Active Energy Management Architecture from Power Plant to Plug

Data Centres • Industrial Plants • Buildings • Energy & Infrastructure
How do you achieve enterprise-wide energy savings of up to 30%?

With EcoStruxure architecture. Only from Schneider Electric, the global specialist in energy management™.

EcoStruxure™ system architecture enables the convergence of five key domains of our expertise: management of Power, Process & Machine, IT Room, Building, and Security. It acts as a solution ecosystem, delivering guaranteed compatibility across key application areas and leveraging open standards across both Schneider Electric™ and third-party offers. EcoStruxure takes multiple, siloed systems and adapts them to an integrated solution, reducing redundancy in equipment, software, and personnel. It is the only comprehensive, integrated approach designed for the reality of the digital economy.

EcoStruxure energy management solutions

Get on the path to permanent enterprise efficiency

As the global community unites to fix the CO₂ mistakes of the last 50 years in the next 10, Schneider Electric has a clear view of the energy challenge: we need new solutions, new thinking, and new companies to lead us into an era in which we can truly do much more while consuming much less.

The next step in energy management

The solutions to the energy challenge are multiple and complex. In most cases, they rely on a stronger and more efficient collaboration between the key stakeholders, including facility and security managers, IT managers, and machine or production managers. Requisite levels of business efficiency involve system dynamics across platforms and providers like never before.

Real solutions, immediate benefits

The Schneider Electric response to today’s energy challenge is EcoStruxure: Active Energy Management Architecture from Power Plant to Plug™.

EcoStruxure is not a product but rather an approach that creates intelligent energy management systems. EcoStruxure system architecture allows you to see, measure, and manage energy use across your Data Centres, Industrial Plants, Buildings, and Energy & Infrastructure with guaranteed compatibility among your critical energy domains.

And because EcoStruxure integrated system architecture is scalable and can be applied to both retrofits and new construction, you can achieve up to 30 per cent savings on capital and operational expenses across your entire enterprise, starting today.

ROI improves as energy prices rise

Current conditions create a good time to invest in energy efficiency. Your efficiency goals of the future are achievable today with integrated energy management architecture.


Payback time decreased 25% over 5 years.
And with good reason. Energy demand is expected to double by 2050, and some experts forecast the energy demand of the machine-to-machine Internet to be 100-times greater than the current human-to-human network. We are learning the hard way that the earth’s energy generation capacity is finite. You don’t have to be a scientist or economist to recognize the simple outlook for energy supply and demand. Simply put, energy is expensive today and it promises to become even more costly in the future.

What is an Efficient Enterprise?
As energy demands escalate from all aspects of commerce and culture, the most acute pain point is that due to intrinsic inefficiencies, 33 units of energy consumed at the point of use require 100 units of primary energy (the coal required to supply that energy unit)*. It follows that the war on waste – a focus on ‘negawatts’, or watts not used – will deliver the best returns for businesses.

Those returns must come from all levels of an enterprise to be truly efficient. From point-of-use components to enterprise-level energy architecture, meaningful efficiency is a pervasive mandate.

But before you can drive business efficiencies and save energy, you have to be able to see it – and that’s where solutions from Schneider Electric come in.

Our response to the energy challenge
The Schneider Electric response to the energy dilemma turns your business into an Efficient Enterprise™. EcoStruxure Active Energy Management architecture, is our approach to creating intelligent energy management systems that are simplified, save money, and most importantly, reduce waste by enabling guaranteed compatibility between five critical domains.

Schneider Electric has repositioned itself in recent years to providing more energy software solutions, management capabilities, and consultancy services to customers who want to reduce their energy costs. One of the company’s major initiatives in this area has been EcoStruxure...”

– Jonathan Katz, IndustryWeek

Only Schneider Electric integrates tested and validated IT architecture to optimize energy management systems across your organization.
Identify potential savings with increased visibility to your energy consumption, electrical equipment benchmarking, and estimated ROI reporting.

Invest to reduce consumption with proof of profitability through prioritized energy efficiency management and planning, optimized tariff management, reduced electricity bills, and reduced CO₂ emissions.

Monitor and sustain savings by observing energy sources, defining Key Performance Indicators (KPIs), and seeing improvements in real time.

The benefits are clear
EcoStruxure architecture delivers the efficiency you deserve

EcoStruxure architecture delivers optimized systems through compatible product designs and open platform software. A single software package animates, controls, and aggregates the energy data output from the components arranged within the architecture. These solutions emphasize three core principles.

- **Simplicity**
  Easy connections between systems means guaranteed compatibility. Plus, a single, certified point of contact makes projects straightforward and uncomplicated.

- **Transparency**
  Accessibility to energy use and video verification means your energy is visible and trackable everywhere; intuitive, Web-based interfaces give you control from anywhere.

- **Savings**
  Enterprise efficiency comes from modular solutions, simplified installation, and performance tracking for all your sites, and results in up to 30 per cent savings on CapEx and OpEx.

See pages 14-19 for EcoStruxure solutions in action.

EcoStruxure system architecture delivers CapEx and OpEx savings of up to 30%.

Your energy expert and green partner

We stand by you from energy strategy through project execution

Our structured process, professional software, and worldwide network of energy experts help you generate both short-term savings and medium-term energy management plans. With EcoStruxure architecture and our services, we help you achieve sustainable savings that decrease your operating expenses and boost your bottom line. Our proven methodology empowers you to:

- Identify potential savings with increased visibility to your energy consumption, electrical equipment benchmarking, and estimated ROI reporting.
- Monitor and sustain savings by observing energy sources, defining Key Performance Indicators (KPIs), and seeing improvements in real time.
- Invest to reduce consumption with proof of profitability through prioritized energy efficiency management and planning, optimized tariff management, reduced electricity bills, and reduced CO₂ emissions.

The method behind the savings

We make it easy to put Active Energy Efficiency to work in your enterprise

At the heart of our strategy is the simple and powerful idea that using resources more productively and efficiently is both profitable and better for the environment. We developed this approach to Active Energy Efficiency™, which employs this simple four-step life cycle process:
EcoStruxure integrated system architecture

Control, supervise, and manage total enterprise performance

How EcoStruxure integrated system architecture works

EcoStruxure system architecture’s simple, open approach has the needs of future-ready businesses in mind. Its open, scalable design ensures that companies can leverage existing infrastructure investments as well as be equipped for future technology upgrades.

Integrated Domain Management and Control Solutions

EcoStruxure architecture integrates critical energy management domains for consolidated monitoring, reporting, and efficiency. It is compatible with third-party systems, so you can leverage existing investments.

Five Domains of Expertise

<table>
<thead>
<tr>
<th>Domain</th>
<th>Product and Control</th>
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| Power Management                     | > Power measurement  
> Power quality  
> Local LV/MV protection and control  
> Intelligent power and motor control  
> Renewable energy conversion  
> Electric vehicle recharging |
| Process & Machine Management         | > Production management  
> Information management  
> Process automation  
> Advanced process control  
> Machine control  
> Remote site management  
> High availability and safety |
| IT Room Management                   | > Network connectivity  
> Rack systems  
> Uninterruptible power supply  
> Cooling control  
> Surveillance |
| Building Management                  | > HVAC control  
> Lighting control  
> Outdoor lighting control  
> Sun blinds control  
> Room control |
| Security Management                  | > Video surveillance  
> Emergency lighting  
> Intrusion detection  
> Access control  
> Fire and life safety |

Enterprise Performance Management

The CEO, CFO, and energy manager master business operating cost efficiency and track the potential energy savings at the site and enterprise levels. EcoStruxure system architecture enables your energy management investment to yield the best returns, no matter which vendor you’ve selected in the past or which technology best suits your enterprise in the future.

Remote Supervision

Stay in control of your energy from anywhere in the world with Remote Supervision.

Integrated Site Supervision

The site manager ensures business continuity, user comfort, equipment security, and energy performance. Supervising integrated domains at one location, the site manager can drive improved performance and react quickly in all situations. Apply Integrated Site Supervision for Buildings, Data Centres, Industrial Plants, and Energy & Infrastructure.

EcoStruxure architecture combines efficient control solutions and global supervision systems, resulting in energy savings of up to 30%.
One facility, many functions

Integrated Site Supervision gives you even more from efficient components and applications

There are several ways to approach enterprise efficiency. A common and valid first step is to take action at the site level, where functional managers can oversee the installation of components and measure improvements in order to meet performance and budgetary objectives.

For this first step to be, in fact, a stride toward true efficiency and the savings in CapEx and OpEx, the site must be equipped for more than point-of-use improvements. Maximum savings can be achieved when intelligent and energy-efficient devices are not only installed, but also controlled to use only the energy that they require.

EcoStruxure architecture delivers fully tested, validated, and documented solutions that support integrated site supervision. That means that a site manager has visibility to component-level efficiency gains and single-seat control of corrective action throughout an entire facility and across the five critical domains of Power, Process & Machine, IT Room, Building, and Security Management.

EcoStruxure takes multiple, siloed systems and adapts them to an integrated solution, reducing redundancy in equipment, software, and personnel. This integrated system enables participation in demand response programmes.

Unite the siloed domains

EcoStruxure architecture integrates disparate energy management systems onto a single platform

In the average building, each energy management system is independent, and requires its own design, installation, and management. An inherent disadvantage to this scenario is wasted time and money dedicated to multiple vendors, redundant supervision, and excess cabling and devices.

Many companies with buildings constructed of siloed systems are forced to endure the burdens of managing multiple vendors, training on disparate networks, waiting out complex troubleshooting, absorbing higher operational expenditures, and facing obstacles to achieving energy efficiency.

Schneider Electric provides an integrated system on a common, open platform, enabling significant savings on design, installation, and commissioning time, as well as on hardware and software costs. A single system that integrates HVAC, power, lighting, electrical distribution, security, IT, and telecommunications is not only easier to manage, it delivers significant cost savings — during installation and throughout your facility’s life cycle.

An integrated system provides a single, actionable view of your facility. It also makes a minimal impact on the environment thanks to reduced energy consumption.

In the long term, the greatest benefit of implementing EcoStruxure system architecture is finding real, measurable business value by watching your CapEx and OpEx decrease by up to 30 per cent.

Integrated architecture optimizes CapEx and OpEx

Siloed systems create inefficiencies in vendor management, training, troubleshooting, and energy use.

This integrated model streamlines system management, data reporting, and costs, resulting in optimized ROI.
Many sites, one vision

EcoStruxure architecture gives you single-seat control of energy in key application areas

EcoStruxure enterprise solutions exceed the traditional boundaries of energy management, power, and process operations software by uniting business and energy strategies across your entire enterprise while performing wide-area analysis of events and conditions.

KPIs and advanced analytics help you manage energy in financial terms and gain unique insight into the performance of your business. Stakeholders from management to operations will be empowered by actionable energy intelligence to discover opportunities, isolate problems, and drive cost- and risk-reduction strategies.

EcoStruxure system architecture is composed of unifying applications that complement and extend the benefits of existing energy-related data resources. This can include power monitoring and process control systems, metering systems, substation automation and SCADA systems, EMS systems, building and process automation systems, utility billing systems, weather services, spot-market energy pricing feeds, and enterprise business applications. Data is automatically acquired, cleansed, and warehoused. Personalized, browser-based dashboards and innovative visualization and modeling tools help you accurately monitor, validate, predict, and ultimately control all energy-related expenses and risks to reliability.

Our Web-based software helps you reach your energy efficiency goals.

- Capture and track KPIs.
- Monitor carbon emissions.
- Estimate utility bills.
- Access crucial information from anywhere.
See how our solutions helped each of these companies become an Efficient Enterprise

The Orchard Ostrava
Ostrava, Czech Republic

Located in the heart of the Czech Republic’s third largest city, The Orchard Ostrava provides a dynamic urban environment, combining three seven-storey office buildings with a premium hotel. By connecting business with leisure time, the Orchard distinguishes itself from typical class A office premises in the area.

When the project was in development, emphasis was placed on ecology, and Schneider Electric was engaged to provide a high-performance building systems solution that would deliver low operation costs.

Customer benefits:

- 20% CapEx reduction versus non-integrated solutions
- Complies with class A requirements for energy savings
- Integrated solution with one BMS system
- Open architecture easily integrates third-party products
- 20% CapEx savings due to integration
- 36k m² lease area of three seven-storey office buildings
- 186 hotel rooms

EcoStruxure Solutions in Action

Buildings

- Power Management
  - Power measurement
  - Power quality mitigation

- Process & Machine Management
  - Uninterruptible power supply

- IT Room Management
  - HVAC control
  - Lighting control

- Building Management
  - Video surveillance
  - Access control
  - Intrusion detection

Buildings Integrated Site Supervision
  - TAC Vista™ Building Management System
Csepel Wastewater Treatment Plant
Budapest, Hungary

With a capacity of 350,000 m³/day, the Csepel wastewater plant is the largest facility of its kind in the European Union (EU). The plant required a unique partner to take on the full responsibility of process and energy management solution implementation on a deadline established by the 1994 Sophia Convention and to standards established by the EU.

According to a client facility representative, ‘The upstream collaboration with Schneider Electric at the design stage allowed standardization and minimized the risks all along the project.’

Customer benefits:
- Energy efficiency
- Flexibility during design
- Compliance with European Union regulations
- Standardization and minimized risk
- Single point of contact
- A demonstrated, deep technical involvement in products, applications, and projects
- 100% compliance with European Union regulations
- 350k m³ daily waste water treatment capacity
- 15% design cost reduction
- 76% boost in productivity

EcoStruxure Solutions in Action

Global Supervision
Vijeo Citect™ SCADA

Power Management
- Power quality mitigation
- Local LV/MV protection and control
- Intelligent power and motor control

Process & Machine Management
- Process automation
- Pump and fan control

IT Room Management

Building Management

Security Management
The Schneider Electric Technology Centre (SETC) is a 9,290 m² (100,000 ft²) facility that serves as a power and cooling showcase and test bed for Schneider Electric, its customers, and industry partners.

The facility’s data centre was comprised of more than 500 servers – about half of which were virtualized. Our goal was to consolidate and simplify the mix of IT vendors, low- and high-density pods, blade servers, and standard servers (and even some non-rack-based equipment) to achieve substantial efficiency gains.

Customer benefits:

- Planned with scalability in mind
- Built with energy-efficient technologies, including UPS rightsizing, InRow™ cooling, hot aisle containment, and energy-smart server
- Connections to economizer and solar panels in place
- 33% CapEx savings due to rightsizing with modular Power & Cooling architecture
- 99.98% data centre availability
- PUE of 2.86 down to 1.52
- 47% improvement in PUE

**EcoStruxure Solutions in Action**
Enterprise-wide energy management

Ford Motor Company

Multiple locations, USA

Historically, a six-week time delay existed between month-end and utility data reporting at Ford Motor Company®, resulting in missed opportunities for energy reduction and savings in procurement. Ford turned to Schneider Electric’s power management operation to customize its enterprise energy management (EEM) software interface to integrate data from all Ford manufacturing sites in North America, while also communicating in near real time with utility meters to obtain electricity and natural gas consumption data.

In the first year of this system’s operation, Ford reported several success measures. Schneider Electric’s EEM solution succeeded in significantly reducing time and costs, eliminating risk, creating benchmarks which continue to aid conservation efforts, and establishing real-time access to data.

Customer benefits:

- Energy cost savings. Accurate and timely consumption data has led to an overall reduction in the purchasing cost of natural gas.
- Risk mitigation. The new system can reduce financial risk through the use of KPIs, accurate forecasting, load aggregation, ‘what-if’ rate analysis, and stronger energy contract negotiation.

Metering and monitoring projects typically save a company 2% of its energy spend. At this rate, Ford’s estimated savings is €7.6 million per year, according to Bill Allemon of Ford Motor Company.

Ford Motor Company’s 43 facilities across the United States gather power and processes locally and feed a cloud-based energy management system. This allows for both on-site and remote monitoring and results in optimized energy efficiency.
Integrated energy management across your entire enterprise

EcoStruxure solutions have made a difference in the efficiency and performance of many respected businesses worldwide. This architecture speaks a language that crosses geographic and operational borders, resulting in compatibility and significant savings in the most renowned enterprises.

Delivering the Efficient Enterprise
Schneider Electric is the only company that is able to provide solutions from enterprise level software down to hardware components across the five critical domains of your enterprise: Power Management, Process & Machine Management, IT Room Management, Building Management, and Security Management. As your energy expert and green partner, we also offer a full suite of services that sustains your energy management objectives throughout the life cycle of your facility.

With EcoStruxure system architecture, businesses can anticipate better results and improvements in operations through systematic energy visibility and real-time control of energy usage. Energy waste in all forms can be captured and mitigated to achieve improved efficiency.

At the component, application, supervision, software, and service levels, our approach enables enterprises to create the right answers to energy management and business performance challenges, by making energy:

- **Safe**: Protecting people and assets
- **Reliable**: Limiting financial penalties and avoiding expensive interruptions in critical operations
- **Efficient**: Reducing energy tariff and consumption (active), enabling demand-response systems
- **Productive**: Optimizing machine, plant process, and building user comfort
- **Green**: Providing the ability to switch to renewable energies

As consumers, businesses, and entire economies become increasingly reliant on technology, they insist that devices become more intuitive, more efficient, and more intelligent. With EcoStruxure solutions, Schneider Electric encourages them to expect the same of their energy.

Get on the path to permanent enterprise efficiency with EcoStruxure solutions from Schneider Electric.

Connect with the experts

The Collaborative Project Portal is a private online community designed to help energy management professionals to work smarter and more productively. It is the first private project management tool in the industry to provide real-time access to Schneider Electric experts. The Collaborative Project Portal offers comprehensive Web meeting and social networking features to help customers decrease costs, expedite time-to-market, and boost productivity.

http://collaborate.schneider-electric.com
Take your next step with these FREE resources from Schneider Electric

Visit www.SEreply.com and enter key code 83359T

There's much more to the EcoStruxure story. Catch the videos, case studies, and more online!

FREE white paper: Learn how EcoStruxure solutions help companies like yours respond to real energy challenges.

Download Share to see the Schneider Electric vision for business solutions and sustainable development.

Make the most of your energy™

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