

Rudy
PROVOOST

ENERGY 3.0

SYNTHESIS



Transforming the world of energy for growth

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About Rudy Provoost's book,
Chairman of Rexel's Management Board

'Energy 3.0': Creating a world of energy tailored and designed around the end-user

Energy 1.0

Global warming, rising prices of hydrocarbons, huge blackouts... The current energy system that concentrates on the central production of energy, which we can call 'Energy 1.0', suffers from serious limitations. If we rely on this system, the cost of raw materials as well as the ecological impact of fossil fuels will make it unfeasible to build the number of power plants necessary to meet the current energy demand of the nine billion people on earth, rising to 12 billion in the foreseeable future.

In this model, the end consumers play a very passive role. In terms of energy saving, they can insulate their homes and buy quality equipment in the hope of consuming less, but the lack of precise information provided by measurement devices makes it almost impossible for them to monitor and reduce their consumption by these means alone.

Energy 2.0

Enter 'Energy 2.0.' The digital technology that is steadily spreading through every other economic sector is beginning to converge with the energy world. Like the 'Web 2.0' model, the 'Energy 2.0' system has seen the consumer become increasingly active, whilst buildings which were previously seen as 'envelopes' requiring insulation, are today starting to produce their own energy. One of the consequences of this new paradigm is the ability to share energy between buildings as well as in and between a centralized and decentralized production infrastructure. As energy sharing relies on smart grids and two-way interconnected transmission networks enabled by digital technologies, Energy 2.0 puts more emphasis on distribution than production.

But more is needed. Developments in technology and infrastructure, remain ineffective if the consumer is not motivated or does not take responsibility in managing his own consumption. Focusing on the best ways to manage energy production and distribution will not solve the problem if demand and consumption are not seriously taken into account. Upstream operators too often dominate the energy debate, with most of the emphasis placed on sources or the energy production system.

Energy 3.0

For the energy transition to be successful, it is crucial that we radically change how we think. After all, it is not the buildings and cities that should concern us, but the individuals who live in them and their precise energy needs. They are the end-users who will ultimately drive the energy system by becoming energy producers (via positive-energy buildings, renewable energy technology, etc.,) and using the systems and services of their choice. The issue of consumer behavior and the experience of the end-user is where we now need to focus our efforts. The concept of Energy 3.0 brings this issue to the fore and can be summed up as follows: allowing consumers to become masters of their own energy.

Production and consumption are already becoming increasingly optimized, personalized and customized. Waste is being eliminated and energy use is becoming more adapted to respond to personal needs such as, lighting, heating, or air-conditioning, which can be turned off or lowered in the user’s absence. When the user is present the different energy appliances and systems can be customized for every room and every function, for example, lighting that can simulate the sunrise or illuminated pathways at night . This customized control of energy uses interactive interfaces that allow individuals to create their own consumption scenarios to meet specific needs, such as allowing a school to optimize the energy consumption of each classroom corresponding to the school timetable. Furthermore, these control mechanisms can be accessed from any terminal, be it a computer, tablet or smartphone and can provide anyone real time access to their own energy world. This new world of energy is simple, open, constantly evolving and limitless in its possibilities. It surrounds the end-user ubiquitously, whilst remaining invisible and indispensable. Buildings are adapted to the usages and needs of their inhabitants using learning algorithms; everything everywhere can be built to better manage energy.

	Energy 1.0	Energy 2.0	Energy 3.0
Driver	Supply/ Production	Offer/ Distribution	Demand/ Consumption
Focus	Source	System	Experience
Model	Verticalized/ Centralized	Shared/ Decentralized	Personalized/ Customized
Communication	Passive	Active	Interactive
Information	Batch/ Interval	Request/ Iterative	Real time/ Instant
Force	Hierarchical	Lateral	Ubiquitous

Energy 3.0: Making products and services ‘energ-eas-y’ to drive faster adoption, higher productivity and to optimize usage

Today, we are faced with the challenge of finding a solution that removes complexity from every level of the value chain – production, distribution and consumption – to create a favorable environment for the energy transition. To emphasize the issue of simplicity this revolution can be named ‘energ-eas-y’. It relies on the involvement of all the players in the energy sector.

Local governance structures must first of all encourage innovation by eliminating barriers, simplifying regulations and stimulating new developments. Energy producers and distributors can benefit from the energy transition by investing in partnerships with others in the sector, as well as in intelligent energy infrastructure based on smart grids and smart meters.

Manufacturers of electrical products and the other players in the value chain (IT service companies, telecommunications operators, digital companies, insurance companies, etc.) need to focus on simplifying their products and services. Electrical contractors and installers must be trained and position themselves as specialists in energy management. They must also be capable of selling energy saving solutions and services, helping the customer understand the return on investment in energy saving solutions and guarantee their performance. In the energy world, the role of distribution as a meeting point and hub between manufacturers, electrical contractors and installers is, above all, to engage and drive the sector, as well as to develop new markets and growth opportunities.

The successful sharing of energy and expertise is the single biggest challenge that remains for the energy sector. No one player is able to manage the entire spectrum of services alone; from the invention of new products, energy audits of buildings and towns and the definition of an energy strategy, to the selection, financing and installation of equipment and, last but not least, providing maintenance. Only by pooling expertise and forming successful partnerships can 'Energy 3.0' technologies become widespread. The ultimate challenge is to build a world in which energy is accessible, reliable and respectful of the environment, with offers and services that have the potential to improve the lives of everyone.

Energy 3.0: empowering the end-user to make the energy transformation a reality

Improving access to energy

Energy is very unevenly distributed in today's world. While many millions of homes suffer from fuel poverty, the amount of energy being wasted elsewhere is extensive. Energy equity aims at using energy-efficiency technologies so that everyone can make use of the exact amount of energy that they need, therefore limiting waste. Without detriment to comfort, purchasing power is put back in the hands of households.

Striking a balance between reducing consumption and increasing convenience

According to a variety of surveys conducted internationally by Rexel, consumers across the board have a keen interest in making energy savings. Another study of the electrical sector showed that by investing approximately 2,500 euros into an active energy efficiency solution, the average French household could save 400 euros per year on its energy bill, that is equal to one quarter of its annual energy expenditure. The

potential for energy and financial savings is considerable; several hundred billion euros could be saved each year worldwide using existing technologies.

The reduction in CO₂ emissions would also be significant. According to the International Energy Agency, energy efficiency could help reduce CO₂ emissions by 38% between now and 2050. This potential can even be achieved without having to compromise on the comfort and needs of individuals.

Enhancing quality of life and comfort

Energy 3.0 allows for the emergence of a combination of all the services and applications to automate our daily chores, increase our comfort and improve quality of life on a global scale.

One of the most important aspects of Energy 3.0 is the development of services to benefit our health. Poor indoor air quality, often worse than the air outside, can cause asthma, allergies and respiratory illnesses. Accidents in the home can end in disability or even death, especially among infants and the elderly, whilst fuel poverty is blamed for more deaths than road traffic accidents in the UK. This new system presents a huge opportunity to improve health through the use of telemedicine, providing support for the sick and infirm and assisted home care for the elderly.

Examples of energy solutions that demonstrate the services on offer to everyone include: customized and innovative lighting to help the visually impaired, improved air quality in homes and in the workplace, the ability to check if an older person has taken their medicine, and ways to detect gas and water leaks and to alert vehicles to pedestrians stepping out onto the street at night. These are just some of the many value-added services that will contribute to changing our lives for the better in the future. The common goal of these services and mechanisms is to help people take care of one another, and for everyone to feel responsible.

Turning the energy transformation into a driving force for value and job creation

We are engaged in an energy revolution that will transform the way we live, similar to the changes brought about in the 20th century by electricity and information technology. It is a sustainable revolution based on the fundamental principles of the circular economy and the fight against global warming, in which new services and technologies will bring about new growth cycles. Millions of jobs have already been and are being created in the Energy 3.0 sectors (smart grids, renewable energies, energy efficiency, etc.), which are structured around new areas of expertise; notably in high-performance and communication mechanisms, shared networks and software and new financial models which will combine with services to transform both the sale and installation of energy solutions. To meet these challenges the energy sector has to restructure and reinforce its existing training framework in order to drive the dissemination of the most relevant innovations.

Accelerating the transition

Governments must work to remove market barriers, business needs to be challenged to create simple, scalable economic models and the energy sector must develop “trust agreements” based on performance guarantees. Buying energy-efficient solutions is particularly complex in today’s world; there is a profusion of products with varying specifications to contend with, an often poorly understood return on investment, operational risks, and so forth. The energy sector must be prepared to assure consumers that the solutions they install can achieve the goals they were designed for and continue to work well over the long term.

Improved purchasing power, a better of quality of life, winning the fight against fuel poverty: these are just some of the real benefits that “empowering” the end customer will bring in the coming years.

The concept of ‘Energy 3.0’ heralds the birth of a new energy world, based on three core pillars: customization (production and consumption specifically adapted to the individual’s needs), ‘Energ-eas-y’ (the much needed simplification at all levels of the energy value chain) and ‘empowerment’ (helping end-users to take responsibility and master their energy consumption for greater energy equity, improved purchasing power and quality of life, economic growth and to accelerate the spread of new technologies). The ultimate challenge is to build a world in which energy is accessible, reliable and respectful of the environment, with offers and services that have the potential to improve the lives of everyone. It is in this spirit that the author wanted to share his ideas and beliefs in the hope of engaging players at all levels in the energy debate. By working together we can find the best solutions to make this energy transition a reality.

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Energy 3.0

Buildings that produce their own energy and respond to our everyday needs; simple management tools that improve the comfort of our homes making them more economical and connecting them to the world; safer, smarter and more sustainable towns and cities that provide greater mobility, improve communication and make life easier for everyone. These are just a few examples of the energy transformation that is underway.

The energy world has entered a new chapter in its history, a digital age that will impact our lives as much as the advent of electricity did at the end of the 19th century, bringing with it a groundbreaking wave of innovations that blur the lines between the energy and the digital space.

Across the urban and built environment, new technologies are already advancing the convergence of different economic models with the energy system and infrastructure. This will fundamentally change the energy landscape and give each one of us access to tailor-made energy solutions adapted to our needs and means.

This book *Energy 3.0* discusses how these changes will continue to evolve and stimulate growth. It also investigates the new tools and services that will be made available to everyone and how the entire energy sector, as we know it, is going to reinvent itself, spurring job creation and the emergence of new energy professions.



Rudy Provoost is chairman of the management board of Rexel, global leader in the professional distribution of products and services for the energy world, and chairman of the Rexel Foundation for a better energy future. With over 25 years of director-level experience in the electrical and electronic sectors, he is a subject matter expert in questions relating to transformation and innovation.

All proceeds from the sale of this book will go to the Rexel Foundation for a better energy future (under the aegis of the Fondation de France).