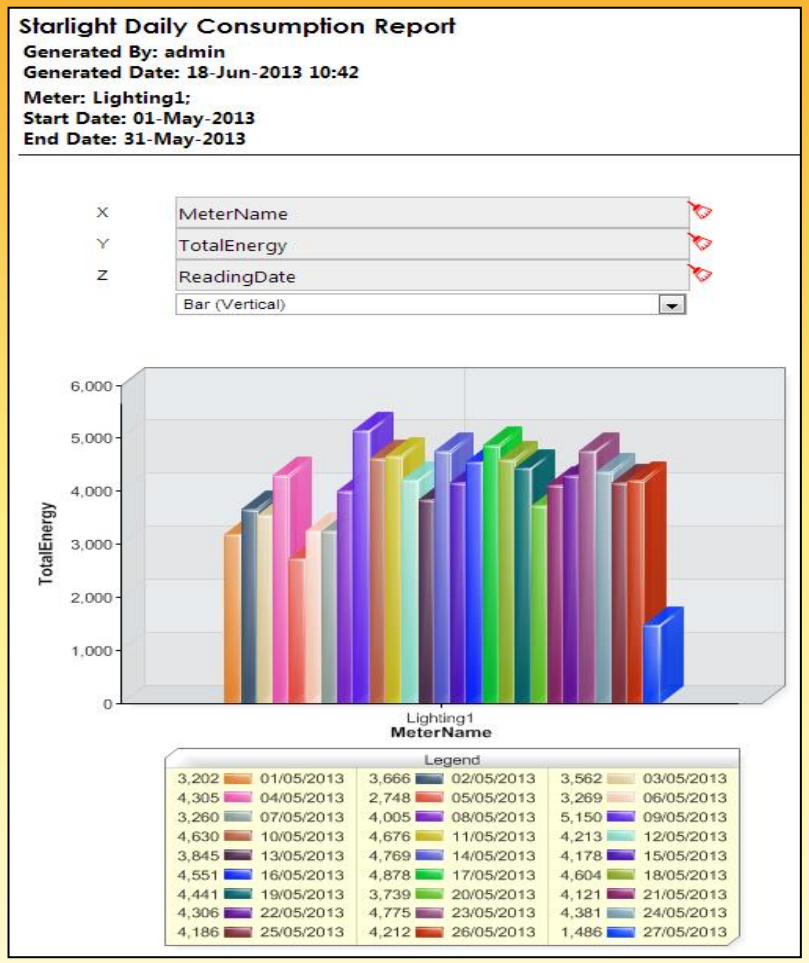
-View profile trends in half hourly/ daily modes

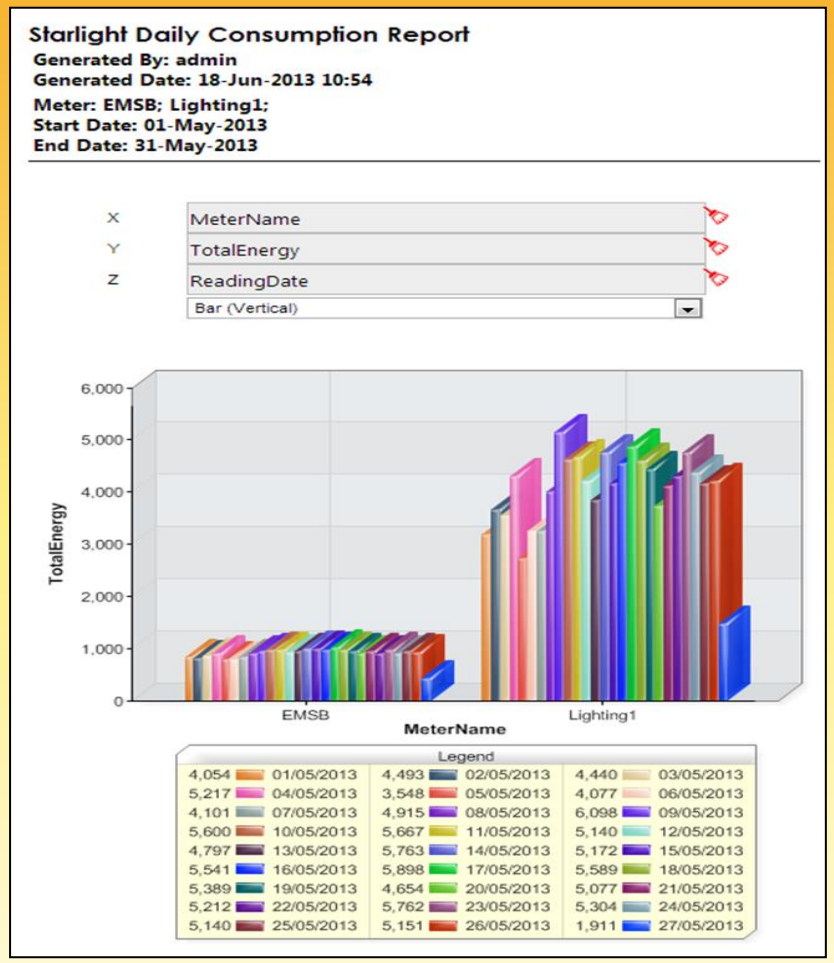
-Set baselines to trigger alerts for sudden spikes/ drops in consumption





Reports Generation





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Manual Vs Automated Meter Reading

	Manual Meter Reading	Automated Meter Reading
Manpower	Manual meter reading and data entry/ checking	Process is fully automated
Possibilities of errors	Possible errors from meter reading and data entry	Readings are directly read by the system from the meter. Validation rules are in place to catch possible errors
Frequency	1 reading once a Month	Readings at 15 mins interval
Analysis of data	Not possible due to lack of data	More frequent polling allows analysis & catching of abnormal situations earlier

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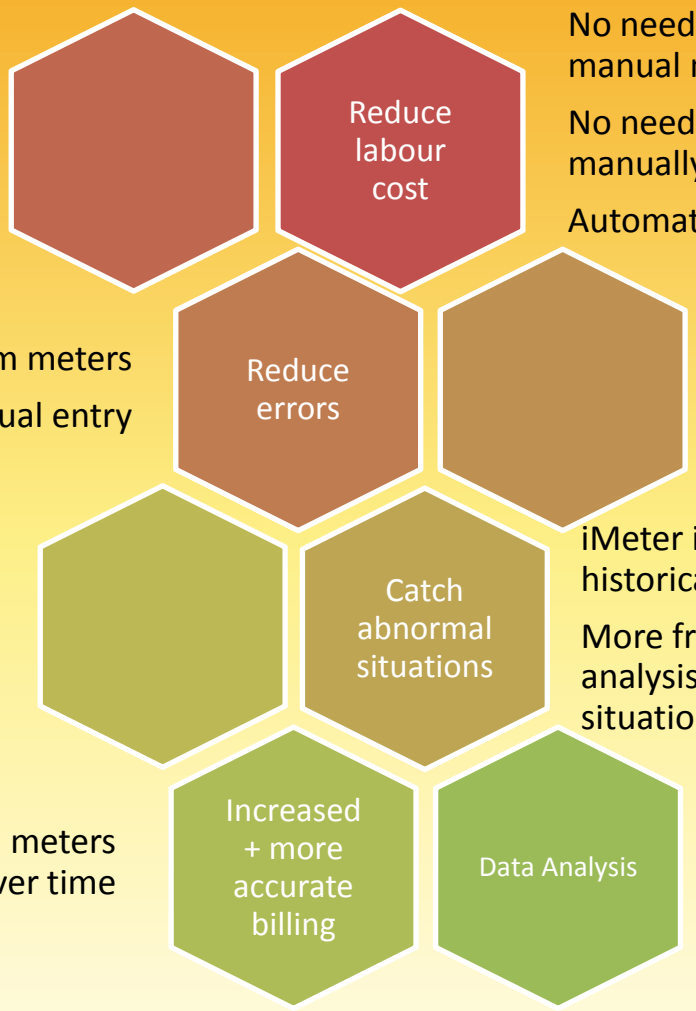
Key Benefits



No need to perform manual meter reading

No need to enter readings manually

Automatic Charting

Errors reading from meters

Errors from manual entry

iMeter installation will uncover historical installation errors

More frequent polling allows analysis & catching of abnormal situations earlier

Electromechanical meters wear out over time

With half hourly data, more analysis can be done and energy pain points identified

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Thank You