SIEMENS

Tapping into the potential of smart energy infrastructure

A guide to how smart grids are making the energy transition successful for power utilities, businesses and society

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Preface: This is a revolution! Let's act and create impact

Our lives and the way we do business depend on a sustainable, secure and affordable energy supply. Over the past 100 years, the power grid has undergone countless technological changes. But megatrends such as climate change, digitalization, and urbanization – coupled with the drive to decarbonize and decentralize – are leading to a transformation of the energy landscape at unprecedented speed. In addition, the risk of global pandemics, rising geopolitical tensions, possible gas shortages and increasing prices have the potential to create an energy crisis, that can only be averted if we reinvent the way we plan, build and manage energy.

Over the past

100 years

the power grid has undergone countless technological changes

Advanced energy systems already reflect this growing complexity. All power utilities – from generation through transmission to distribution – need to manage volatile generation and load profiles as well as multi-directional power flows from more and more distributed, increasingly renewable sources. Sources and points of use include central and distributed generation facilities, substations, electric-vehicle charging points, intelligent buildings, behind-the-meter solar generators, campus-based storage solutions and microgrids, critical infrastructure as well as commercial and industrial sites. In addition, smart, data-driven solutions and services are stabilizing grid operations and creating exciting growth opportunities. All of these developments are converging to create nothing short of a revolution and we are in it together. Mastering such a major transformation in technology and business cannot be achieved by strictly sticking to the traditional methods. We are preparing our customers to adapt and lead this change. We should seek close collaboration to create a strong ecosystem of partners. We must escape silos and think in terms of holistic systems.

Here at Siemens, we are convinced that grids need to become more flexible to accelerate the energy transition and exploit the endless possibilities of digital technology. Therefore, we made a bold strategic move in launching Siemens Xcelerator, our open digital business platform. It features a curated portfolio of IoT-connected hardware and software, a powerful ecosystem of partners and a marketplace to explore, educate and share ways of making power grids smarter. All of which allows operators to connect the real and digital world while leveraging the data in the grid in a flexible and secure way. Siemens Xcelerator will be key in turning challenges into opportunities, contributing to a sustainable future and improving business performance. Because it provides everything our customers need to accelerate the transformation of their grids into autonomous, resilient and sustainable power networks.

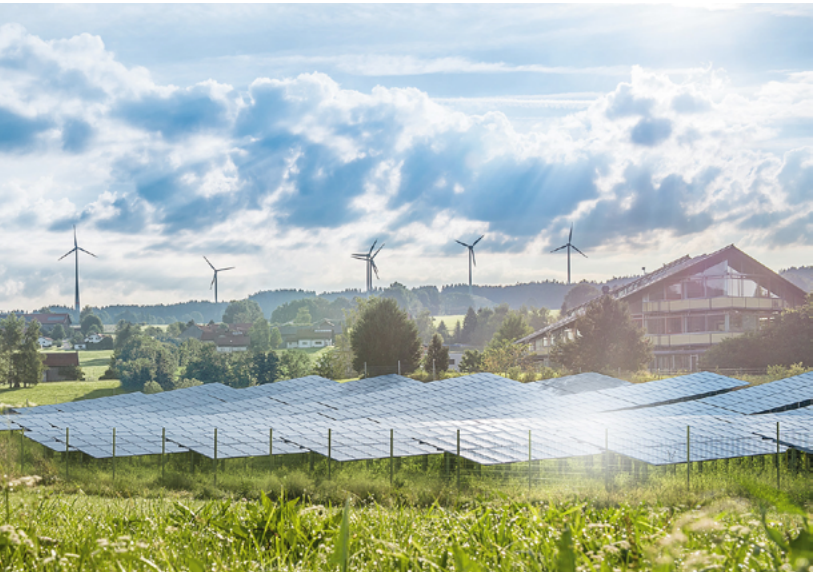
We are presenting this publication to explain our perspective on the future of energy systems and to stimulate an open dialog. Taking a broad view of the challenges at hand, this resource outlines the trends and disruptions that are reshaping the energy landscape. It also shows how smart grids, powered by our new Siemens Xcelerator digital business platform, can help avoid potential pitfalls, flexibly capitalize on emerging opportunities and thus jointly transform the everyday!

Thomas Kiessling,
CTO Siemens Smart Infrastructure

2.

An energy system in turmoil calls for more speed to transform

Over the last decade, our world has changed faster than ever before, driven by global megatrends like climate change, urbanization and digitalization. In addition, geopolitical tensions, paired with the desire for independence from fossil fuels and autocratic suppliers, is causing gas and electricity to skyrocket and accentuating the need to accelerate transformation of the energy system. Today, the average EU prices for electricity and gas are already five and four times higher respectively than the prices forecast in a reference scenario for the EU in the year 2030.[1] Furthermore, experts believe that structural changes in supply[2] and rising costs of EU emission trading system (ETS)[3] will keep prices high in the long term. Blackouts due to energy shortages have even become a real threat again.[4]



Blackouts

due to energy shortages have become a real threat again

At the same time, the effects of climate change are increasingly apparent: Higher average temperatures, more destructive weather phenomena and droughts around the world. To halt the progress of climate change and mitigate some of these effects, the energy system must be decarbonized as quickly as possible, and clean, affordable electricity must become the primary energy source. The energy system is at the heart of efforts to tackle the most pressing challenges of our time – whether they be political, social, economic or ecological. This is also what world leaders at COP27 have recognized: They demand fast actions and see investments in climate protection as investments in affordable security of supply.[5]

We all must join forces and act with unprecedented speed to create a decarbonized, decentralized, and digitalized energy system that will help us to create a net zero world. If we utilize those "3 Ds" to our advantage, we can ensure security of supply and affordability of energy while also saving our planet.

1 Eichhammer, W./ Scheuer, S. (2022): Assessing the impact of high energy prices on the economic potential for energy savings in the EU, from Fraunhofer ISI and Stefan Scheuer Consulting, April 2022

2 Harper, J. (2022): Energy crisis: Europe's winter woes driven by high prices, in: DW, October 12, 2022

3 Ari, A./ Arregui, N. et.al. (2022): Surging Energy Prices in Europe in the Aftermath of the War: How to Support the Vulnerable and Speed up the Transition Away from Fossil Fuels, in: IMF Working Paper, July 2022

4 Leigh, T. (2022): European power use falls, but winter targets still a stretch, in Reuters, October 13, 2022

5 Sengupta, S (2022): 'A Reason to Act Faster': World Leaders Meet on Climate Amid Other Crises, in: New York Time, November 07, 2022

In 2020

five million assets were introduced to the supply and demand side

Decarbonization

Political agendas, new regulations, industry initiatives and a broad societal consensus support the significant reduction of CO2 emissions. This can be achieved by further electrifying all major energy-consuming sectors – transportation, buildings, and commercial as well as industrial facilities with electricity from renewable sources. This development is already underway:

- The European Commission has raised the ambition to reach net zero emissions by 2050. From 30 % today, renewable generation is expected to meet over 80 % of the EU's future energy needs.[6]

- The US Inflation Reduction Act, signed into law in August 2022, incorporates major elements of the Build Back Better Act, which aims to reduce America's contribution to global climate change and will drive multiple infrastructural and environmental programs to achieve this.[7]

Decarbonization will be driven by the growing share of renewables in the energy mix, advances in storage technologies and changes in demand patterns. This will not only help to achieve sustainability goals but also, in the long-run, to reduce energy prices and establish independence from finite fossil fuel sources. Connecting renewable generation and loads like power2heat, e-mobility or buildings, which are responsible for 40 % of global energy consumption alone, will change the traditional load and production profiles (e.g. residual duck curve) or could overload the current infrastructure.

Decentralization

An inherent effect of decarbonization is the dramatic transformation of the energy system into a heterogeneous, interconnected network of large- as well as small-scale generation sites, storage facilities and other flexible loads. The economic benefits (e.g. ease of financing and faster time-to-grid of small-scale, decentralized assets) and the positive effects on the environment as well as a higher degree of independence from centralized fossil energy generation are strengthening the robust position of distributed energy resources (DERs). It is estimated that the vast majority of all distributed energy resources are and will most likely continue to be connected at distribution grid level, in the form of many small-scale installations from commercial and industrial companies (C&I) and private households.[9] In Germany alone, the approximately 245 fossil power plants (with over 50 megawatts each) are offset by over 31,000 wind power plants and 1.7 million PV plants.[10] Through 2030, a seven-fold growth in new distributed energy resources (DERs) annually with fluctuating infeed and demand is forecasted. In 2020 alone, five million assets were introduced to the supply and demand side.[11] This profound growth in DER capacity means we need to rethink and transform the physical topology of future energy grids as well as the systems and processes to manage them – at the planning, operations and maintenance levels.

Although this development poses challenges for the network, it also has many advantages if properly managed. More decentralized, renewable generation assets can increase system resiliency against natural hazards and attacks; reduce dependency on energy from abroad; and increase cost-efficiency, resulting in stable and lower energy prices. In addition, it enables new market roles and business models. Aggregators can pool and manage these DERs on dedicated platforms (e.g. as virtual power plants) to ensure a secure, cheap and reliable power supply.

6 European Commission (2020): Making the EU climate-neutral by 2050; Eurostat (2020): Wind and water provide most renewable electricity, January 29, 2020

7 Cochrane, E. (2022): "Senate Passes Climate and Tax Bill, With All Republicans Opposed", in: The New York Times, August 7, 2022

8 Alliance to save energy (2020): Overview, https://www.ase.org/initiatives/buildings

9 Eurelectric (2019): Eurelectrics's vision for DSOs: From pipes to platforms

10 Kraftwerksliste Bundesnetzagentur April 2020, https://www.bundesnetzagentur.de; Fraunhofer IEE (2018): Windenergiereport Deutschland 2018; Fraunhofer ISE (2020): Aktuelle Fakten zur Photovoltaik in Deutschland

11 Gunjan, P./ Labastida, R. R. (2019): Global DER Development Database, Navigant Research, March 2019

Digitalization

The rise of smart devices and the utilization of billions of data points has already disrupted many industries and the energy world is no exception. Bear in mind that the amount of data from one million smart meters, which collect data every 15 minutes, accumulates to generate over 2,900 terabytes per year.[12] The data from all these individual devices must be made available to all relevant participants on a unified platform for further processing and analysis. At grid level, interoperable software applications that enable advanced analysis of data (e.g. from smart meters, SCADA), forecasting (e.g. weather, traffic, consumption patterns), geographic information systems, and operation control systems can ideally be combined to create a digital, real-time representation of the physical infrastructure. In other words, an electrical digital twin. This can be leveraged to plan, operate and maintain the infrastructure more efficiently, shift grid investments, manage constraints, detect faults, minimize outage times, and enhance flexibility. Digitalization of the energy world opens up a whole new spectrum of possibilities. It helps to connect traditionally isolated silos, turning sustainability and stability from contradictory into complementary goals and speeding up the evolution of the system.

Data from one million smart meters generate over

2,900 terabytes

per year

Grid edge – a major area of transformation

The effects of these trends vividly manifest at the grid edge, as we move from a centralized energy system to one that is more decentralized, decarbonized, intelligent, local, and efficient. When we speak of the grid edge, we refer to the many connected technologies that exist at the interface between the energy supply side (grid) and the energy demand side (industry, buildings, and consumers). These technologies include those for local consumption and production as well as for the storage of energy. A recent study of the World Economic Forum quantifies the magnitude of the grid edge in one, impressive number: US $ 2.4 trillion. This will be the economic value created by investments, new jobs, and new revenues through the adoption of grid edge technologies in the OECD countries over the next ten years.[13] A prime example of this is a microgrid across a whole community or facility (e.g. energy village Wildpoldsried; https://new.siemens.com/global/en/products/energy/references/wildpoldsried-pebbles.html). It features a high penetration of DERs such as solar, energy storage, and electric vehicle charging infrastructure. It provides secure power to critical infrastructure, helps to reduce overall energy costs, minimizes investments in new distribution infrastructure, and provides valuable services to the overall grid (e.g. peak load shaving, voltage and frequency balancing, and demand response).

12 Lapping, D (2018): How big data analytics is disrupting the energy industry, in: DisruptorDaily, https://www.disruptordaily.com/big-data-analytics-disruptingenergy-industry/

13 WEF (2017): The Future of Electricity: New Technologies Transforming the Grid Edge

3.

Opportunities for everyone

In the face of these dynamics, the different market players and stakeholders of the energy ecosystem pursue their specific strategic agendas and multiple business objectives:

Reliable and affordable energy supply

Energy producers, system operators and municipalities must provide reliable and affordable energy in the face of natural disasters, grid congestion, geopolitical disturbances, or intermittent renewable generation. Commercial consumers need to leverage energy as a key resource (power quality, saving potential, autarky).

Profitability

Securing traditional sources of income and transforming the organization with digitally enabled smart grids to tap new business opportunities like energy management for third parties, virtual power plants, reserve and flexibility market or platform models.

Safety and security

As a critical infrastructure, the energy system needs to be protected against all kinds of risks. This is true for physical as well as cyber-attacks and incidents and must encompass product, system, and operational safety and security.

Competitiveness

Growing importance of energy as a key competitive advantage (e.g. reduced energy costs, higher reliability) for commercial and industrial facilities, campuses and cities. Alteration of the competitive landscape through the rise of new competitors and performance-based regulations in the traditional playing field of power utilities.

Climate and environmental protection

Investments in renewable energy sources and more efficient energy consumption help to save the planet. In addition, becoming CO2-neutral and reducing impact on the environment (e.g. land usage, recycling) can provide a significant economic and image boost for companies and cities alike.

As self-evident as these goals seem, as demanding it is to achieve them. Our customers are confronted with a variety of challenges that they must master to serve society and remain ahead of the competition.

Taking new routes to grid stability

The inevitable influx of more renewable energy sources – especially into the medium- and low-voltage levels – and the connection of more electrified devices are putting pressure on the energy system. A mismatch of supply and demand, congestion, reverse power flows from the distribution to the transmission grid as well as voltage and frequency fluctuations can be the result. Yet, as many challenges as there are, as many opportunities exist for far-sighted, agile market participants. Innovative solutions and services (e.g. digital substations, wide area monitoring, smart meters, software platforms) offer a plethora of advantages:

Power utilities	Commercial & industrial sites and urban areas
Better forecast of load and production profiles	Control consumption and increase efficiency
Improved utilization of the grid infrastructure	Generate and store electricity to reduce costs
Optimized matching of demand and supply	Participate in the energy market
Simplified aggregation & management of DERs	Stability and power quality

Building an "Internet of Things" in the energy domain and ensuring power quality

The grid needs investments to cope with the energy transition and the speed of transformation. One key challenge will be to connect the real and digital world. This means that various assets (e.g. storage, digital substations, EVs, smart meters) on both the consumption and generation side of the grid will need to communicate with each other and work together with software applications. All this must comply with the highest, end-to-end cybersecurity standards. Therefore, an interoperable, open and flexible platform will be a key element of a secure and sustainable digitalization strategy. It allows the fast and easy deployment of solutions from any provider as well as collaboration between different assets and partners. A prime example is the electrical digital twin of power grids. It mirrors the physical electrical network and enables operators to simulate different scenarios. These insights can be combined with technological, societal, political, economic and environmental trends to identify investments geared towards cost-effectively meeting growing grid needs.

Tapping new business opportunities of the energy transition

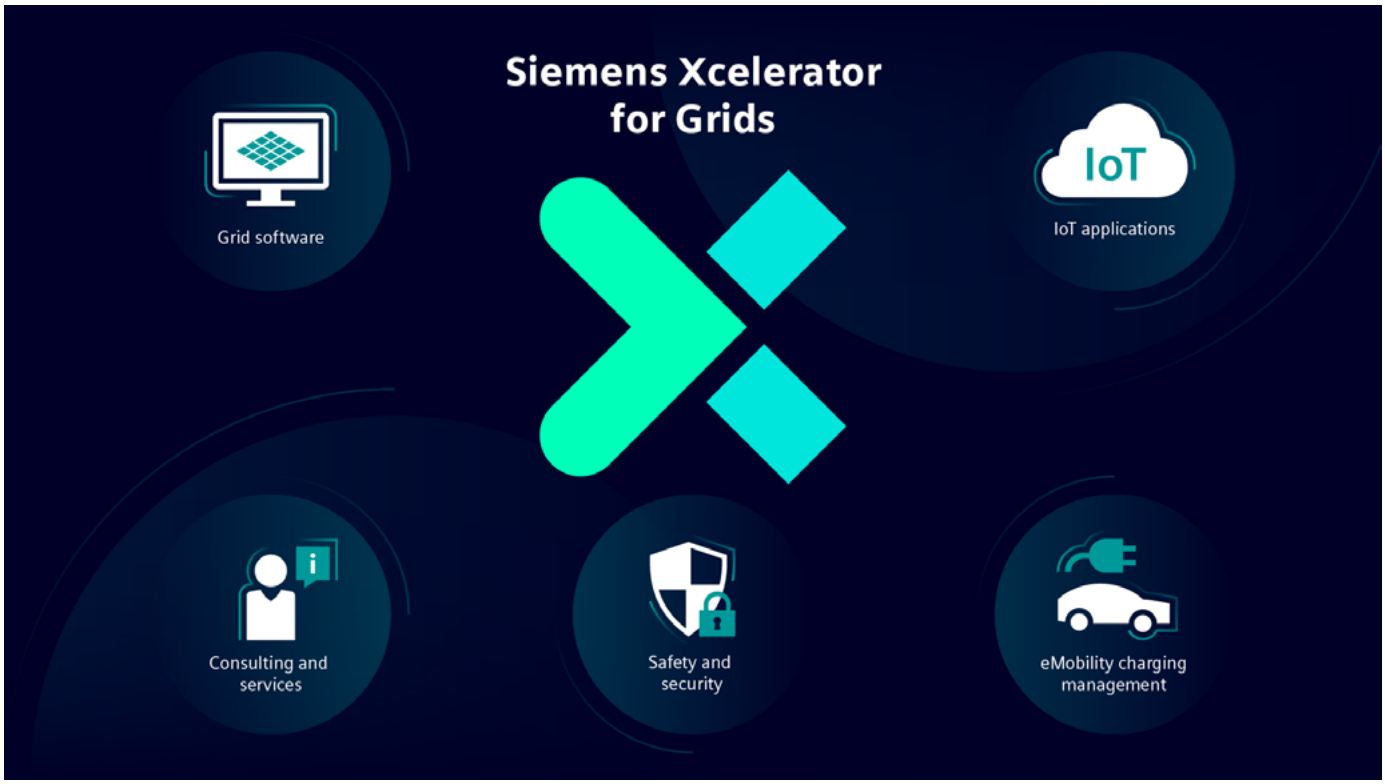
Energy is becoming more expensive and managing the grid more complex. At the same time, profitability is high on the strategic agenda and freeing up resources for important investments is necessary. Therefore, our customers are looking for ways to save on their capital expenditures (CAPEX) and operational expenditures (OPEX) as well as to tap new revenue potential. Advanced, digital solutions, cost-parity of renewable generation, and intelligent energy management tools, in combination with new financing models (e.g. as-a-service), are the perfect answer. The intelligent combination of generation, storage, energy management, and energy efficiency measures into a microgrid, for example, can be realized with next-to-no upfront costs, thanks to energy-as-a-service concepts. Microgrids can reduce costs and lead to new revenue streams, e.g. by selling off excess energy.[14] Grid operators and dedicated aggregators can build virtual power plants, install demand-side management software, or simply offer their energy expertise to prosumers to create additional revenues, minimize operating costs or defer investments in their grid.

14 Deign, J. (2020): Europe's Plan for Districts That Produce Energy, Rather Than Using It, greentechmedia

4.

The Siemens offering

Using our deep domain knowledge of electrification and our pioneering digital solutions, we have created a comprehensive offering for all participants in the energy system. It combines our state-of-the-art hardware portfolio with digital solutions from our Siemens Xcelerator for grids platform.



4.1.
Siemens Xcelerator for grids

Siemens Xcelerator for grids is the key to leveraging data to support planning, operations and maintenance. This allows to make grid operations more reliable, cost-efficient, flexible, safer and sustainable. Siemens Xcelerator for grids is an ecosystem of solutions and partners built on our unique digital business platform. Siemens Xcelerator is our open digital business platform enabling efficiency, resiliency, flexibility, exceptional user experience and sustainability. It makes digital transformation easier, with faster time-to-market and at scale. It comprises a curated, modular portfolio of software and IoT-enabled hardware, a growing ecosystem of partners – from solution vendors to technology partners – and a marketplace as a central point to explore, educate, exchange and transact alongside a community of customers, partners and developers.

Grid software

Siemens grid software enables grid operators as well as industry and infrastructure companies to accelerate and secure the energy transition in a sustainable and profitable way. The Siemens grid software portfolio (e.g. PSS® Grid Simulation and Resilience, energy management system Spectrum Power, EnergyIP®Meter Data Management) connects the physical with the digital world across an integrated OT and IT landscape – based on the design principles of modularity, openness, user-centricity, interoperability and resilience.

IoT applications

Siemens offers a suite of IoT applications (e.g. Nxpower Monitor, SIMARIS control, SICAM Navigator, SICAM Localizer, SIPROTEC Dashboard) for power distribution that help TSOs, DSOs, and industry and infrastructure customers to reduce energy costs, CO_2 emissions, and operations and maintenance costs; increase uptime and resilience; extend the lifetime of assets like switchgear, transformers, and motors; ensure cybersecurity through automated patch management; and much more.

Consulting and services

With the multitude of challenges the utility industry is facing today, operators need a partner that delivers innovative solutions for their business. We work with our customers to overcome today's obstacles. These include navigating growing demand, integrating renewable and distributed energy sources, market fluctuations and regulatory uncertainties. Siemens PTI, Advanta and Energy and Performance Services provide customers access to our global experience from a wide variety of projects, while Siemens Financial Services offers tailor-made financing solutions for customers based on their technological and financial needs.

Safety and security

Siemens delivers a unified, holistic security offering supporting the flexible composition of applications, tools and services to address the needs of critical infrastructure such as substations. We provide solutions that address incident, command and control management systems, fire protection, access control, video surveillance, intrusion detection, alarm, analytics, information & operation management, and more.

eMobility charging management

As a one-stop shop for eMobility charging infrastructure, Siemens offers the entire spectrum of state-of-the-art AC and DC charging hardware as well as software and services spanning everything from residential through commercial to depot applications. With Siemens' domain expertise in smart buildings and smart grids, we are uniquely positioned to meet the needs of our customers with full-fledged solutions, and to support them in developing, installing and managing sustainable charging solutions – for a better tomorrow.

4.2.
Areas of excellence for a smart energy world

Consulting and planning – ideas and ingenuity for a perfect blueprint

With our expertise and broad portfolio (e.g. PSS® Grid Simulation and Planning software, Energy Business Advisory, Power System Consulting), we help our customers find the best solutions and set-up to realize their strategic agenda. This includes optimizing grid development and expansion, modernizing the hardware and software infrastructure, pushing automation and intelligence in system planning and operation, leveraging flexibility potential at all system levels, identifying cost-cutting opportunities, and monetizing new value streams, and ultimately securing reliable grid operation and energy supply for all end-consumers.

All information at the fingertips for Fingrid
ELVIS, Fingrid's digital twin, allows infrastructure planning on a solid information basis, making decision processes faster, more efficient, and highly sustainable. *READ MORE ↗*

Siemens Xcelerator

Smart grid operation – intelligent, flexible, secure, and cost-efficient

With our broad suite of applications including metering, diagnostics, trading and virtual power plants, we help our customers to simply connect, integrate and manage all levels of the traditional grid as well as distributed energy systems – even in the cloud and with an "as-a-service model". Key building blocks are our open and scalable grid control platform Spectrum Power, automation solutions based on SICAM, IoT-based solutions like the applications of the Grid Diagnostic Suite, NXpower Monitor or EnergyIP® Meter Data Management.

Boosting grid reliability for CAISO
Utilizing Siemens Spectrum Power Energy Management System and Energy Market Management module, CAISO (California Independent System Operator) can reduce complexity in day-to-day trading, lower the cost of power, and significantly increase the stability and resilience of the grid. *READ MORE ↗*

Siemens Xcelerator

Silicon Valley Power accelerates digital innovation by moving to software-as-a-service (SaaS)

Silicon Valley Power (SVP) is responsible for powering the largest high-tech companies and data centers in the world and is facing new challenges daily. The forward-thinking utility trusted our EnergyIP® Meter Data Management SaaS solution to allow their highly talented resources to focus on high-value tasks, plan better with predictable costs, rely on top-notch security and scale with the city's rapid growth. *READ MORE ↗*

Siemens Xcelerator

Doubling down on America's largest transmission system – grid management with a digital twin

American Electric Power (AEP) will soon have a digital twin of the largest transmission system in the US. This enables centralized data, enhanced asset management and simplified grid planning – plus the ability to see into the future of their customers' needs. *READ MORE ↗*

Siemens Xcelerator

Digital substations – the heart of the digital transformation of the power grid

Our comprehensive portfolio leverages the benefits of digitalization throughout the grid. Here at Siemens, we offer an expansive and expanding spectrum of innovative products and solutions with our proven brands SIPROTEC and Reyrolle for energy protection, SICAM for substation automation and power quality analytics, as well as communication products such as PowerLink to make our customers' grid infrastructures digital and intelligent. The IoT-based applications enable our customers to make decisions based on real-time information from anywhere. In addition, our cloud-based digital twin solution simplifies maintenance practices as well as asset management.

Digital ingenuity for more resilience in Con Edison's grid

Con Edison became the first US utility to install power network "storm hardening" technology. Siemens' distribution feeder automation technology keeps power flowing in areas of lower Manhattan, including Wall Street, even during severe weather events like flooding. *READ MORE ↗*

Renewables management – highest flexibility where it matters

The efficient integration of renewables is not easy. Our photovoltaic electrical balance of plant (PV eBoP) solution includes all necessary electrotechnical equipment for PV systems, storage components and even complete microgrids, along with comprehensive offerings for end-to-end planning, engineering, financing and service. The Siemens' Decentralized Energy Management System and the Distributed Energy Optimization Software enable a comprehensive view of the system, real-time actions or even participation in the secondary energy market.

Instant adaption to changing needs at the Blue Lake Rancheria
Installation of a local energy solution, consisting of solar power, storage and a back-up diesel generator controlled within a microgrid helps to reduce costs and ensure the uninterrupted operation of the infrastructure during outages by automatically managing demand and supply. *READ MORE ↗*

Distributed energy solutions – the power of integrated diversity

We help our customers manage local energy generation and consumption with an intelligent network of decentralized power, heating and cooling elements such as renewables, storage, combined heat and power (CHP), microgrid controllers or advanced building management systems. We bring our experts from the Power System Consulting and Energy Business Advisory, advanced simulation techniques and the Siemens Energy Configurator to the table to find the optimal solution. Our SIESTORAGE solutions or the SIPROTEC, Reyrolle and SICAM energy automation portfolios make every endeavor smarter. In combination with control and management software from EnergyIP® or Spectrum Power, customers can take their energy future in their own hands.

Evolution of power on the Galapagos
The installation of a hybrid system on Isabella island, consisting of a solar farm, a storage solution and a biodiesel generation facility, allows the biological sanctuary to switch its power supply to an environmentally compatible alternative. *READ MORE ↗*

Storage – energy whenever it's needed

Storage is one of the key technologies for a successful energy transition. It helps to smooth peak demands, increase self-consumption, avoid grid expansions and significantly reduce energy costs. Together with global power company AES, we launched the joint venture Fluence. The products GridStack, SunStack and EdgeStack provide the right solution for any use case. Built using our sixth-generation technology stack, they make it simpler for customers to deploy storage faster and more cost-effectively without sacrificing quality and configurability.

Sello: A truly powerful shopping center
Sello and Siemens identified areas for optimum use of energy resources. The system is made up of a microgrid based on Sello's building technology, a 550 kW peak solar panel system, intelligent LED lighting, charging station for electric vehicles, and about 2 megawatts of electricity storage capacity. Sello can significantly save energy costs, reduce CO2 emissions, sell excess energy, and be an active part of the electricity reserve market. *READ MORE ↗*

Siemens Xcelerator

EV charging – electrifying mobility for a better tomorrow

Electromobility will be the norm. To make it a reality, we are cooperating with OEMs, utilities, fleet operators, companies, cities and end customers alike. Our contribution extends beyond products to build intelligent connections between the digital and the physical world. The electrification of fleets calls for a lot more than simply installing charging hardware. We provide digital solutions for optimal operation, including control of the energy demand and costs. Ultimately this means less OPEX and less CAPEX for our customers.

State-of-the-art bus depot in Hamburg
The Alsterdorf bus depot covers 45,000 square meters. It is one of the most advanced bus depots in Europe as well as the first in Germany designed solely for emission-free buses. *READ MORE ↗*

Cybersecurity – resilience in a digitally-connected world

Cyber-attacks on critical infrastructure are a very real threat. Siemens' unique Security Circle – a holistic, four-pillar concept (trusted partner, product security, system security, operational security) supports our customers across the energy landscape in establishing a resilient cybersecurity approach. We analyze the technical customer requirements, consider their policies, and ensure a secure implementation of all components, verified, and validated in factory acceptance and site acceptance tests, and we offer security services to keep the whole system up to date. Across our portfolio, we meet strict cybersecurity requirements.

Financing – making the impossible possible

With the power of our Siemens Financial Services unit, we have the right experts at hand who can help our customers with their individual energy transitions. Our experience in the energy, industrial and infrastructure sectors allows us to offer financing solutions and advisory services, grounded in in-depth understanding of our customers' market environments. Adaptability and flexibility are part of our operational mindset and we offer traditional and innovative financing options, tailor-made to the project at hand.

Shaping the energy transformation in Brazil
Siemens Financial Service (SFS) invested in the Brazil-based start-up Micropower-Comerc (MPC) to deliver solar and battery storage to commercial and industrial clients (C&I). *READ MORE ↗*

5.

Open invitation – let's ideate and create together!

Energy intelligence is all about perfectly aligning different assets and capabilities to form a cohesive and cooperating unity – across technologies, businesses and people. In this paper, we present you with our take on the new energy world and share some key ideas on how we can bring together the right resources to support the different stakeholders in reaping its benefits.

Openness, collaboration and co-innovation are at the heart of our new digital business platform Siemens Xcelerator. Therefore, we want to conclude by issuing an open invitation to all players in the energy market to get in touch with us and embark on a co-creation journey to accelerate the digital transformation and shape the energy transition – together.

You can contact us

24/7

We are ready to help you with a concrete project, a quote for any of our products or solutions, or direct support for installed equipment.

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Siemens Smart Infrastructure is shaping the market for intelligent, adaptive infrastructure for today and the future. It addresses the pressing challenges of urbanization and climate change by connecting energy systems, buildings and industries. SI provides customers with a comprehensive end-to-end portfolio from a single source – with products, systems, solutions and services from the point of power generation all the way to consumption. With an increasingly digitalized ecosystem, it helps customers thrive and communities progress while contributing toward protecting the planet.

siemens.com/smart-infrastructure