

Overview of the European electricity revolution: getting down to business

European Utility Week 2018 - Takeaways for further Research & Development by Clarion Events and with Scientific Contribution of Enel Foundation.

Introduction

There was a ‘getting-down-to-business’ feel about European Utility Week 2018, which aimed to explore four key areas in the European energy landscape: Digitalisation, Low Carbon Economy, Energy Markets and Innovation.

Themes covered included resiliency of energy supplies in a context of **decentralisation** and **decarbonisation**; **e-mobility challenges** and **opportunities** in relation to the **electricity grids**; the latest on **blockchain applications** in the **energy trading**, and on the progress towards a **low-carbon future**. Evidence of **emerging business models** of the future was also shared, while giving special attention to developments in the **cybersecurity** space and to the ongoing adaptation of **energy-intensive users** to the changing energy markets.

Enel Foundation joined the event as Global Knowledge Partner, providing scientific advice ahead of the event and collaborating with Clarion Energy to elaborate this white paper, designed to offer a common reference to academic and industrial stakeholders about the discussions held and their pivotal importance for the sustainable development of European economies and citizens.

While many of the 450 speakers at the event in Vienna tackled in broad strokes how to navigate Europe’s electricity evolution, and a show floor packed with 650 exhibitors saw companies buying-in to the opportunities offered by the energy transition, this document outlines the main discussions and contributions in the different conference arenas. The aim is to increase the reach and involve other stakeholders in the debate.

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In addition to companies involved in the core value chain, industry associations, regulators and agencies, many of which joined the event for the first time, such as Wind Europe, IFIEC, Vision 2050, Hydrogen Europe, VKU and ECSO, now have a short and easy to read summary of the Utility Week. This same document, shared with leading academic institutions network with the support of Enel Foundation, will also contribute to reduce the gap between the business and academic research agenda and hopefully bring new and vibrant developments for next year's event.

A customer centric view of energy transition

For many of the 12,000 participants coming from more than 100 countries who attended the three days of European Utility Week 2018, the theme “energy transition” has become a usual reading subject. However, according to many speakers at EUW, this transition is still in its infancy, and there is still untapped – and in some cases, unknown – potential waiting to be unlocked.

“There is huge potential for further electrification,” said Ralf Christian, chief executive of Siemens Energy Management Division. Delivering one of the keynote speeches, he made the point that in the near future, “demand is going to need to follow generation more and more”, and added, “the grid has to become more intelligent – and that requires innovation”. The executive pointed out “prosumers will play an increasingly important role, and this will lead to a prosumer-centric energy world”.

Electrification is indeed experiencing a growing trend on a European basis. In the 1990-2016 period, total electricity consumption has risen from 17% to 22% of the total energy consumption, making the European Union the 3rd largest electricity consumer in the world, just after China and the US. The political agreement reached between the European Commission, the European Council and European Parliament will further support the deployment of sustainable energy policies as the region commits to achieve, by the year 2030, a reduction of at least 40% in greenhouse gas emissions compared with 1990 levels, a share of renewable energy sources of at least 32% and an improvement of at least 32.5% in energy efficiency.

Such transformation needs to acknowledge the importance of the customer, a transversal theme also [stressed by Chris Peeters](#) of ELIA Group, who said that the success of the 21st energy sector hinged on “putting the consumer at the centre of the market”.

He warned that that the role of the consumer in Europe's energy transition “is still underestimated by many players in the market at the moment” and added that this “is not something that we can wait for – it is something that we must anticipate.”

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Advanced energy systems with consumers/prosumers at their centre “do not want energy as a commodity: they want energy as a service”, Peeters explained. “Consumers want optimal use of the energy transition. We need to expose the consumer to the upgraded energy market. We need to make sure that they are incentivised to become directly involved in the new energy system.”

Digitalization

From an industry perspective, digitalization is a critical enabler for innovation across all technologies and business models. [Joanna Hubbard](#), chief operating officer of blockchain company Electron, says that the digitalization of the electricity sector marks the second energy revolution: “If the first energy revolution was clean energy, the second energy revolution is shared data structures that anyone can build-out on top of.”

She says that this should be “happening over the next three-to-five years and it’s going to completely change the energy market and the whole supply-consumer relationship” and added, “what’s exciting about the digitalization of energy now, is that it is a foregone conclusion: I don’t think that was true a year ago. There’s a huge amount of work going on.”

One of the most discussed consequences of Digitalization is that it is pushing the development of more and more new business models based on data. As digital technologies enable utility companies to automate all repetitive tasks and create powerful data lakes, future business opportunities are going to emerge around the use of data of the assets, the individual consumers and the interaction between them.

However, unlocking this digital potential is about more than just technology. “We need to change our assumptions and challenge our mindset,” said Signe Horn Rosted of energinet in Denmark.

“The value chain is changing. The development of the sector in the past was linear. Now we see deep decentralization and other developments that we were not planning for. We have to move to a logic mindset of exponential development. And we have to set data free – data is the key.”

An all-women keynote panel of seven industry experts outlined how the combination of digitalization and decentralization could transform the European energy sector. Frauke Thies, executive director of smarten, a European industry group of market players driving digital and decentralized energy solutions, stated: “you can’t picture a decentralized energy system working without digitalization – it is needed to enable decentralization. Digitalization and decentralization inherently go together in a decarbonizing system.”

Decarbonization

Electricity has become the fastest growing energy vector in the world and Renewables will largely power the increased demand for electricity, as they are already contributing with nearly half of new global electricity generation – according to the IEA . The Agency also declared 2018 as the year of electricity, in recognition of the rapid growth of electricity demand and the global transformation of electricity systems.

Barbara Cuitino, global partner manager for energy and natural resources at SAP, said that the driver for much of the digitalization is indeed the need to decarbonize: “information technology can make the energy world run better. That might sound quite philanthropic or even romantic, but it is the needs of the energy industry to diversify and decarbonize that is making this vision concrete.”

Progressive electrification based on renewable generation mix, especially in the transport, industrial and buildings sector can accelerate decarbonisation. Enel Foundation supported this idea with scientific data from an important [research on electrification of the Italian economy](#) recently completed. In addition to showing the potential for the share of electricity in final energy consumption to grow from 21% up to 30% by 2030 in Italy, and detailing the sectors in which this growth can be achieved, the research addressed the health benefits of decarbonisation. In the transport sector alone, the [introduction of electrified low carbon mobility by 2030](#) can help cut air pollution due to tailpipe emissions in the country and help save the equivalent of 1.400 lives and around 2.000 cases of lung cancer.

The benefits of transport electrification can be enhanced by the availability of smart infrastructure such as the bidirectional charging enabling vehicle-to-grid, vehicle-to-home and other potential (vehicle-to-X) applications. As outlined by Alberto Piglia, Head of eMobility within Enel X, Charging Infrastructure for EV and Interactions with the Grid can play a major role in the energy transition characterized by increasing share of renewables in the mix and larger number of prosumers.

At its World Energy Outlook 2018, presented in the aftermath of EUW 2018, the IEA points out that RES (incl. hydro) already represent one fourth of all global electricity generation, showing market value and economic advantages over other sources. Hydro remains largest renewable source, followed by wind and solar PV. Lower costs and favorable government policies, will however boost solar PV capacity– overtaking wind by 2025 and coal in the mid-2030s. PV is set to become 2nd largest installed capacity globally, after gas.

Energy markets

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A dedicated space on the European Utility Week show floor, called the Energy Markets hub, hosted discussions on European Energy trading and how digital solutions could revolutionize trading if adopted more widely across the market.

[Marius Buchmann](#), research associate at Jacobs University, noted that the rate of utilities investing in digital energy trading solutions was still low – and significantly lower than the spend of digital technologies for assets.

This message was echoed by Andre Jager, senior vice-president of Product Management at ION Group. The executive pointed out that each day between 10,000 and 30,000 European energy trades are being conducted, meaning a total of over 4000 per hour. Jager explained that “you are flying blind if you don’t have data available” and that the future energy trading IT landscape will be “scalable and future proven, fast, and have easy data distribution and integration.”

And Gordon Thompson of Innogy Innovation Hub, said that a further game-changer would be the introduction of blockchain to energy trading, which he said would enable a shift not just from business-to-business to one of peer-to-peer, but from there on to a machine-to-machine model.

[The entire discussion on Innovation in trading can be viewed here.](#)

A key trend in energy market element is the participation of new actors, as proven by the active participation of associations such as IFIEC (The Industrial Federation of Industrial Energy Users) to EUW. But other sectors, such as the tech sector, have been investing heavily on green energy to address issues related with costs predictability and in association with climate change concerns. Long term power purchase agreements have become a central tool and boosted energy investment by the likes of Google, Amazon, Facebook, Apple or Microsoft. Bloomberg reports that since 2010, these companies have signed agreements to buy nearly 18,000 MW (Israel installed capacity in 2015 was 17 GW) most in wind and solar assets.

Innovation

European Utility Week cemented its reputation as an incubator for innovation this year, attracting 50 startups, 250 students, ten international delegations, 12 country pavilions and 24 EU projects.

Thanks to funds such as Horizon 2020, the European Commission is supporting a huge Research and Innovation program with different implications on the ongoing energy transition. Mercè Griera i Fisa, DG Communication Networks,

Content and Technology, European Commission Projects, commented, “Investment in research and innovation and maximising its impact is probably the best option for shaping a better future.”

Towards European Utility Week 2019

An Advisory Committee Meeting for preparing the European Utility Week and POWERGEN Europe 2019 program was held on 16 January in Amsterdam, The Netherlands, with the support of Enel Foundation.

[Representatives of the joint advisory board](#), a multi-stakeholder engagement group supporting the planning of the event, had the opportunity to meet with their counterparts in January in order to examine the main takeaways from European Utility Week 2018. Based on this brainstorm exercise they outlined a joint conference programme for the European Utility Week and POWERGEN Europe, taking place alongside one another in Paris this November. This marked the starting point to develop a relevant agenda that will shape a conference covering all the links in the energy value chain.

Looking ahead to EUW 2019, the Advisory Committee Members identified many opportunities to contribute to the strategic sessions forming the joint conference Summit, where issues of policy direction, regulation, finance and markets are uppermost, regardless of whether the focus is from the generation, trading, power delivery or customer side. EUW / POWERGEN Europe also plans to extend relevant discussions onto the exhibition floor, through theatres covering Innovations in the energy revolution, gas and power trading, digitalization, smart metering and enabling technologies, distributed generation and lifecycle management.

Generation

The energy value chain is getting more complex up to a point in which it can hardly be described as a chain anymore. This traditional model does not adhere anymore to the complexity of energy supply and demand, which is better described by a network where multiple paths connect virtually any given point in the energy system.

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Energy generation is of course one of the crucial elements in this complex network, and has undergone a deep evolution in the last decade, with distributed generation and renewables a growingly important piece of it. This is why a heavy and renewed focus on power generation will be included in the event. The POWERGEN Europe theatres will thus focus mainly on distributed generation and lifecycle management, addressing, among the other things, issues connected to the increased penetration of small scale, dispersed generation units and of the management of facilities either displaced by novel and more efficient technologies or close to the end of their operational life.

Energy markets

European Union has now taken a clear stance on the decarbonisation of the energy sector. It is now up to the industry and market to make it happen. In this changing energy landscape, the sector will need to adapt to new market dynamics and competitive landscape, with new, also non-traditional players, entering the arena. What are the emerging value opportunities they have the biggest potential to open profitable areas in the market, what new business models will enable to capture this value, are among the key questions to address.

C&I energy users

More emphasis will lie on the role of commercial and industrial energy users. The energy-intensive sector is of huge importance to the energy transition. Although the sector is slowly changing from having energy consumers only, to welcoming energy prosumers, progress needs to be made in improving energy efficiency. Commercial and Industrial energy users currently consume 26% of Europe's energy annually. With Europe targeting a 40% CO² emission cuts by 2030 and 60% by 2040, the importance of industrial and commercial energy is crucial at the moment.

The new energy mix

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The diversification of power sources and increased penetration of renewable are critical to ensure system reliability and flexibility and at the same time addressing decarbonization. If electrification of everything has the leading role, we cannot deny the role of gas and its potential in the transition to a future sustainable energy mix.

We will look at the role of decentralisation in the transition to a new mix and to the opportunities arising at the edge of the grid. This new ecosystem is where the future grid smartly connects generation, storage and consumption of energy, enabled by digital technologies capable of managing the myriad of physical and economic transaction. We will also look at the future energy scenarios, its new energy mix and the latest developments with particular regard to sector coupling.

Digitalisation

For 2019, the digitalization programme of our Summit is going to return to the basics. We are going to focus on the core of digitalization, mainly the use of digital technologies (sensors, meters, connected devices, infrastructure, etc.) that help reduce costs and rapidly transform the existing business models by creating – among other things – new sources of revenue.