

ARDIAN

INFRASTRUCTURE

INTRODUCTION

FIFTEEN YEARS AT THE HEART OF INFRASTRUCTURE

Infrastructure has become a critical asset class for investors seeking consistent long-term returns. Essential infrastructure investments offer protection from inflation and ensure that balance sheet liabilities, such as life insurance and pension payments, are covered. Ardian Infrastructure funds invest in a comprehensive range of infrastructure assets, key to the populations, focusing in particular on energy (gas, electricity and renewable energy), transport (rail, road and airports) and other public infrastructure (health, environmental). This offers investors a diversified portfolio generating consistent returns and downside protections.

Ardian Infrastructure team works closely both with major international industrial, utility and construction companies, as well as infrastructure operators and with public authorities, as partners, clients or key stakeholders. This network provides the team with privileged access to transactions, often through bilateral negotiations.

The Augmented Infrastructure: Ardian Infrastructure has carried out industry-leading research work on the opportunities for infrastructure owners and investors from digitalization. 2018 edition explains how the blending of digital services with physical assets can create new revenue opportunities for infrastructure owners. 2019 edition explores how technological innovation can help infrastructure to improve their impact on the environment and lower carbon emissions.

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KEY FIGURES

>45
INVESTMENTS
SINCE 2005

\$16Bn
MANAGED
OR ADVISED

50
PROFESSIONALS
DEDICATED TO
INFRASTRUCTURE
INVESTMENT

REVIEW AND OUTLOOK



MATHIAS BURGHARDT
MEMBER OF THE EXECUTIVE COMMITTEE,
HEAD OF INFRASTRUCTURE

What is your investment strategy?

We invest in essential infrastructure and work with an international network of industrial partners, construction companies and infrastructure operators. At Ardian, we believe that investment in infrastructure is the best way to support the economy as a whole, as well as individual companies. Not only do the best infrastructure projects create employment for the people who build and operate them, but they also offer long-term investment opportunities and above all they act as a catalyst, enabling industries to move further and faster, opening access to new markets and increasing possibilities for innovation. Over the past fifteen years, Ardian has become one of the main players in infrastructure investment worldwide.

What role do you play in regional economic development?

Infrastructure encompasses a wide range of assets that are essential to job creation and development, both at national and local levels. High quality transportation networks, fast and stable telecommunications, reliable and sustainable sources of energy, education systems and modern health services are all essential for economic and social development. Our goal is to establish close long-term relationships with public bodies, who become our partners, as well as other shareholders, and intermediaries. Sustainable development and respect for social dynamics are also an integral part of Ardian's business model. We believe that both economic and financial

performance is stronger when stakeholders' interests are aligned.

You have recently closed your fifth-generation fund dedicated to Europe, what does that mean for Ardian?

We raised €6.1 billion for our latest fund, which represents one of the largest Europe-focused Infrastructure funds ever raised. The fundraising, which we closed in less than six months, demonstrates the strong appetite among LPs for our infrastructure investment and asset management strategies. In addition, in 2017 we raised an \$800 million fund dedicated to investing in essential infrastructure assets in the Americas.

Over the past fifteen years, our investment team has proved its ability to source excellent opportunities and to help their management teams transform the assets. Together with the American Infrastructure Fund, the Ardian Infrastructure team now has \$16 billion of assets under management in Europe and the Americas.

What is your main challenge?

One of the main challenges is without doubt the digital disruption taking place in the infrastructure field. Today large technology companies are becoming infrastructure players. Infrastructure investors and operators must now evaluate the potential impacts of technological evolutions on an asset's value, or risk seeing it become obsolete. In order to ensure the assets we manage continue to perform well and show growth, we have developed a framework to assess each of them. Together with Fabernovel, a digital consultancy, we published in 2018 a study entitled "The Augmented Infrastructure". This sets our five criteria for scoring infrastructure investments: intelligence, openness, prolificacy, resilience and impact. In 2019, our research work has focused on using technology to the benefit of environment and more precisely climate change.

How can technology affect environment and society?

We use digital to increase the operational efficiency of the infrastructure itself, but it also enables to improve its environmental and societal impact. In this context, the ability of

"We have integrated sustainability at the core of our investment and management strategies as it is our role, as a global leader, to act and work in the most responsible way to limit carbon emissions and fight climate change."

an infrastructure to collect, analyze and exploit data is the cornerstone to accelerate its path to intelligence and carbon neutrality.

With this mind, in 2019, Ardian Infrastructure, in collaboration with three university students, developed Air Carbon. It is an analytics tool for real-time monitoring of CO₂ emissions related to airport activity and for building trajectory scenarios to contain emissions.

What types of investments are you looking for at the moment?

In line with our historical strategy based on a disciplined, industrial approach, we target European and American assets with a focus on transport (rail, road and airports), energy (gas, electricity and renewable energy), telecoms and other public infrastructure assets (health and environmental). We work closely with local public and private stakeholders to ensure good integration with the local community and thus the best development potential for the asset.

In 2018, we completed a succession of strategically important transactions in Europe and North America. Following the acquisition of a 40% stake in Gavio Group, in addition to previous toll road transactions, Ardian Infrastructure became the world's second-biggest owner of toll roads.

UNITED STATES

SKYLINE RENEWABLES



- 800 MW wind farm renewable operator
- Aiming for 3GW capacity

HILL TOP



- 620MW natural gas-fired plant to be built in Pennsylvania

LBC TANK TERMINALS



- 2nd biggest global capacity for storing chemicals: 2.4M m³

FRANCE

INDIGO



- 2.2m parking spaces in 17 countries
- Sold in 2019

GEOSEL & SPMR



- Largest French Oil & Petrochemicals storage (9M m³)
- 760km of pipeline

KALLISTA



- 368MW wind farm operator
- Sold in 2018

LISEA & SYNERAIL



- 303km high speed rail line
- GSM network on 14,000km of railway line

NORDIC RENEWABLES



- 408.7MW capacity from wind farms

SCANDINAVIA

CANADA

MAPLE LEAF



- 20 MW of battery storage capacity

VESPUCIO NORTE EXPRESS AND TUNEL SAN CRISTÓBAL



- 29km Santiago's ring road
- 4km toll tunnel

SOUTH AMERICA

RENEWABLES CHILE/PERU



- 94.5MW from PV plants

SPAIN & PORTUGAL

ASCENDI



- Over 1,000km network of highways and tunnels in Portugal and Spain

CLH



- 4,000km of oil pipelines with storage capacity of 7 million m³
- Sold in 2018

SPANISH RENEWABLES



- 658.8 MW capacity from windfarm and PV plant

2I AEROPORTI



- Holding of six of Italy's top airports
- 70m pax in 2018

ITALY

ARDIAN INFRASTRUCTURE PORTFOLIO

- Transport
- Hospitals
- Renewable energy
- Airports
- Electricity
- Oil & Gas
- Telecommunications
- Parking

LONDON LUTON AIRPORT



- 5th largest UK airport
- 15.8m pax
- Sold in 2018

GERMANY

EWE AG



- One of the largest utility companies in Ger.
- 190,000km of elec grid, natural gas grid and telecom networks

LUXEMBOURG

ENCEVO



- 280k delivery pts
- 9,500km elec lines
- 3,500km gaspipelines
- Sold in 2018

ITALIAN RENEWABLES



- 615 MW of gross capacity from wind, hydro and biomass plant

HISI/LEGNANO



- Design, construction and management of hospitals

ASTM

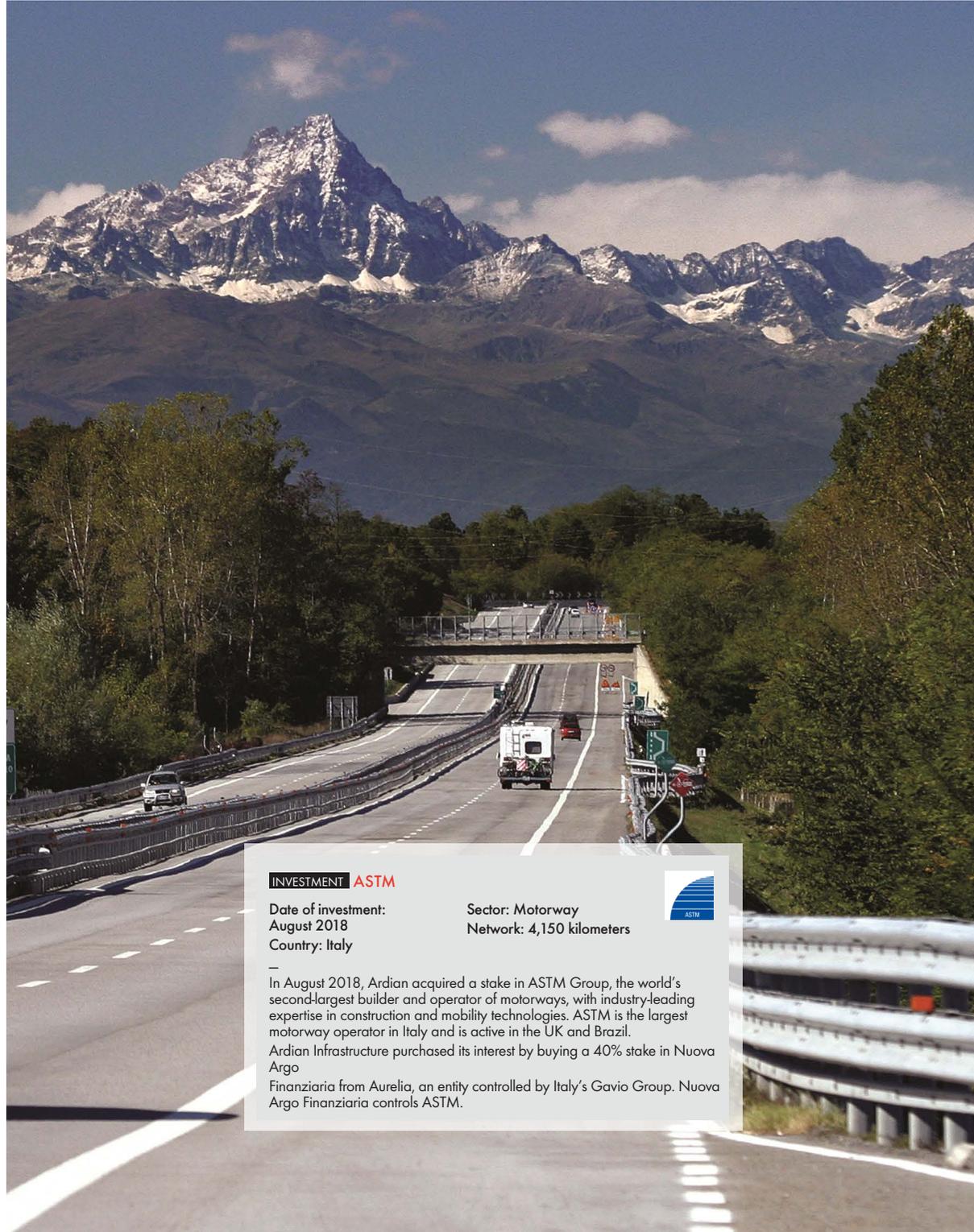


- 2nd largest motorway operator with network of more than 4,600km

2I RETE GAS



- 2nd largest Italian network of natural gas distribution (over 57,000km)



INVESTMENT ASTM

Date of investment:
August 2018
Country: Italy

Sector: Motorway
Network: 4,150 kilometers



In August 2018, Ardian acquired a stake in ASTM Group, the world's second-largest builder and operator of motorways, with industry-leading expertise in construction and mobility technologies. ASTM is the largest motorway operator in Italy and is active in the UK and Brazil. Ardian Infrastructure purchased its interest by buying a 40% stake in Nuova Argo Finanziaria from Aurelia, an entity controlled by Italy's Gavio Group. Nuova Argo Finanziaria controls ASTM.

FOCUS
ASTM



BENIAMINO GAVIO
CHAIRMAN OF GAVIO GROUP AND NUOVA
ARGO FINANZIARIA

Why did Gavio Group decide to bring Ardian into Nuova Argo Finanziaria, the joint venture that controls ASTM?

The global infrastructure market is extremely competitive and Gavio Group's ambition is to be one of the world's leaders in our sector. To achieve that we need to work with the right partner. We could see that Ardian had the same level of ambition as we did and they shared our strategic and industrial vision, so we were keen to work with them to help us accelerate our global growth.

Could you briefly describe ASTM Group and its activities?

ASTM Group is listed on the Italian Stock Exchange and operates in the motorway concessions sector through two main subsidiaries: Itinera, our construction division, and Sinelec, which is our technology arm. We have annual revenues of around €2bn and we are now the world's second-biggest builder and operator of motorway infrastructure, with a network of approximately 4,600 km in Italy, the UK and Brazil, where we operate through our joint venture, Ecorodovias.

How does this transaction allow ASTM, and Gavio Group, to achieve its long-term strategic objectives?

I believe our partnership with Ardian is essential if we are to become a more competitive player globally. It allows us to grow faster, to expand internationally and take advantage of major opportunities to win further concessions in Europe, Latin America and the US.

More than a year has passed since Ardian's investment. What milestones have you achieved so far?

We are in constant dialogue with Ardian over ASTM's strategic development and during the first year we have made significant progress.

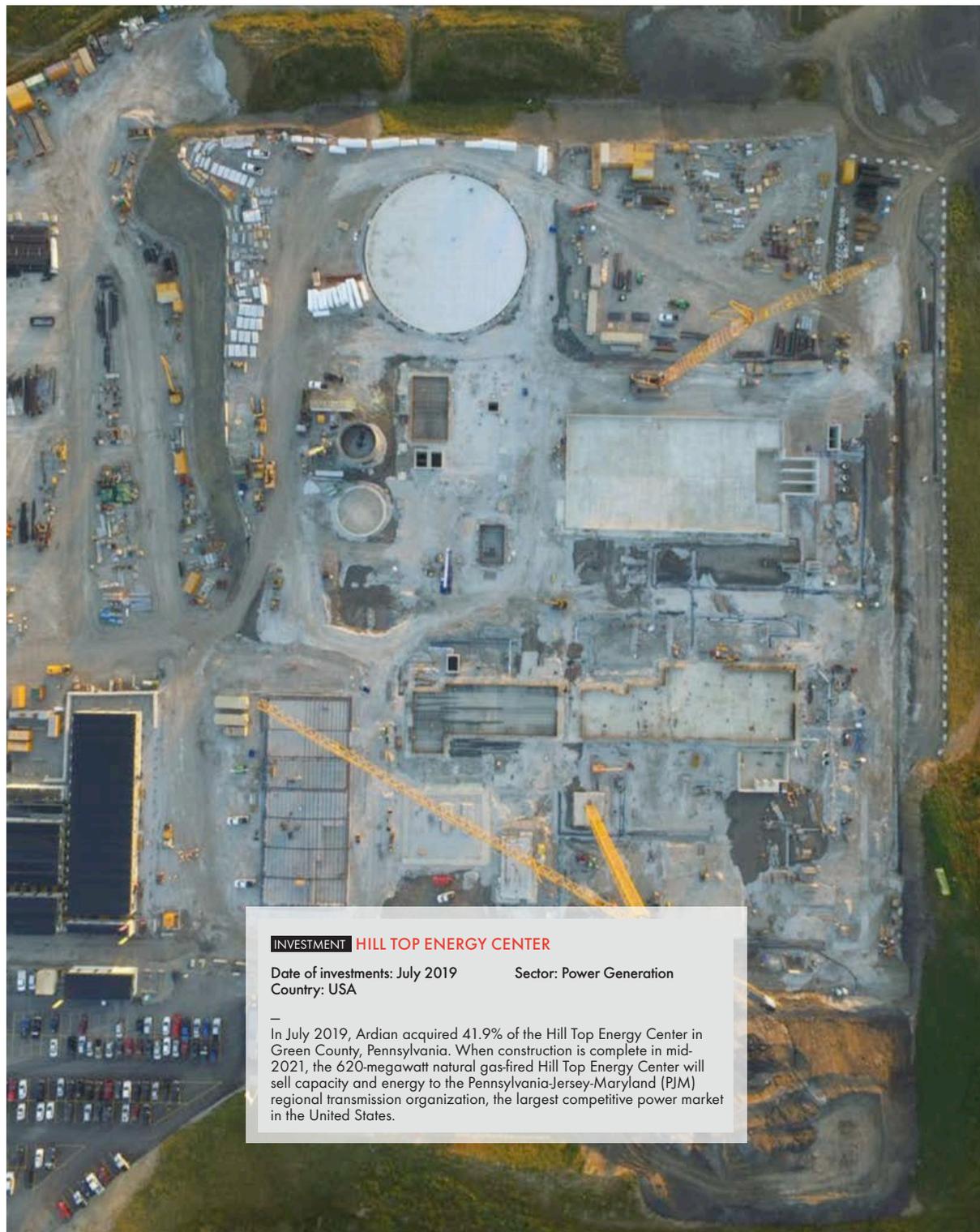
But the most important step so far has been to simplify the group's management structure by merging SIAS into ASTM. This has allowed us to create a single company with skills in our core sectors of motorway concessions, construction and technology.

Looking at innovation, ASTM owns Sinelec, a digital technology company. How important is this to the group's future development?

Sinelec's 20-year history in the motorway infrastructure sector is a critical asset for ASTM.

It combines technology expertise with a thorough understanding of the processes and demands of running essential infrastructure such as motorways. This has enabled it to develop innovative data collection systems that use artificial intelligence engines and machine learning. Smart motorways are becoming a reality. In future motorway infrastructure will be linked to the control centre, to travellers and to self-driving cars. There will be an entire ecosystem where real-time flows of data will ensure the infrastructure is well maintained, travellers' safety and comfort are ensured and risks of all kinds are identified and controlled. Sinelec will allow us to make all of this a reality.

"Our partnership with Ardian is essential to become a stronger competitor in the global infrastructure market."



INVESTMENT HILL TOP ENERGY CENTER

Date of investments: July 2019 Sector: Power Generation
Country: USA

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In July 2019, Ardian acquired 41.9% of the Hill Top Energy Center in Green County, Pennsylvania. When construction is complete in mid-2021, the 620-megawatt natural gas-fired Hill Top Energy Center will sell capacity and energy to the Pennsylvania-Jersey-Maryland (PJM) regional transmission organization, the largest competitive power market in the United States.

FOCUS
HILL TOP ENERGY CENTER



MARK VOCCOLA
CO-HEAD OF US INFRASTRUCTURE

Why was Hill Top Energy an attractive deal for Ardian?

When it comes online in Q2 2021, Hill Top is going to be the cleanest, most efficient gas-fired power project in the largest US power market, the PJM Interconnection. Providing cleaner burning power for this part of the country is vital as there is not a lot of renewable capacity locally due to the terrain. Natural gas is the fuel of choice in the US as it moves away from coal-fired generation.

How much cleaner is Hill Top than previous gas-fired plants?

Significantly cleaner: the latest gas turbines are 20% more efficient than the previous generation. To give you an idea, 15 years ago you needed two gas turbines and one steam turbine to produce 500MW. This plant will use one gas and one steam turbine to

generate 620MW. Hill Top Energy Center will displace 620MW of legacy coal-fired generating capacity and cut the greenhouse gas emissions in half.

How do you expect this asset to perform financially?

We believe this project will deliver excellent risk-adjusted returns for our LPs. Because of Hill Top's efficiency, as the low cost producer, we expect it to operate around the clock. In addition to the efficiency, Hill Top has a long-term fuel supply agreement that ties the cost of our natural gas to the market price electricity, locking in a margin. So when electricity prices are low, our fuel costs fall, and vice versa, giving us a positive gross margin on all the power we generate. These factors make this a very attractive investment for our fund.

How does owning gas-fired capacity fit with Ardian's sustainability agenda?

Hill Top is going to be the cleanest, most efficient gas-fired plant in a market with limited potential for renewables, allowing for the retirement of coal-fired assets. We've brought 400 well-paid, unionized jobs to Pennsylvania, so the project has received tremendous support from local communities. And once it's finished, Hill Top will pay taxes to the local government, helping to fund public spending for 30 years or more. We firmly believe that providing cleaner power and quality employment represents a positive impact.

"Hill Top is going to be the cleanest, most efficient gas-fired plant in a market with limited potential for renewables, allowing for the retirement of coal-fired assets."

New natural gas-fired assets like Hill Top play a critical role in the energy transition happening in the United States. This class of essential infrastructure asset provides the bridge from a coal dominated electricity market to a new low-carbon electricity market.



PLATFORM ENORDIC



Date of investment: February 2019
Country: Sandinavia
Sector: Renewable Energy

eNordic is the Nordic's first sustainable energy platform, formed by a partnership between Ardian and leading domestic industry executives. Through a local, responsible and agile investment approach, eNordic enables the transformation of the energy sector through long-term partnerships with those that develop or operate sustainable energy projects in the Nordics. It will invest in opportunities in wind, biomass, hydro and district heating, in addition to traditional energy assets that have the potential to be transformed or managed in a particularly sustainable way. eNordic is based in Sweden and Finland, with local teams operating throughout the Nordics region.



Eero Auranne and Simo Santavirta set out their plans to build a major sustainable energy business serving the Nordic region



EERO AURANNE
 CEO, ENORDIC

What's the big idea behind eNordic?

Eero Auranne: We're aiming to build a major sustainable energy platform covering the Nordics from a combination of acquisitions and greenfield developments. Our strategy is to combine clean power generation across wind, biomass and combined heat and power with distribution and utility businesses. This will create synergies across the group from operating different types of assets together and allow us to go to market with a distinctive offering.

"Over the next five years we intend to build and acquire a €3bn asset base across the Nordics. That will make us a major regional player in sustainable energy."

Simo Santavirta: A lot of the existing Nordic energy players have legacy assets that are not clean. We have the opportunity to start from scratch with eNordic and build a sustainable energy business from day one. That immediately differentiates us in our market.

E.A.: Our most recent deal is a good illustration. In February 2019 we acquired the Åndberg wind farm in Sweden, which is under construction and had no power purchase agreements in place. Within six months we had signed a ten-year PPA for a third of its output with Skellefteå Kraft, one of the biggest utility companies in Sweden. When it comes on stream in 2022, Åndberg will be one of the biggest wind farms in the region at 280MW – enough to heat around 150,000 homes.

Why are Ardian and eNordic in a strong position to do this?

S.S.: Obviously, Ardian has a major focus on sustainability and this project is very much in line with the company's long-term aims. But building eNordic also plays to our strengths in other ways. Unlike other institutional investors we have a very industrial approach to infrastructure based on deep industry expertise, and we always reinforce that with well-connected local teams. In this case, eNordic's relationships and industry knowledge have already enabled us to make rapid progress with our plans.

What are your long-term ambitions for eNordic?

E.A.: We now have three wind farms, two in Sweden and one in Norway, and over the next five years we intend to build and acquire a €3bn asset base across the Nordics. That will make us a major regional player in sustainable energy.



SIMO SANTAVIRTA
 SENIOR MD, ARDIAN INFRASTRUCTURE

The Augmented Infrastructure: Digital for climate?



PUBLICATION THE AUGMENTED INFRASTRUCTURE: DIGITAL FOR CLIMATE?  

Date: October 2019
Country: France

Ardian Infrastructure and Fabernovel, an international transformation consulting and digital product and service creation company, have released the second edition of their study on The Augmented Infrastructure focusing on the climate urgency and how digital can be considered an enabler for carbon emission reduction.

The first part of the study introduced a scoring model to assess the digital maturity of an infrastructure in the connectivity era. It lays out five criteria: intelligent, open, resilient, prolific and impactful. Ardian and Fabernovel focus in the 2019 edition on the role that the Augmented Infrastructure can have in the fight against climate change with two key findings. First: technology should be put at the service of sustainability. Second: data analysis gives the right tools to help informed decisions on how to reduce carbon emissions.

FOCUS DIGITALIZATION



PAULINE THOMSON
SENIOR INVESTMENT MANAGER, ARDIAN
INFRASTRUCTURE

How is digitalization changing the way people use infrastructure?

We see the clearest examples where digital technology enables a direct connection between the infrastructure operator and the end-user that didn't exist before. Airlines used to have a relationship with individual passengers, but airports did not use to have that. Now, our airports can use points of contacts in the airport as well as apps and chatbots to start conversations with travellers and collect data to better serve them. For example, thanks to technology, we can improve the flow of passengers through the airport and save people time. The OpnGo app that we developed alongside Indigo lets people book on-street and off-street parking spaces from many different providers including Indigo and allows an improved user experience as well as an optimization of the assets occupancy rate. That's really the point of the Augmented Infrastructure framework that we've developed: to make our infrastructure assets much more efficient and user centric.

Does this change Ardian's approach to the asset class?

It doesn't change the type of assets we invest in, but we use our Augmented Infrastructure framework as a strategic compass to assess the different levers which we can activate to enhance our assets. We now have a digital team within Ardian Infrastructure that includes our first data scientist, and a key part of our asset management strategy involves improving the digital capabilities of our assets. For example, we're working closely with the cross-departmental digital team at Ascendi, our toll road operator in Portugal, on a list of strategic digital initiatives to make sure the network is fully prepared for the changing dynamics of the sector. We believe that GPs who take a proactive approach on technological innovation will benefit from a competitive advantage and we want to stay ahead of the market in this field.

Can you give us some practical examples of your digital initiatives?

The OPnGO app was an important project because we had identified a clear risk of 'Airbnbization' in parking: where a disruptor enters the market and prevents an infrastructure from having a direct relationship with its users. By anticipating the threat and moving quickly, we were able to protect the value of our assets and create a valuable service for end users. Ascendi has also developed a strategic tool called Sustainable Infrastructure Management System, for which the team collaborated with two universities to build an integrated maintenance platform optimizing the maintenance needs through sensors placed on the physical network that are linked to an online platform sending real time information to technicians. This lets them monitor the condition of the roads in real time

and optimize maintenance as they can repair the infrastructure before an actual failure. This is also a key benefit in terms of users' safety.

Does digitalization link to Ardian's sustainability agenda?

Absolutely. We are convinced that technological innovation will be necessary to achieve the target set by the Paris Agreements to contain climate change. Moreover, infrastructure assets generate huge amounts of data that we can use to help us improve the environmental impact of our assets. For example, we can now monitor and report the carbon emissions of our airports in real time, which we do via our Air-Carbon.com website. And we're analysing how we can better use windfarms' data to improve the power output forecasts from our windfarms in Italy and to optimize maintenance, so they have a longer operating life. Continuously improving the operational performance of renewable assets will be key for the energy transition.

"Infrastructure assets generate huge amounts of data that we can use to help us achieve our sustainability goals."

PIONEER TEAM IN INFRASTRUCTURE SECTOR



Mathias Burghardt
Head of Infrastructure
Based in Paris



Laurent Fayollas
Senior Managing Director
Based in Paris



Juan Angoitia
Senior Managing Director
Based in Madrid



Benoît Gaillochet
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Andrew Liau
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Sylvain Goetz
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Simo Santavirta
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Alexis Ballif
Managing Director
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Pauline Thomson
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Edouard Bertagna
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Olivia Genereux
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René Hauzeur
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Thierry Denoyel
Managing Director
Based in Paris



**Daniel Graf von
der Schulenburg**
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Based in Milan



Amir Sharifi
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