SIEMENS
Ingenuity for life

Pioneering a new era – a guide to mastering disruptive change in the energy world

siemens.com/agility-in-energy

“The energy systems of the future will be highly decarbonized, distributed, and digital.”

Agility in energy – managing the 3D grid

Our energy system today is completely different from how it was 20 years ago. There have been staggering advances in generation and distribution technology, in the economic viability of renewables and storage, and in energy efficiency. New market models and players are entering the scene, and in addition there is a strong desire to keep our planet clean and safe.

Transformation has reached all global markets in varying manifestations. Nevertheless, three core characteristics have emerged as focal points of change: The energy systems of the future will be highly decarbonized, distributed, and digital. These “3D grids” are testing the capabilities of the traditional players, but they also offer a wealth of new opportunities on the technology and business fronts.

Agility is the key quality required of all participants in the energy ecosystem on a proactive journey towards 3D grids to capitalize on the great many opportunities. Agility in energy means openness to business and technology, transparency in all areas of operation, and the right degree of foresightedness to anticipate future developments. This is the foundation for creating appropriate business models, investing in the best solutions, and finding the right business partners.

A joint new approach is required for technology and energy suppliers to become strong business allies. Cooperation and innovation in future business fields will be essential for executing all action in the 3D grids with a clear focus on the end customer. Software and intelligent grid technology provide significant potential for new consumer-centric offerings in the demand for more advanced and digital services and for a cleaner and more sustainable energy supply.

Let us identify the most promising approaches together.

Ralf Christian
CEO Energy Management Division

Trends and challenges: the 3D grid

Trends and technology are reshaping the energy system

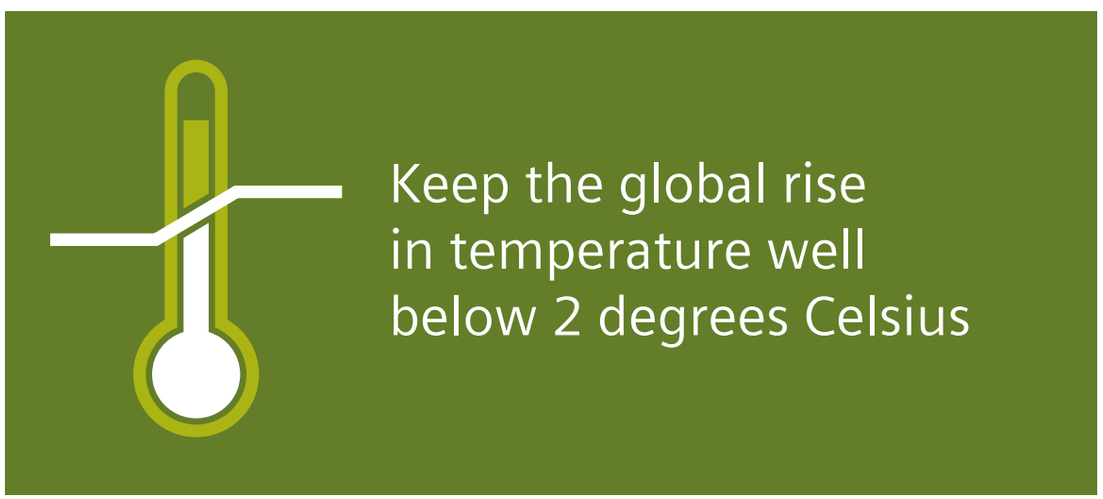
The megatrends of our era, such as climate change, resource scarcity, urbanization, digitalization, and demographic change, have significantly impacted the energy sector and stimulated its transformation. On a more granular level, there have been staggering advances in generation and distribution technology, in the economic viability of renewable resources and storage, as well as in energy efficiency. Furthermore, the market is driven by constantly changing political regulations. New market models and players are entering the stage, and a strong desire to keep our planet clean and safe is emerging both in politics and across society.

The emergence of the 3D grid

In many countries the current energy system topology is transforming from a strictly centralized model into a **distributed, decarbonized, digital grid with bidirectional power flow – the 3D grid.** While each energy system has its own peculiarities in terms of regulations, state of development, stability, and rate of change, the transformation itself has reached all markets – a situation that is testing the capabilities of the traditional players but is also offering a multitude of new opportunities on the technology and business fronts.

In Germany alone, the number of electricity generation sites has increased from roughly 300 large-scale, fossil power plants to over 1.5 million generation units, most of which are photovoltaic.*

* Wirth, H (2017): Aktuelle Fakten zur Photovoltaik in Deutschland, from Fraunhofer ISE 26.03.2017
https://www.ise.fraunhofer.de/content/dam/ise/de/documents/publications/studies/aktuelle-fakten-zur-photovoltaik-in-deutschland.pdf



3D grid – Dimension 1: Decarbonized

Decarbonization significantly affects the strategic agendas and daily business of utilities, from new forms of generation, management of different sectors, lower kWh consumption, and new stochastic load prediction models to identifying the right degree of coopetition with new competitors.

Over 141 countries have ratified the 21st Conference of the Parties (COP21) agreement in Paris to battle climate change and keep the global rise in temperature below 2 degrees Celsius. This goal has become part of many regulations and a key driver of clean electricity plans and energy-efficiency initiatives.

Globally, over 25 percent of greenhouse gases are emitted as a result of electricity and heat production, making these factors a major lever for reducing carbon emissions by finding the right mix of energy resources and substituting coal and oil with wind, solar, and water as well as gas and nuclear. This development will affect grid layouts and necessitate the aggregation and management of small-scale generation sites.

Another area of action will be more efficient transmission and distribution. Technical and non-technical losses must be minimized, and storage has to become a key component of the future grid. Utilities can even act as external energy managers, optimizing consumption patterns in office buildings, production sites, or residential housing, and leveraging demand response (DR) systems to reduce greenhouse gas emissions. Coupling additional sectors, such as mobility, with the electricity grid creates new challenges and opportunities for utilities: On the one hand there is the need to invest in advanced, intelligent infrastructure to create the necessary transparency for all stakeholders, while on the other hand aggregating generation and storage capacities and providing additional energy management services opens up new revenue streams. In addition, other industries are moving into the electricity sphere to offer their customers “one-stop solutions.” This represents a potential competitive threat and at the same time an attractive partnering opportunity for traditional players.

3D grid – Dimension 2: Distributed

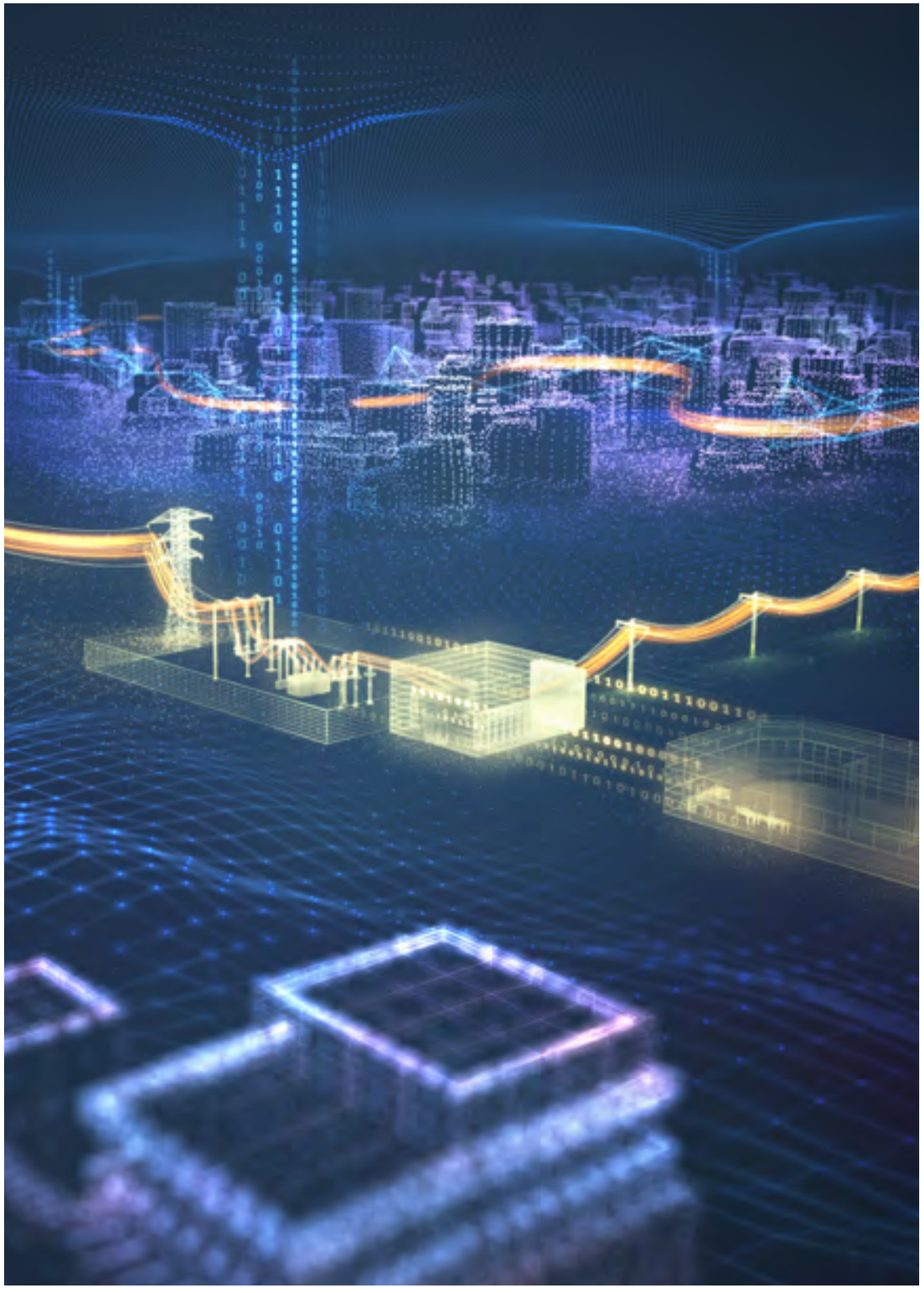
The energy world is characterized by the growing proliferation of small-scale energy generation, storage, and demand response programs across the grid as well as behind the meter. This leads to increased complexity of the grid and the emergence of many new energy management tasks that are often outside of the conventional sphere of influence for utilities.

The dynamics and disruption of the energy sector comes from the many distributed, decarbonized generation sites that have been installed over the last years. Countries that still have large areas with no access to power utilize distributed energy resources to bring electricity to remote areas and stimulate their economic upturn.

The economic benefits of lower installation costs and faster time-to-grid are strengthening the robust position of distributed energy resources in countries with a lot of renewable potential. Independent power producers (IPP) are investing heavily in renewable generation in suitable regions. Although these are mostly large-scale projects, they are often aimed at serving far-away load centers that demand "green power." In addition, many customers are moving away from their passive role and becoming active prosumers. They are motivated by environmental concerns, economic considerations, and the desire to become independent from the grid. In combination with commercial and industrial customers, who were traditionally involved in self-generation to a limited extent and now increasingly leverage renewable resources at many of their sites, this boosts behind-the-meter generation capacity dramatically.

But generation is only one part of the puzzle. Storage is becoming a vital element in many parts of the system. Alongside efficient and intelligent buildings, connected industrial and household machines that are remotely managed through the Internet of Things (IoT), and a general awareness of energy consumption, are changing demand patterns. This results in increased management and balancing efforts on the one hand and less "paid consumption" on the other. That is why future grid management needs to include aggregating, managing, and incentivizing behind-the-meter generation and storage as well as stimulating new usage patterns – even more so as consumers become increasingly actively involved in the markets from generation to distribution, and electricity is transforming from a mere commodity into an emotionally charged "consumer product."

Customer expectations in terms of customer service and interaction are growing, and many consumers have the power to interact with traditional utilities at eye level nowadays. Cooperation at all levels will trump centralized control mechanisms and, what is more, enabling transactions could even become more important than owning assets. Utilities need to acknowledge consumers as important partners in managing the grid and actively engage with them. A fundamental mind shift towards consumer-centric strategies and the creation of new channels and services for interaction with consumers are helping utilities to tap into potential new revenue streams that emerge at the so-called grid edge, beyond the domain of classic grid operation and management.



3D grid – Dimension 3: Digital

Digitalization leads to much more intelligence within and interconnectivity between different systems. Data from connected sensors across the grid and from many other sources is becoming the core resource for automated, successful, and profitable grid management.

Digitalization is a core technology that has already disrupted the media industry (Netflix), brick-and-mortar retail (Amazon), travel accommodation (Airbnb), and the transport sector (Uber). The energy sector will also be affected by this trend. It has the potential to change the very nature of grid management and proactively address the challenges and opportunities of increasingly distributed and decarbonized grid resources.

A digital grid with intelligent substations and sensors located at critical points enables more efficient grid management. It opens the way for predictive maintenance and situation-specific asset utilization, which will, ultimately, strengthen self-healing capabilities. The intelligent design of data-based platforms and business models could enable utilities to create new revenue streams, even from assets that they do not own. Virtual power plants (VPP) can pool distributed generation sites. Enhanced connectivity is opening the way for new demand response systems, grid balancing services, and home energy management platforms. Utilities need to be quick on their feet to capitalize on these opportunities as new players are already entering the market.

Above all, data-savvy companies from the IT and telecommunication sectors and agile start-ups have started to offer energy-related services. They are introducing new business models with flat rates, energy communities, sharing platforms, pay-per-use tariffs, and energy cloud models. They are not necessarily interested in managing the grid or selling kWh. They are rather addressing fundamental consumer motivations of the millenials, such as becoming self-sufficient, saving the environment, outsmarting the utilities, or just showing off in the neighborhood. New technologies such as blockchain are enabling transparent, automated, and efficient trading between multiple participating systems and various stakeholders, while at the same time taking grid-specific requirements into account. Several companies are even working on blockchain-enabled demand response management, where each connected device becomes its own active player within the system. Incumbents need to keep up with these new developments and at the same time ensure that old and new elements work seamlessly together and that the prime goal of grid stability is not endangered.

Shifting value streams – new roles for utilities

Looking at these three factors and their interplay, it becomes clear why leading researchers predict a value shift within the energy system from generation towards consumers.

Many large-scale, fossil generation resources will become mere backup power sources in future and attention will shift to distribution system operators (DSOs) and the behind-the-meter realm. DSOs will have to start acting like transmission system operators (TSOs) for the medium- and low-voltage level of the grid. They will also play a key role in stabilizing it. A bidirectional low-voltage grid with a lot of intermittent power sources poses extremely high demands on Volt/Var control and frequency stabilization as well as the avoidance of harmonics and phase shifts.

Agility in energy explained

Understand, focus, act

Creating the energy system of the future is a journey marked by uncertainty; disruptions are the new "normal." It requires a high degree of flexibility and the capability of adapting to new conditions to survive and prosper in this evolutionary environment – in short: Agility in energy.

Agility in energy is a mind-set that should be deeply entrenched through the whole organization, from C-level executives and the R&D department to customer service and technical field crews. Understanding the challenges ahead, focusing on decisions that have the greatest business impact, and efficiently putting strategies into action are cross-cutting issues. And we at Siemens want to ensure that our customers and partners acquire and strengthen the agility required to capitalize on opportunities today and in the future and build a sustainable, affordable, and reliable 3D grid.

Agility as key success factor

Companies that have an edge over their competitors substitute random evolution with strategic planning and manage to do three things better than everybody else: They deeply **understand** and constantly interact with their stakeholders, partners, and customers. They are able to **focus** on the most important market opportunities. They **act** according to their strategy and constantly changing requirements. Our concept of "Agility in energy" is built around these three topics. Breaking them down to dedicated principles makes them relevant and actionable for the specific dynamics of the energy market.

There are eight characteristics and qualities that truly agile companies and solutions must have in order to find new value spots in the energy system that is becoming increasingly decarbonized, distributed, and digital: Successful companies in the 3D grid need to be extremely **open** about their business and technology, have **transparency** in all areas of operation, and show the right degree of **foresightedness** to anticipate future developments. This is the foundation for creating the right business models, investing in the best solutions, and finding the right business partners.

Each action in the 3D grid must be executed with a clear **consumer focus** to create outstanding consumer experience, satisfaction, and retention. As energy infrastructures have a significant impact on the environment, **public acceptance** is another beacon that companies must follow.

Manageability is a core prerequisite for executing the long-term business strategy. Software and intelligent grid technology reduce efforts for everyday tasks, significantly enhance the influence that market players have on assets, and even provide potential for complete automation. Rapid **adaptability** to changing requirements leads to fast reaction times – a key asset in a turbulent market environment. This is especially true for grid management but also for R&D and business development. Finally, the principle of **leanness** helps identify areas in an organization where the most impact can be achieved and to determine the best operational model for the future.

Mastering disruptive change in the energy world

The eight areas of action to ensure future market success

Area of action 1

Sparking the fire:

State your motivation and get the organization to commit

Area of action 2

Setting targets:

Determine core goals and define milestones

Area of action 3

Joining forces:

Find your sweet spot by taking a holistic approach to the ecosystem

Area of action 4

Exploiting the budget:

Continuously optimize costs and maximize return on investment

Area of action 5

Taking safe steps:

Ensure highly reliable grid operation in times of change

Area of action 6

Monetizing your ingenuity:

Promote and harness innovative power for business success

Area of action 7

Knowing and showing your success:

Measure and communicate progress to internal and external audiences

Area of action 8

Expecting the unexpected:

Be prepared to flexibly navigate industry turbulence

Area of action 1: Sparking the fire

State your motivation and get your organization to commit

The emergence of the 3D grid means that utilities have to bid farewell to "business as usual." But change will not happen automatically, even if the market demands it.

Clear motivation drives organizational development

Start-up companies usually keep their employees highly motivated and create an atmosphere of constant change by a shared core idea. This leads to a "self-selection" of employees that are willing and able to follow. Ask yourself: What will motivate our employees more and show that we really want to change?

Lead by example, not by PowerPoint

Every utility needs a clear ambition and a reason for being in this market beyond "this is what we've always done." A shared and valued vision pushes the company in the right direction. As such, it is an important prerequisite for "Agility in energy."

Frame this idea in clear, engaging words, convey it across the whole organization, and, most importantly, live it every day by leading by example. C-level executives and management teams need to act as ambassadors and explain their motives. This gets everybody "on board" and makes it much easier to change the direction even of large "utility tankers." In addition to this, it will help you reframe your story to external stakeholders.

What we bring to the table

At Siemens, we want to act as a sparring partner, providing innovative workshop formats and ideation sessions that help our customers formulate and substantiate the visions they have for their companies.

Our BizMo™ approach helps us directly link entrepreneurial ambition with a company's bottom line. Our Siemens Management Consulting can help you define a roadmap and processes to leverage the full power of motivation across your organization. This helped the native American community Blue Lake Rancheria, for instance, translate their vision of conserving the environment into an economically viable solution, reduce CO_2 emissions, and significantly enhance grid reliability.

Hands-on advice

Define the strategic motivation for your company concisely and provide a clear answer to the question "Why do we want to change?"

Proactively explain your reasons for making changes to the organization to unite all employees behind one strong idea.

Lead by top-down example and recruit ambassadors in all departments.

Area of action 2: Setting targets

Determine core goals and define milestones

The 3D grid requires us to reconsider the way goals are defined, implemented, and measured. Long-term goals might not be fully achieved, so the focus needs to be on many different connected, flexible, short-term goals. A huge challenge that can be tackled in two steps:

1. Defining a company's ideal role in the energy system

A company needs to decide how it sees its role in the future energy system. Is it focused exclusively on managing the grid and distributing energy, or rather on service-oriented business models? It would even be possible to become a virtual platform orchestrator that coordinates markets players across different sectors. A clear role model makes it significantly easier to assess the changes required, and decide on investments, people, and mergers and acquisitions.

2. Setting the pace with measurable milestones

Utilities also need to define clear, measurable milestones that will be tracked and communicated across the organization plus a set of clearly actionable sub-goals that can be reached in the next two to three years. All major investments should be guided by them. This helps to reorganize and dramatically speed up the organization, create an agile mind-set in all departments, consider the shorter product life cycles of digital equipment, and ensure that all investments will effectively contribute to the overall strategy.

What we bring to the table

Our Energy Business Advisory team helps balance a long-term agenda against the new degree of flexibility that is required. One example is NB Power, a vertically integrated Canadian utility, that modernized its network and developed future-proof business models with our support. We also help our partners stay ahead of the challenges through flexible financing options from Siemens Financial Services.

Hands-on advice

Define clear, measurable goals that align with your ambition and constantly track your progress.

Create multiple short-term goals that help you constantly align your strategy and operations with market change.

Be aware that some goals may never be achieved, but make sure that they drive the organization in the right direction.

Area of action 3: Joining forces

Find your sweet spot by taking a holistic approach to the ecosystem

Digitally linked networks of hardware and software from different sectors as well as players with various backgrounds will be key elements of the future energy landscape. Market players must be prepared to use a diverse mix of technologies and collaborate with customers, strategic partners, and the public to develop the next generation of energy market solutions.

Joining forces and pooling resources are key success factors

Integrating big data from different sources across the grid and beyond can help increase management efficiency and reduce response times. Bundled service offerings and alliances of private consumers, energy-supply companies, and other players are changing the way utilities and other players influence the grid.

Digitalization has changed grid management and customer expectations

Utilities need to digitalize their assets, infuse their grids with more intelligence and automation, and transform their critical "asset-centric system backbone" to keep pace with the multitude of digital services from inside and outside the grid. Transparency and collaboration in ecosystems will be critical for mastering the 3D grid.

What we bring to the table

Software and services from Siemens bring together mission-critical data from the operational sphere and asset management on the cloud-driven, open platform MindSphere. The Smart Pool application, for instance, which can be considered the brain of a VPP, can bundle distributed energy systems on a central mass-market platform. Siemens' Energy Trading and Risk Management solution enables the best possible combination of risk reduction and profit optimization across the entire value chain and helps monetize new forms of transactions and business models. SIESTORAGE is the optimal harware tool for stabilizing grids and making them more flexible.

The triumphal march of renewable energy production, which is set to grow by more than 43percent worldwide between 2015 and 2021* and the constant shift from centralized generation to distributed energy resources (DER) are living proof of this.

* IEA (2016): Medium-Term Renewable Energy Market Report 2016, from http://www.iea.org/bookshop/734-Medium-Term_Renewable_Energy_Market_Report_2016

Hands-on advice

Enable open collaboration between all stakeholders by developing the right skills, mind-set, organizational processes, and technologies.

Proactively develop joint product and business models in collaboration with partners from many different areas of expertise and business domains.

Ensure that your assets and software systems are well prepared to seamlessly interact with different solutions, tools, and data sources.

Area of action 4: Exploiting the budget

Continuously optimize costs and maximize return on investment

Power consumption is stagnating and customer-sited DERs are mushrooming. At the same time, utilities need to invest in grid modernization to meet demands for more advanced services, new technologies to reduce environmental impact, and unimpaired power quality and security of supply.

Leverage new technologies to increase grid management efficiency

A clever investment strategy based on transparent processes and insights within and beyond the grid will target the right technologies and assets to increase the efficiency and effectiveness of grid management. In many cases, a system's intelligence is more important than the sheer power of installed assets. By simulating how the grid and behind-the-meter activities will evolve, utilities can get more out of existing assets and invest in the infrastructure, software, and services that have the most impact on the bottom line.

Continuous cost optimization at all levels

Leveraging big data analytics and increasing grid automation is a promising approach towards sustainable cost optimization, and utilities should move fast to adopt new technologies and DERs to compensate for the loss of old revenue streams, deploy promising business models downstream, and shift CAPEX to OPEX to become more flexible and adaptive to changing market environments.

What we bring to the table

Our team at Power Technologies International can help customers find the optimal grid layout and find the perfect spots to continuously optimize their system. One example is the advanced metering infrastructure (AMI) we installed for the Brazilian energy company Eletrobras Distribuicao. It increased grid management efficiency and reduced non-recognized losses at an equivalent of US $150 million per year. Together with our partners from Siemens Financial Services, we can also offer attractive financing options that help shift CAPEX to OPEX.

US

US $–48 bn a year

Europe

US $–61 bn a year

Experts forecast potential revenue losses of up to US $48 billion a year in the US and US $61 billion in Europe by 2025.*

Hands-on advice

Leverage data-based insights and advanced simulations to ensure that every investment in grid improvement is on target.

Focus on leveraging digital technology to increase the efficiency of grid operations and utilize existing resources instead of adding new infrastructure.

Build a strong investor-related value story and leverage innovative financing models to shift CAPEX to OPEX and free up investment resources.

* Accenture (2014): How can utilities survive the energy disruption? Exploring energy demand disruptions in the digital era, from https://www.accenture.com/us-en/insight-acn-digitally-enabled-grid

Area of action 5: Taking safe steps

Ensure highly reliable grid operation in times of change

In the 3D grid, DSOs absorb excess behind-the-meter generation and need to assume the role of TSOs in medium- and low-voltage networks. At the same time, grid topologies are changing rapidly. This development calls for resilient and intelligent technologies.

Knowledge is power for grid management

Meaningfully processed data from the core of a grid to its edges and even beyond helps utilities significantly increase transparency and, consequently, enables them to react to higher stress levels and develop actionable response plans in advance. State-of-the-art control and management systems can provide recommendations for optimal grid management within seconds. On top of that, regulated transformers at a grid's critical points plus automation systems and sensors for self-healing or microgrids can prevent grid failure or at least confine it to a very small area.

Spreading risk on many shoulders

The characteristics of the 3D grid result in some of its major risks: decrease in power quality, unbalanced power flows, Volt/Var fluctuations, harmonics, and challenging load forecasts. However, they can also be a key part of the solution. Existing smart inverters on PV installations can be used to minimize their impact on the grid. Distributed storage and generation assets as well as DR systems can significantly increase stability, reliability, and power quality. Utilities should try to manage the complete DER landscape in the grid and behind-the-meter through dedicated virtual power plants or even create microgrids that can run in island mode, which is a viable way of preventing large-scale blackouts. Integrating all this closely with the local DMS or SCADA system can allow utilities to respond to irregularities in a timely manner.

Cyberspace requires a new approach to security

With the collaboration of many new players and the additional digital layer, cyber security is becoming a top priority. Utilities need to manage the balance between open system standards and ensuring the highest security for their assets and data. Programs and processes need to be implemented from physical sensors and smart meters to the consumer portal and invoicing in order to prevent unauthorized access. Employees across the whole organization need to internalize the danger of cyberattacks and integrate precautions into their daily behavior.

What we bring to the table

We provide a comprehensive range of solutions that increase risk mitigation and safety across all areas of the energy system. On the hardware side, for example, intelligent transformer substations that enable DSOs to monitor and ensure power quality, master peak loads in the grid, and minimize downtime. At the control level, Spectrum Power™ and EnergyIP enable advanced distribution management systems. For the US utility Wabash Valley Power, for instance, we leveraged the existing smart meter infrastructure to set up an advanced demand response system that allows bidirectional communication for load reduction in real-time, integrated a broad range of different stakeholders, and ensured an efficient and stable network. Our microgrid management control solution allows microgrid operators to dynamically manage and control distributed energy resources with integrated weather and load forecasting.

Hands-on advice

Make sure the grid is transparent, intelligent, and automated to anticipate disturbances and quickly find the right response.

Turn challenges into opportunities and leverage existing DERs to stabilize your grid.

Make hardware and software resilience a top priority to protect the grid from all kinds of hazards.

Area of action 6: Monetizing your ingenuity

Promote and harness innovative power for business success

Sustainable, successful business models in the 3D grid will have to adapt to a rapid pace of innovation. At the same time, the safety of the grid needs to be ensured. Complementary routes can generate innovative drive. Utilities can leverage their extensive expertise in energy grids and act as a sponsor for agile start-ups or partner with established players from other domains.

Rework the organization to create an "innovation environment"

Innovation is not about following trends, but about finding the sweet spots in the energy system. That is why utilities should find, hire, and integrate people with a strong entrepreneurial spirit and set up interdisciplinary teams across all departments. A data-driven, design-thinking approach is the foundation that helps focus scarce resources on the most promising areas. Utilities should extensively leverage their current database and apply advanced data analytics to uncover potential for innovation.

For more control over the monetization of innovation and to overcome regulatory restrictions, utilities could even retain only the minimum core resources at the regulated entity and create a non-regulated structure that provides consultation services for grid optimization and investment. This results in more freedom to explore business models built on consumer data. DSOs are ideally positioned to tap into all relevant data sources. Integrating e-mobility information and feedback from intelligent buildings can further optimize grid management and help develop new data-driven services.

Think beyond the grid to uncover innovation potential

A core asset of DSOs is the ability to interconnect diverse equipment, stakeholders, and behaviors into a single manageable system. Managing connected, intelligent buildings and devices or taking an active role in the design of smart cities can be an attractive growth market. A great example is the development of the smart city project Aspern in Austria. It illustrates how close collaboration between different partners can drive innovation and progress.

Utilities should always be open-minded and have the foresightedness to embrace new technical developments, such as blockchain technology, even if they emerge in different contexts.

What we bring to the table

We strongly engage in innovative research and pilot projects in areas of innovation that will have a significant and sustainable impact on the energy business. Examples are the DynaGrid, a control center that can manage load flows across the transmission system dynamically and in real time, and the joint venture egrid, which emerged from the IREN and IREN2 projects and offers consulting services for the integration of distributed infeed and storage solutions into distribution grids. We have also teamed up with Accenture to create the OMNETRIC Group, which provides unparalleled expertise in integrating OT and IT in energy systems and realizing innovative, digital, and data-driven projects.

Hands-on advice

Take a broad view of innovation, from the core of the grid to the edges and beyond, starting with your existing capabilities and strengths.

Leverage data to create innovations on the operational side as well as on the business side.

Create a supportive environment for innovation with the right skills and mind-set internally and the right partner network externally.

Area of action 7: Knowing and showing your success

Measure and communicate progress to internal and external audiences

In today's energy landscape, utilities need to become proactive communicators. More and open communication and a more consistent measurement of key success indicators are required to meet stakeholder expectations and adapt to the fast-changing business environment.

Clear measures to avoid being sidetracked

Utilities need to quickly adapt to changing requirements, reduce time-to-market, convince financial stakeholders, and motivate internal target groups. That is why clear-cut messages, proven by solid benchmarks and realistic risk assessments, are a must today. Predictive assessments of key risk factors, the development of KPIs and methods of regularly evaluating progress and overall innovative drive, plus breaking down values and business strategy into quantifiable, trackable elements create the basis.

Keeping everybody in the loop – constantly

A top-down communication strategy, the efficient exchange of information across departments, and a culture of open dialog across the organization are important for keeping initiatives on track. They are also important when working in ecosystems and consortiums and when it comes to attracting investors with engaging, consistent stories.

Engaging consumers through emotional, relevant communication

Today, stakeholders generally expect an open, proactive dialog, instant feedback, and a constant stream of information on relevant topics. To provide this, utilities require an adequate technological infrastructure, such as social media management and CRM systems, yet they must also adopt a more emotional and empathetic business culture.

What we bring to the table

We provide extensive project management expertise, performance measurement models, and tools as well as a broad array of data-driven solutions that help customers measure, manage, and optimize their operational performance. For example, we developed an energy-efficiency platform for leading automotive supplier Gestamp in Spain. It is managed from our Smart Grid Control Center in Seville and enables Gestamp to constantly track the progress of the energy-efficiency initiative and leverage the results for internal and external communication such as environment-related communication. Our EnergyEngage application for utilities such as Westar Energy and KCBPU allows these companies to provide their consumers with information on their energy consumption, environmental impact, and energy-saving potentials.

Hands-on advice

Install accurate measurement processes to quickly adapt strategic guidelines and operational action plans.

Engage in active, open dialog with internal and external stakeholders to create a positive, emotional image.

Leverage feedback from stakeholders to generate valuable insights into their individual demands, and channel this input into future innovation.

Area of action 8: Expecting the unexpected

Be prepared to flexibly navigate industry turbulence

Natural disasters like hurricane Sandy, a political development such as Germany's decision to completely phase out nuclear power, or a technical problem in the energy system itself can easily turn well-laid plans upside down. That is why utilities need to be in a constant state of alertness. Two key areas need to be considered:

Speed up the organization

Utilities should adopt a highy flexible approach to strategy, constantly scan markets, and discuss developments with technology partners, business partners, and customers. These insights are essential input for a process that constantly evaluates strategies. In addition, the organizational structure needs to become more agile and nimble with shorter decision-making processes. Finally, the right people need to be on board – employees with an entrepreneurial spirit and the courage to take risks and act fast.

One-touch grid management

A broad portfolio of agile and smart solutions helps create a system that is well prepared for unforeseen turbulence. Digitalization is a key enabler here. Data analytics should be used on all data points within the grid, ideally integrating further sources of external information such as social media, weather forecasts, or news. This helps substantiate and validate predictions, quickly identify problem areas, and act accordingly.

What we bring to the table

Designed to make grids more intelligent, our products provide grid operators with unprecedented levels of transparency and control, enabling them to react fast and flexibly and to be prepared for unforeseen challenges. For example, we provided the control system for a pilot project by the British distribution company Northern Powergrid. The system coordinates the operation of all technologies in the network and allows for a high degree of real-time automation and management. The goal is to optimally align all existing elements of the network and seamlessly integrate new parts such as photovoltaics and storage whenever and wherever they are needed. The system automatically adapts its actions to changing situations and even predicts them. Another example is our innovative Pretact® concept, which allows customers to prevent, protect, and react at every step of the energy value chain on the basis of modular and mobile hardware solutions as well as service concepts such as predictive maintenance.

Hands-on advice

Establish an organizational structure and processes that enable your teams to operate quickly and locally.

Promote an open, entrepreneurial mind-set; constantly challenge your strategy and support fast decision-making.

Leverage smart technologies to increase grid adaptability and manageability; use mobile, flexible assets to respond rapidly to developments.

Published by
Siemens AG 2017

Energy Management
Freyeslebenstrasse 1
91058 Erlangen, Germany

For more information, please contact
our Customer Support Center.
Phone: +49 180 524 70 00
Fax: +49 180 524 24 71
(Charges depending on provider)
E-mail: support.energy@siemens.com

Published in Germany
Article No. EMDG-T10126-01-7600
Dispo 06200
fb7741 WS 0917