DISTRIBUTION TECHNOLOGIES BY RBH SOLUTIONS

Products, Solutions & Technology

By

RBH Solutions Private Limited

RBH Introduction

- Provides solutions for SMART Communication / Interfaces and Automation Solutions
- Holds one the largest IPs in India for Communication Middleware used in automation industry
- 5 Indigenously developed different products to cover all End to End Requirements
- Example Smart Grid(1 – 6: Generation to Consumption)

Key Customers

Product MAP

Sensors / Devices
Plant Fields

Communication Middleware
RBH ICx Gateway (USP)

Digital Dashboards/ Displays
RBH RsS SCADA

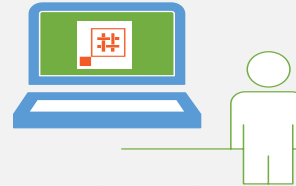**ICX GATEWAY**
SDK / API

Windows / Linux Platforms

ICxRTU

Raspberry Pi

Arduino

IoT Gateway

Any Type of Sensor / Vendor / Technology Supports 90% of industrial communication standards

Industry Standard Products
Dashboard / Reports / Interactive Plant Operations / Monitoring / Control System Alerts / Simulations
- **Automation Platform**
- **Energy Management System**
- **Building Management System**
- **Substation Automation System**
- **Demand Management System**
- **Load Shedding Analytics**

RsS RCDC
Cloud based SCADA System

Control Center

Cloud Servers

M2M VPN Frontend Server
ICx Gateway M2M Frontend Servers
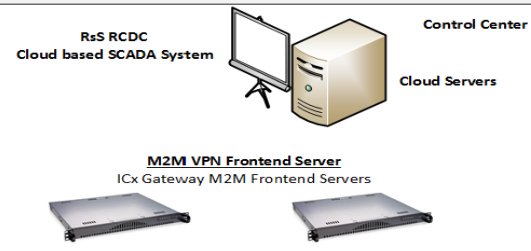
RBH Products

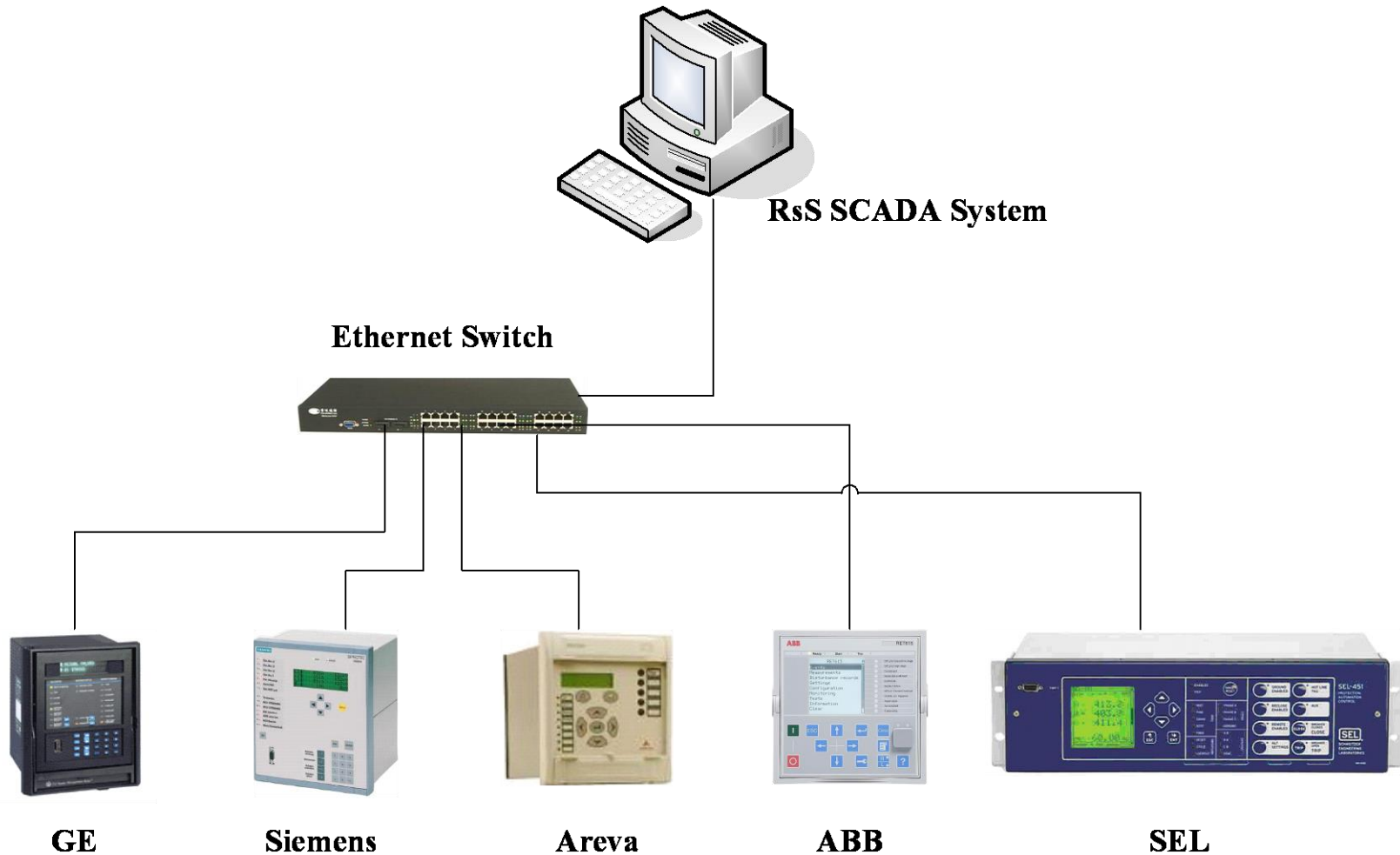| SCADA Systems	Metering Systems
• Substation Automation • Centralized Monitoring System	• MDM / MDAS Solutions • EMS Systems • Metering Headend / Data Concentrators
Gateway Systems	Networking Solutions
• Gateway / Data Concentrator • M2M / Remote Devices Connectivity over VPN • IEC / MODBUS / DLMS / OPC / ICCP / DNP3 / MQTT	• Serial / Ethernet / Fiber Convertors • Ethernet / Fiber Switches • MODEMs

Solutions for Distribution Utility

- Substation Automation
  - Local SCADA and Centralized SCADA System
  - Support for IEC, MODBUS, DLMS, OPC Protocols
  - Gateway / RTU / FRTU Based
  - M2M / Secure VPN based Central Communication Platform
- RT-DAS – IPDS Projects
  - Control Center Infrastructure
  - Substation RTUs / FRTUs
  - SAIDI / SAIFI Calculations
- Meter Data Management Solution
  - VPN Enabled Secure / M2M enabled Headend System
  - Multi vendor / multi protocol (MODBUS / DLMS) support
  - DCU / Gateway based
- Automatic Demand Management System
  - Load Shedding
  - Outage Management System
  - FRTU / Gateway based

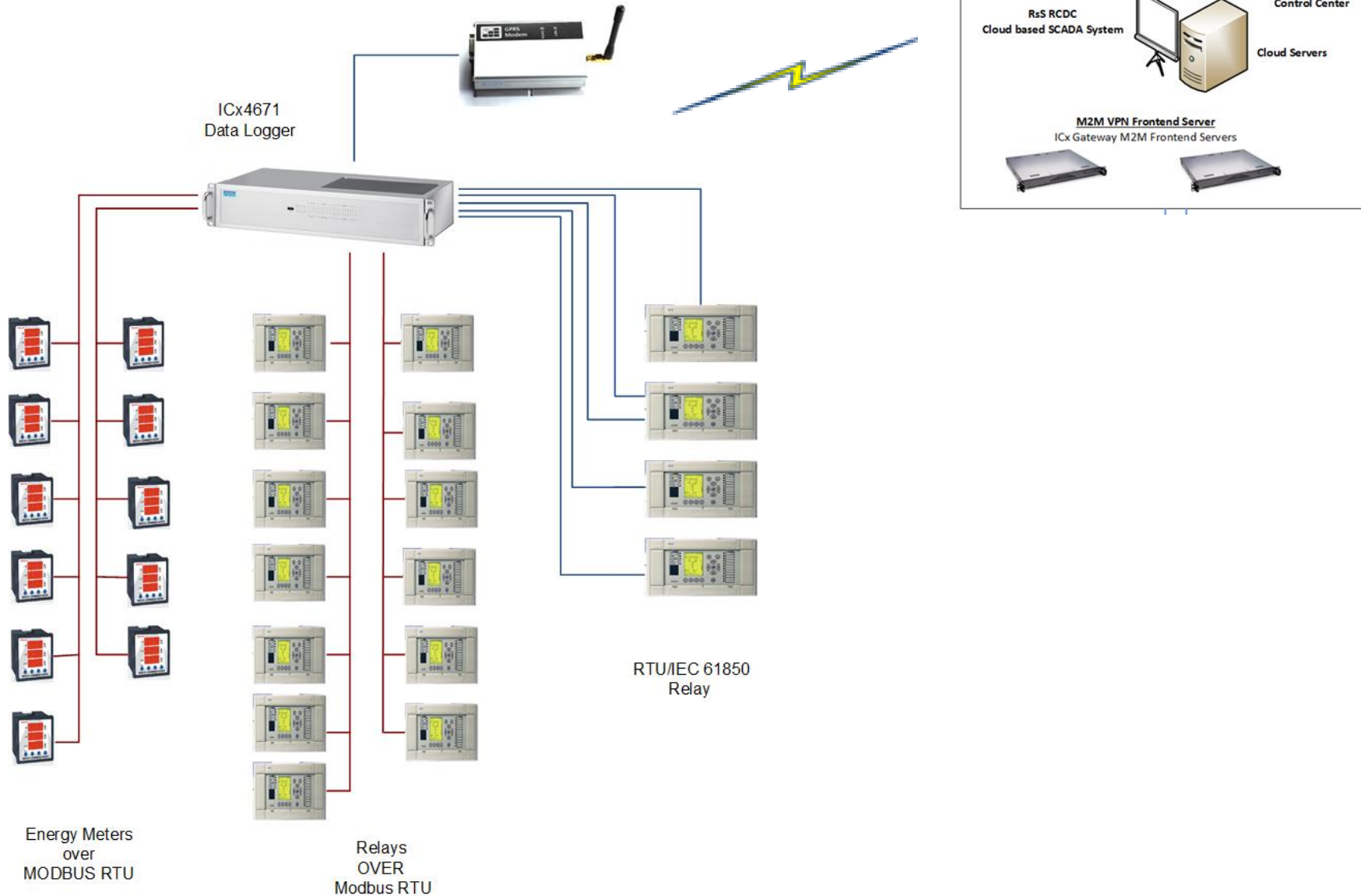# Solutions for Distribution Utility

- DT Transformer Monitoring Unit
  - Installation of DT Monitoring Unit
  - Centralized monitoring and remote tripping of DTs
  - Preventive Maintenance
- MDAS / Energy Management System
  - Metering data and billing solution
  - Utility Grade Billing and Management
  - Customer Portal and comprehensive accounts management solution
  - Data analysis and energy management
- FRTUs / DCU / Substation Gateways
  - Substation / RMU FRTUs
  - Metering Data Concentrators (DCUs)
  - Substation Alerts (SMS & Email) Solution
  - GPRS / 3G / 4G Modems and Routers
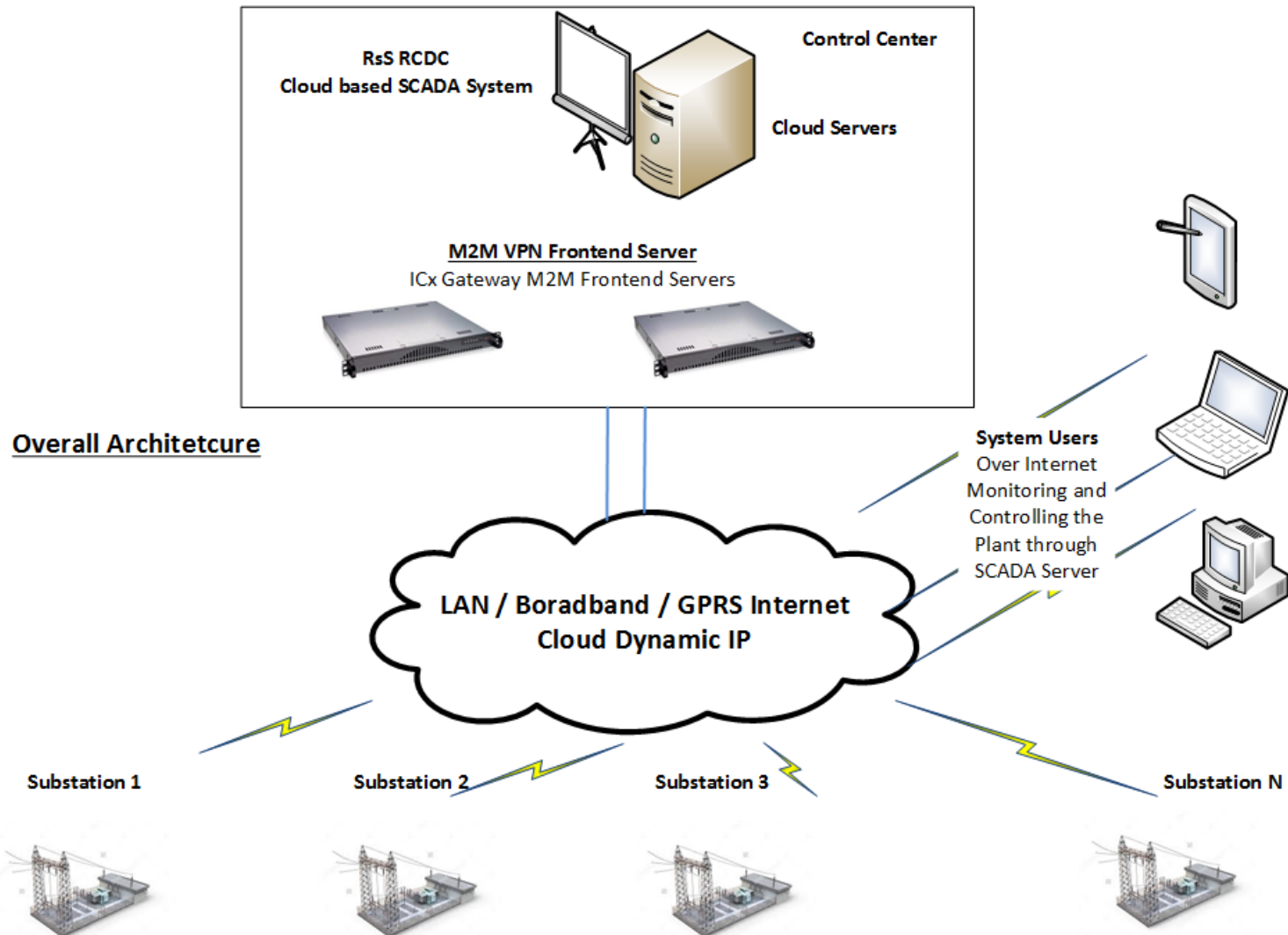
RBH Products: Vendor Independent

RsS SCADA System

Ethernet Switch

GE   Siemens   Areva   ABB   SEL
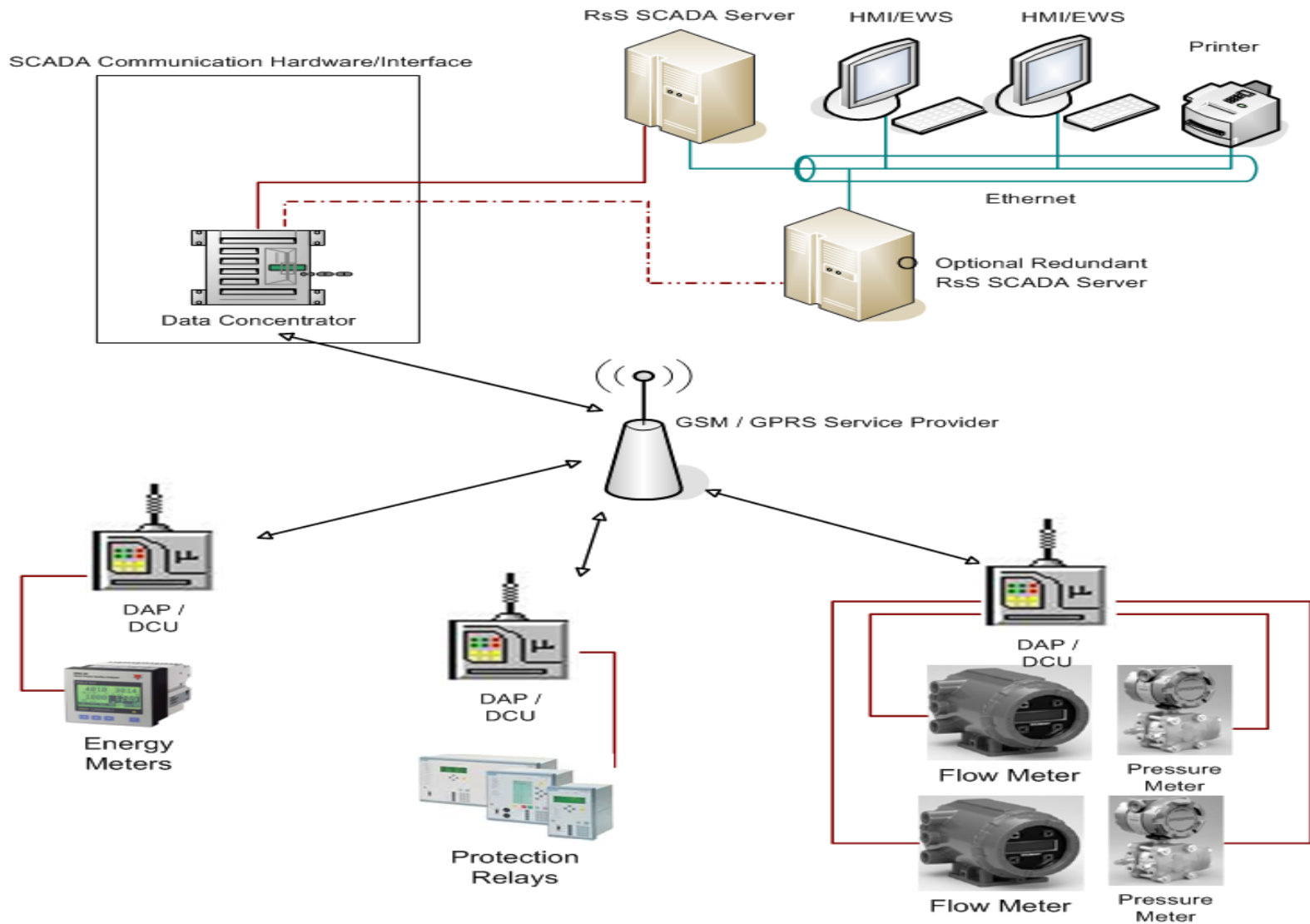
ALL IEDs / BCUs over IEC 61850 Protocol

Substation Monitoring: New and Existing Substations

Central Monitoring System: Substation

Overall Architecture

RT DAS – SAIFI / SIADI Calculation

SCADA Communication Hardware/Interface

RsS SCADA Server

HMI/EWS

HMI/EWS

Printer

Ethernet

Data Concentrator

Optional Redundant RsS SCADA Server

GSM / GPRS Service Provider

DAP / DCU

Energy Meters

DAP / DCU

Protection Relays

DAP / DCU

Flow Meter

Pressure Meter

Flow Meter

Pressure Meter

DAP: Data Access Point / DCU
RsS : Real- Time SCADA System
HMI : Human Machine Interface
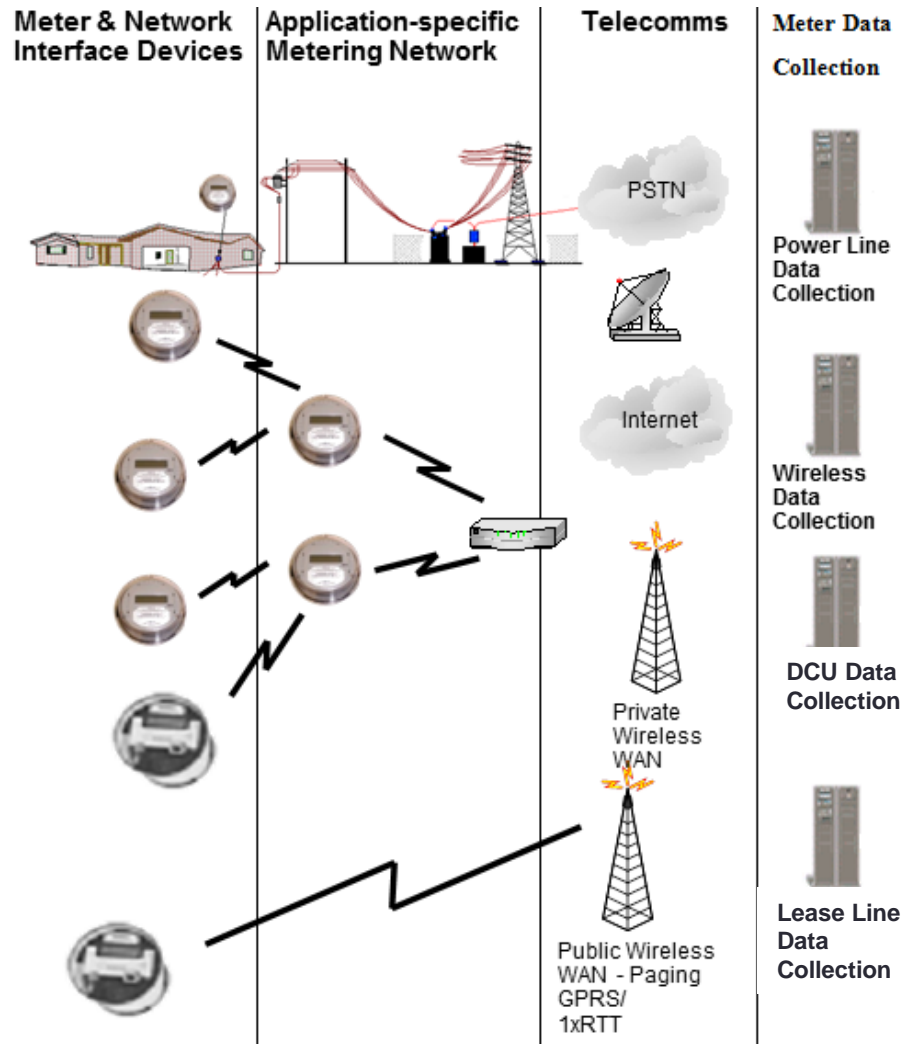**EWS** : Engineering Work Station

Wired Communication

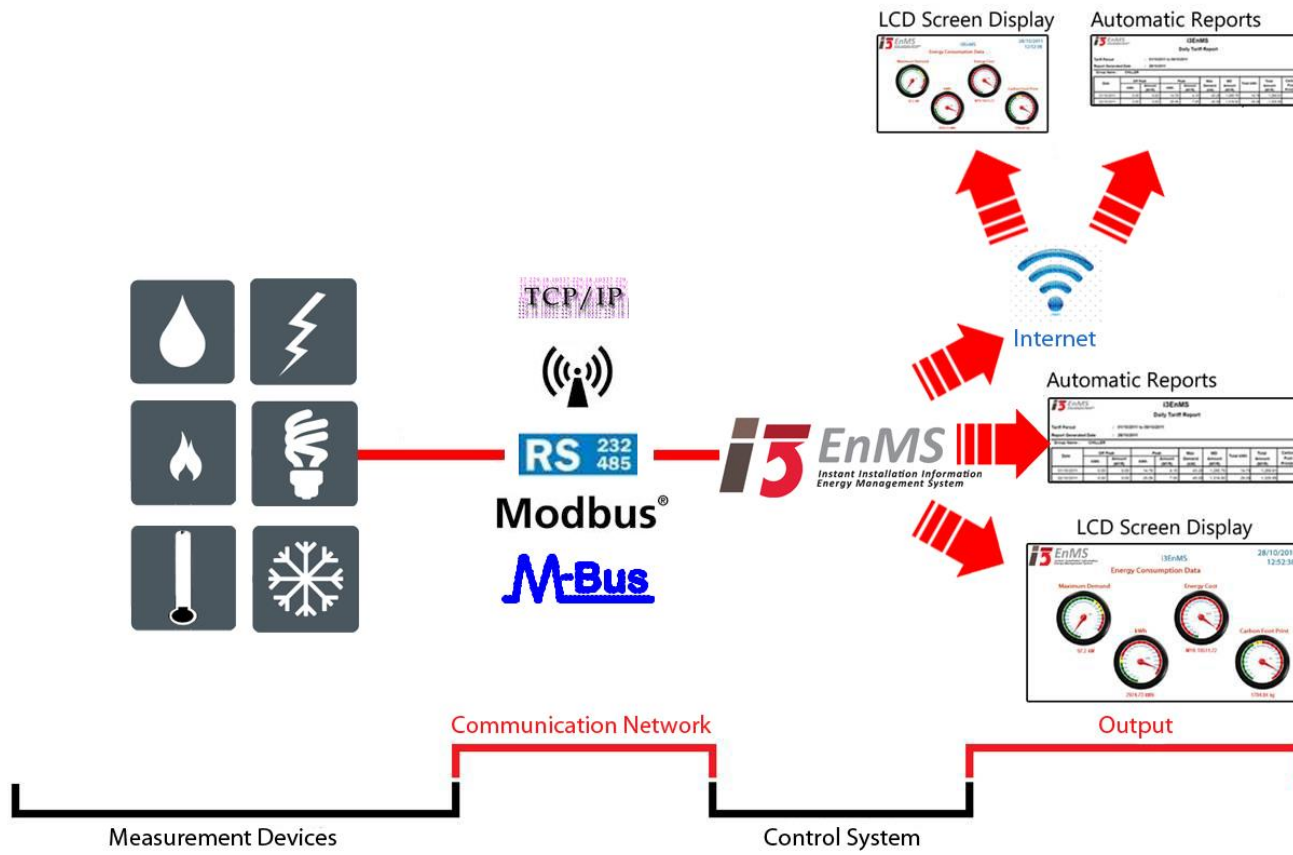Wireless Communication

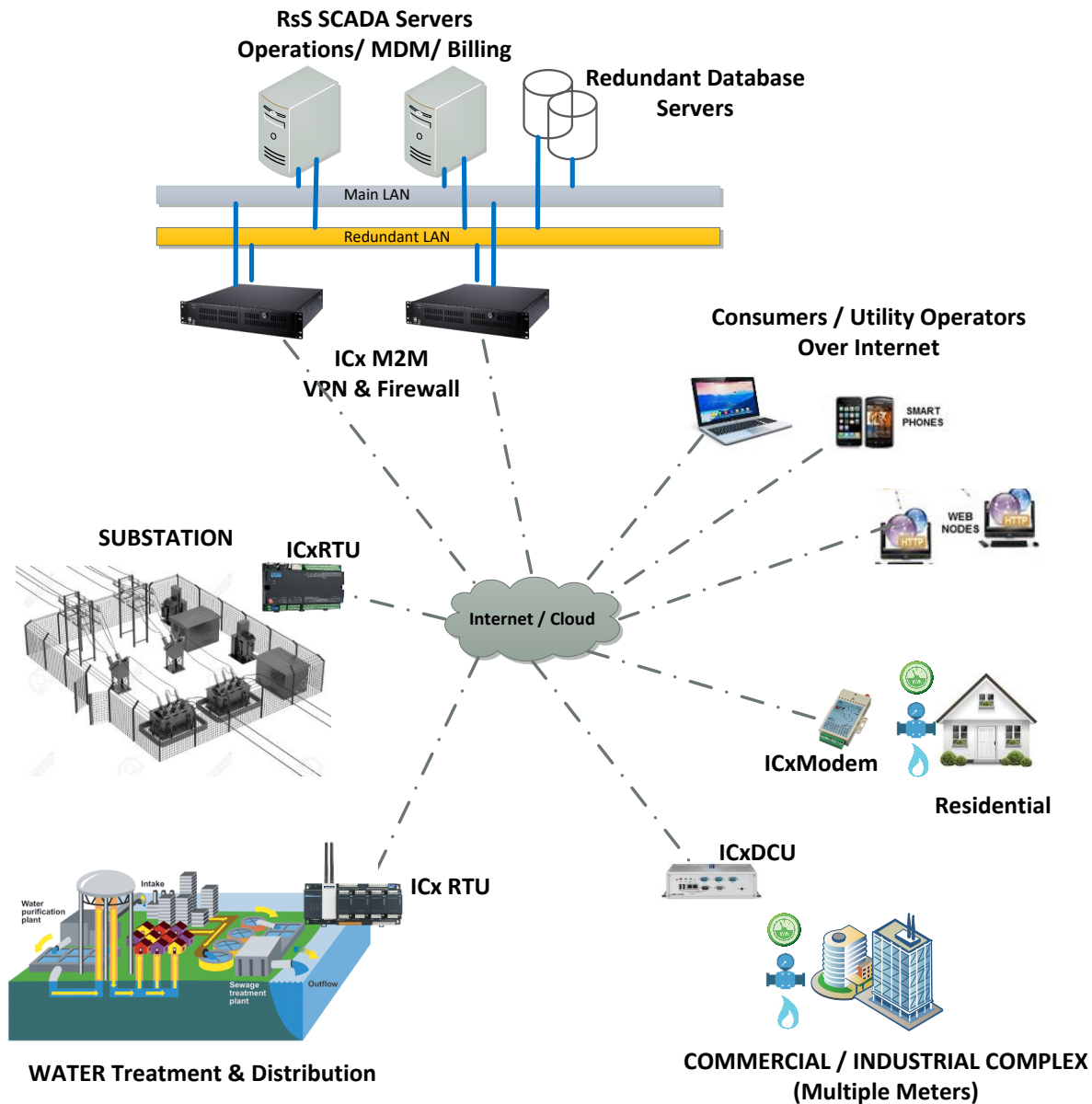Ethernet Communication

MDM: Architecture

SYSTEM ARCHITECTURE
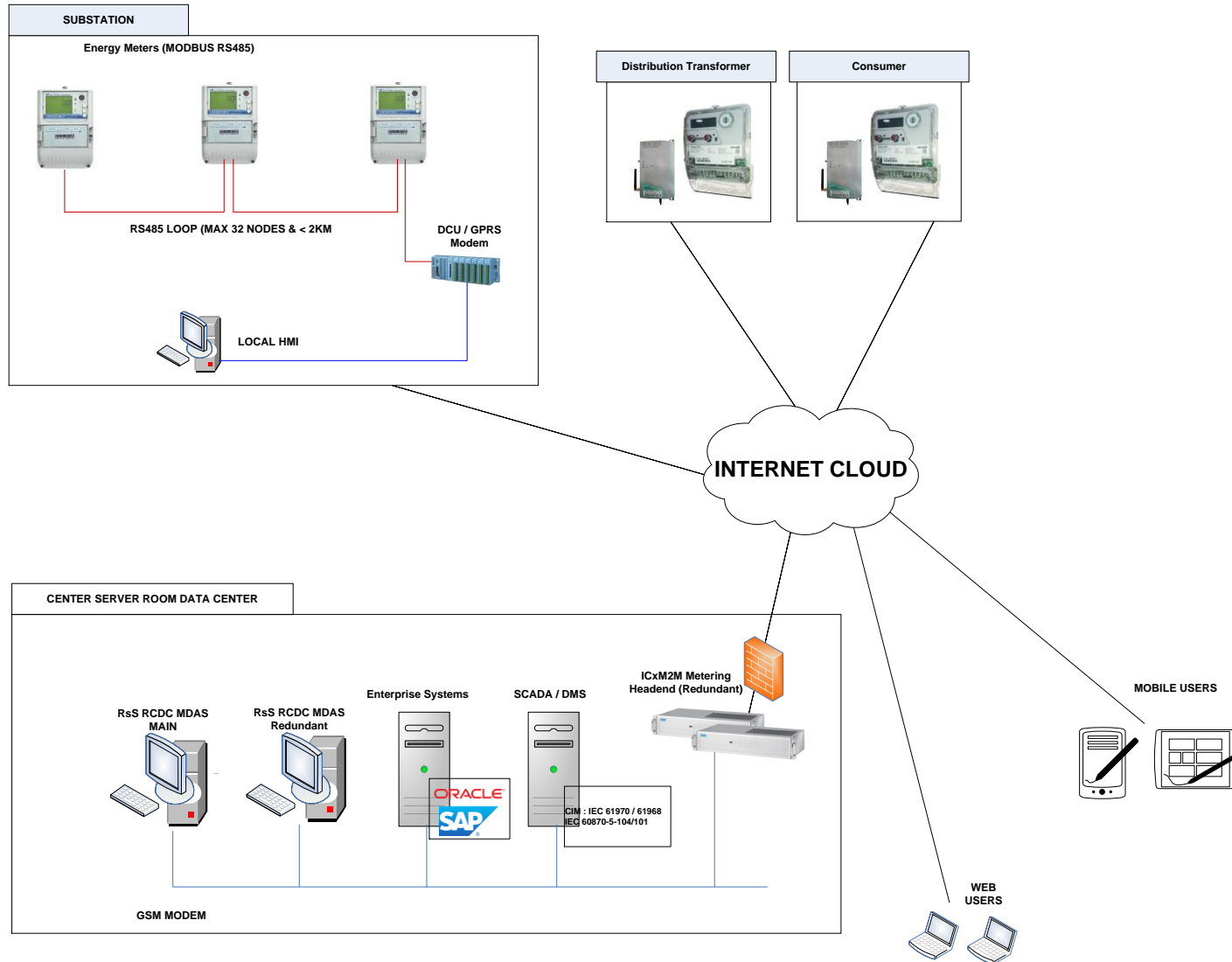
RBH RCDC: Open System / Any Technology

Energy Management System

Central Monitoring System: All in One

RsS SCADA Servers
Operations/ MDM/ Billing

Redundant Database Servers

Main LAN

Redundant LAN

ICx M2M
VPN & Firewall

Consumers / Utility Operators
Over Internet

SMART PHONES

WEB NODES
HTTP HTTP

SUBSTATION   ICxRTU

Internet / Cloud

ICxModem

Residential

ICxDCU

ICx RTU

WATER Treatment & Distribution

COMMERCIAL / INDUSTRIAL COMPLEX
(Multiple Meters)

Sample WEB Views

Sample WEB Views

Sample Reports

Time Zone / Maximum Demand / Energy table:

Time Zone	Maximum Demand (kW)	Energy (kWh)
Peak	28,885	3,229,030
Mid Peak	28,986	8,057,414
Off-peak	28,584	7,978,602

Time Zone	MD Rate (RM/kW)	Energy (sen/kWh)	MD Charge (RM)	Energy Charge (RM)
Peak	38.30	39.00		1,259,322
Mid Peak	35.00	31.00	1,014,510	2,497,798
Off-peak	NA	20.20		1,611,678
TOTAL BILL				RM6,383,308

Time Zone	MD Rate (RM/kW)	Energy (sen/kWh)	MD Charge (RM)	Energy Charge (RM)
Peak	35.50	33.70	1,029,003	3,803,532
Mid Peak				
Off-peak	NA	20.20		1,611,678
TOTAL BILL				RM6,444,212

Tariff Category	MD RATES (RM/kW) TOU PEAK	ETOU PEAK	ETOU MID - PEAK	ENERGY RATES (RM/kWh) TOU PEAK	TOU OFF - PEAK	ETOU PEAK	ETOU MID - PEAK	ETOU OFF - PEAK
Commercial C1	RM 30.30	RM 34.00	RM 28.80	RM 0.365	RM 0.365	RM 0.584	RM 0.357	RM 0.281
Commercial C2	RM 45.10	RM 48.40	RM 42.60	RM 0.365	RM 0.224	RM 0.636	RM 0.339	RM 0.224
Industrial D	-	RM 42.10	RM 37.20	RM 0.441	RM 0.441	RM 0.484	RM 0.327	RM 0.249
Industrial Ds	-			RM 0.427	RM 0.427			
Industrial E1	RM 29.60	RM 35.50	RM 29.60	RM 0.337	RM 0.337	RM 0.566	RM 0.333	RM 0.225
Industrial E1s	RM 23.70			RM 0.336	RM 0.336			
Industrial E2	RM 37.00	RM 40.00	RM 36.00	RM 0.355	RM 0.219	RM 0.592	RM 0.332	RM 0.219
Industrial E2s	RM 32.90			RM 0.336	RM 0.191			
Industrial E3	RM 35.50	RM 38.30	RM 35.00	RM 0.337	RM 0.202	RM 0.576	RM 0.327	RM 0.202
Industrial E3s	RM 29.00			RM 0.317	RM 0.175			

Time	Hour	kW
Off-Peak	00:30	26,343
	01:00	26,197
	01:30	25,928
	02:00	25,888
	02:30	26,357
	03:00	26,430
	03:30	26,146
	04:00	26,234
	04:30	26,040
	05:00	25,958
	05:30	26,034
	06:00	26,107
	06:30	25,809
	07:00	25,353
	07:30	24,837
	08:00	25,103
Mid Peak	08:30	25,705
	09:00	26,019
	09:30	26,127
	10:00	25,963
	10:30	25,915
	11:00	25,855
Peak	11:30	26,088
	12:00	26,331
Mid Peak	12:30	26,182
	13:00	26,236
	13:30	26,006
	14:00	25,919
Peak	14:30	26,226
	15:00	26,309
	15:30	26,117
	16:00	26,194
	16:30	26,298
	17:00	26,245
Mid Peak	17:30	26,306
	18:00	26,304
	18:30	26,167
	19:00	25,921
	19:30	25,707
	20:00	26,059
	20:30	26,470
	21:00	26,473
	21:30	26,228
	22:00	26,103
	22:30	25,957
	23:00	26,179
	23:30	26,532
	24:00	26,663
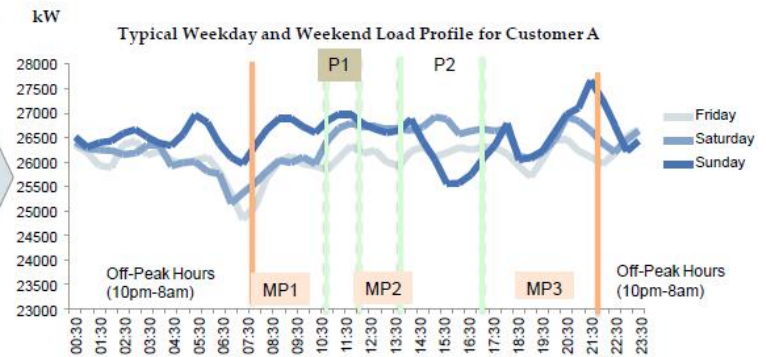
Typical Weekday and Weekend Load Profile for Customer A

Off-Peak Hours (10pm-8am) P1 P2 MP1 MP2 MP3 Off-Peak Hours (10pm-8am)

Friday / Saturday / Sunday

Time Zone	Maximum Demand (kW)	Energy (kWh)
Peak	28,885	3,229,030
Mid Peak	28,986	8,057,414
Off-peak	28,584	7,978,602

Sample Analysis

TOU Time Zones	
Time Zone	Hours
Peak	08:00 – 22:00 hours
Off-peak	22:00 – 08:00 hours

Enhanced Time of Use Time Zones	
Time Zone	Hours
Mid-Peak	08:00 – 11:00 hours
Peak	11:00 – 12:00 hours
Mid-Peak	12:00 – 14:00 hours
Peak	14:00 – 17:00 hours
Mid-Peak	17:00 – 22:00 hours
Off-Peak	22:00 – 08:00 hours

Off Peak Rate and No Maximum Demand
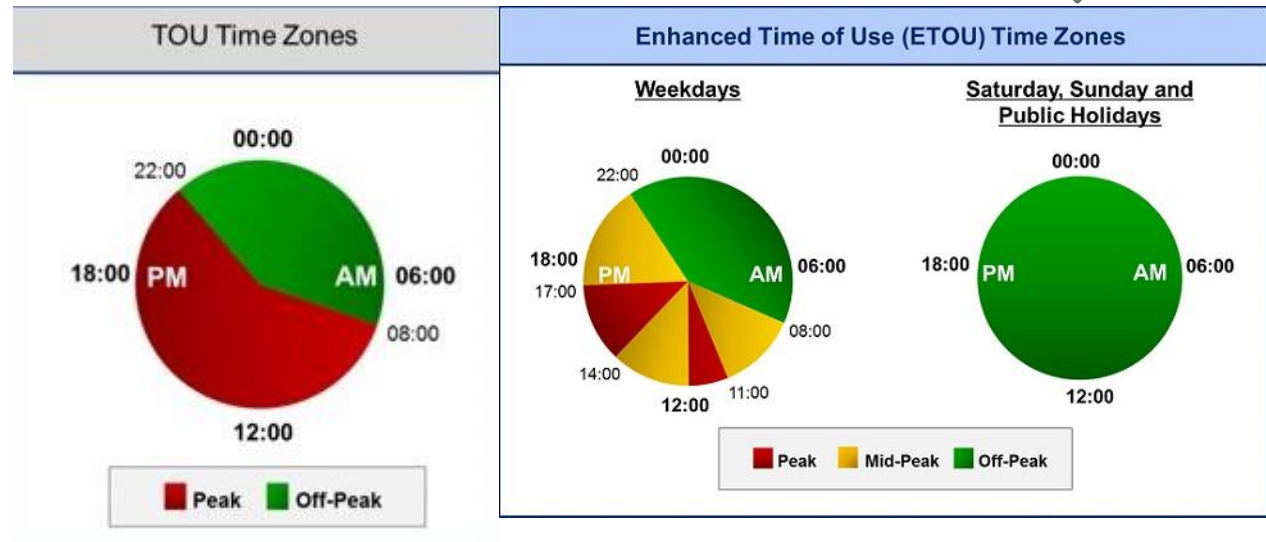
Sample Application Views