Our solutions for municipalities and distribution system operators (DSOs)

Partnering for reliable distribution
Today’s main challenges of the energy system

**Economic efficiency**
“Over the past century, affordable energy has been a significant component of global economic growth and development.”

*World Economic Forum*

**Reliable power supply**
“Inefficient, antiquated energy supply stifles productivity.”

**Climate protection**
“Europe will cut its greenhouse gas emissions by 40% by 2030 and will produce 27% of its energy from renewable sources.”

*The Guardian*

**Resource efficiency**
“Decentralized generation will call for changes to the electricity network and, to ensure flexibility, the power sector will need to become more intelligent and computer-controlled.”

*Kelvin Ross, PEI*

**Acceptance**
“The concept of achieving public awareness, positive experience and acceptance as a prerequisite for the successful full scale roll-out of a smart grid has not only delivered a positive stakeholder response …”

*2013 Global Impact Report*
Main challenges for Municipalities and DSOs

Growing demand
Global demand for electricity continues to grow. In many emerging countries with high population there is growth of basic supply. Stability of supply and security are also of major importance.

Reduce losses
Energy theft, also known as non-technical losses, causes avoidable costs to society. Weak and aging infrastructure leads to technical losses. Many components are in need of maintenance or need to be replaced.

Distributed generation
In many countries “prosumers” can create their own electricity and market it through the grid causing capacity and stability constraints. Continued growth in distribution/small scale applications with focus on power electronics, automation and IT add to the challenge.

Digitalization & changing business environment
The digitalization of the grid and new market players for smart IT solutions pose a threat to today’s business models. Creative solutions/ideas are needed to profit from changes.

Municipalities & DSOs’ main task is to ensure reliable and economic power supply – related challenges are depending on the development status of the existing energy system and the regulatory framework in the respective country.
Municipalities & DSO face high customer expectations

**Citizens and industries expect…**
- Reliable, safe & secure supply at all times
- Cost efficient electricity and environment friendly energy
- Low visibility/low impact of equipment on environment
- Easy handling of own energy generation and marketing support

**Municipalities and DSOs have to provide…**
- Grid stability and high availability
- Efficient eco-friendly electricity infrastructure
- Easy grid access, and electricity marketing services
- Management and protection of increasingly complex energy systems
An intelligent overall solution from a trusted partner

Siemens – uniquely positioned to support you across the entire project lifecycle

With a comprehensive portfolio

...to design, implement and service your future-proof solution

...based on
- long-term experience
- in-depth understanding of your needs
Electrifying, automating and digitalizing the power distribution grid
Challenge
Plan, build, expand & maintain your distribution network infrastructure

Solution
• Network analysis and calculation
• Intelligent substations – smart switchgear (e.g. GIS), transformers, intelligent distribution and feeder automation, and protection solutions
• IT solutions like SPECTRUM POWER Advanced Distribution Management System & Active Network Management
• Product-related services such as diagnosis, monitoring, maintenance, refurbishment and modernization
• Stationary energy storage solutions like SIESTORAGE (Li-ion batteries) and SILYZER 200 (Power-to-gas)

Benefits
• Reliable power supply to your customers
• High grid availability, fewer blackouts
• Reduce service cost
Challenge
• Connect your distribution grid to transmission level
• Improve transmission quality and efficiency

Solution
• High voltage products (e.g. circuit breakers, bushings, coils, surge arresters, disconnectors, gas-insulated switchgear, and instrument transformers
• High voltage substations, both gas and air insulated
• Transformers from compact distribution transformers to large power transformers with ratings over 1000 MVA
• SPECTRUM POWER transmission grid control system
• Gas-insulated Lines (GIL) for safe and EMC-compliant transmission of bulk power into urban load centers

Benefits
Safe, reliable and consistent transmission & distribution of electricity
Challenge
Technical prerequisites to cope with the changes in regulations and to become energy independent

Solution
• Small to large scale power generation systems such as gas turbines, wind turbines, and turnkey solutions for combined heat and power plants
• Vacuum Generator Circuit Breakers up to 90 kA short circuit breaking current
• Air-insulated Generator Breaker Switchgear with vacuum technology for indoor and outdoor applications
• Grid connection substations incl. air- or gas-insulated MV or HV switchgear and power transformers

Benefits
• Extension of business models by entering into the lucrative power generation market
• Less dependence from external power supplies
• Active management of CO₂ reduction and sustainability goals of your community
Challenge

• Integration of renewable energy sources (e.g. wind, sun, and biomass) into your existing distribution network
• Stabilization and control of the network due to intermittency issues

Solution

• Network analysis and consulting (PSS SINCAL)
• Integration into existing protection schemes (SIGUARD PSA)
• Network modernization with a regulated distribution transformer FITformer REG, intelligent switchgears including feeder condition monitoring & remote control
• Active Network Management with SPECTRUM POWER
• Network control with SICAM Smart Grid Unit, and Distributed Energy Management System (DEMS)
• Design and installation of microgrids and energy storage solutions such as the SIESTORAGE (Li-ion batteries) and SILYZER 200 (power to gas)

Benefits

• Maintain grid stability despite volatile infeeds from natural resources (wind, sun)
• Ensure secure energy supply independent of weather conditions
• Manage distributed renewable generation to ensure CO₂-neutral power supply as far as possible
Challenge

• Reliable and stable operation of a grid with distributed energy resources, loads, and storage by controlling grid assets (e.g. intelligent switchgear and transformers)
• Independent, sustainable, and highly reliable power supply (e.g. island grid)

Solution

• Products and solutions for microgrids, energy storage, load management and virtual power plant (VPP) applications
• SPECTRUM POWER Microgrid Management System
• SICAM Microgrid Manager (planning, monitoring, and control)
• Distributed Energy Management System (DEMS) incl. Demand Response (DRMS), and virtual power plant (VPP) applications
• Energy storage solutions, e.g. SIESTORAGE (Li-ion batteries) and SILYZER 200 (power to gas)

Benefits

• Maintain grid stability and security of supply despite volatile infeeds from natural resources
• Possibility to trade power surplus
• Safeguard power quality
Challenge
- Support in defining your smart grid strategy
- Professional network performance evaluation
- Effective monitoring of your grid assets
- Responsive servicing of your grid

Solution
- Network analysis & consulting (PSS Sincal, Smart Grid Diagnostic Kit, Smart Grid Compass, Siguard PSA)
- Grid monitoring and diagnostics (condition monitoring products)
- Maintenance and repair
- Asset performance management

Benefits
- Guidance on how to develop your smart grid
- Continuous information on overall network conditions and dedicated devices
- Preventive maintenance and modernization only when needed
- Lifetime extension of grid installations
- Reduce CAPEX and optimize OPEX
Challenge
Operation and management of your entire supply and distribution system for power, gas, water, etc.

Solution
SPECTRUM POWER – features such as
- Alarm, crew, and outage management
- Fault location and isolation
- Consumption forecasts
- Optimal management of storage resources, even with multi-utility capabilities
- Easy interoperability with any enterprise IT

Benefits
- Efficient and economical supply of power, gas, water
- High availability and reliability of your distribution grid
- One control center system for different commodities (multi-utility application)
- Reduced installation and operation cost
Challenge

- High OPEX caused by manual meter reading
- Energy theft (non-technical losses)
- Increasing distributed generation endangers grid stability creating demand for permanent information on capacity / stability constraints

Solution

- Standardized smart meters support multiple communication modules (e.g. GPRS, PLC, RF,...)
- Tailored communication solutions (incl. cyber security) for high-, medium- and low-voltage networks
- Highly available universal head-end system with multi-vendor support
- Leading Meter Data Management (MDM) system
- Monitoring and detecting of deviations in load profiles remotely
- Flexible grid application platform (e.g. load forecasting, analytics)
- End-to-end advanced metering infrastructure (AMI) from consulting to field services

Benefits

- Automated meter reading reduces OPEX
- Early theft detection minimizes non-technical losses
- Reliable power supply in an environment of distributed generation
- New business models based on data analytics
**Challenge**

- Convergence of operation and information technology
- Enhancement of your business model & services against the digital transformation background of the grid

**Solution**

OMNETRIC Group, Siemens’ joint venture with Accenture

- Develops and delivers advanced solutions focused on data management and systems integration
- Brings together operational technologies – such as distribution management and real-time grid operations – with IT systems supporting smart metering, energy consumption as well as work and asset management
- This combination can provide utilities with an integrated view of their systems and data as well as support advanced analysis and decision making

**Benefits**

- Improved reliability and efficiency in the grid
- Improved asset management and customer service
- Improved data management and insight
- Capture opportunities of a digital grid/new business models
Challenge
• Monitoring and managing many components of an energy grid all the way to the consumers via highly secure data exchange
• Use & interoperability of different communication technologies and systems
• Cyber security (confidentiality, integrity, availability)

Solution
• Rugged switches and routers using fiber optics, broadband powerline carrier or WiMAX
• WiMAX and wireless mesh solutions from consumer access to RMU backhaul applications
• Cyber security including product / system / solution security and integrated processes & services for the setup and the operation of a secure network
• Build / care and professional services (e.g. cyber security consulting and training; security assessments and compliance audits; network penetration tests)

Benefits
• Tailored communication infrastructure complying with energy industry standards
• Hardened IT infrastructure to minimize risk of intrusion
• Highest level of protection though holistic cyber security
Electrifying, automating and digitalizing the municipal infrastructure

- Gas Distribution
- Transportation Infrastructure
- District Heating and Cooling
- Waste Treatment
- Power Generation
- Water and Wastewater
- Power Transmission
- Utilities Control Center
- Power Distribution
- IT / OT Integration
- Smart Communication & Cyber Security
- Grid Consulting & Services
- Renewables
- Microgrids
- Smart Metering

Siemens core offering for Municipalities & DSOs
Siemens additional offering for municipal infrastructure
Challenge
Solutions for a reliable and safe domestic gas supply

Solution
• Powering gas facilities
• Managing gas distribution
• Reliable forecasting
• Condition analysis

Benefits
• Optimal use of gas purchases
• Holistic consideration of dispatchable loads and own generation
• Uninterrupted supply
Water and Wastewater

Challenge
Solutions for a safe and cost-efficient water production, drinking water treatment and distribution, and water sewage

Solution
• MV and LV power supply installations
• Pumps and motors
• Process automation equipment and software
• Modular water management system incl. leakage identification and localization simulation of network behavior

Benefits
Efficient operation, control and automation of water / wastewater facilities
Challenge
Solutions to use heat – e.g. generated from combined heat and power (CHP) plants – for district heating and cooling

Solution
• Heat generation (CHP, waste to energy plants)
• Intelligent distribution management

Benefits
• Environment friendly and reliable supply of heating and cooling for customers
• Increase energy efficiency of your generation plants
• CO₂ reduction
• Additional revenue through portfolio diversification
Waste Treatment

Challenge
Sustainable, cost-efficient, and environmentally friendly waste treatment solutions

Solution
Power supply solutions, drives, and automation equipment for
• Waste treatment plants
• Waste to energy plants

Benefits
Optimize OPEX and minimize environmental pollution
**Challenge**
Well organized and efficient public transportation and traffic management systems

**Solution**
- Rolling stock from trams to metros
- Rail electrification and automation
- E-vehicle infrastructure
- Intelligent traffic control systems
- Parking space management

**Benefits**
- Manage ever-increasing traffic in cities
- Satisfy citizens’ needs for fast and comfortable transportation
- Reduce CO₂ emission and air pollution
Challenge
Cost-efficient solutions that help increase
• Traffic safety
• Security of citizens and sense of well-being

Solution
• Power supply infrastructure
• Real-time monitoring of the street lighting grid
• Intelligent management system for operation depending on daytime, weather, and traffic conditions

Benefits
Reduced cost due to
• Condition-based operation
• Extended service intervals
• Event-driven maintenance

Street Lighting
Siemens Energy Management lives up to future challenges with the most comprehensive portfolio

- **Software/IT**
  - Grid control – big data analytics – grid application

- **Communication, automation, protection, and field devices**

- **Electrification solutions**

- **Products and systems**
  - High-voltage switchgear – power transformers – medium-voltage switchgear – distribution transformers – low-voltage circuit breaker

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TSO: Transmission system operator  
DSO: Distribution system operator
## The Siemens Municipality Suite (Electrification)

### Muni & DSO offering

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<th>Power Distribution</th>
<th>Water / Wastewater</th>
<th>Natural Gas Distribution</th>
<th>District Heating / Cooling</th>
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### Power supply (turnkey) solutions

- Grid connection s/s
- Distribution s/s
- Power quality
- Electr. BoP
- Compact s/s
- Grid connect. s/s
- Distribution s/s
- Compact s/s

### Energy storage

- Power-to-gas and battery solutions
- Power-to-gas and battery solutions

### Transformers

- Large power transformers
- Medium power transformers
- Distribution transformers
- Medium power transformers

### High-voltage switchgear

- AIS switchgear
- GIS switchgear
- AIS switchgear
- GIS switchgear

### Medium-voltage switchgear

- Generator swgr
- Outdoor systems
- AIS switchgear
- GIS switchgear
- Outdoor systems
- AIS switchgear
- GIS switchgear

### Low-voltage equipment

- MCC
- Fuses
- Motor control centers (MCC)
- Air circuit breakers (ACB) and molded-case circuit breakers (MCCB)
- MCC
- Busbar systems

### Product related and value added services

- Network analysis and consulting
- Installation and commissioning
- Repair, maintenance, monitoring and diagnostics
- Substation extension, refurbishment and modernization
- Service contracts, outsourcing of operation and maintenance (with or without performance KPIs)
The Siemens Municipality Suite
(Automation & Digitalization)

Muni & DSO offering
- Power Generation / Renewables
- Power Distribution
- Water / Wastewater
- Natural Gas Distribution
- District Heating / Cooling
- Street Lighting
- Transportation Infrastructure

Digitalization
- IT / OT Integration, big data analytics
- Energy mgmt. system
- Distribution mgmt. system
- DG & Microgrid mgmt. system
- Demand response mgmt. system
- Virtual power plant
- Meter data management / head-end systems

Information & communication
- Rugged communication equipment, various communication technologies & protocols / cyber security solutions

Automation
- Control center infrastructure
- Rail control center
- Substation / feeder automation

Field equipment
- Remote terminal units (RTU)
- Protection relays
- Power quality

Meters / sensors
- Rogowski meters
- Grid meters
- CT / VT
- Secondary engineering and turnkey projects

Grid services
- Grid diagnostics; security audits

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DG – Distributed generation
VT – Voltage transformer
IT / OT – Information & operational technology
Municipalities & DSOs
Portfolio highlights

Transmission substations
Integration of renewables
Control centers

Distribution substations
Smart grid applications
Multi-utility technologies

Compact substations
Grid-related services
Site safety & security

Outdoor distribution equipment
Financing services
Cyber security
Municipalities & DSOs
Transmission and distribution substations

Transmission substations (HV/MV)

Bringing power to the city – with our HV and MV switchgear, power transformers, control and protection equipment, and substation automation

Distribution substations (Primary distribution, MV/MV)

Ensuring a safe supply within the city – with our MV switchgear, distribution transformers, control and protection equipment, and substation automation
Municipalities & DSOs
Compact substation and outdoor distribution equipment

Compact substations (Secondary distribution, MV/LV)
Bridging “the last mile” – with our MV switchgear, LV switchboards, distribution transformers, remote control, and protection equipment

Outdoor distribution equipment
Supplying peripheral areas – with our vacuum circuit breakers, reclosers, disconnectors, and grounding switches with remote control and protection equipment
Zero-emission generation becomes a reality – thanks to our grid integration experience including energy storage, load flow management, and power quality solutions; also for microgrids

Building your smart grid – with our solutions for grid consulting and diagnostics, smart metering and communications, microgrids, demand response, and virtual power plants
Municipalities & DSOs
Grid-related services and financing services

**Grid-related services**

Everything under control – with our switchgear, transformer and cable services, monitoring diagnostics, substation modernization, network analysis and consulting as well as service contract and outsourcing of operations and maintenance

**Financing services**

Commercial finance, tailor-made project financing; insurance and other innovative financial solutions from Siemens Financial Services (SFS) – for your invest in infrastructure
Efficient network operations – with our control center in multi-site configuration for power, heat, domestic gas, and drinking water suppliers and rail operators (SCADA)

Reliable drinking water, domestic gas, and heat supply – with our MV and LV switchgear, motor control centers, drives, automation equipment, and control centers
Municipalities & DSOs
Safety & security applications

Site safety & security
Protecting people and assets against fire, crime and theft – with our fire detection and extinguishing systems, perimeter surveillance and intrusion detection, central access control as well as command and control center solutions

Cyber security
Protecting your IT / OT infrastructure and data integrity – with our holistic approach comprising security assessments, compliance audits for security standards, network penetration tests, access control and password management, security patch management for SCADA, and cyber security training
Municipalities & DSOs

References

New Brunswick Power, Canada
University Campus of Savona, Italy
Stadtwerke Krefeld (SWK), Germany

Elektrizitätswerk der Stadt Zürich (ewz), Switzerland
EWE NETZ, Germany
Netze BW, Germany

Troms Kraft, Norway
İSU, Turkey
Aare Energie (a.en), Switzerland

Stadtwerke München (SWM), Germany
CEMIG, Brazil
Bashkirian Power Grid Company, Russia
## Municipalities & DSOs reference

**Smart solutions – New Brunswick Power, Canada**

### Challenge
- Modernize the electrical supply system
- Allow greater customer choice, control and education
- Balance consumption and generation
- Become “utility of the future”

### Solution
- Reduce and Shift Demand (RASD) modernization plan in July 2012, a multi-year agreement to integrate smart grid technology into New Brunswick’s electrical system
- Backbone of the system is Siemens Demand Response Management System (DRMS) and Decentralized Energy Management Suite (DEMS)

### Benefits
- Created Smart Grid Center of Competence (40 new local jobs immediately created)
- End customers receive more choice on electricity use
- Improved image
- Clear return on investment

### Why Siemens?
- Experience in smart cities / infrastructure
- Know-how in integrating all components
- Image as a leader in the market
- Customer already worked with Siemens
- Similar long-term vision
Municipalities & DSOs reference
Smart energy supply – University Campus of Savona, Italy

**Challenge**
- High degree of efficiency in power generation
- Optimization across different energy sources
- Better management of renewable energy sources
- Reduction in emissions
- Increased system resiliency

**Solution**
- Siemens Microgrid Manager integrates renewable (rooftop photovoltaic and concentrating solar generation) and traditional power generation sources
- Siemens e-car operation center

**Benefits**
- Increased energy efficiency
- Reduced operation costs and CO₂ emissions
- Improve image of campus and increase attendance
- New R&D opportunities jointly developed with industry and DSOs
- Be a prototype for similar applications in urban or industrial districts

**Why Siemens?**
- Clear plan to reduce costs & CO₂ emissions
- Experience with decentralized energy
- Best technical evaluation in tender process
- Global company, but works locally
- Leader in microgrid development
Modernize aging infrastructure and increase grid capacity to intelligently integrate renewable energy sources while guaranteeing reliable power supply

Cost efficiency through:
- Avoidance of grid extension while increasing capacity by 35 percent
- Reliable operation of grid infrastructure
- Compliance with federal regulations
- Reduction of CO₂ emissions by integrating renewable energy sources

Municipalities & DSOs reference
A smart grid for Wachtendonk – Stadtwerke Krefeld (SWK), Germany

**Challenge**
Modernize aging infrastructure and increase grid capacity to intelligently integrate renewable energy sources while guaranteeing reliable power supply

**Solution**
Comprehensive, integrated solution that includes all components for intelligent distribution substations and smart meters, as well as measuring, monitoring, and communication

**Benefits**
Cost efficiency through:
- Avoidance of grid extension while increasing capacity by 35 percent
- Reliable operation of grid infrastructure
- Compliance with federal regulations
- Reduction of CO₂ emissions by integrating renewable energy sources

**Why Siemens?**
- Best solution to reduce costs and avoid grid expansion
- Experience in working with renewable energy sources
- Image as best-in-class player
### Municipalities & DSOs reference

**Tinizong hydropower plant upgrade – Elektrizitätswerk der Stadt Zürich (ewz), Switzerland**

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<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Benefits</th>
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</table>
| Siemens upgraded the Hydropower Plant Tinizong in Switzerland, including the replacement of a majority of the electromechanical system components in the plant. Built about 60 years ago, the Tinizong hydroelectric plant’s 70-megawatt capacity makes it the most powerful station owned by ewz, the utility company of Zürich and Mittelbünden, Switzerland | • VB1 – Generator breaker switchgear  
• Transformers  
• Various other switchgear units  

• Secondary systems for control and protection purposes  
• High-voltage components | • High level of operational safety by means of clearly arranged switching operations  
• Solution-oriented special plant business with a Siemens-wide portfolio  
• The generator switches are configured with proven switch technology for the highest operating currents |
Municipalities & DSOs reference
Intelligent transformer substation – EWE NETZ, Germany

Challenge
• Increasing number of wind and solar power plants has a significant impact on the power flow in the grid
• The components of the grid have to deliver numerous information and must be able to regulate different situations

Solution
• Delivery of an intelligent 8DJH, 24kV, 16kA, 630A
• Switchgear combined with a regulated distribution transformer
• Flexible e-house concept

Benefits
• Reliable partner for flexible intelligent transformer substations
• Flexibility of the switchgear if upgrade of existing stations would be necessary

Why Siemens?
• Siemens is a trusted partner in the area of medium-voltage switchgear for intelligent transformer substations
### Challenge
- Distribution grid with long feeders and long outage times
- Integration of distributed renewable generation
- Problems with voltage stability

### Solution
- Grid monitoring and fault management with intelligent measuring technology and long-range control for active voltage stability
- Distributed intelligence with a self-healing functionality – self-healing grid
- Installation of two medium-voltage in-phase regulators, including power quality measurement on the primary and secondary side, for long-range voltage control

### Benefits
- Distributed grid intelligence makes operation highly energy- and cost-efficient
- Reduction of outage times
- Improvement of voltage stability, including voltage optimization

### Why Siemens?
- Proven energy automation technology
- Seen as innovative leader in this field
- Experience with decentralized energy and renewable energy sources
Municipalities & DSOs reference
Legacy substation migration to new system solution – Troms Kraft, Norway

### Challenge
- Migrate the legacy control unit to a new state-of-the-art control and monitoring system
- Visualization system based on SICAM SCC provided the customer with total central control and monitoring of the substation

### Solution
- Replace the old system by a SICAM PAS and SICAM SCC system
- The field devices were replaced by SIPROTEC 4 devices, which offer IEC 61850-based communication

### Benefits
- With the new substation monitoring, control, and protection system, data communication far exceeds standards in terms of speed and ease of maintenance
- Self-monitoring, flexible redundancy concepts, and simple remote maintenance ensure high availability

### Why Siemens?
- Leader in energy automation field
- Clear three step approach for migration
- Legacy devices could be connected to SICAM PAS, ensuring a smooth migration
**Municipalities & DSOs reference**
**Integrated water network control system – İSU, Turkey**

### Challenge

New waste water SCADA system:
Provide complete solution for the entire monitoring and control system for wastewater and integrating into already existing freshwater control system.

### Solution

The system is based on SIMATIC WinCC OA for the SCADA system, which also controls a number of high-definition (HD) cameras, on SICAM TM RTUs, and on third-party RTUs.

### Benefits

The new system makes İzmit the only municipality in Turkey that manages all freshwater supplies as well as wastewater treatment with a single integrated control system.

### Why Siemens?

- Quick time frame for completion – 8 months
- Proven solution provider for sustainable growth of large cities
- Proven integrated technology company
- Experience with metropolitan municipalities
### Municipalities & DSOs reference
Modernized protection system – Aare Energie (a.en), Switzerland

<table>
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<th>Challenge</th>
<th>Solution</th>
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</table>
| Modernize the 16-kV medium voltage substation and equip with state-of-the art, reliable, efficient protection system | • 9 x Distance protection 7SA86 (feeder)  
• 3 x Overcurrent protection 7SJ85 (transformer, coupling)  
• Medium-voltage switchgear: 8DJH |

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Why Siemens?</th>
</tr>
</thead>
</table>
| • Provide an innovative and reliable energy automation system regarding protection and automation functions, communication interfaces and physical realization of the substation | • Leader in the market for protection devices  
• Proven technology  
• Cost-efficiency |
### Challenge

- Integration of an increasing number of small distributed energy producers into the power grid
- Need to improve the planning and forecasting reliability of distributed power generation sources, loads, and storage in order to ensure a stable power supply
- At the same time, SWM was looking for a way to optimize marketing opportunities

### Solution

- Creation of a virtual power plant (VPP) with many small distributed energy sources, that are operated as a single plant
- Decentralized Energy Management System (DEMS) from Siemens as core component

### Benefits

- Enables reliable and cost-effective operation
- Environment: Integration of renewable energy sources
- The implementation of a VPP opens up new business options and enables these to be optimally exploited through energy marketing

### Why Siemens?

- Experience in finding new revenue streams for customers
- Experience in managing distributed energy sources
- Partnering for innovative solutions

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**Municipalities & DSOs reference**

**Virtual Power Plant – Stadtwerke München (SWM), Germany**

**Why Siemens?**

- Experience in finding new revenue streams for customers
- Experience in managing distributed energy sources
- Partnering for innovative solutions
### Challenge
- Challenge: High cost with individual and manual reading on HV-MV industrial consumers
- 10,000 geographically dispersed consumer units
- High non-technical losses

### Solution
- Metering Center with Siemens MECE Software and AMI (GPRS RTU)
- Remote and near real-time monitoring and control of around 18,000 (0.5% of total) consumer units that represents around 46% of CEMIG’s revenues;
- Smart metering solution in all of the 18,000 consumer units
- Algorithms and alarming systems anti-tampering and anti-theft

### Benefits
- Direct cost savings/OPEX reduction (field and back office workforce labor optimization, energy loss reduction)
- Non-technical losses reduction of ~48 GWh and US$ 7.5 million
- Better data management and enhancement of fraud and theft detection by accessing customer load profiles and reports
- CEMIG recovered their investments in the metering center in less than a year

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**Why Siemens?**
- Software and hardware was best fit for customer requirements
- Shared spirit of innovation
- Trustful partnership with strong and experienced supplier
### Municipalities & DSOs reference
**Electrical network modernization – Bashkirian Power Grid Company, Russia**

### Challenge
- Low level of electricity network automation
- Poor reliability and aging equipment
- High technical and non-technical losses

### Solution
- Design of strategic long-term development plan for Ufa electrical network
- Innovative automation, protection and metering concept
- Development of transition roadmap to year 2020 network model
- Proof of outstanding network performance

### Benefits
- Plan for complex network modernization
- Improved reliability of power system
- Development of the network with smart grid elements
- Optimal investment strategy

### Why Siemens?
- Wide experience in strategic power system development
- High competence in technical as well as economical evaluation
- Supplier of innovative smart grid solutions
Contact

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* Charges depending on provider; from the German fixed network €0.14/min. and from the German mobile phone networks max. €0.42/min.