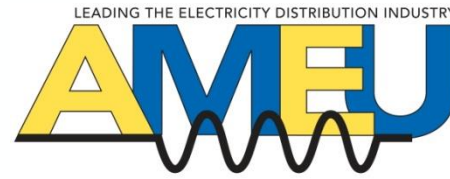


**SIEMENS**



# Achieving Optimal Benefits with a Demand Response System

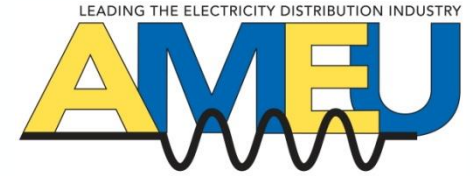


# Discussion Points

- Background on Demand Response
- Applications for Municipalities
- Considerations



# Background



- Medupi
- Capacity Constraints (Supply)
- Demand Management (DSM)



# Demand Response



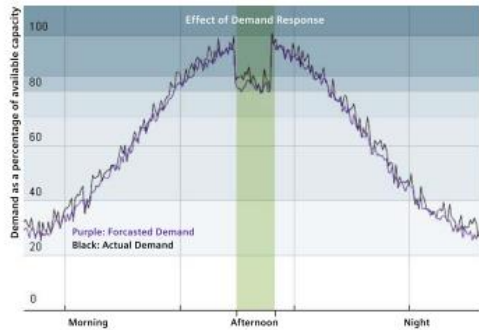
## What is Demand Response ?

- Utilities incentivise Consumers
- Reduce Non-Essential Loads
- Critical System Conditions
- Supply Constraints
- High Generation Costs

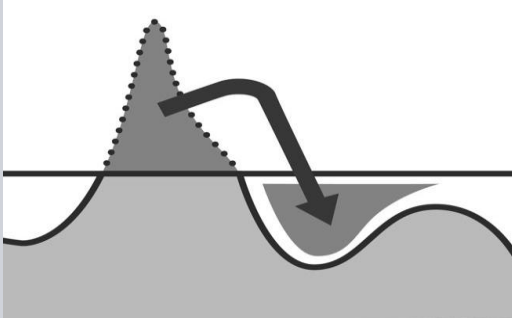
# Demand Response

## Participation

- Contract – Utility & Consumer
- Quantity, Duration, Frequency
- Notice Period
- Incentives



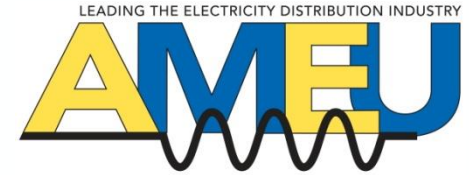
# Demand Response



## Why Demand Response ?

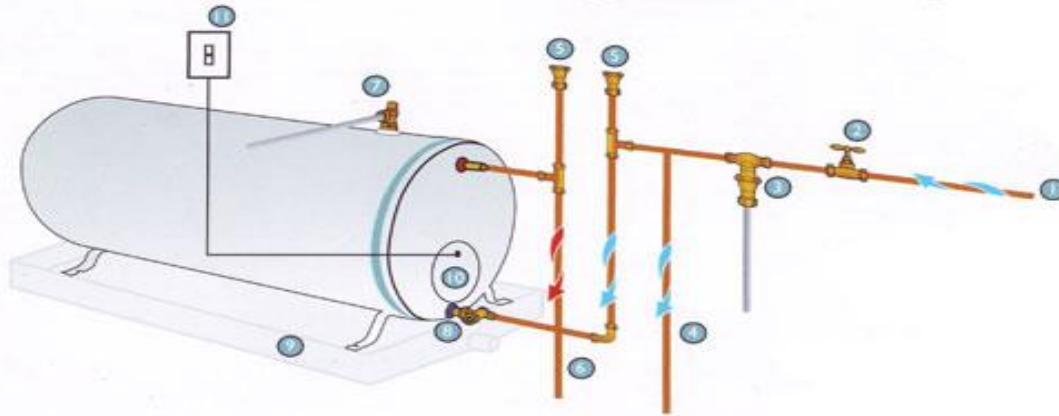
- Contrasted to Load Shifting
- Standby to Reduce Load
- Virtual Power Plant
- Lower “Generation” Costs

# South African Situation

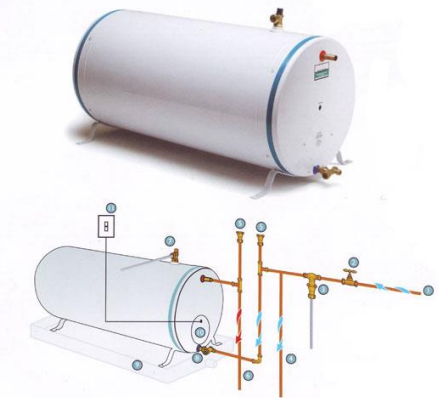
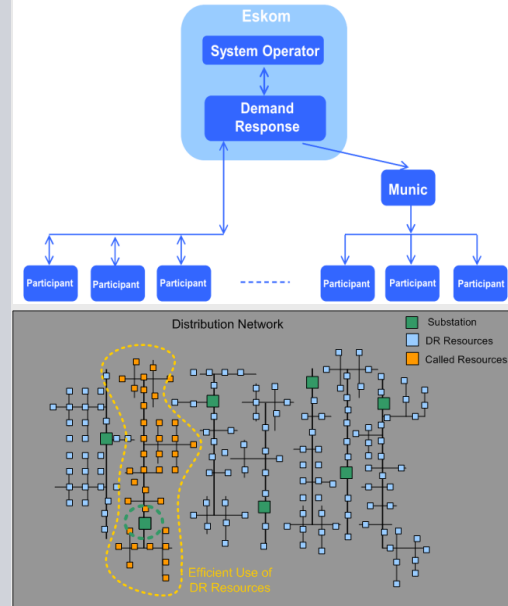


- Peak Demand – 35 525 MW
- Nominal Capacity – 41 919 MW
- DR Program – 900 MW
- Provision for < 100kW
- Aggregation of Loads

# Municipality Opportunities



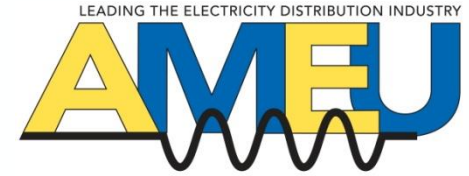
- ① Municipal Water Supply    ② Isolating Valve    ③ Pressure Reducing- and Expansion Relief Valve    ④ Balanced Cold Water Draw Off
- ⑤ Vacuum Breakers (minimum height of 300mm above Hot Water System)    ⑥ Balanced Hot Water Draw Off
- ⑦ Temperature- and Pressure Safety Valve    ⑧ Draincock    ⑨ Drip Tray    ⑩ Electrical Compartment    ⑪ Isolator Switch



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# Demand Response Process



- Marketing & Sign-Up
- Register Participants & Loads
- Receive Eskom Forecast
- Verify Existing Load
- Notify to Reduce & Restore Load
- Determine Load Reduction
- Pay Incentive



# DRMS Considerations

## Program Constraints

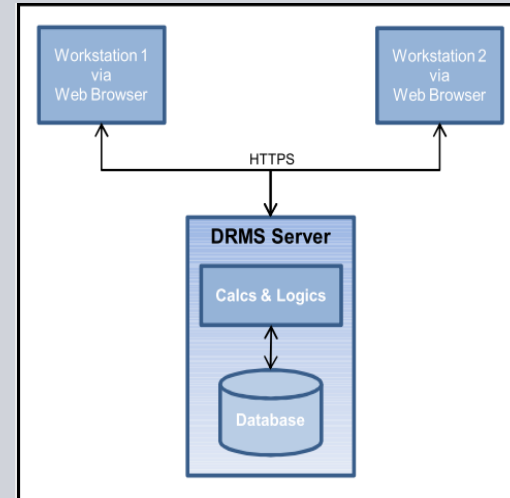
- How many times DR Event called
- Consecutive Hours
- Consecutive Days
- Option to Opt-Out
- What Days and Times
- Advanced Notification
- Base Line Calculation



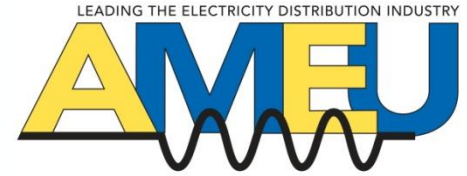
# DRMS Considerations

## DRMS Platform

- Server – Database & Calculations
- Access via HTTPS
- In-House or Cloud Based

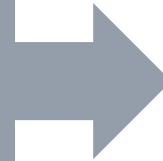


# Sending Event Notifications



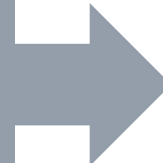
1

Email / SMS /  
Automated Phone



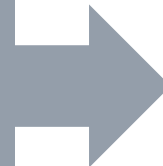
2

Advanced Metering  
Infrastructure (AMI)



3

Gateway Devices

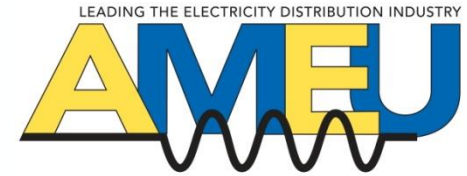


# Grouping of Loads

- Substation or Feeder
- Participant Contract
- Participant Site



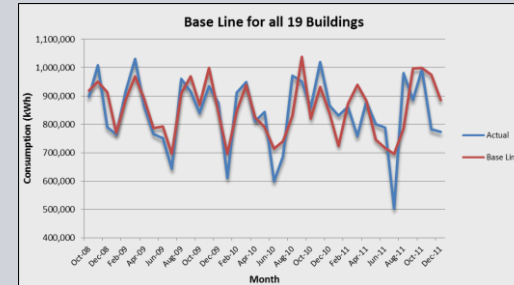
# Baseline Algorithms



## PJM (4 of 5)

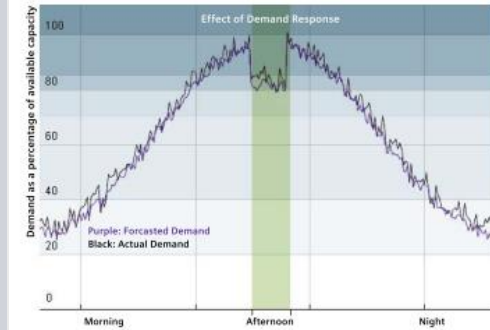
- 5 Similar Weekdays
- Non Event Days
- x Days in History
- Max Delta in Consumption
- 4 Highest

## ERCOT (8 of 10)

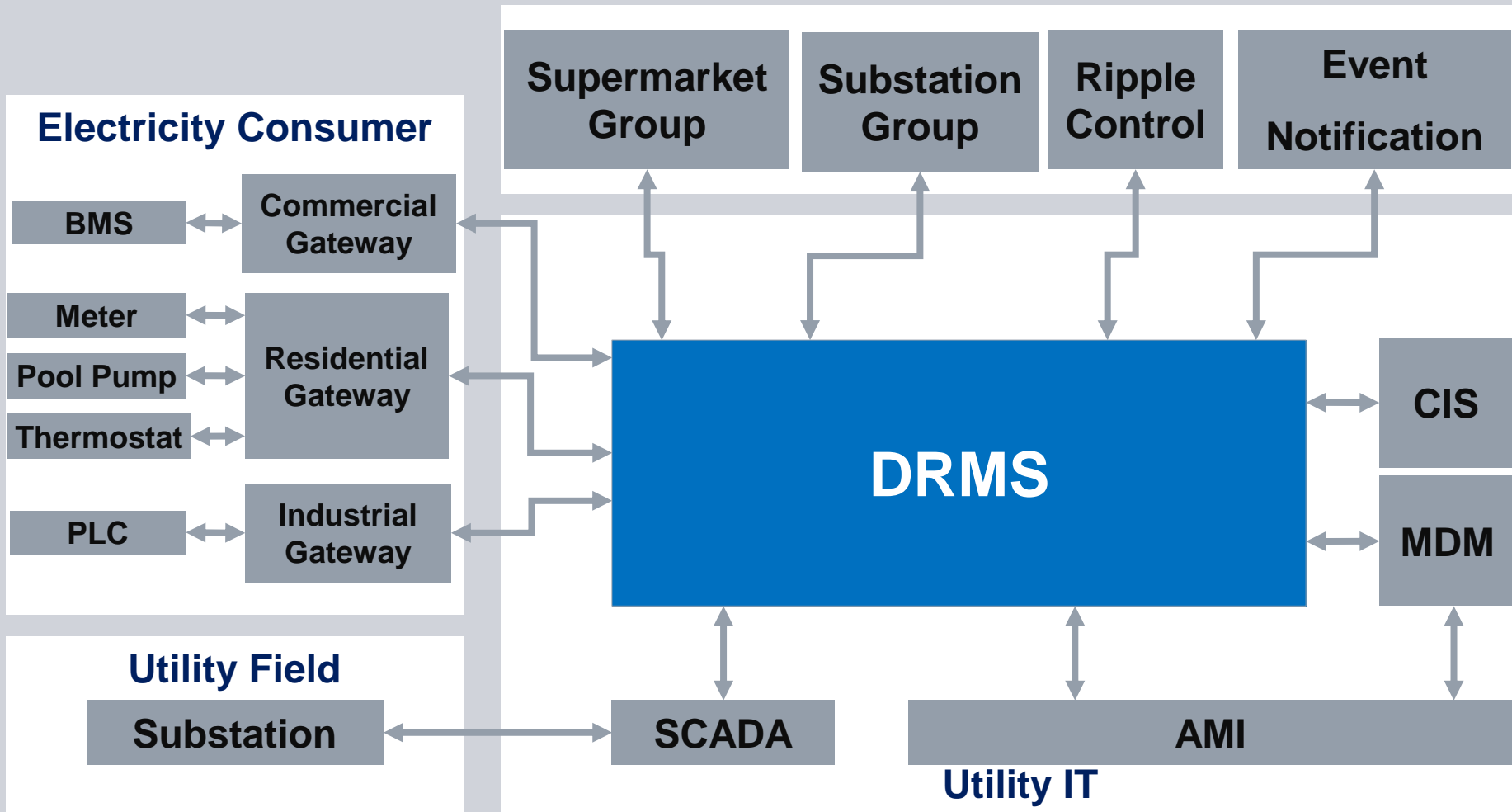


# Settlement Calculations

- Access to MDM
- Delta Baseline & Actual Usage
- Linked to Billing System



# Scalability





# Conclusion



- Municipality as Aggregator
- Existing Load Management Systems
- Own & Manage Scalable DRMS
- Revenue Protection
- Asset Management
- Customer Satisfaction

# Thank You

