

PARIS  
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## **Ardian publishes the fourth edition of "The Augmented Infrastructure" study, a report on the need for "data-driven control" to create a clean energy system**

- In the European Union, only 23% of our energy system is electrified. Of this electrified share, 22% comes from renewable sources.
- Data intelligence is a key element for the creation of a sustainable, secure and affordable energy system, which is necessary to achieve the objectives of the Paris Agreement.
- The use of data will make it possible to increase the production of renewable energy and reduce its intermittency, and to harness the potential of decentralized production, notably by improving the accessibility and efficiency of electricity grids.

Ardian, a world-leading private investment house, today is releasing the fourth edition of its study, "The Augmented Infrastructure". The study underlines the essential role of "data-driven control" in creating a clean, reliable global energy system.

The report, written by Ardian with the support of consultancy firm Compass Lexecon, presents operational pathways for the decarbonization of Europe's power system and energy sector, from a digital, data-centric perspective. Compass Lexecon has been contributing its knowledge of the energy sector and the changes that currently are ongoing in the sector. Thereby, it has leveraged results from previous work on the topic of decarbonization, electricity markets, regulation and market design, renewables, batteries and related technologies including digitalization.

The study demonstrates that the use of data will act as a lever for the development of a sustainable, affordable and secure energy system, and thus overcome existing obstacles, in particular to:

- Develop clean energy production and ensure that it can be deployed appropriately and at a large scale, thereby increasing the share of renewables in the energy mix
- Harness the potential of decentralized suppliers, encourage the supply of clean energy and ensure that supply and demand are matched in real time.

- Ensure that networks have the necessary capacity and accessibility.

The report draws on case studies to demonstrate the essential role of these technologies in shaping tomorrow's energy landscape.

*"Harnessing the data potential of our energy systems is imperative if we are to achieve the goals of the Paris Agreement and progress towards "Net Zero". Currently, only a minority of our electricity is supplied by renewables, but demand in the European Union is set to increase by 50% by 2050. Geopolitical crises such as the war in Ukraine have heightened the urgency of the energy transition, pushing investors and governments to seek solutions to provide citizens and businesses with clean, affordable and secure energy."*

*"Only by adopting a digital strategy and harnessing the potential of data can energy systems overcome the challenges between production, transmission, distribution and consumption. COP28 will give fresh impetus to discussions on the investments needed in clean energy. Digitization should be at the heart of these discussions. To enable such investments, regulatory changes will also need to be encouraged to promote innovation".*

● **MATHIAS BURGHARDT** ● MEMBER OF THE EXECUTIVE COMMITTEE AND HEAD OF INFRASTRUCTURE, ARDIAN

## Summary of the report:

### Powering a cleaner future: tomorrow's energy landscape?

The report imagines how digital technologies will shape our future lives and facilitate the transition to a 100% clean energy grid, through the study of tomorrow's electrical ecosystem. This ecosystem includes several clean energy components from electric vehicles, offshore wind turbines and hybrid connectors.

### Towards a clean energy system

The transition to clean electricity is well underway worldwide, and represents a real paradigm shift away from the current fossil fuel-based system. Renewable electricity production is expanding its market presence in unprecedented ways, but these efforts are accompanied by considerable challenges in terms of supply, demand and networks.

Successfully reconciling the three dimensions of the energy trilemma remains the main challenge of this transition: guaranteeing citizens and businesses clean, affordable and reliable energy.

### Supply: harnessing renewable energy production

The road to a clean, cost-effective and reliable supply has already been mapped out. The next phase of decarbonization will require significant development of renewable energy sources as well as other clean energy technologies and supporting networks. In order to achieve the decarbonization targets set by industry and public authorities, the deployment of clean energy assets will need to be accelerated.

The use of data is a key element in the deployment of new modes of renewable energy production, enabling them to be more flexible, while mitigating the main challenges that arise. For example, data can be used to optimize the operation of renewable assets by maximizing production and reducing operating expenses - Ardian already uses a proprietary tool, Opta, that enables it to do this with wind and solar assets. Data will also help mitigate risks such as price cannibalization, in a context where oversupply of renewables is leading to a significant reduction in prices, while helping to forecast demand more accurately.

### **Demand: electrify and harness the potential of decentralization**

Electricity demand in the European Union is set to increase by almost 50% between now and 2050, thanks to direct and indirect electrification. By 2050, around 60% of installations will need to be powered by electricity, compared with 23% in 2020.

The use of data will enhance demand flexibility and strengthen consumer contribution, while matching consumption to production. For example, the number of new connected flexible assets, such as heat pumps and electric vehicles, in the power system will see unprecedented expansion - the number of electric vehicles in Europe is set to rise to over 120 million by 2040. Data will be essential to support smart charging, optimize costs and enable two-way charging.

### **Networks: promoting accessibility and efficiency**

With new renewable energy sources and new ways of using electricity, increasing demand for grid connections and growing complexity are likely to create problems of grid saturation and congestion.

Data management and digital solutions play an essential role in mastering the growing complexity of systems. Digital solutions will make it possible to maximize the potential of existing networks, efficiently integrate new assets while anticipating and controlling congestion. In this way, energy infrastructures will be able to effectively manage the increase in their own capacity, while avoiding hardware constraints that could limit the pace of the transition.

### **Towards smart regulation**

As part of a successful global approach where digital solutions can realise their full potential, market design and regulation must go hand in hand with the evolution of digital businesses, and ensure a suitable format:

- A framework for standardized and secure data exchange, communication and interoperability
- Market accessibility for all, to facilitate consumer engagement and direct peer-to-peer commerce
- Regulatory changes to encourage innovation, promoting the investment needed to support digital solutions and the conditions for adapting to rapidly changing business models.

## The way forward

The use of data and digitalization are key solutions for developing renewable electricity generation. To go further, it will also be necessary to put in place a framework for standardized and secure data exchange, communication and interoperability, and to evolve regulations to encourage innovation and investment.

## ABOUT ARDIAN

Ardian is a world-leading private investment house, managing or advising \$156bn of assets on behalf of more than 1,470 clients globally. Our broad expertise, spanning Private Equity, Real Assets and Credit, enables us to offer a wide range of investment opportunities and respond flexibly to our clients' differing needs. Through Ardian Customized Solutions we create bespoke portfolios that allow institutional clients to specify the precise mix of assets they require and to gain access to funds managed by leading third-party sponsors. Private Wealth Solutions offers dedicated services and access solutions for private banks, family offices and private institutional investors worldwide. Ardian's main shareholding group is its employees and we place great emphasis on developing its people and fostering a collaborative culture based on collective intelligence. Our 1,050+ employees, spread across 17 offices in Europe, the Americas, Asia and Middle East are strongly committed to the principles of Responsible Investment and are determined to make finance a force for good in society. Our goal is to deliver excellent investment performance combined with high ethical standards and social responsibility.

At Ardian we invest all of ourselves in building companies that last.

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## ABOUT COMPASS LEXECON

Compass Lexecon is internationally recognized as a leading economic consulting firm with preeminent competition, finance, intellectual property, international arbitration, and energy practices. With more than 825 professionals in 21 offices around the world, Compass Lexecon offers a global perspective on economic matters. For the past 17 years, Compass Lexecon has been ranked as one of the leading antitrust economics firms in the world by the Global Competition Review. To learn more about Compass Lexecon or to find one of our professionals, please visit [compasslexecon.com](https://compasslexecon.com)

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