

# Digitize the Power Automation Grid Reliably, Safely, and Efficiently

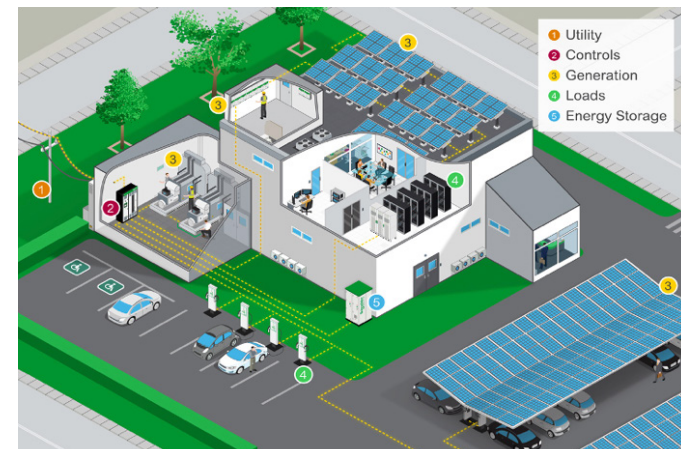
Looking for a way to manage the modern electric grid and its technologies, equipment, and controls while meeting your sustainability goals? We're partnering with Schneider Electric to deliver the solutions you need, including Advanced Metering Infrastructure (AMI) and Distribution Automation (DA).

In today's digital world, the demand for energy has never been greater. There's also an increasing focus on sustainability and reducing CO<sub>2</sub> emissions. Sixty-eight percent of current fossil-based energy systems lead to significant energy losses<sup>1</sup>. Electricity is the most efficient energy and offers a path toward decarbonization. And when electric meets digital, energy becomes visible, connected, smarter, and more controlled. Electricity 4.0, a term introduced by Schneider Electric, represents the next chapter in the energy revolution—the fastest way to net zero carbon emissions while delivering clean and affordable energy.

In response to this energy revolution, utilities are investing mightily in digital power systems to meet the ever-growing need for sustainable, reliable, and efficient delivery of power. Electric grids are being modernized to be “smarter” and more resilient, using cutting edge equipment and controls that communicate and work together efficiently. Utilities are transforming to reduce operational costs, improve customer service, keep power grids safe from cyber threats, improve reliability, and more—all to meet the needs of a world that is always on and striving to meet sustainability goals.

How can utilities keep these complex, sophisticated systems running smoothly? Rely on the collaborative solutions developed by Cisco and Schneider Electric to integrate the software, compute, networking, security, and IoT devices required for a successful modernization of the distribution grid (See Figure 1). You'll gain a customized network solution to meet your unique needs while reducing integration risk and improving system reliability and security.

Figure 1. Cisco and Schneider Electric power grid modernization solution



## Benefits

### AMI

- Supports a variety of meters with a standards-based approach, helping to reduce cost, spur innovation, and prevent vendor lock-in.
- Enables large-scale AMI deployments as the digital grid expands.
- Optimizes operational efficiency with fast outage notification and prevents power theft.
- Delivers lower operational costs by automating data collection and reduce truck rolls.
- Improves end-customer service with more accurate usage information and billing.



### DA

- Reduces outage time by detecting faults early and automatically configuring the network afterward.
- Integrates intermittent and distributed generation smoothly to maintain energy quality and stability.
- Optimizes asset management with advanced analytics to manage load shedding and peak shaving, while reducing technical and non-technical losses.
- Delivers the advantages of grid connectivity without compromising grid security.
- Reduces maintenance costs with smart sensors for substation monitoring.
- Improves energy availability with a cost and time-effective solution.

### Cisco Zero Trust: National Institute of Standards and Technology cybersecurity framework

- Identify all devices and users on the network and integrate for detection and response to network threats through network segmentation and visibility.
- Validate device and user attribution to protect assets and data through multi-factor authentication.
- Detect anomalies and revoke access when policy is violated or threats occurred.
- Identify all workloads and network flows through workload segmentation.
- Protect vulnerable assets/data from unauthorized access and respond with protective actions.

### Utilities Cisco Validated Design (CVD)

- Reduce implementation and operational risks by validating and documenting Cisco best-practice designs and solutions.

## Trends and challenges

It's an exciting time for utilities. The industry is working together to expand the power distribution grid and meet the growing demand for energy, while incorporating electricity generated from renewable sources. To revitalize utility infrastructure and expand the power distribution grid, utilities are projected to spend US\$14 billion annually over the next five years<sup>2</sup>. Thirty-three percent more electricity generation will be added to the US grid over the next three years, primarily wind, solar, and geothermal<sup>3</sup>. Worldwide power capacity will reach 2x current levels and with 50 percent renewable generation by 2040<sup>4</sup>.

As the power distribution grid grows, last mile wireless communications offer critical link in connecting and supporting field deployed automation assets. Optimizing voltage distribution while protecting against cybersecurity threats are among the top priorities and concerns for utilities.

The pace of change is accelerating, and utilities are challenged to:

- Simplify and accelerate the process of delivering energy
- Adapt to quickly evolving market conditions, boost productivity, and grow sustainably
- Boost agility and competitiveness
- Automate distribution automation for renewables
- Invest in grid infrastructure, including security, the transition from serial to IP, and digitization
- Provide cybersecurity threat containment, user identity, and device visibility
- Tap into the necessary expertise due to a lack of in-house experience and the lack of industry-proven deployments and regulatory processes

## How it works/ Key features/ Components

### AMI

As you expand your power grid network, choose an AMI platform built on standards by Cisco and Schneider Electric. Cisco provides a standards-based network to connect a variety of meters and endpoints, while Schneider EcoStruxure Power provides the head end management system used to manage the selected meters.

### Key capabilities

This solution enables large-scale AMI deployments while delivering lower operational costs, improved end-customer services, and smarter, sustainable energy for any utility. AMI can help utilities to achieve its business goals by saving truck rolls, enabling demand response, fast outage notification, and preventing power theft.

### Models and options

- Cisco Field Area Network (FAN) enables grid modernization by providing an end-to-end, IP-based reference architecture that includes the vendor-agnostic Wi-SUN wireless communication standards used by many smart-grid devices.
- Schneider Electric's EcoStruxure Advanced Metering Option platform leverages their information management expertise to roll out and manage a variety of meter vendors, including integration capabilities to maximize subsequent smart metering returns.

<sup>2</sup> ABI Research, 2019

<sup>3</sup> Worldwatch, Institute, 2018

<sup>4</sup> BNEF

## DA

Choose an integrated DA solution that combines the Schneider smart Ring Main Unit (RMU) platform with the Cisco DA Field Area Architecture.

### Key capabilities

Our DA solution monitors and controls energy distribution networks through a multiservice FAN solution and enables utilities to reduce line loss, increase reliability index—System Average Interruption Duration Index, System Average Interruption Frequency Index, etc., increase customer satisfaction, enable smooth integration with Distributed Energy Resources through Volt-VAR control, Fault Location Isolation and Service Restoration, and optimize asset management through advanced analytics. In addition, Cisco's Distribution Automation CVD provides multiple networking options: public and private LTE, Wi-SUN mesh, end-to-end security, easy deployment and management, and is designed for secondary substation and feeder automation deployment.

### Models and options

- Schneider RMU platform
- Cisco FAN gateways. Built on a flexible, two-tier architecture that generates IP network services and offers security, QoS, resilience, and management
- Schneider Easergy T300 Remote Terminal Unit

## Use Cases

Industry	Description
Utility	<ul style="list-style-type: none"><li>• Distribution energy resources</li><li>• Distribution automation and substation automation</li><li>• Advanced metering infrastructure</li></ul>

## Financing to help you achieve your objectives

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## Case study

### Electricity holding company

#### Challenge:

A national project aligned with United Nations Sustainable Development Goals sought to establish and develop distribution and control centers for smart grids to integrate traditional and renewable energy sources.

#### Solution:

Cisco and Schneider Electric partnered to install 14 distribution and control centers. The project also included the installation of 12,000 smart ring main units designed to improve energy availability by detecting network faults as soon as they occur and then reconfiguring the network to ensure stability.

#### Result:

- Improves the safety of the power supply and quality of the national electrical distribution network.
- Leverages data and digital communications to detect, react to, and predict changes in electricity usage.
- Expected to deliver breakthroughs in energy integration and distribution.

## Value of Cisco and Schneider Electric strategic alliance

As the energy industry evolves, utilities are digitally transforming their power grids, deploying a variety of digital solutions that combine IT and OT functionality. For 15 years, Cisco as a leader in IT networking and security, has formed strategic alliance with Schneider Electric, a market leader in OT energy management and automation to offer joint solutions that drive innovation, sustainability, and efficiency. We can help utilities successfully digitize the electric distribution grid with innovative solutions that increase reliability, reduce operational overhead, integrate renewable energy as well as keep a high standard of security and safety.

### Modernize your energy distribution grid

Are you investing in modernizing your electric grid? Rely on market-leading solutions from Cisco and Schneider Electric to successfully deploy and manage the digital infrastructure that is the foundation of a successful distribution system. For additional information, visit [Cisco and Schneider Electric partnership page](#), [Cisco Utilities Solutions](#), or [Schneider Grid Digitization](#) sites.



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