Introduction of Power Solutions

Presented by: John Cheng and Ken Loh
Power Solutions Category Management

Power Solutions Offers

A POWER MANAGEMENT SYSTEM INVOLVES BOTH:

Energy Monitoring

+

Electrical System Monitoring

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Power Solutions Offer

Meters

Gateways

Software

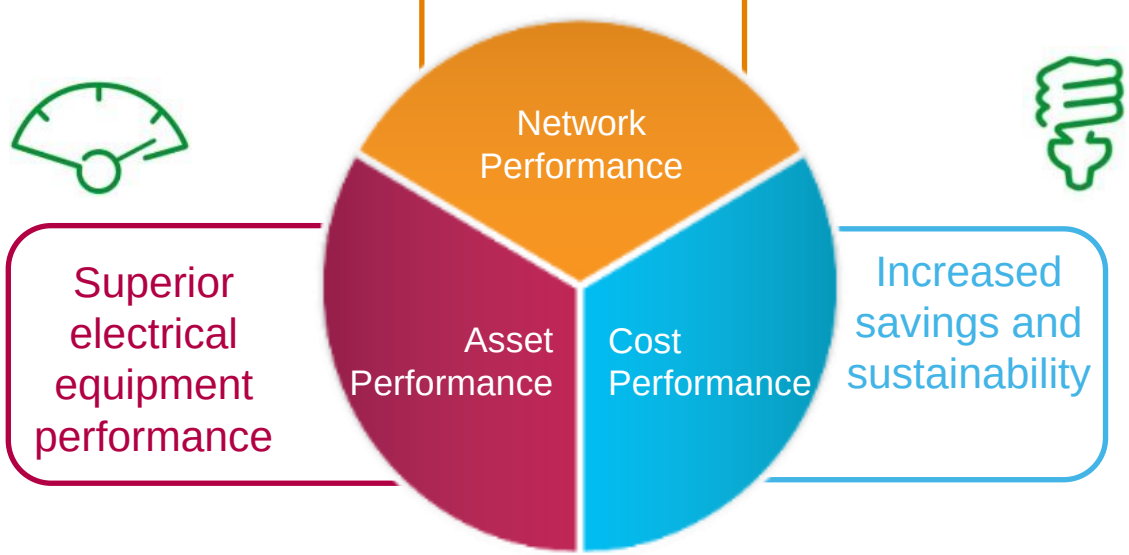
Power Factor

Core value propositions: how we can help

Maximize electrical reliability & uptime

Distribution & protection <
Power monitoring & control system <
Power quality analysis <

> Motor management & diagnostics
> Crisis management & recovery
> Source management



Optimize equipment performance

Asset Information <
Asset monitoring <
Asset use optimization <
Maintenance management <
Critical Asset management <

Increase energy savings and sustainability

> Cost allocation
> Energy usage optimization
> Energy cost optimization
> Green standard compliance

Life Is On Schneider Electric

Power Performance: Hardware Ranges

Cost Performance

Network Performance

Asset Performance

Partner Led Via Panel Builders

End User Led Via Specifiers/Consultants


PowerTag


NSX PowerTag



iEM2000 / iEM3000


PM2000


PM3000


PM5000


PM8000


ION9000


ION7400


ION8650


ION8800


IM10/20


IM400

Basic Metering

Advanced Metering

Utility Metering

Insulation Monitoring


Com'X

Gateways & Energy Servers


Link150

EasyLogic Range: DM1000/DM3000/DM6000

Discover

EasyLogic DM1000/DM3000/DM6000

Buildings Industry

Customer Profile:

Customer needs

EasyLogic DM1000/DM3000/DM6000 series meters are ideal for helping improve:

- Monitoring of small electrical distribution panels
- Monitoring and verification of Genset panels

Key influencers

Panel builders, Electrical contractors, Installers

Unique Value Propositions:

Customers

Cost-effective replacement for out-dated analog meters (one 3-phase meter can replace three analog meters)

Measures multiple power system parameters (Volts, Amps and Frequency). Performs auto-scaling.

Panel builders, electrical contractors, installers

Compact for ease of installation in panels.

Save on installation time, cost, and space. Reduce your installation and commissioning costs due to efficient design

EasyLogic PM2000

Discover
EasyLogic PM2000

Buildings Industry

Customer Profile:

Customer needs

EasyLogic PM2000 series meters are ideal for helping improve:

- Electrical installation remote monitoring
- Energy accounting and balancing
- Tenant and sub-billing (where local regulation do not apply)
- Panel Instrumentation
- Energy management

Key influencers

Energy Managers, Facility Managers

Unique Value Propositions:
Customers and Integrator

Measures power and energy parameters. Detect abnormalities with min/ max events. Analyze power quality

Measure, understand, and act on insightful data gathered from your entire power system.

PowerLogic PM3000

Discover

PowerLogic PM3000 Series

Commercial Buildings | Hotels | Healthcare | Green buildings | Data centers & networks | Industry

Customer needs

PowerLogic PM3000 series meters are ideal for helping improve:

- Network Reliability
- Energy Consumption & Efficiency
- Cost allocation
- Sub-billing/Tenant metering
- Green building compliance

Key influencers

Facility managers, electrical contractors, panel builders, and distributors

Unique Value Propositions:

Customers

Cost-attractive, feature-rich metering offer, ideal for helping customers better understand the true condition of their electrical installations

System Integrator /EcoXpert

Save on installation time, cost, and space. Integrate safely and commission with ease.

PowerLogic iEM3000 Series

Discover

PowerLogic iEM3000 Series

Commercial Buildings | Cloud and telecom | Transportation | Green buildings | Data centres & networks | Industry

Customer needs

PowerLogic iEM3000 series meters are ideal for helping improve:

- Cost allocation, including WAGES
- Sub-billing/Tenant metering
- Green building compliance
- Network monitoring

Key influencers

Panel builders, Electrical contractors, Installers

Unique Value Propositions:

Customers

> Cost-attractive, feature-rich, energy-metering offer ideal for helping your customers' installations become more energy efficient

System Integrator /EcoXpert

> Reduce your installation and commissioning costs due to efficient design

PowerLogic PM5000 series

Discover

PowerLogic PM5000 Series

Commercial Buildings | Hotels | Retail | Green buildings | Data centres & networks | Industry

Customer needs

PowerLogic PM5000 series meters are ideal for helping improve:

- Cost allocation
- Sub-billing/Tenant metering
- Green building compliance
- Network monitoring

Key influencers

Facility managers, electrical contractors, consultants

Unique Value Propositions:

Customers

Best balance between cost and network management features with the right connectivity at an affordable price

System Integrator /EcoXpert

Easy to install, use and connect offer with the right connectivity and affordable price

PowerLogic PM8000

Discover

PowerLogic PM8000

Healthcare | Data centres & networks | Buildings | Industry | Energy & Infrastructure

Customer Profile:

Customer needs

PowerLogic PM8000 series meters are ideal for helping improve:

- Power availability and reliability
- Electrical distribution monitoring & maintenance
- Financial performance

Key influencers

Energy Managers, Facility Managers

Unique Value Propositions:

Customers and System Integrator /EcoXpert

Reveal and understand complex power quality conditions.

Measure, understand, and act on insightful data gathered from your entire power system.

PowerLogic ION9000

- **World's most accurate meter, at Class 0.1S**
- **Cyber security ready**
- **Onboard power quality analysis**
- **Smart power event analysis**
- **Unique, patented ION programmability**

Healthcare | Data centres & networks | Buildings | Industry | Energy & infrastructure

Customer Profile:

Customer needs

Mains and critical circuit metering from a power quality meter that helps improve:

- Power quality, reliability, & availability
- Electrical distribution monitoring & maintenance
- Energy cost performance

Key influencers

Energy Managers, Facility Managers

Unique Value Propositions:

Customers and System Integrators / EcoXpert

Reveal and understand complex power quality conditions.

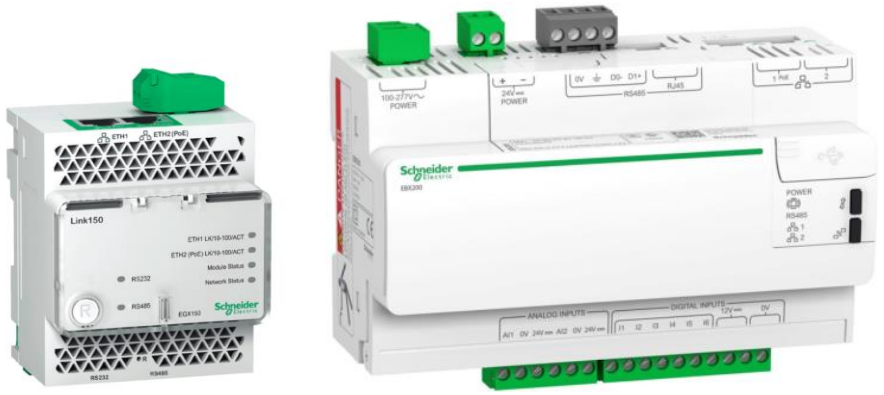
Measure, understand, and act on insightful data gathered from your entire power system.

Gateways & Energy Servers

What’s in the offer

> Com’X 200 / 510

> Link 150



Key features

Data loggers and gateways help measured data reach the power monitoring software for analyses. They are fundamental components in most power and energy management system architectures.

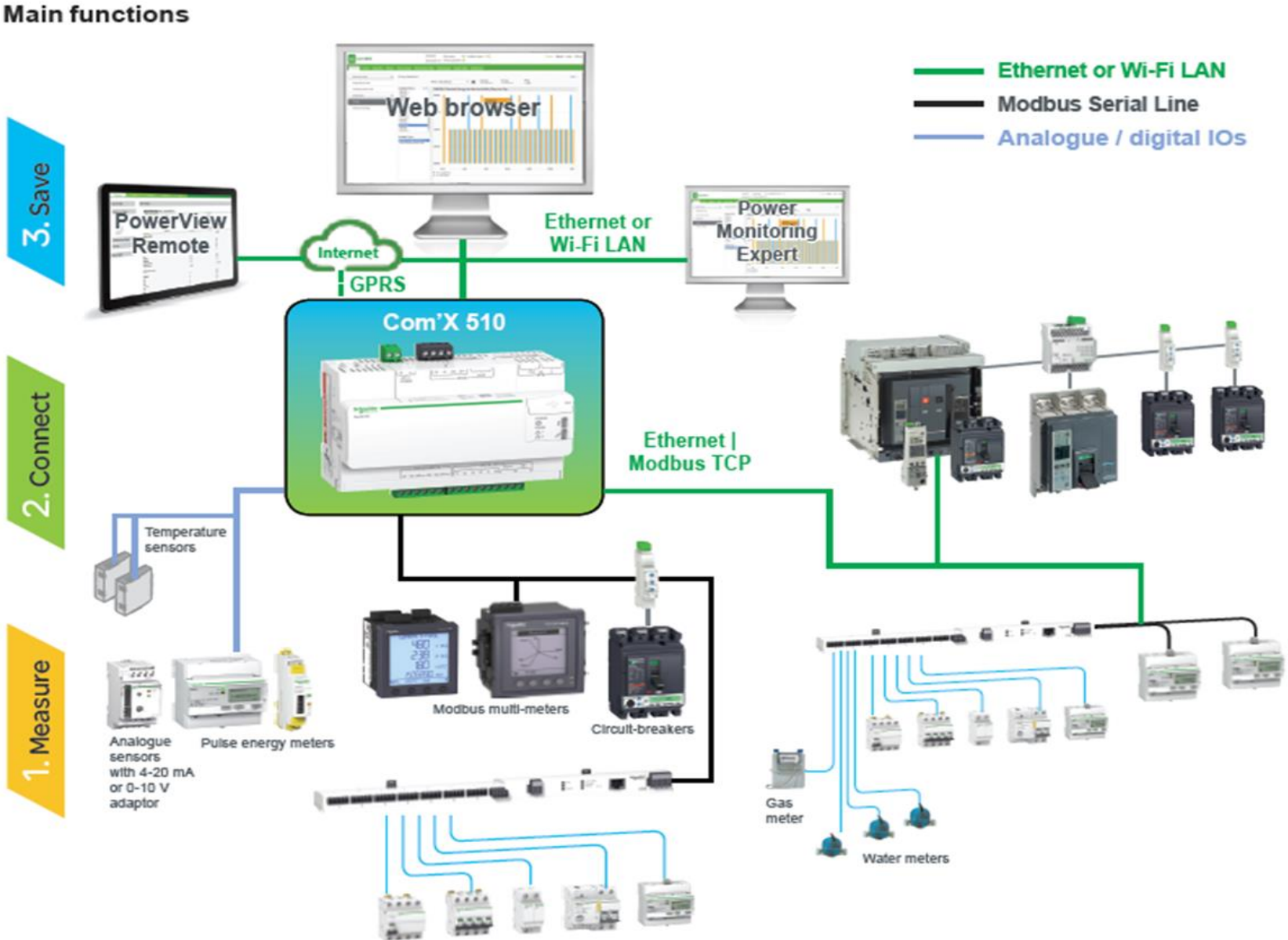
>Ethernet gateway (Link 150)

>Embedded energy management software (Com’X 510)

>GPRS, WiFi, Ethernet access to the web (Com’X200)

Architecture – Main Functions | Com'X 510 and Link 150

Gateways and Energy Servers Portfolio



Vigilohm Insulation Monitoring

Discover

Vigilohm Insulation Monitoring Devices

Healthcare | Marine | Industry | Energy & infrastructure | Photovoltaic

Customer Profile:

Customer needs

> IT Ungrounded Networks are needed in order to:

- Improve Energy Availability
- Improve Safety on the Network, prevent fire or explosion
- Ease Maintenance, save on OPEX

> Vigilohm is required on IT Ungrounded Networks:

- Insulation Monitoring Device is mandatory/highly recommended as per the Standards
- Customers need expertise and support because of limited knowledge on IT networks

Key influencers

Solution Architects, Design offices, End-Users

Unique Value Propositions:

- Simple and Reliable offer
- Applicable in all IT networks, Compliant with segments' needs and compatible with other SE products
- Measure, understand and act on insightful data gathered by the Vigilohm modules (Insulation Monitor and Insulation Fault Locators)

Wireless Metering – Retrofit Range

Discover

Power Monitoring & Gateways for Retrofit

is a portfolio of devices that allows improvements:

- Reduce the design cycle
- Reduce the installation and commissioning time
- Enlarge energy management possibilities
- Reduce decision cycle
- Adapt the solution to the customer need/budget

Short Range Wireless Meter
EM4300 Zigbee Meter

Long Range Wireless Meter
WT41XX/42XX Serial RF Device

Building Management
SSL

Data Logging / Energy Server
Com'X200/210/510

Utility Metering range

What's in the offer

> ION8650:

> ION8800:

Key features & Key Applications

>Power Quality Management

-Harmonics, Sag/Swell, Unbalances, Flicker, Transients, Sequence of events recording.

-Power Quality Compliance Reporting (EN50160, IEC61000 4-30)

>Root cause analysis, Network Protection/Monitoring

-Transient Detection & Waveform Capture

-Disturbance direction detection

-Programmable Logic, Alarming & Control

>Revenue metering

-Energy accuracy (Class S)

-Multi-tariff , time of use

-On board energy logging

-Multi-Protocol & Multi-Port ;ION, DNP 3.0, Modbus RTU, Modbus TCP, IEC 61850, Modbus Master, MV-90, DLMS

Power Performance: Power Quality Offers

Cost Performance

Network Performance

Asset Performance

Partner Led Via Panel Builders

End User Led Via Specifiers/Consultants

LV Component Offer Kits
Optimum and Medium

LV Components
Optimum and Medium

LV & MV Equipment
VarSet, VarSet Easy, MEB
Local Offers & Modules

Active Correction
AccuSine PCS+/PFV+/PCSn

LV Components	LV Component Kits	Equipment	Active Correction

VarPlus Range of PFC LV Components

Discover

VarPlus Range of PFC LV Components

Capacitors

VarPlus Can

VarPlus Box

Detuned Reactors

VarPlus DR

PFC Controller

VarPlus Logic

Customer Profile:

Customer needs

VarPlus range of LV Components provide the immediate savings through power factor correction with its high performance and flexible offer basket

- Reduced capital expenses & Energy losses
- Reduced reactive energy billing penalties and lower operating expenses
- Improved reliability and performance

-Key influencers

Energy managers, Consulting Engineers, Panel builders, Utilities

Unique Value Proposition:

VarPlus range of PFC Components are engineered to work with stringent network conditions. Its wide range and compactness makes it easy to use for panel builders and contractors. Long life of VarPlus Can gives the better return of investments apart from its contribution for energy efficiency and carbon footprint reduction. VarPlus logic controller is the best in the segment providing the most intelligent control with real time capacitor power measurement and display. The entire range is tested and validated in all Schneider solutions like Prisma, Blokset & Okken

Easy Range of PFC LV Components

Discover

Easy Range of PFC LV Components

Local Panel Builder

Capacitors

EasyCan

PFC Controller

Varlogic RT

Customer Profile:

Customer needs

EasyCan range is an easy choice for energy efficiency . This range helps the customers to improve their power factor correction to add savings in their energy bill . Apart from this customers will be benefited with

- Reduced capital expenses & Energy losses
- Lower operating expenses
- Easy to operate and maintain.

-Key influencers

Energy managers, Consulting Engineers, Panel builders, Utilities

Unique Value Proposition:

- Schneider electric quality at a great price
- Type tested as per IEC standards
- Performance you need
- Easy integration with other Schneider components to build the equipment

Defend your local competition with EasyCan range of products

Varset and Varset Easy Range

Discover

VarSet and VarSet Easy

Industry

Buildings

Customer Profile:

Customer needs

VarSet range is the easiest solution for energy efficiency and low electricity cost with :

- Reduced capital expenses
- Reduced reactive energy billing penalties and lower operating expenses
- Reduced energy losses
- Improved reliability

Key influencers

Energy managers, Consulting Engineers

Unique Value Proposition:

VarSet low voltage capacitor bank is a complete range of high quality power factor correction solutions engineered to compensate reactive power and harmonic distortion. These are easy and flexible solutions that can immediately boost your facility's energy efficiency and productivity. Thanks to VarSet, your power factor is maintained at an ideal level for optimum power system efficiency and cost reduction.

Accusine PCS+

Discover
AccuSine PCS+

Industry

Customer Profile:

Customer needs

AccuSine PCS+ active harmonic filters are ideal for helping improve:

- Power availability, quality, and reliability
- Financial performance

Key influencers

Energy Managers, Facility Managers, Consulting Engineers

Unique Value Propositions:

Customers and System Integrator

AccuSine PCS+ is a flexible, high performance, cost-effective solution to stabilize electrical networks by providing harmonic filtering, power factor correction and load balancing.

>Compliance to all harmonic standards

>Only harmonic filter in the world to have THD(I) or THD(V) setpoints

Accusine PFV+

Discover
AccuSine PFV+

Industry | Renewable Energy | Data centers & networks

Customer Profile:

Customer needs

AccuSine PFV+ electronic VAR control systems help improve:

- Power availability, quality, and reliability
- Financial performance

Key influencers

Energy Managers, Facility Managers, Consulting Engineers

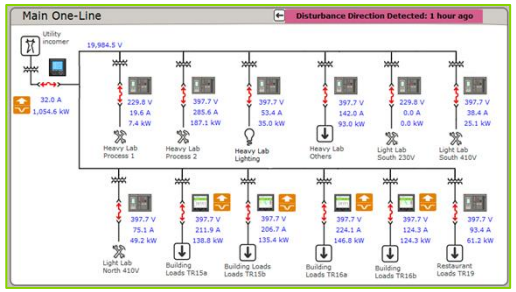
Unique Value Propositions:

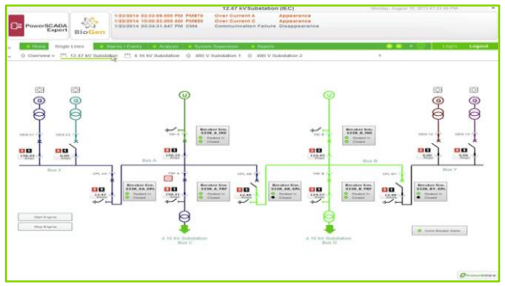
Customers and System Integrator

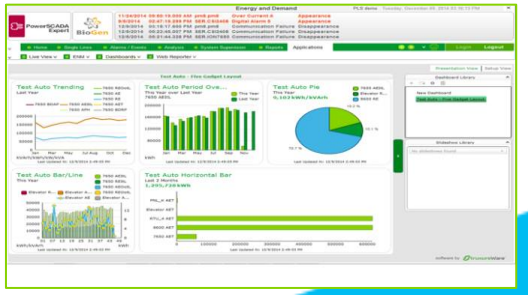
AccuSine PFV+ provides high speed dynamic power factor correction and load balancing of electrical networks with lagging or leading power factors. The Volt-VAR voltage regulation feature is unique in a standard package.

Power Performance: Software Ranges

- Cost Performance
- Network Performance
- Asset Performance







Energy Expert

Support Services

Power Monitoring Expert

Support Services

PowerSCADA Expert
+ Advanced Reporting

Support Services

Available Software Modules

Each Module is a Part Number

Efficiency and Compliance

Energy Analysis Reports Module:

- Improve Operational Efficiency, Energy Performance and help achieve ISO50001 compliance

Energy Analysis Dashboards Module:

- Advance analysis and visualization gadgets. Sankey, heatmap/carpet, pareto and ranking.

Energy Billing Module:

- Flexible rate engine and reports for cost allocation, bill verification and tenant billing.

Reliability and Safety

Power Quality Performance Module:

- Simple, global overview of the impact of power quality on your facility's operations

Capacity Management Module:

- Monitor the capacity loading of electrical equipment (UPS, Generators, multi-circuits)

Insulation Monitoring Module:

- Monitor insulation levels for power Isolated panels (IEC and ANSI)

Event Notification Module:

- Receive text or email notifications when power system events occur.

Asset Compliance and Reliability

Breaker Performance Module:

- Breaker status diagrams and reports including electrical ageing and mechanical wear, for proactive maintenance

Backup Power Module:

- Monitor the parameters of your generator

Software Modules

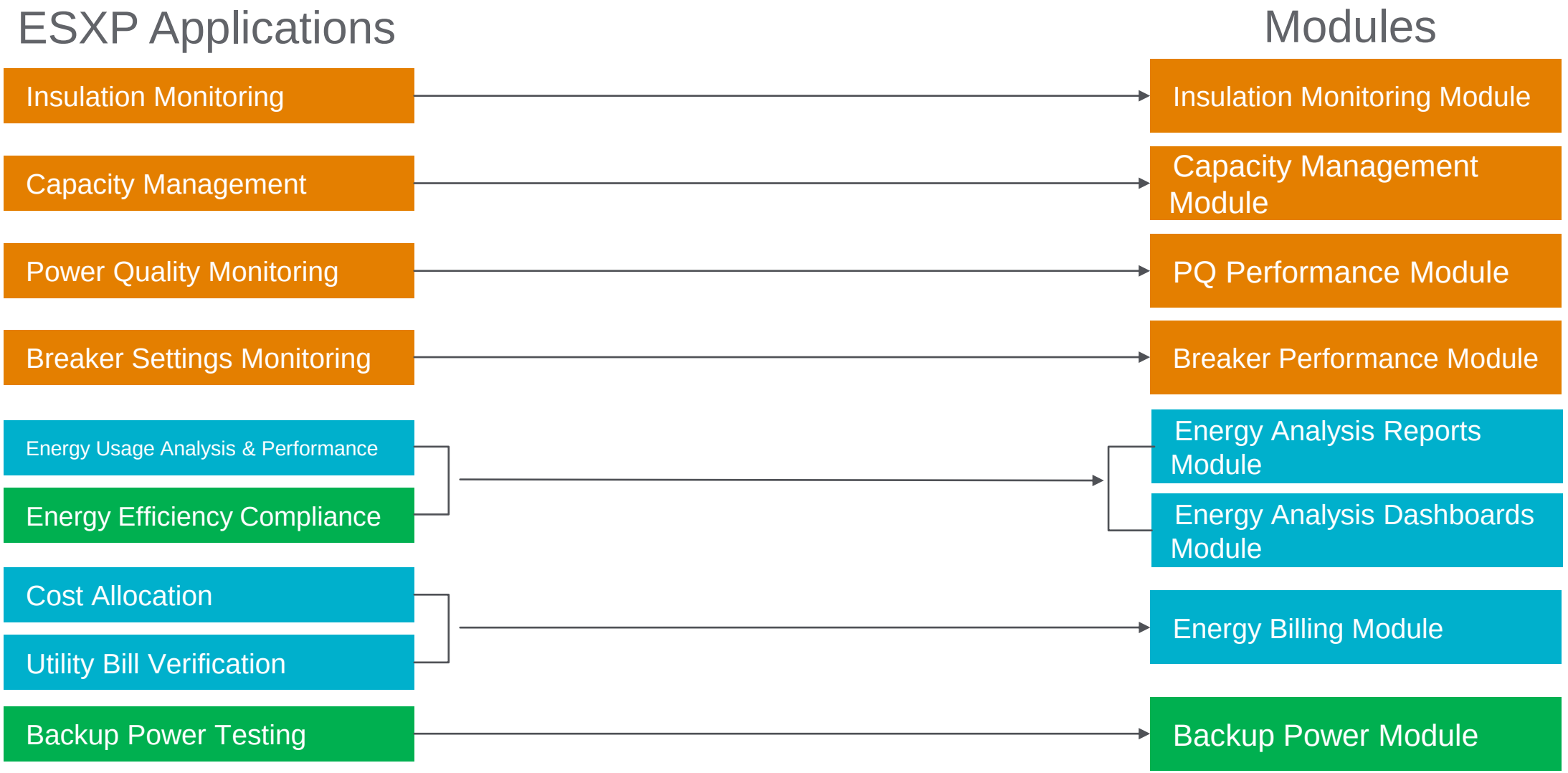
Commercial Updates

Modules are being restructured to provide more value and be more aligned with the EcoStruxure Power Applications:

EcoStruxure Application	PME 8.2 Modules	PME 9.0 Module
Insulation Monitoring	OT Interface included in PME4HC base	Insulation Monitoring Module
Capacity Management	• Power Capacity Module • Power Efficiency Module • Generator Performance Module*	Capacity Management Module
Backup Power Testing	• EPSS • Generator Performance • UPS Performance	Backup Power Module
Cost Allocation	• Energy Billing Module • IT Billing Module	Energy Billing Module
Bill Verification	Energy Billing Module	

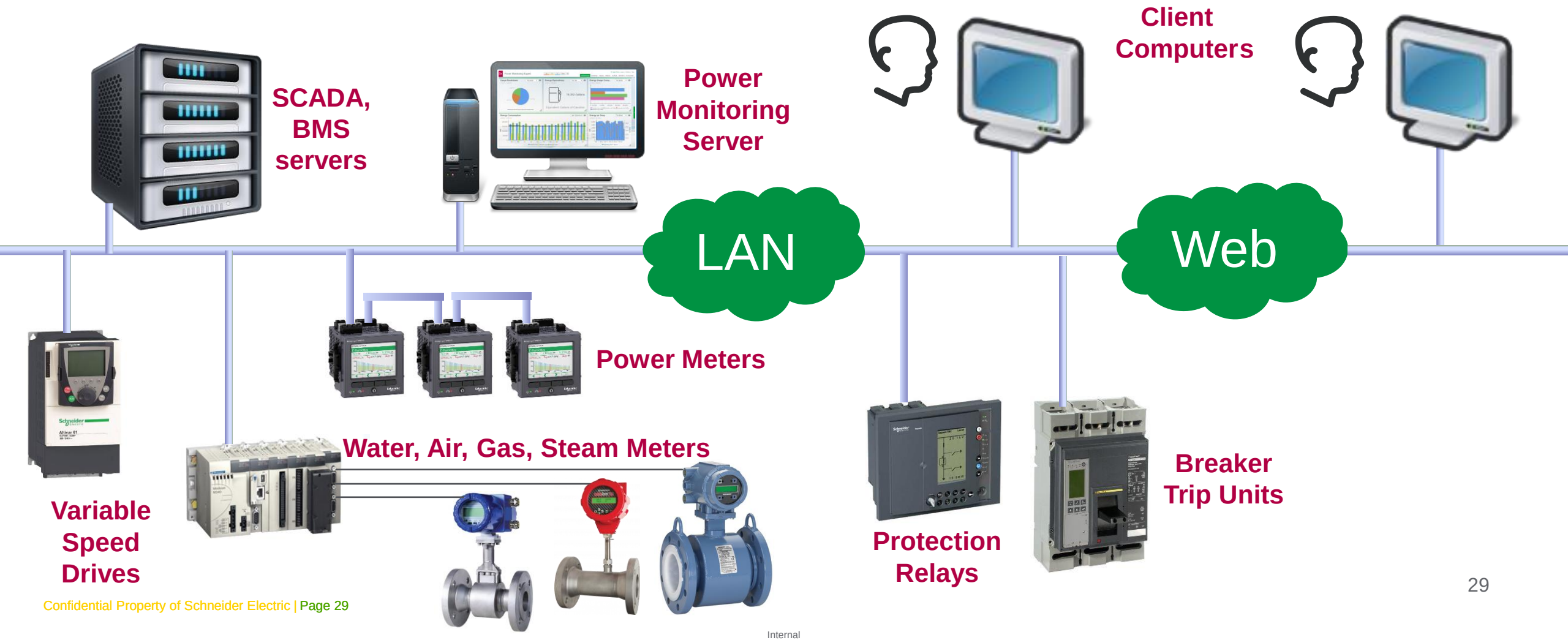
*Existing functionality will be honored during upgrades

Software Modules vs EcoStruxure Power Applications



Simple System Architecture

Power Monitoring Expert has a **simple architecture**



Did you know?

25% of power management systems have outdated configurations that put monitoring and control of the network at risk

10-15% of devices in the typical power management system are nearing end of their supported lifecycle

>15% of facilities are operating with problematic power quality conditions, which could lead to equipment damage and unplanned downtime

For facility managers with large and critical power facilities, **EcoStruxure Power Advisor** delivers optimized system **performance** and power **reliability** through advanced analytics and expert services.

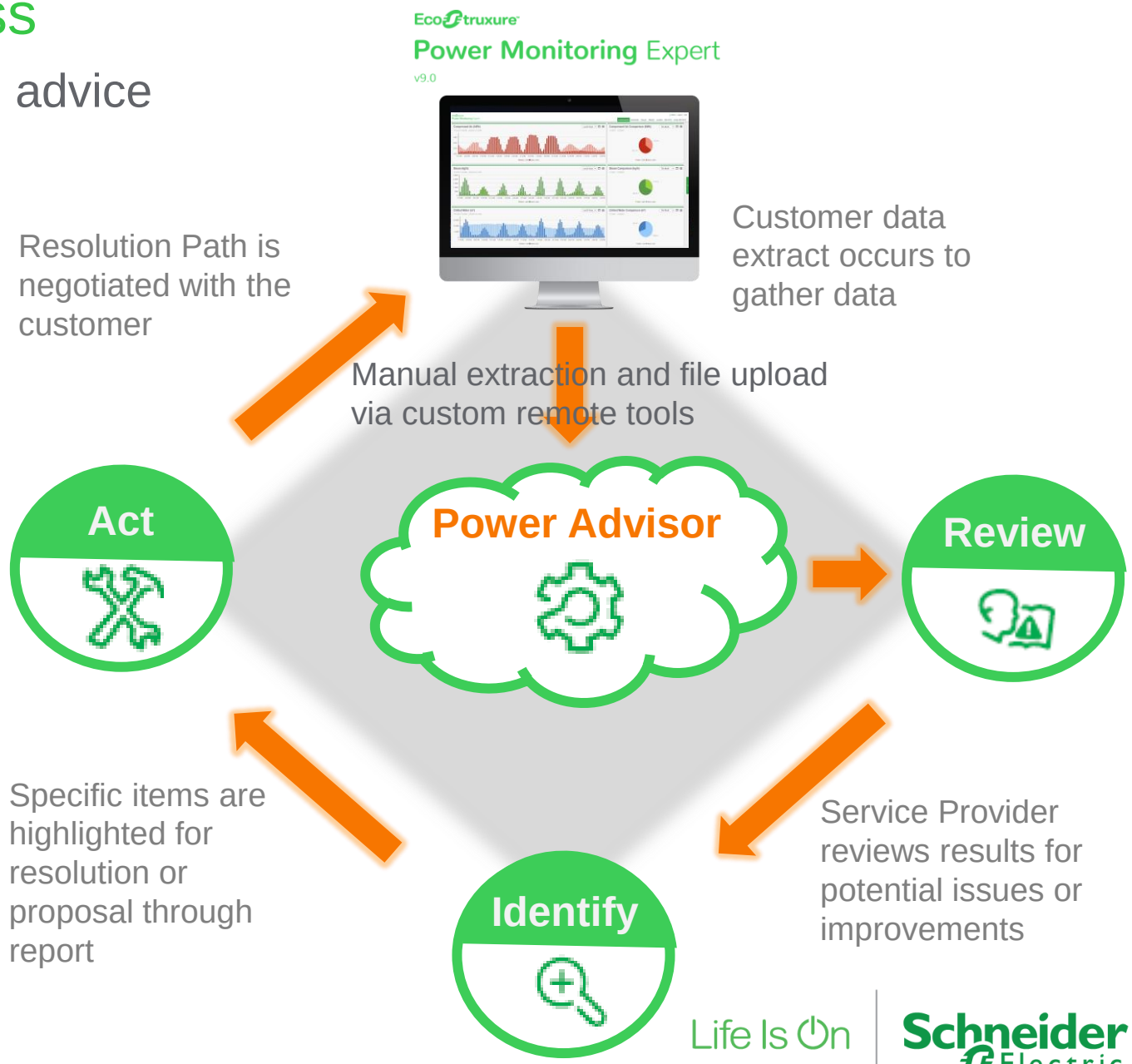
EcoStruxure Power Advisor Process

How customer information becomes trusted advice

1. **Review** all of the data obtained on the customer system for analysis

2. **Identify** problem points generated by the report

3. **Act** with the customer to provide a recommended solution and system improvement



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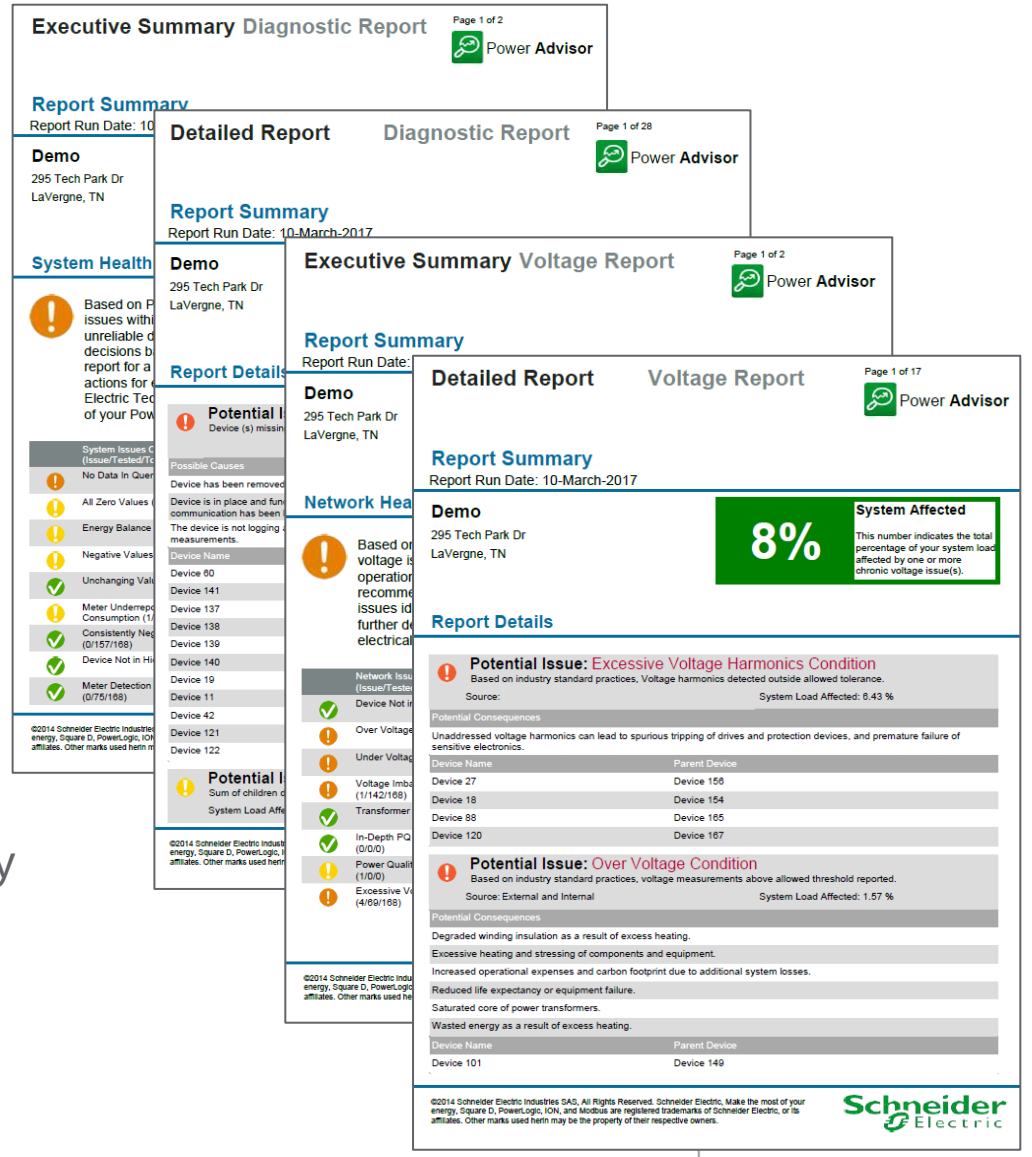
EcoStruxure Power Advisor

Introduction and Core Benefits

- Cloud based analytics and service tool
- Provides in depth analysis and assessment relating to system and network diagnostics
- Identifies potential issues such as:
  - Data Quality Issues (Gaps, Zero Values, Mismatched Intervals)
  - Unmetered loads / Obsolete metering
  - Energy Balance violations / Meters under reporting
  - Chronic power quality issues (ex. Voltage imbalance, harmonics)
- When used in conjunction with on-site maintenance it ensures highly focused productivity for on-site maintenance from identification of a problem to clear resolution.
- All results produced with actionable Executive and Detailed Reports



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How we address your needs

Meeting customer needs by fulfilling value propositions

What Should an Energy Management System Provide?

- Energy Cost Management
- Energy Use Optimization
- Utility Service Verification
- Capacity Management
- Downtime Avoidance
- Equipment Performance

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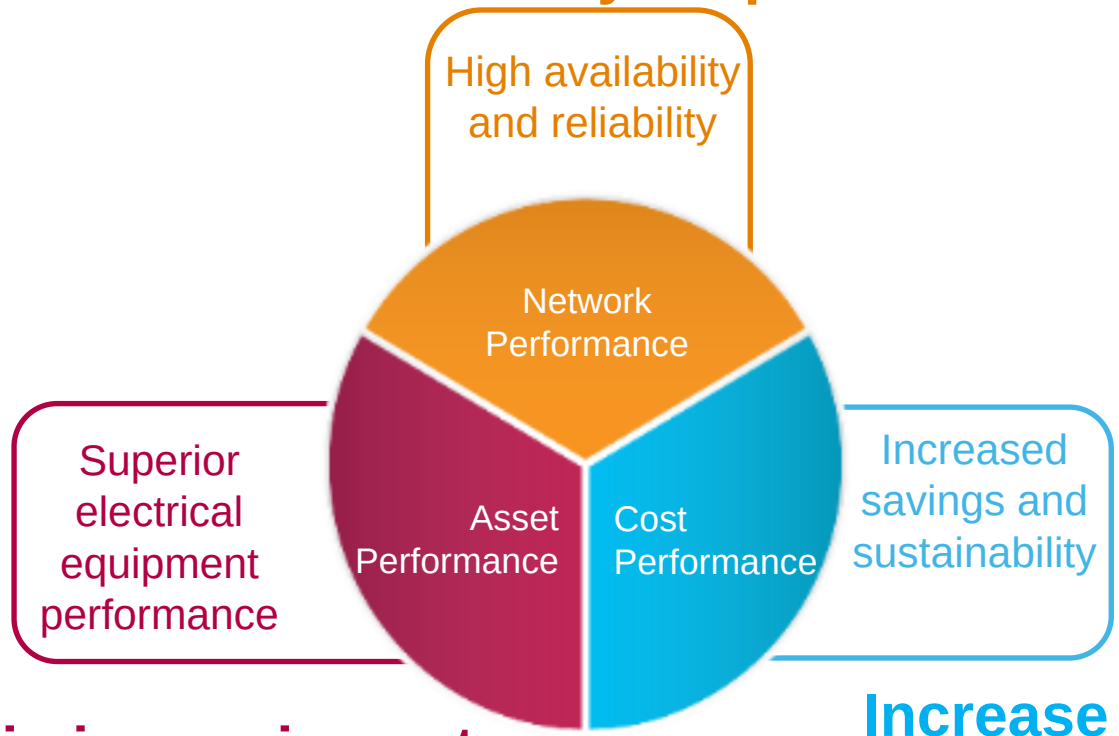
Solutions that provide ROI on power management

Maximize electrical reliability & uptime



Optimize equipment performance

Increase energy savings and sustainability

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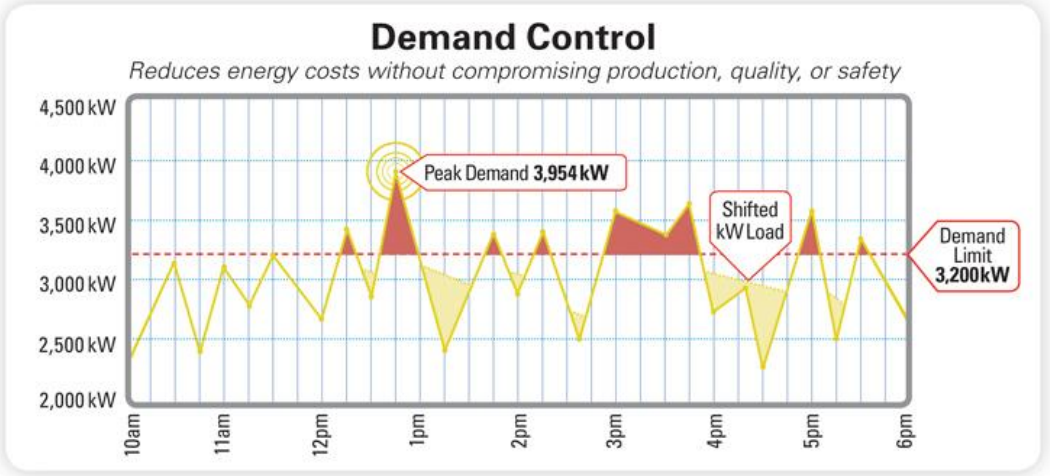
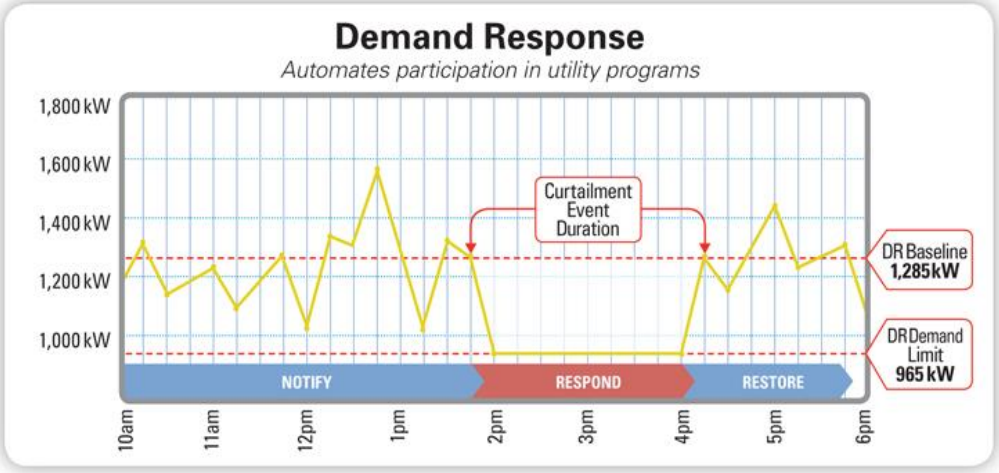
Energy Cost Management - Understand utility rate schedules and actively reduce energy spend

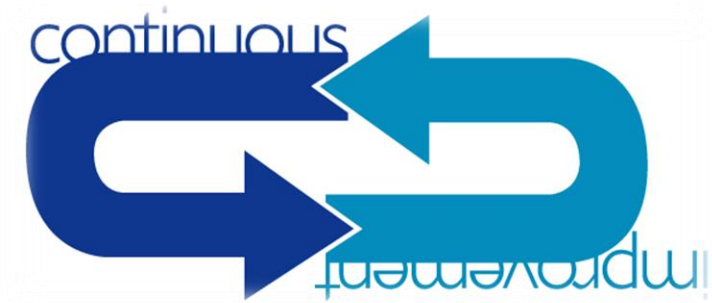
- **Demand Control**
  - Intelligent Process Automation
  - Adjust operations to reduce peak demand
- **Demand Response**
  - Load shedding as part of a utility program
- **Power Factor Correction**
  - VarSet Capacitor Banks at common point of coupling
- **Operate according to cost of energy**
  - Consider utility rate rules like Time of Use (TOU)
- **Actively respond to "energy alarms"**
  - Monitor for unusual energy events
  - Find problems quickly and minimize energy waste





Energy Use Optimization - Continuously track energy and adjust operations to be more efficient

- **Baseline energy usage throughout the facility and compare processes**
  - Determine current energy usage patterns
- **Set energy reduction targets and KPIs**
  - Track energy usage against baselines
- **Adjust operations for continuous efficiency improvements**
  - Measure efficiency improvements and show savings



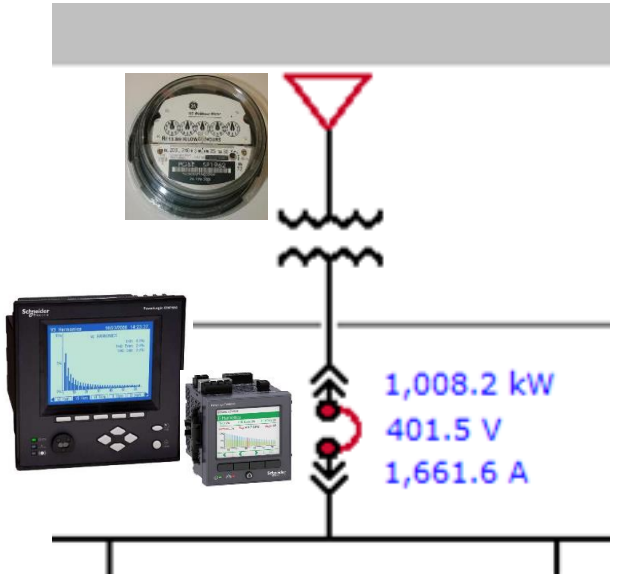
Utility Service Verification - Validate electrical service for compliance, accuracy and quality

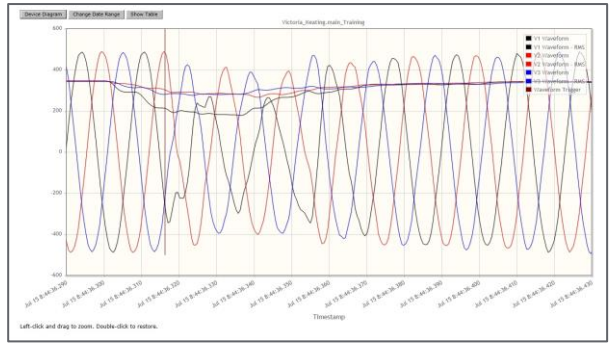
- **Utility companies make billing mistakes**
  - If you don't check your bills - you will pay for it!
- **Check for discrepancies and verify your bills are correct**
  - Install a utility-grade power meter to audit the electrical utility meter
  - Install power monitoring software to collect billing data
  - Conduct "shadow billing" and verify your bills are correct


Schneider Electric
Machine Shop Monthly Energy Cost

Utility Service Verification - Validate electrical service for compliance, accuracy and quality

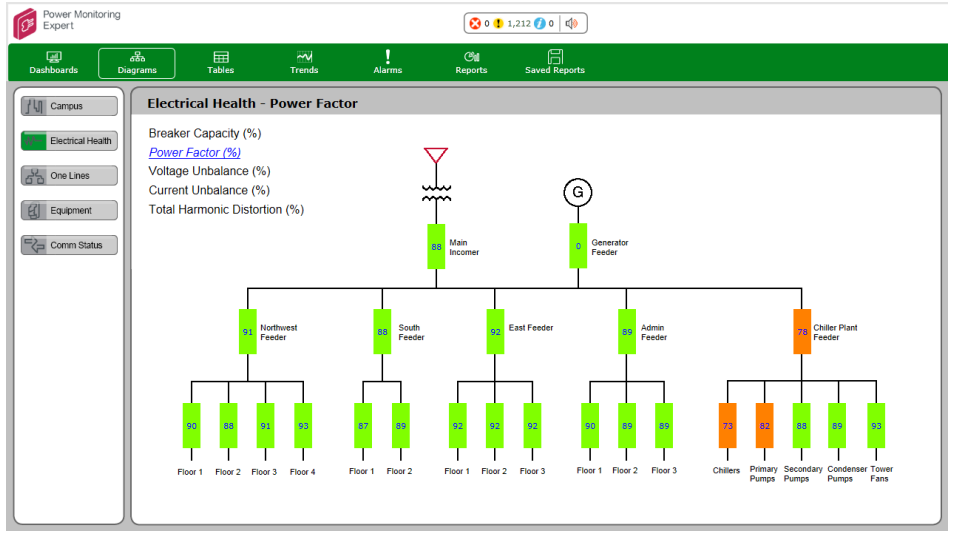
- **Audit the quality of power that is delivered to your facility**
  - Install a utility-grade power quality meter at the point of common coupling
- **Determine when your utility is serving you dirty power**
  - Capture high speed electrical disturbances that come into your facility
  - Provide proof that the issues are caused by the utility and not your facility
- **Challenge your utility to provide higher quality power**
  - Be in a stronger negotiating position, armed with information
  - Improve the relationship with your utility service rep





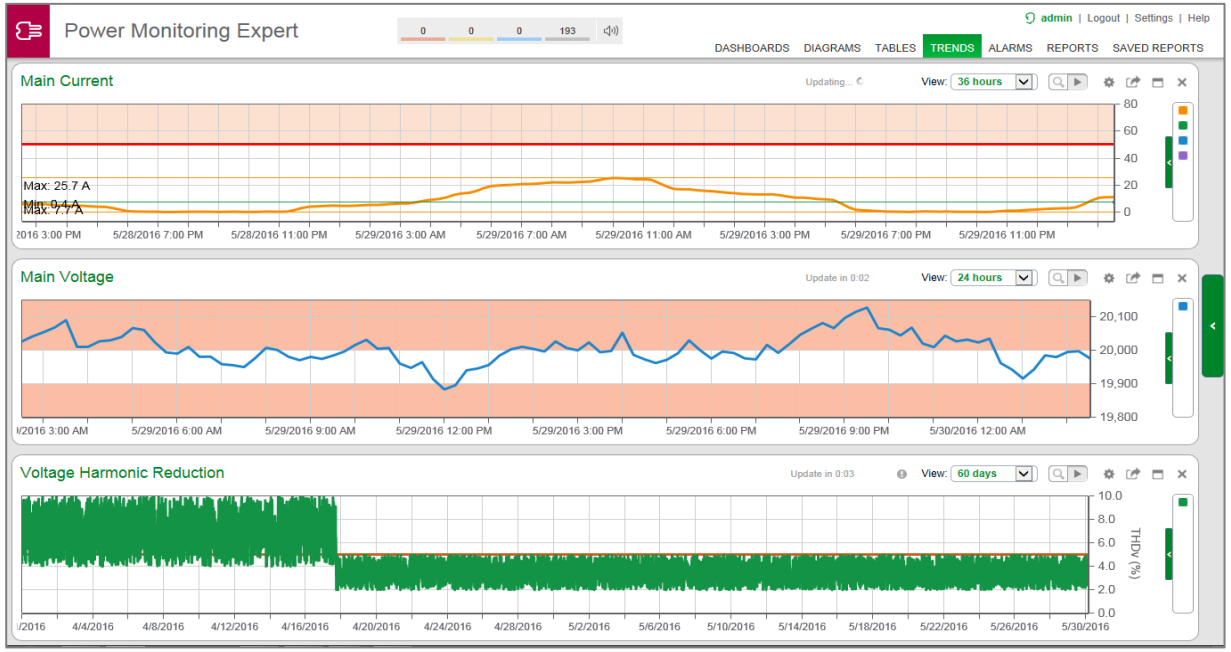
Capacity Management - Reconfigure loads with confidence & expand with less risk and cost

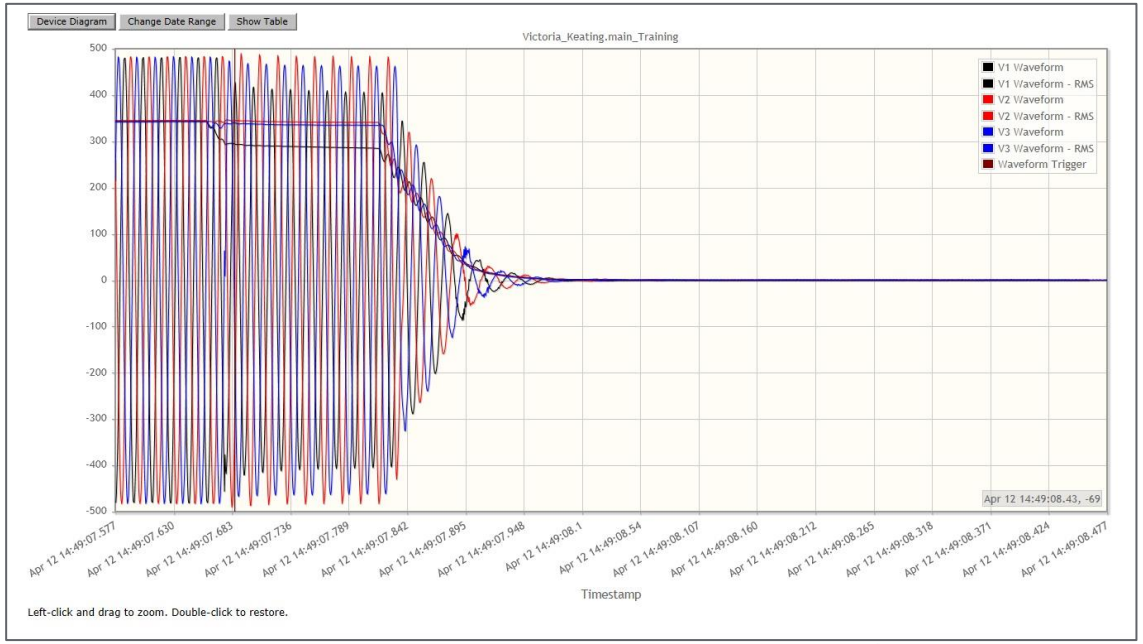
- **Monitor load levels over time so that existing electrical infrastructure is optimised**
  - Monitor for heavily loaded circuits and avoid breaker tripping and downtime
  - Identify under utilized circuits and make better use of them
  - Conduct efficient adaptation and expansion projects with confidence using real “circuit loading” data
  - Prevent “over building” and save large project dollars



Downtime Avoidance - Diagnose electrical disturbances and maintain a healthy power system

- **Use historical data and captured events to diagnose electrical problems**
  - Capture high speed voltage disturbances, detect ground faults, identify harmonics and find faulty equipment
  - Avoid outages, reduce nuisance trips and prevent equipment damage



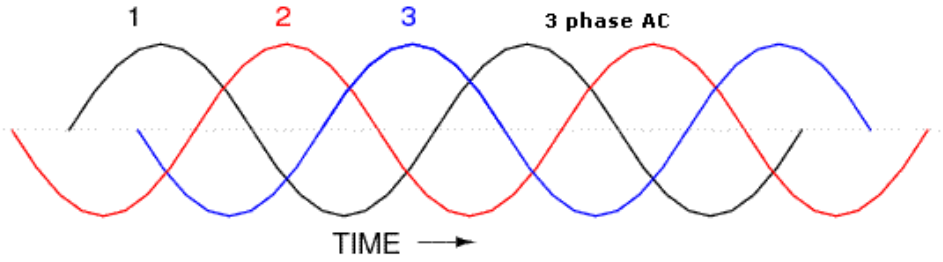


Equipment Performance - Reduce degradation, interruption, malfunction & failure of equipment

- **Electrically powered equipment can be adversely affected by low quality power:**
  - Phase unbalance
  - Inrush current levels
  - Frequency fluctuations
  - Sudden changes in voltage
  - High harmonic distortion
  - Poor grounding and ground current loops

Good Power Quality

3 phase electrical power has unique characteristics that must be maintained and continuously delivered in order to provide efficient, effective and safe energy.



Questions and Answers