Make the most of your ENERGY

Energy Efficiency Solutions

15th May 2010

Abhay Muley

Schneider Electric

A world where we can all

achieve more while using less

of our common planet

Schneider Electric

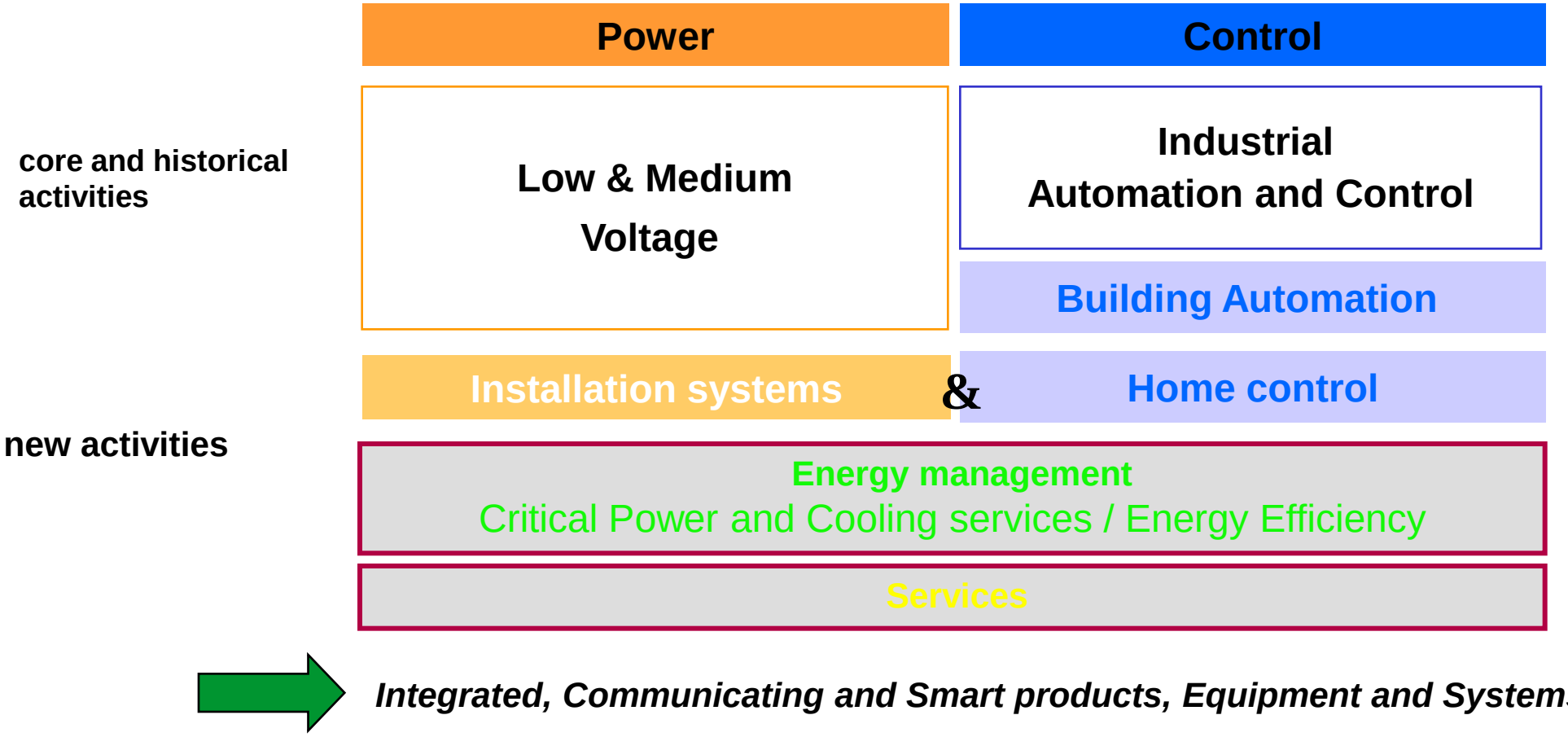
Schneider Electric

We are
“ the global specialist in Energy Management”

Schneider Electric

Helping people make the most of their energy

A unique offer
in the Management of Power and Control



Integrated, Communicating and Smart products, Equipment and Systems

A Global Company

INR 119,450 crore revenue in 2008

114,000 people in more than 100 countries

>200 factories around the world

R&D centres in **25 countries**

Schneider Electric in India

7700 employees

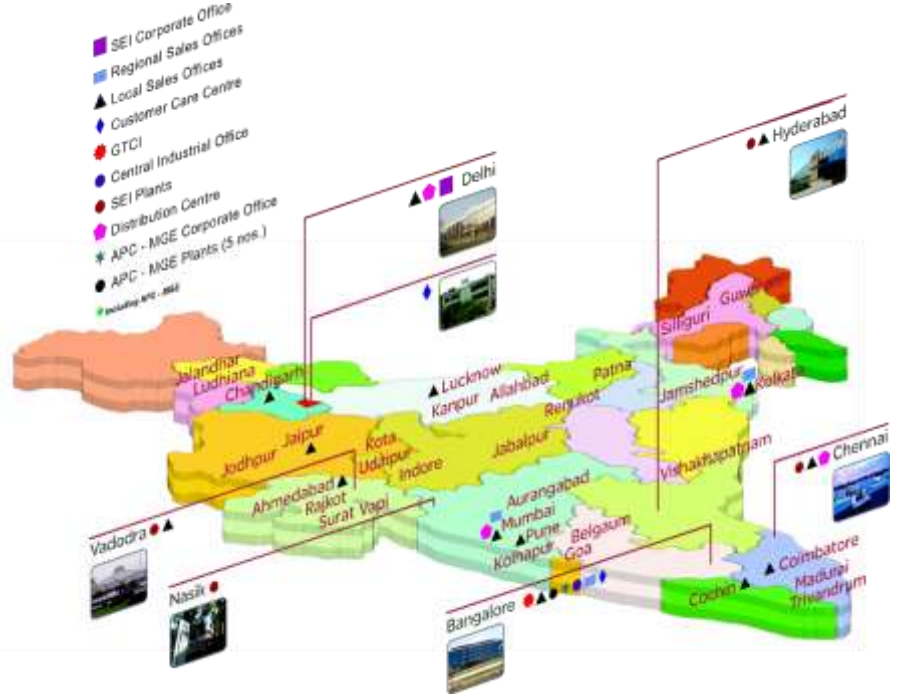
9 manufacturing sites,

4 distribution centers around the country

6 R&D centers

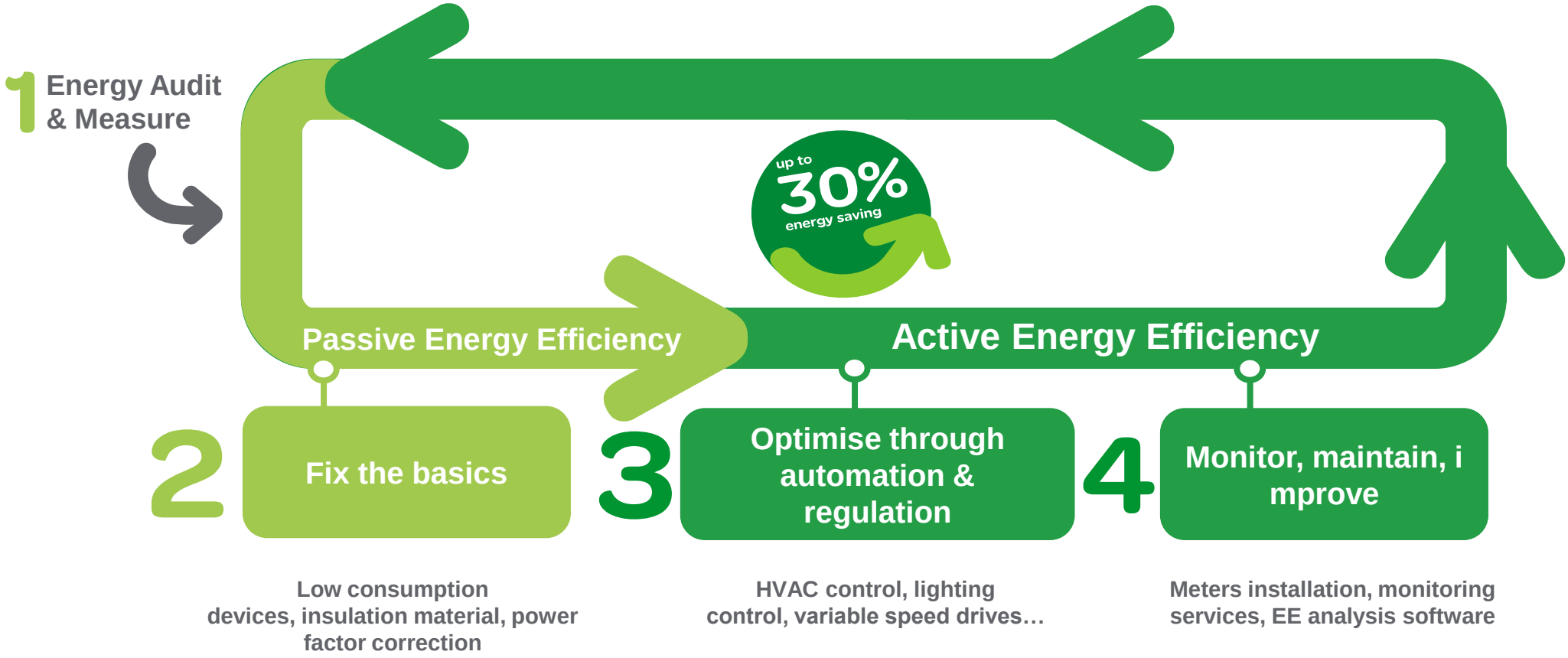
500 authorized partners (Distributors, System Integrators and Panel Builders)

One Regional Project & Engineering Centre

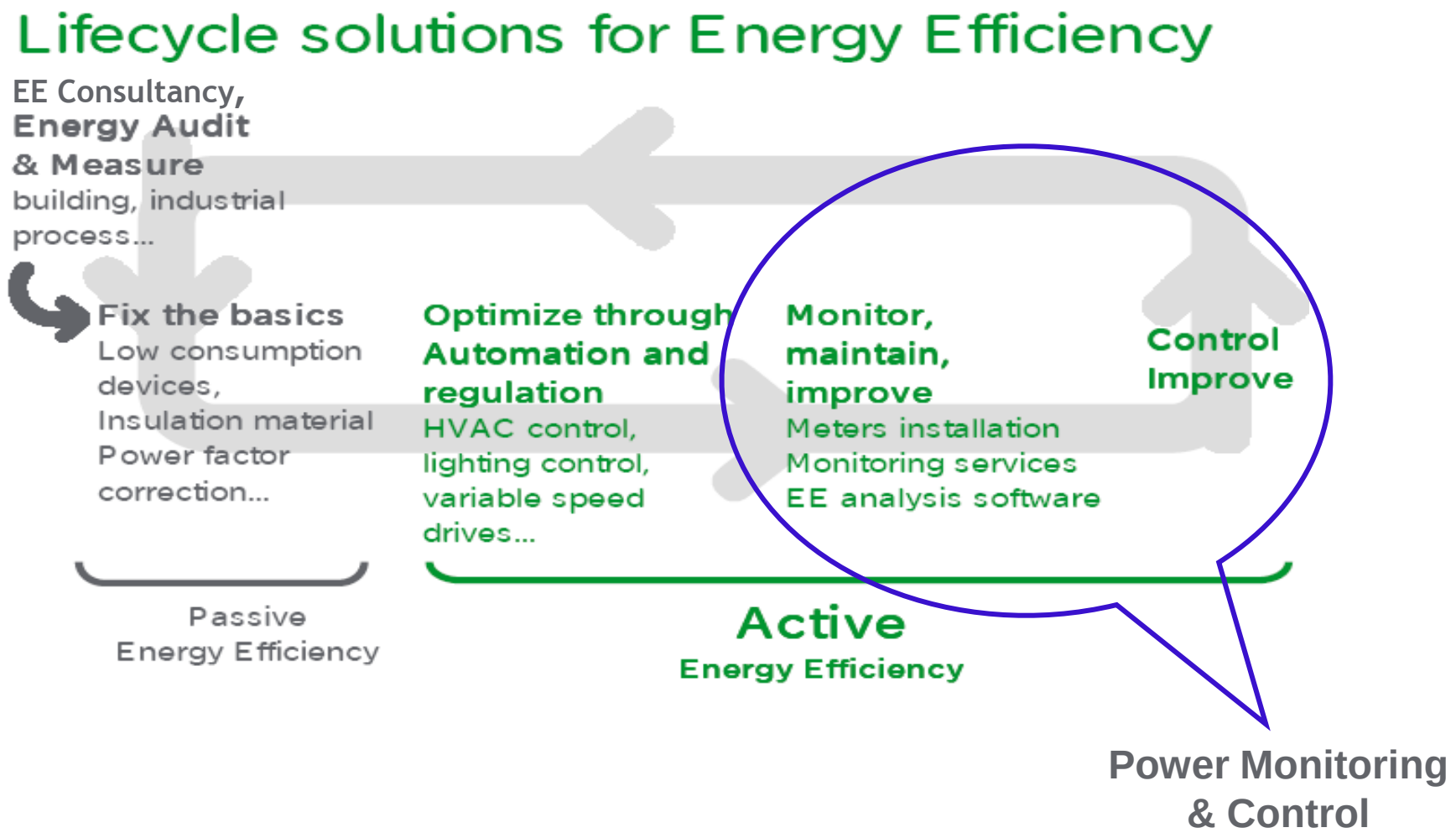


* **Energy Efficiency**

Lifecycle solutions for Energy Efficiency



A systematic approach & offering



Goals of Power Monitoring

- Energy Cost Control
- Power Equipment Management
- Power Quality Improvement
- Improve System Reliability
- SAVE the PLANET

What is Power Monitoring?

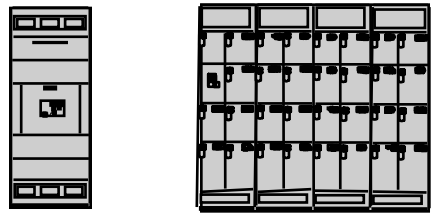
Power monitoring is a process that observes the characteristic operation of a power system or a facility's electrical use.

To Achieve Its Goals, a Power Monitoring System is:

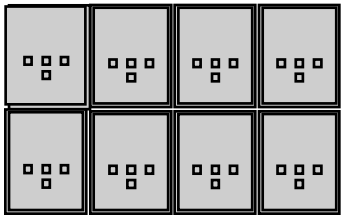
- Capable of regularly recording information about your electric power – **LOGGING**
- Able to notify you if readings go out of user specified ranges – **ALARMING**
- Capable of providing reports about your electrical system in graphical or spreadsheet format - **REPORTING**

An integrated system of hardware and software that

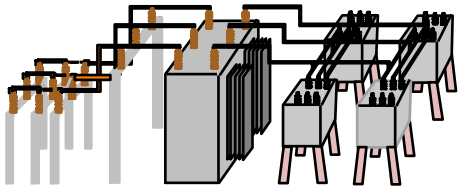
Transforms Data ***Into*** **Useful *Real Time* Information**



Switchboards & MCC's



High Voltage Switchgear



Substations

- KWhr
- Amps
- PF
- Volts
- KW
- KVA
- KVAHr
- Average Demand
- Peak Demand
- Harmonics

NETWORK

INFORMATION

Engineering

- Load Planning Study
- Harmonic Analysis
- Historical Trending

Maintenance

- Alarms / Events
- Circuit Loading
- Phase Balancing

Accounting

- Cost by Dept.
- Cost by Product
- Verify Electric Bill

Management

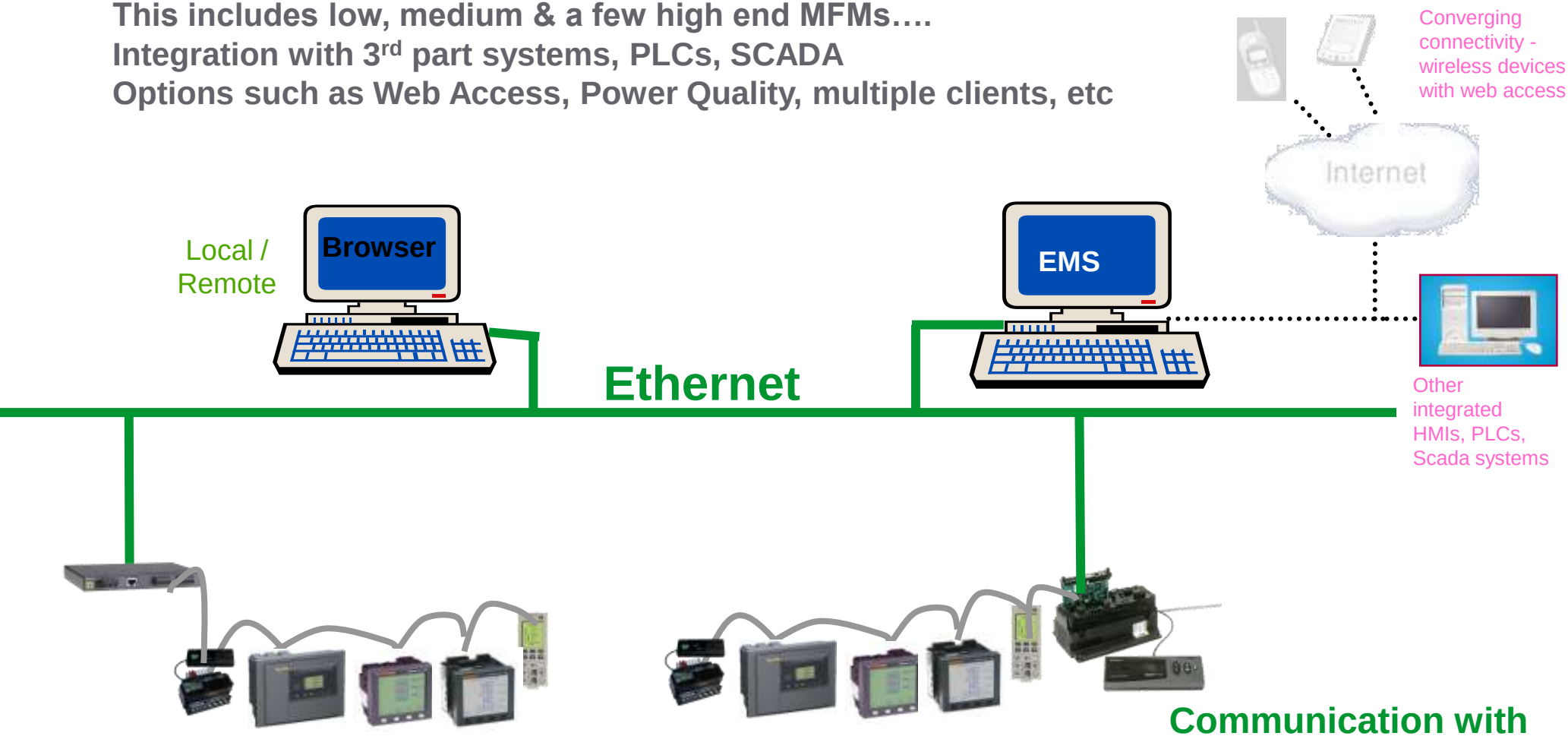
- Summary Reports
- Timely Information

Automatic Controls

- Load Shedding
- Auto Transfer
- PF Correction

Advanced Power Monitoring System

When more than 32 devices to monitor (~ 300)
Most industries fall in this category…….
This includes low, medium & a few high end MFMs….
Integration with 3rd part systems, PLCs, SCADA
Options such as Web Access, Power Quality, multiple clients, etc

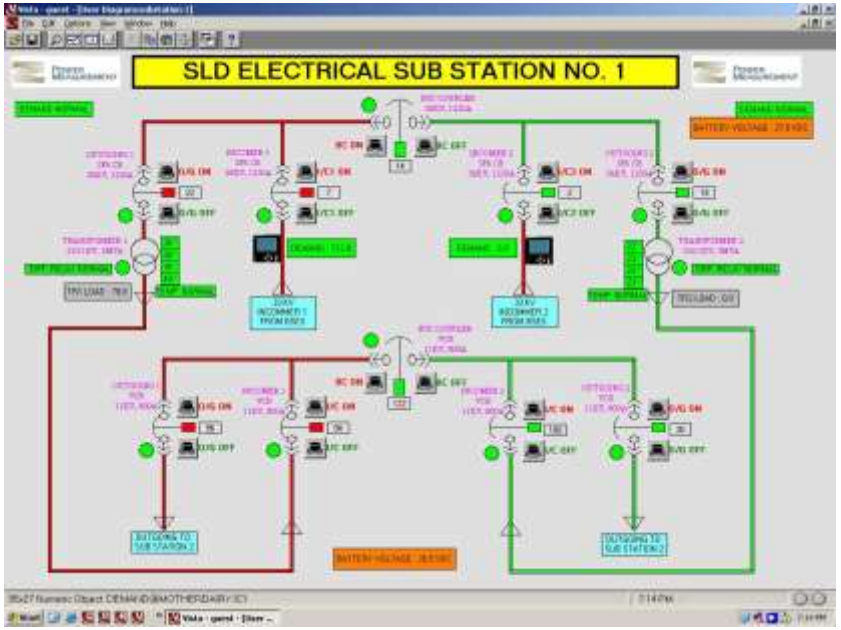


Communication with Eth gateway

Advanced EMS

The customer needs,

- Monitoring of all parameters as in a basic EMS
  - trouble shoot, after something has gone wrong
- Monitor more than 300 nodes (incomers, feeders, loads)
  - collect max data to improve overall operations
- Monitoring of advanced parameters – Indl harmonics, sags/swells, waveform capture, onboard data logging/alarms, transients, status & control of CB/isolator
  - operate with minimal shutdowns



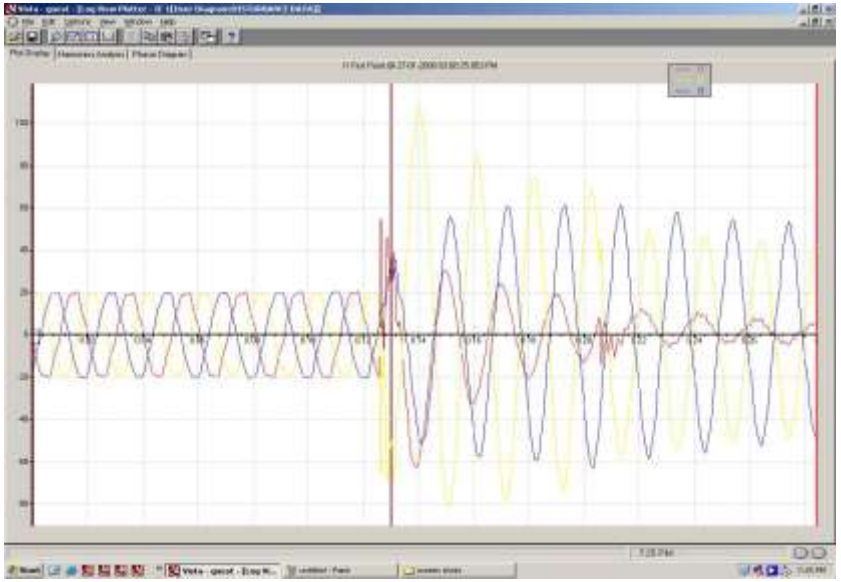
Advanced EMS

…….the customer needs

- Monitoring non electrical parameters - temperature, pressure, flow, etc.
  - provide single system for multiple facilities/plants

- Customized & complex reports – user defined reports on energy consumption, load & Pf trend, sub-billing/cost allocation (periodical), power quality, events, multiple tariffs
  - maximize performance & reliability and plan efficiently

- Remote monitoring through web (require meters/RTUs with webserver capabilities)
  - know if everything is OK.



Our Offers

Reactive Power Compensation

Std Duty, Gas Filled, MDXL Capacitors

IPFC Relays

APFC Panels

MV APFC Panels

Metering & EMS Solutions

Basic Meters

Energy Meters

MFM

Demand Controllers

MFM with LCD Display

ABT Meters

Meters with Ethernet Port / Profibus

Services

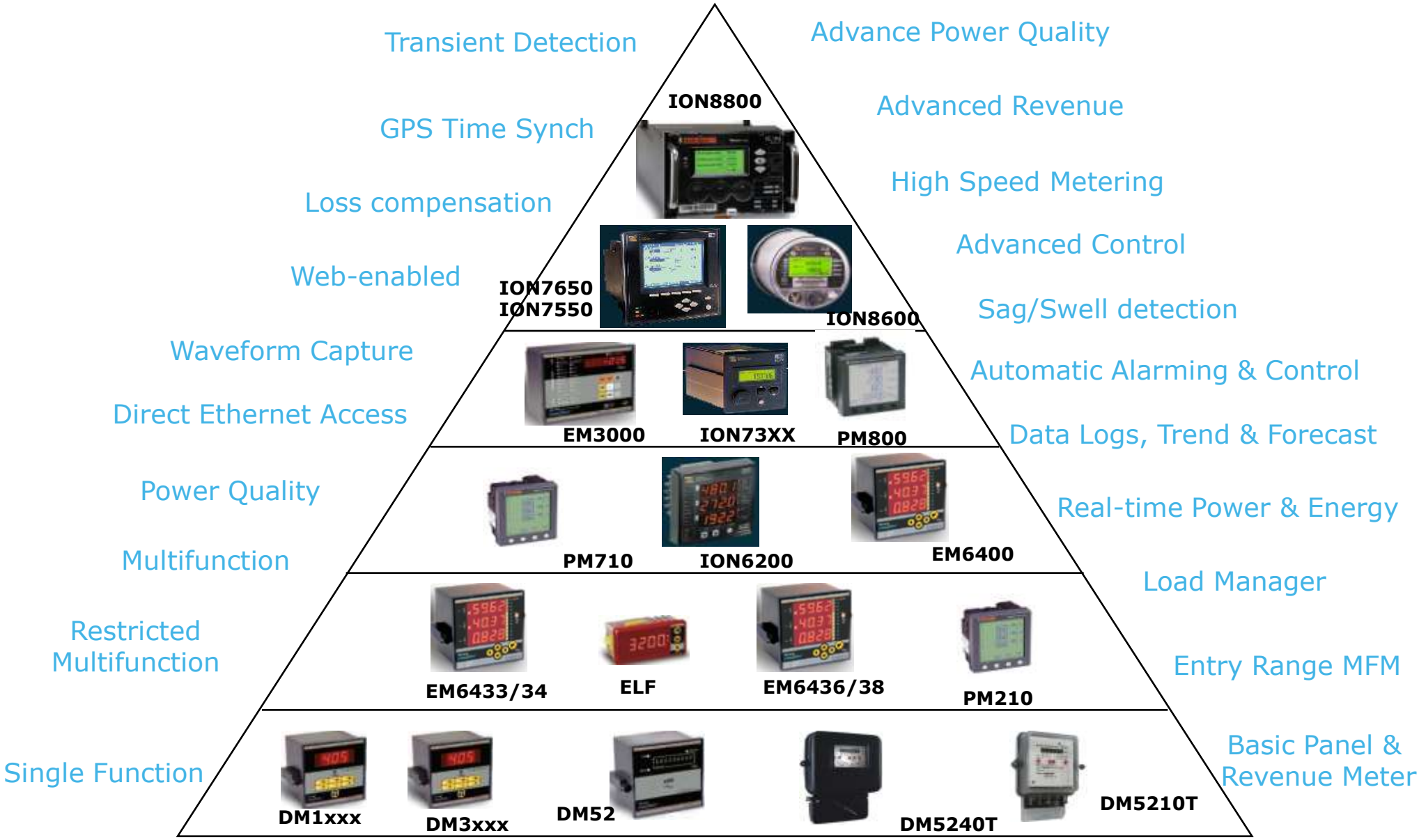
Energy Audits

Power Quality Audits

Harmonic Audits

EMS Services

Remote Monitoring Services


Transient Detection
Advance Power Quality
ION8800
GPS Time Synch
Advanced Revenue
Loss compensation
High Speed Metering
Web-enabled
Advanced Control
ION7650
ION7550
ION8600
Sag/Swell detection
Waveform Capture
Automatic Alarming & Control
Direct Ethernet Access
EM3000
ION73XX
PM800
Data Logs, Trend & Forecast
Power Quality
Real-time Power & Energy
Multifunction
PM710
ION6200
EM6400
Load Manager
Restricted Multifunction
EM6433/34
ELF
EM6436/38
PM210
Entry Range MFM
Single Function
DM1xxx
DM3xxx
DM52
DM5240T
DM5210T
Basic Panel & Revenue Meter

ION -- ABT Metering Systems


ION-8800


ION-8600
Socket Mount


ION-8600
Switch board


ION-7650/7550

ABT Metering system from SCHNEIDER ELECTRIC includes devices like

ION 8800 Series	ION 8600 Series	ION 7x50 Series
19" Rack Mount	*(Socket mount and Switch-board case)*	*Flush/Panel Mount*
Class 0.2s (All Powers and Energies)	Class 0.2s (All Powers and Energies)	Class 0.2s (All Powers and Energies)
IEC 62053-22 & ANSI C12.20 0.2s	*IEC 62053-22, ANSI C12.20 0.2s & IS14697*	*IEC 62053-22 & ANSI C12.20 0.2s*
Sampling max= 1024samples/cycle	Sampling max= 256samples/cycle	Sampling max= 1024samples/cycle
GPS sync- RS485/IRIG-B port	GPS sync- RS485/IRIG-B port	GPS sync- RS485 port
User configurable Meter DISPLAYS	User configurable Meter DISPLAYS	User configurable Meter DISPLAYS

With ION Enterprise software that is *fully* CUSTOMISABLE as per USER Configuration

Advanced Metering Panel Devices - ION7650/7550
Features and benefits table

Feature	ION7550	ION7650
Metering		
Power, energy, & demand		
Power Quality		
Dip/swell, harmonics monitoring		
Harmonics: individual, even, odd, up to	63rd	63rd
Harmonics: magnitude, phase, and inter-harmonics		50th
Symmetrical components: zero, positive, negative		
Transient detection, microseconds (20 µs for 50 Hz, 17 µs for 60 Hz)		17/20
Sampling rate, maximum samples per cycle	256	1024
Uptime in number of nines		
Logging and Recording		
Memory standard/optional	5MB/10MB	5MB/10MB
Min/max, historical, waveform logging		
Timestamp resolution in seconds	0.001	0.001
Historical trend information via front panel display		
GPS time synchronisation		

Advanced Metering Panel Devices - ION7650/7550

Features and benefits table……

Feature	ION7550	ION7650
Communications and I/O		
RS-232/485; RS-485; Ethernet; Optical		
Internal modem	1	1
3-port DNP 3.0 via serial, modem, Ethernet, I/R ports		
Modbus RTU slave/master; Modbus TCP		
EtherGate, ModemGate, MeterM@il, WebMeter		
Analog inputs/outputs (optional)	4/4	4/4
Digital status inputs/outputs	16/4	16/4
Relay outputs (standard)	3	3
Setpoints, alarming and control		
Setpoints, number/minimum response time	65/ ½ cycle	65/ ½ cycle
Math, logic, trig, log, linearisation formulas		
Call-out on single & multi-condition alarms		

Advanced Metering Panel Devices - ION7550RTU

- Data concentrator & I/O controller - Does not physically have Metering
- 2x RS485* and 1x RS232* communications ports
  - Modbus RTU, Modbus Master; ION, DNP 3.0; EtherGate, ModemGate
- Optional built in Modem and/or Ethernet
- Front Optical communications port
- Customizable front LCD panel
- 8 DI, 4 DO & 3 relay outputs - Module I/O card for add. I/O capability
- ½ cycle response time for setpoint based alarms
- 5MB of memory for logging (optional 10MB maximum)
- Time synchronization via GPS
- Alarming via e-mail or pager (with Ethernet or modem option)

Advanced Revenue Meters

- ION8600 and the IO Expander

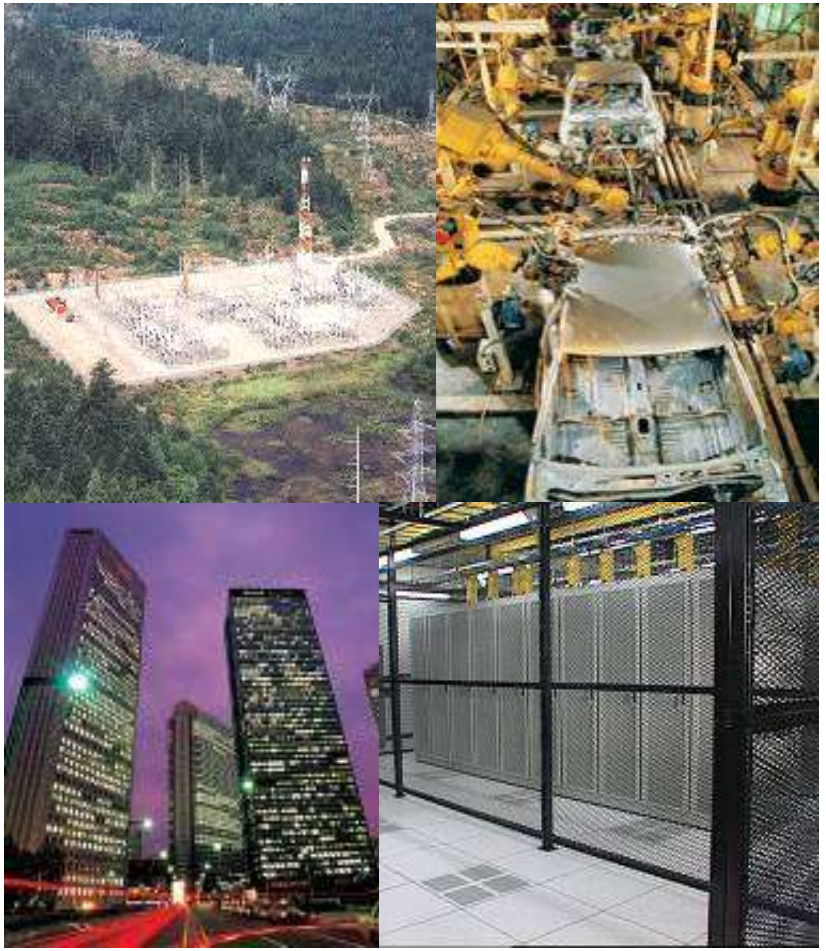
Advanced European Revenue Meter

- ION8800

PowerLogic ION Enterprise - overview

Complete power management for:

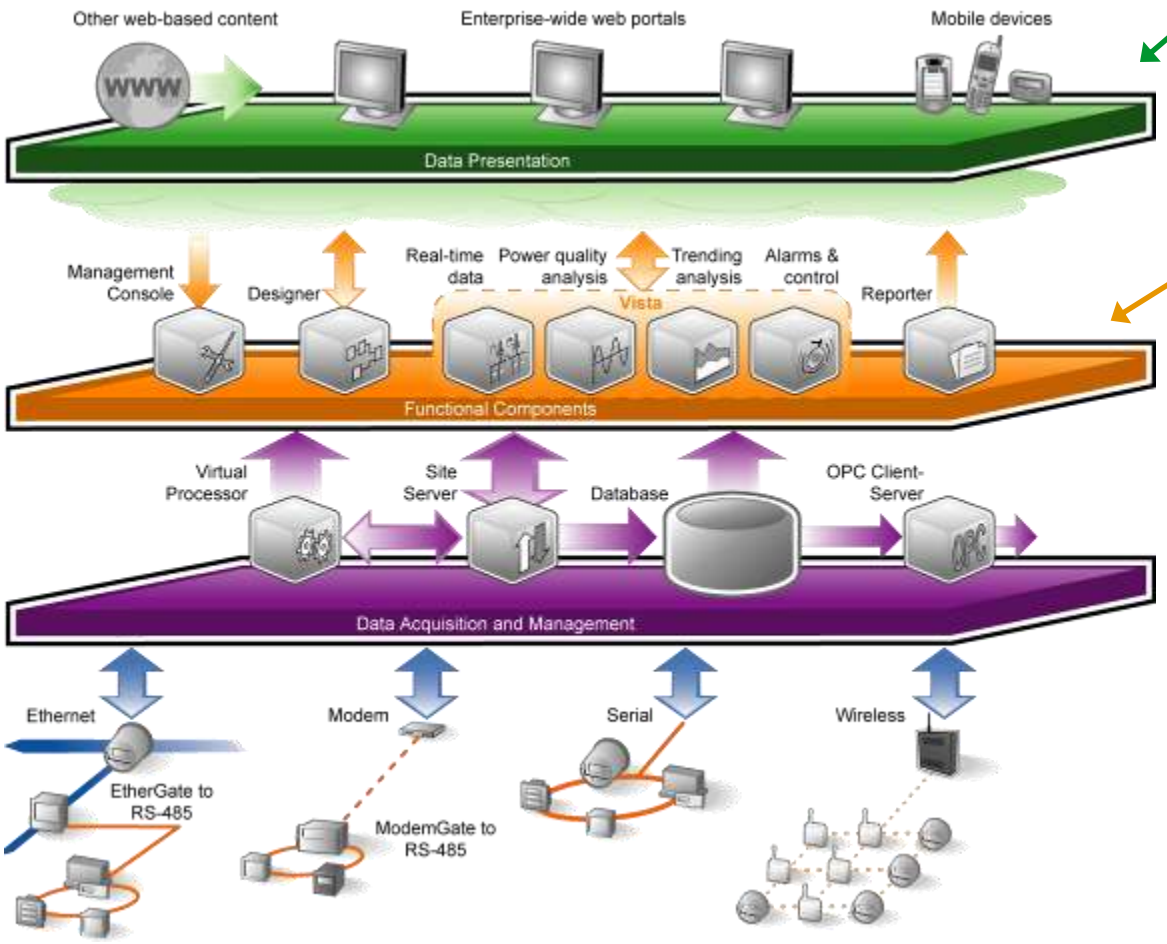
- Electric Utilities and Independent Power Producers (IPP,CPP)
- Industrial facilities
  (oil &
  gas, chemical, automotive, pharmaceutical, pulp & paper, mining, etc.)
- Water/wastewater facilities
- Office and retail buildings
- Government and university buildings
- Airports
- Critical power environments
  (data or telecommunications centres, trading floors, hospitals, laboratories, power-sensitive processes, etc.)



PowerLogic ION Enterprise - overview

- Acts like a layer of intelligence on top of all energy assets
- Gives you reach across one or more facilities, campuses or service areas
- Gives you the tools to monitor, analyse and control your entire power network

Software architecture



Data presentation

- Data access through local server, thin-client web browser, or terminal services
- Tiered security
- Information and alerts via mobile phone, PDA and other devices

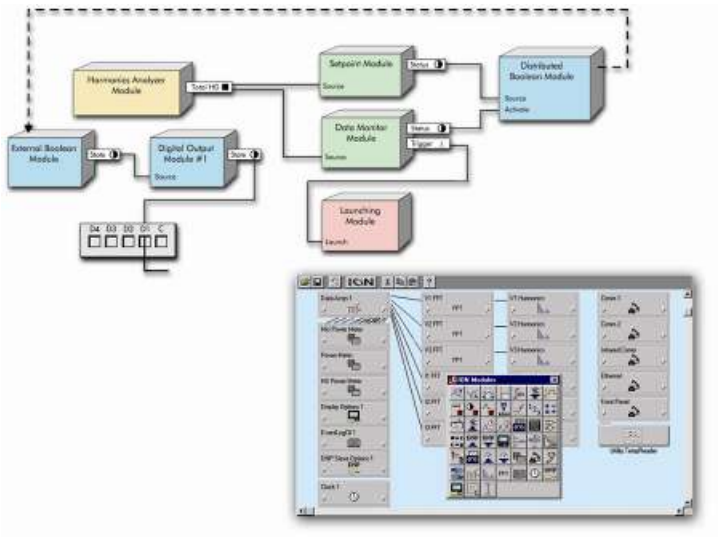
Functional components

- Management Console – network configuration
- Designer – modular device programming
- Vista – real-time data monitoring, analysis, control
- Web Reporter – predefined or custom reports

Data acquisition/management

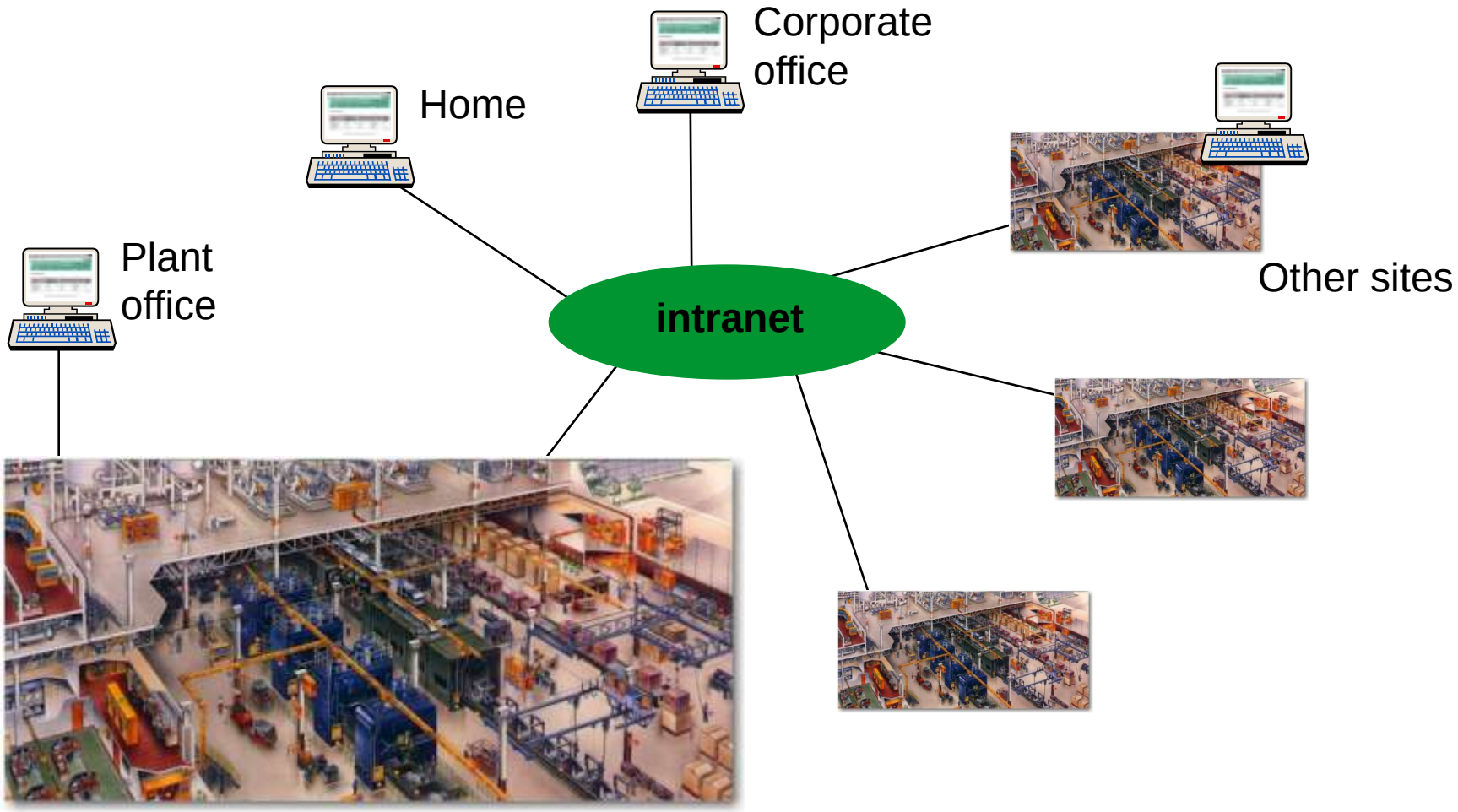
- Virtual Processor - aggregation, complex calculations and control
- Site Server – data acquisition (Internet, Ethernet, telephone, serial, wireless, satellite)
- SQL ODBC databases – device and system data, accurate timestamps,
- OPC DA Client and Server
- PQDIF Exporter

Patented ION technology



- PowerLogic ION Enterprise and many ION series metering products feature the unique ION architecture
- Modular, flexible architecture:
  - Extensive customisation of functionality
  - Uses simple “building block” approach
- Benefits:
  - Uniquely addresses advanced monitoring and control applications
  - Adapts to changing needs, avoiding obsolescence

Access to the Information you need from anywhere in the world



The Future - Enterprise Management

Who uses It ?

- Used by
  - Energy Management/Conservation
  - Accounting
  - Energy Trading Entities
  - Operations
  - Engineering
  - 3rd Party Consultants

PowerLogic ION EEM: Applications summary

Energy conservation

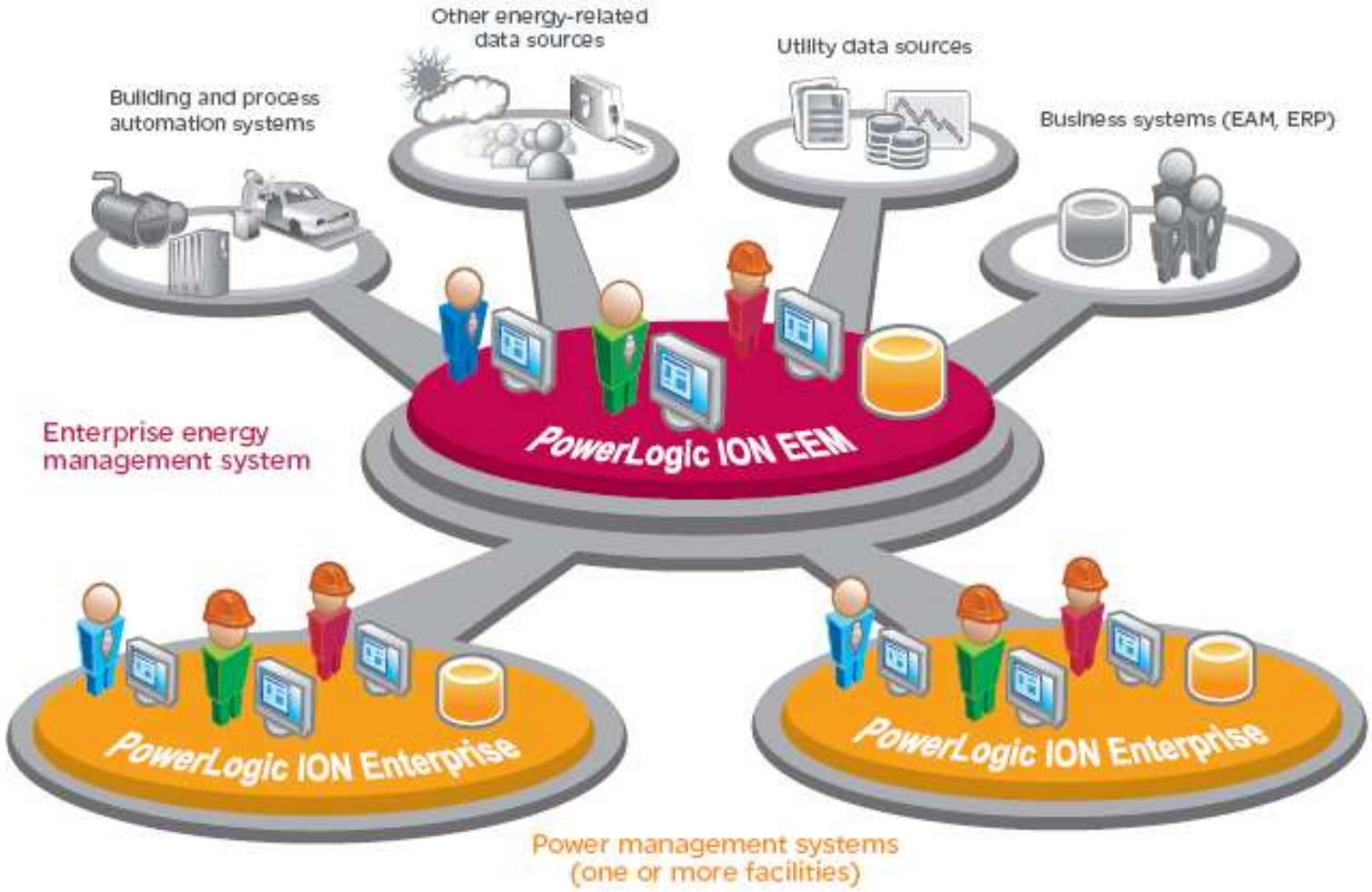
- **Allocate costs**
- **Bench mark & Rate modeling**
- **Identify energy savings opportunities**
- **Audit energy savings projects**
- **Track, normalize, and compare energy usage and costs**
- **Forecast energy usage and costs**
- **Drive energy awareness and behavior**

Environmental sustainability

- **GHG tracking and reporting**
- **Regulation Compliance Monitoring**

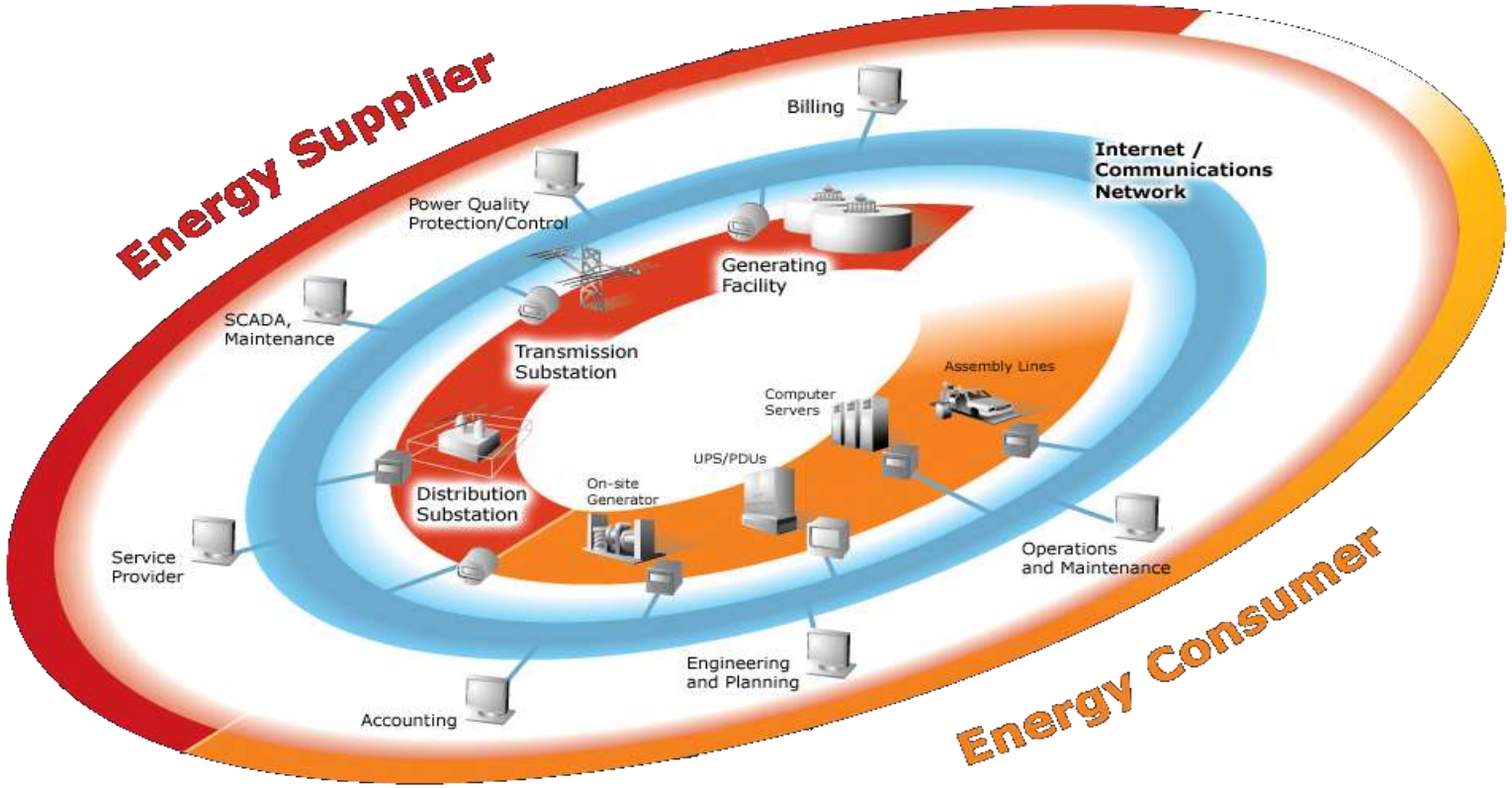
Operational optimization

- **Power quality event detection, analysis, and reporting**
- **Equipment & infrastructure troubleshooting and optimization**
- **Process efficiency maximization**
- **Infrastructure & equipment preventative maintenance**
- **Determine optimal run schedules for generation equipment**
- **Justify capital spending**
- **Analyze planned & unplanned downtime**


Other energy-related data sources
Utility data sources
Building and process automation systems
Business systems (EAM, ERP)
Enterprise energy management system
PowerLogic ION EEM
PowerLogic ION Enterprise
PowerLogic ION Enterprise
Power management systems (one or more facilities)

Serving the Supply & Consumer Sides

Our experience with both Energy Suppliers and Consumers means we know the Applications for Energy Management Solutions from a Utility Generator to the the Factory floor



Make the most of your energy

Thank You

Schneider Electric