

Nexans Perspectives

#2
DECEMBER 2020

ELECTRIFY THE FUTURE

**Q&A interview with
Christopher Guérin,
CEO Nexans**

**How Can Electrification
Stop Climate Change?**

IEA - ENERGY TECHNOLOGY

Perspectives 2020

The Nexans logo features a stylized red 'N' followed by the word 'Nexans' in a white, sans-serif font.

“Nexans has played a crucial role in the electrification of the world for more than a century. Now we’re amplifying that role.”

**Christopher Guérin,
CEO Nexans**

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LES CAS D'OR
DU DIGITAL

GRAND PRIX DU MARKETING B2B
#GPMB2B

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Big challenges, bold thinking



RAGNHILD KATTE LAND
 EXECUTIVE VICE PRESIDENT,
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 NEXANS

The need for sustainable electrification is now more urgent than ever.

With global warming accelerating and the energy transition gaining momentum, the issue of sustainable electrification is now at the top of the agenda.

Big challenges need bold thinking.

To face the challenges, Nexans has developed three pillars for a sustainable future in line with the UN's Sustainable Development Goals and with concrete and measurable actions to perform. People, environment and ecosystem are all areas within which we will focus our efforts to support the change.

This is the reason why Nexans organised its

first Climate Day in September at the GoodPlanet Foundation in Paris. Climate change, the energy transition and sustainable electrification of the planet were the focus of discussion.

Expert contributors to our Climate Day included Yann Arthus-Bertrand, environmentalist and founder of the GoodPlanet Foundation, and Edouard Lecerf, Deputy General Director of consultants BVA, who presented the results of a survey comparing French, British and US public opinion.

This was followed by a roundtable discussion based on a new global study by Roland Berger, commissioned by Nexans, on the paradoxes that global electrification raises.

Debating this topic were Nexans' CEO Christopher Guérin, Schneider Electric's Chris-

tel Heydemann, Roland Berger's Emmanuel Fages and BNP Paribas Asset Management's Mark Lewis. You can read more about Mark's vision for electrification – and why more and more investors are turning to renewable energy – in this edition of Perspectives.

ESG in the spotlight

In November, we dedicated a day to sharing our Environmental, Social and Governance (ESG) initiatives. ESG is at the core of our purpose as an organisation. What does this mean for Nexans and its stakeholders?

First and foremost, our purpose is to build a sustainable energy highway to the future and to contribute to carbon neutrality. People are at the heart of this journey: we need a diverse, talented and engaged workforce to help turn sustainable energy

into a reality. Overarching all of this is our commitment to robust governance and board practices.

Participants in our ESG Day were able to find out about our commitment to ESG and to hear concrete examples of what we are doing in terms of actions, future plans and measurement scorecards. You can find out more about our commitment to ESG [here](#).

Winds of change

The offshore wind market is poised for spectacular growth. Europe's recently revealed plans for a 25-fold increase in offshore wind by 2050

underline the huge scale of the ambition. This would make Europe climate neutral within 20 years. Meanwhile, a five-fold increase is envisaged this decade.

These targets are exciting. They are also hugely challenging. How can the required capacity be delivered quickly and cost effectively?

Innovation will play a big part in building the next generation of capacity. Turbines are already getting bigger – up to 15MW, enough to power 20,000 homes – and therefore more efficient. The next generation of projects will be located far out to sea where winds are

stronger and more stable. And floating wind turbines will become more common, eliminating the need for fixed foundations and opening up opportunities in deeper waters.

New expertise is needed – and Nexans is here to provide it. We are

already a key player in the offshore wind market. Nexans provides the plug-and-play cable harnesses that drive down the cost and accelerate the deployment of new turbines. And we are leading supplier of the subsea high-voltage export cables that link remote offshore windfarms to the land. All of this is backed by decades of expertise and global experience.

Nexans continues to invest in supporting the offshore wind revolution. In 2021, we will launch CLV Nexans Aurora, the world's most advanced cable laying vessel – underscoring our long-term commitment to support our customers achieve their biggest ambitions.

“Our purpose is to build a sustainable energy highway to the future and to contribute to carbon neutrality.”

Nexans Climate day

**Yann Arthus-Bertrand,
President,
GoodPlanet Foundation**



1:42:08

[Watch Video](#) 

At a time when global warming is accelerating and the energy transition is underway, the issue of sustainable electrification of the world is increasingly urgent.

As a major player in the fight against global warming and leading the energy transition, Nexans organized its first Climate Day in Paris on September 22, 2020.



Our mission is to electrify the future

**Q&A interview with
Christopher Guérin,
CEO Nexans**

Electrification holds the key to combating climate change, respecting the UN's Sustainable Development Goals, complying with the Paris COP 21 agreement and achieving carbon neutrality by 2030. Christopher Guérin, Nexans' CEO, explains where the challenges and opportunities lie.



Q: Why is electrification so important?

Electrification is the bedrock of the energy transition and it is the key to decarbonising the global energy system. Renewable generation and grids will need to be expanded on an unprecedented scale over the next 20 years. This will require global investment of an estimated €23 trillion.

Stimulating electricity consumption is a vital part of the transition. Electricity demand will need to grow at 1.7% per year between now and 2040 if global warming is to be limited to an increase of two degrees Celsius. Consumers in emerging economies and usage substitution will play a key part in driving demand for low-carbon power.

Electrification needs to be inclusive. Today, 11% of the global population has no access to electricity. To avert catastrophic climate change and to meet the UN's Sustainable Development Goals, 100% of the world's population will need access to reliable electricity supplies within the next ten years. We need to connect nearly 1.8 billion people to reach the target of 100% coverage by 2030.

Electricity – when it is renewable and when connected systems are optimised – is the most sustainable form of energy and it will fulfil the needs of humanity in the coming years. The future of the world depends on sustainable electrification.

“Renewable generation and grids will need to be expanded on an unprecedented scale over the next 20 years.”

Q: How is electricity demand evolving?

Demand will rise dramatically, faster than ever before. Substitution will be the primary driver. Almost everything that now runs on oil, gas or coal will need to switch to electricity in the coming years. Buildings, industry and transport will see the highest levels of usage substitution.

In buildings, electricity demand will be driven by the electrification of space heating. “Smart buildings” will incorporate asset management technology to optimise consumption. There is scope for increased electricity use in industry: the iron and steel sector, for example, currently relies on coal for three-quarters of its energy. In transport, the shift from petrol and diesel to electric vehicles will drive electricity demand. Electric cars are expected to account for about 10% of European electricity consumption by 2050. Today, it is less than 1%.

In addition, we expect to see significant new demand for cooling – particularly from data centres. Forecasts suggest that data centre demand could exceed 1,900TWh annually by 2030, ten times the current level. To put this in context, 1,900TWh is equivalent to the entire electricity generation of France, Germany, Canada and the UK.

It is vital that we focus on the reliability of supplies. Sectoral coupling will reduce the impacts of intermittency. This means enabling power flows between previously isolated sources of supply and demand. In parallel with this, there

is a need to integrate storage – including batteries and hydrogen – to ensure that there is no waste. We must never lose sight of the need for efficiency. The signals are positive. An example is the trend towards equipping industrial electric motors with Variable Speed Drives, reducing power consumption by 30-50%. Meanwhile, smart sensors and meters are making it easier to fine-tune electricity consumption everywhere.

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Q: What impact will the energy transition have on business models?

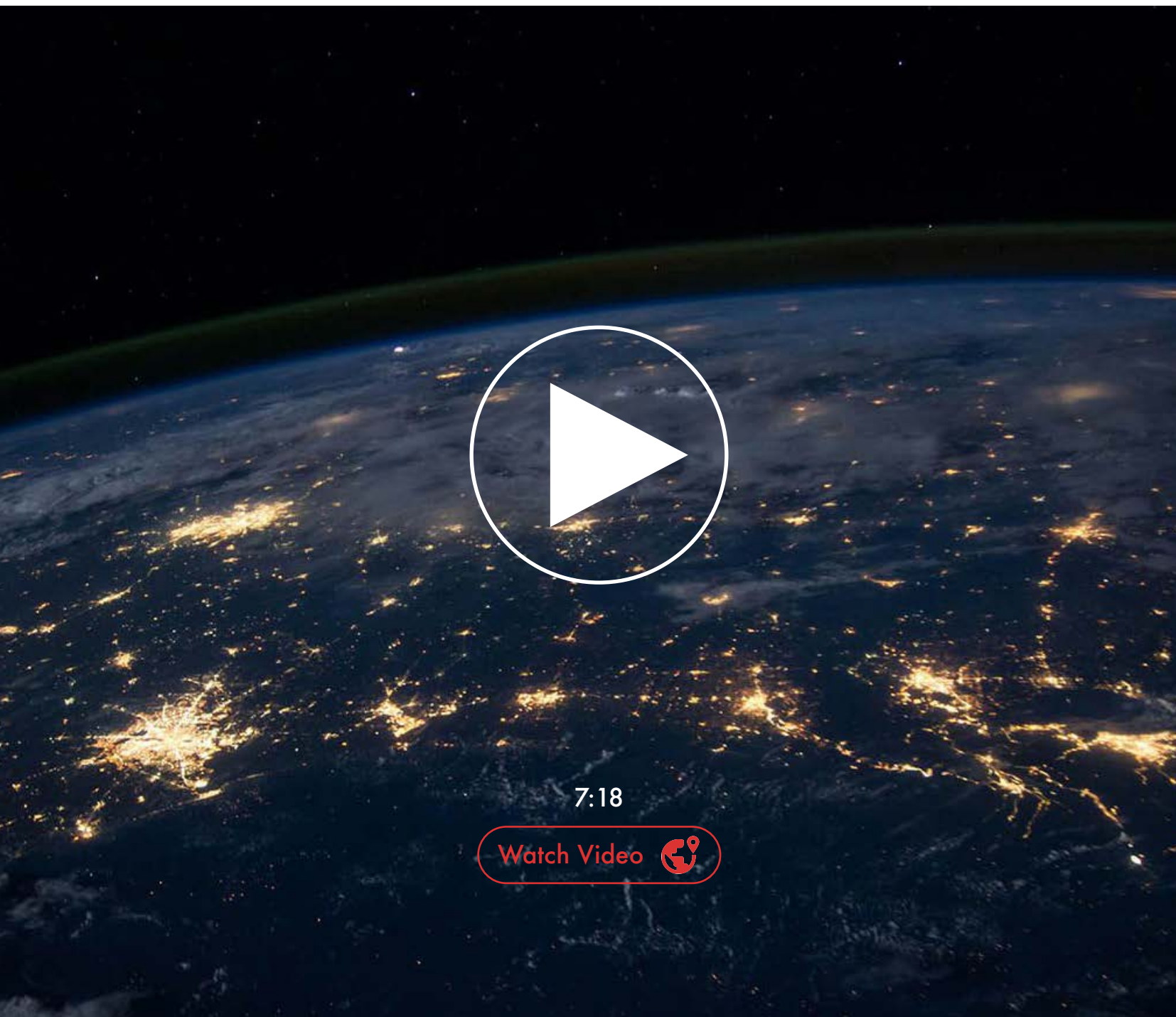
I think there are three drivers here. The first is renewable generation. The second is digitalisation.



The last one is short transportation circuits in our industrial processes. Together, these forces are already enabling new types of business. Examples include generation aggregators, flexibility aggregators and peer-to-peer players. These businesses reflect structural changes in the electri-

city ecosystem, specifically, the need to match supply and demand in a world where generation is less predictable and less centralised.

This raises another key point about the energy system: it is going to become increasingly data driven. Digital technologies such as cloud and



7:18

Watch Video 

the Internet of Things will reshape the way electricity is generated, distributed and consumed. Digital technology will also change the way energy is paid for. An example is the growth of Energy-as-a-Service. Rather than paying directly for energy, consumers instead pay for services derived from energy. We see this already with electric vehicles and commercial lighting.

Digitalisation is also enabling innovative services for electricity transmission and distribution system operators.

Among these are software solutions that transform the way grids are designed, maintained and upgraded.

“Digital twin” technology is an example: asset management solutions based on this technology make it possible to simulate any scenario and to strike the right balance between

network performance, capital and operating expenditure.

Last but not least, our management model has changed to align with the 3P principle: People, Planet, Profit. I have decided to link the three items closely. This means monitoring and rewarding our organisation and its management team on their understanding and respect of the 3Ps. It profoundly changes our common vision, our decision-making process and it influences our strategic choices.

Q: What is Nexans’ role in the energy transition?

Nexans’ mission is to electrify the future. We have played a crucial role in the electrification of the world for more than a century. Now we’re amplifying that role. We are doing this by building leading positions in digital services and data management. These capabilities build on our long expertise in cabling and electrical systems.

“Our mission is to electrify the future. We are doing this by building leading positions in digital services and data management.”

Our teams are designing dedicated digital answers to our customers’ unique requirements. We are present in every part of the value chain – from energy production to transmission, and from distribution to usage. Our innovative electrification solutions generate sustainable profits for all of our stakehol-

ders, whilst enabling progress for people and planet.

As a responsible global citizen, it is our duty – and our purpose – to do everything in our power to deliver an energy system that is safer, more sustainable, decarbonised and renewable.

The threats facing our world are enormous. But so are the opportunities. Our vision is a world in which electrification connects us – all of us – to a cleaner and more prosperous future. And that future is within our grasp.

Viewpoint: The Road to Net Zero

Mark Lewis, Chief Sustainability Strategist of BNP Paribas Asset Management, talks to Perspectives about electrification and why the energy transition requires new thinking.

The Nexans logo is displayed on a white podium. It features a stylized red 'N' followed by the word 'Nexans' in a dark blue, sans-serif font.

Decarbonising the energy system depends on electrification. But is there a “killer app” that will supercharge this transition?



Electrification with renewables is going to be the main tool to achieve net zero emissions by 2050. There are two points to consider here. The first is that green hydrogen will need to be 10-20% of final energy demand in 2050 to get to net zero. This is produced using renewable electricity, so directly or indirectly, green hydrogen is all about renewables.

The second point is that electric vehicles will be absolutely key. What electric vehicles enable is a head-to-head battle between oil molecules and solar and wind electrons. That completely changes the game for the oil companies. Electric vehicle uptake is going to grow bigger – faster – than people were thinking even two years ago.

It's going to take three decades to decarbonise Europe's energy system. But markets price in change as soon as they see credible evidence – and that's really what's happened over the past 12 months. The oil companies are suddenly caught in the headlights of the oncoming electric vehicle.

Things are changing pretty fast. Why now?

The single most important factor is that the economics of renewables are now mainstream. Once renewables can compete without any need for subsidies, which is now the case, then all you need is for the cost of purchasing an electric vehicle to fall to parity with a standard gasoline or diesel vehicle. Running an electric vehicle is much cheaper than running a petrol vehicle.

“Electric vehicle uptake is going to grow bigger – faster – than people were thinking even two years ago.”

There is also broader social change occurring. Millennials and Generation Z have very different attitudes and I think this will have an enormous impact as they reach positions of influence in organisations and in politics.

Electricity consumption in Europe has been static for years. Do you expect demand to start trending up again?

Absolutely. You are going to see more electrification of mobility and potentially a green hydrogen revolution. This is going to require

a lot more electricity and you're going to need to build the infrastructure. A lot of that will be offshore wind, so that will require cabling and supporting assets. There will also be a need for grid coordination.

In the case of hydrogen electrolyzers, some will be built at the point of electricity production but some will be built at the point of hydrogen consumption, so you will need to get the electricity from the point where it is generated to the point of use – again, there is a role for grids and distribution networks.

What does this mean for grid operators?

It's important to remember that the network overall in Europe has so far proved a lot more resilient and adaptable than people thought it would ten years ago. Today, you have Germany getting close to 40% of its electricity from intermittent solar and wind – yet Ger-



many still has the most reliable grid pretty much anywhere in the world. For one of the world's largest exporters of manufactured industrial goods, this is remarkable.

But there is still the need for improvement across Europe's electricity industry. According to one estimate, total capex will need to be in the order of €4.8 trillion to achieve net zero by 2050. Half of that needs to go on strengthening the grid.

There is clearly a huge opportunity for investors. This infrastructure is attractive because you get decent rates of return on a risk-adjusted basis: it's a safe business and it's got growth potential.

Investors are waking up to this, which is why

we're seeing the kind of valuations that we're getting in the market for anything that's renewable or linked to the energy transition. You have a rare combination of high growth prospects and low risk. Those kinds of investment opportunities don't come along very often.

What kind of targets are investors looking at?

All of the action in energy markets is perceived as being upstream. If you think of the oil and gas industry, for instance, all the glamour stories are around oil rigs in the North Sea or the Gulf of Mexico.

It's the same with renewable energy. The market pays a lot of attention to production facili-



ties such as wind and solar farms. But not so much attention has been focused on grids that are going to be transporting the renewable electricity.

Yet the grid is one of the really big capex opportunities – and it has not really received the same degree of attention. I think it’s partly a question of getting the market to focus on the valuation opportunity. That’s not to say that the grid companies are massively undervalued, it’s simply to say that they have been oversha-

dowed to some extent. The capex growth story for grids is now coming into view – and it will be a very big story over the next decade.

Why invest in grids?

Efficiently run grid companies offer significant value creation possibilities at a fair risk-adjusted rate of return. That is a very attractive proposition, particularly for long-term investors. You are looking at an investment opportunity here that stretches out all the way to

2050. That matches very nicely the liabilities profile of a pension fund. Then I think there will be higher value-added activities around the backbone of the network. If you think of the grid as the skeletal framework and the value-added services around it as the nervous system, you can’t function as a living organism without both. But clearly, it’s the central nervous system that provides the higher value-added activities. Given the increasing role that electrification is going to play in our lives, these higher value-added services are going to be a very competitive market. There is going to be massive scope to create value from optimising the way consumers use energy. Digital services, smart grids and smart meters offer enormous scope to create value.

initially, private equity or the big disruptors such as Google, Microsoft and Amazon. And others we’ve never heard of before will see the opportunity.

What are the challenges and opportunities for grid operators?

Disruptive technologies are disruptive precisely because incumbent players never go out to disrupt their own businesses – the disruption comes from outside. I’m not saying the dis-

“You have a rare combination of high growth prospects and low risk. Those kinds of investment opportunities don’t come along very often.”

ruptors are coming in to create instability to the electrical system. But they are going to create a lot of tremors.

That’s not to say that traditional operators can’t form partnerships or joint

How important is private sector investment in delivering the energy transition?

It’s key. But it needs to be catalysed. Improving the resilience of the grid is pretty straightforward. You incentivise private sector investment with appropriate risk-adjusted returns. In the context of pension funds and other investors, there should be a ready appetite for that kind of capex.

If you’re then talking about making the grid more agile and flexible as well, inevitably, that’s a private sector game. And it’s a disruptive game that will attract venture capital

ventures with the innovators – there is obviously scope for this. But anybody who’s observed the impact that renewable energy has had over the last 15 years would be derelict in their duty if they did not think through the implications of disruptions in their industry. Disruption is coming whether they like it or not.

How are environmental, social and governance (ESG) criteria shaping the investment agenda?

By the end of the year, with a fair wind, we’re going to have a legally-binding target for net zero by 2050 under the European Climate

Law. So it's not just going to be an appetite for low-carbon investment in Europe, it's going to be a legal requirement.

Any company that is not thinking about how it gets its business model to net zero by 2050 is failing in its fiduciary duty to its shareholders once that law is passed. The economic logic is already there. There's going to be a legal imperative. There's also a generational shift happening. All of these things are pushing in the same direction.

Where there is a potential problem is governments being a bit too slow to take subsidies away from fossil fuels. And there's a drag effect from fossil fuel companies thinking

they can go for just one more round of big investments in oil and gas.

Do we need to change the way we think about long-term investment?

The one thing we know is that the carbon price has to reach a level that enables the European Union to get to net zero at some point between now and 2050. From an investment perspective, that means you need to start thinking from the future back to today, rather than from today to the future. We should be thinking about what carbon

"The capex growth story for grids is now coming into view – and it will be a very big story over the next decade."

price is needed for green hydrogen to be competitive versus natural gas and oil. And what market price is needed for green hydrogen to be competitive against grey hydrogen as an industrial feedstock.

I came to the conclusion that if we want to reach the EU's interim target of producing 10 million tonnes of green hydrogen a year by 2030, then we will need a carbon price of anywhere between €80 and €100 a tonne by 2030.

You have to assume that the EU will do whatever it takes to deliver a low-carbon future. So in Europe at least, I'm quite confident that 10 to 15 years down the line we will have a competitive green hydrogen industry that is on its way to becoming competitive with natural gas and petroleum products.

What does the shift to renewables mean for energy costs?

The thing that always strikes me when you compare renewable energy with fossil fuel energy is the inherently inflationary nature of fossil fuels. You deplete the easiest-to-access resources first, so you're forced to go up the cost curve all the time.

By contrast, renewable energy is inherently deflationary. It doesn't have an upstream component, it's just infrastructure. And that means it's a pure economies of scale business with technology improvements on top. Far from being too expensive, renewable energy brings us into a new age of abundant and cheap energy.



How Can Electrification Stop Climate Change?

**Frederic Lesur,
Senior Engineer for High
Voltage Products and Cable
Systems, Nexans**

Electrification is at the heart of the energy transition. But what exactly is electrification – and what are the implications for grid and distribution system operators?



Ask what “energy transition” means and the first thing most people think of is renewable generation. Green energy is crucial to the energy transition – and wind turbines and solar farms provide tangible proof that things are changing.

But the energy transition isn’t only about new ways of generating electricity. It’s also about new ways of using it. Transforming consumption will be just as important as renewable generation if climate goals are to be achieved.

Electrify everything

Electrification holds the key to decarbonising the energy system. Once something is converted to electrical operation – transport and heating are examples – emissions at the point of use are eliminated, provided that the source of electricity is renewable. The need for electrification is urgent because an enormous amount of downstream consumption still relies on burning fossil fuels.

To put this in perspective, nearly two-thirds of Europe’s final energy consumption – in our homes, transport and industry – comes from burning carbon directly in one form or another. Electricity accounts for only a fifth of all final consumption.

Electricity’s share of final consumption will need to increase substantially if the goal of limiting the increase in the global average temperature to well below 2°C above pre-in-

dustrial levels is to be realised.

Electrification opportunities

Two of the biggest targets for electrification are transport and heating.

Transport has vast decarbonisation potential. To put this in context, electricity today accounts for just 1% of total transport energy consumption in Europe – including electric vehicles (EVs) and railways. The scope for electrification is therefore vast.

Transport electrification is a multi-decade project. Yet demand for EV charging already threatens grid bottlenecks in some places. Finding cost-effective ways to get electricity from

turbine to tarmac is a priority – and it holds the key to tackling Europe’s transport emissions of more than one billion tonnes per year.

Space and water heating accounts for more than three-quarters (78.4%) of final energy consumption in the residential sector in Europe. Today, most of this energy comes from gas and oil. Electrification has clear potential to reduce emissions dramatically.

Like transport, heating electrification is a long-term project that will require adaptation of the existing housing stock and progressive improvements in the energy efficiency of new buildings.

It will also require big changes to power networks. Grids will need reinforcement to handle new loads, including ground and air-source heat pumps. In parallel with this, there

“We need both long-term vision and immediate action – we cannot wait until 2050 is at the doorstep to act on climate neutrality as if we are coming for an exam at the last moment.”

Kadri Simson, European Commissioner for Energy



will be a growing need to model factors such as clustering, transformer capacity and power quality impacts.

New grid technologies

Transmission and distribution system operators are at the heart of the energy transition. But the challenges they face are huge. On the one hand, grid upgrades are needed to enable new demand. On the other, revenues are under intense pressure.

Innovative and cost-effective grid technologies have a vital role to play in optimising networks and enabling new demand. These include:

Enterprise digital twins: this technology allows grid operators to strike the best balance between performance, OPEX, CAPEX and risk. Using a digital twin, it is possible to predict pinch points and congestion, identify the best locations for new loads on existing infrastructure, engage stakeholders and optimise grids with targeted, evidence-based investments.

Subsea cable systems: high-capacity submarine cables will play an increasingly important role in delivering the energy transition. These cost-effective high voltage solutions not only connect offshore capacity to onshore consumers, but also provide interconnection between nations, boosting the competitiveness of renewables, enabling markets and strengthening energy security.

Superconducting solutions: superconducting cable solutions satisfy the growing demand for energy in cities and transport networks. Superconductors are capable of handling enormous currents, reducing the need for high-voltage distribution and transformers. They also require very little space – a key consideration in urban settings – and eliminate heating and EMF. Technologies like these will play a decisive part in enabling the energy transition by reducing the cost and increasing the flexibility of connections between power generators and power users.



It's time for the world to rise to its energy innovation challenge

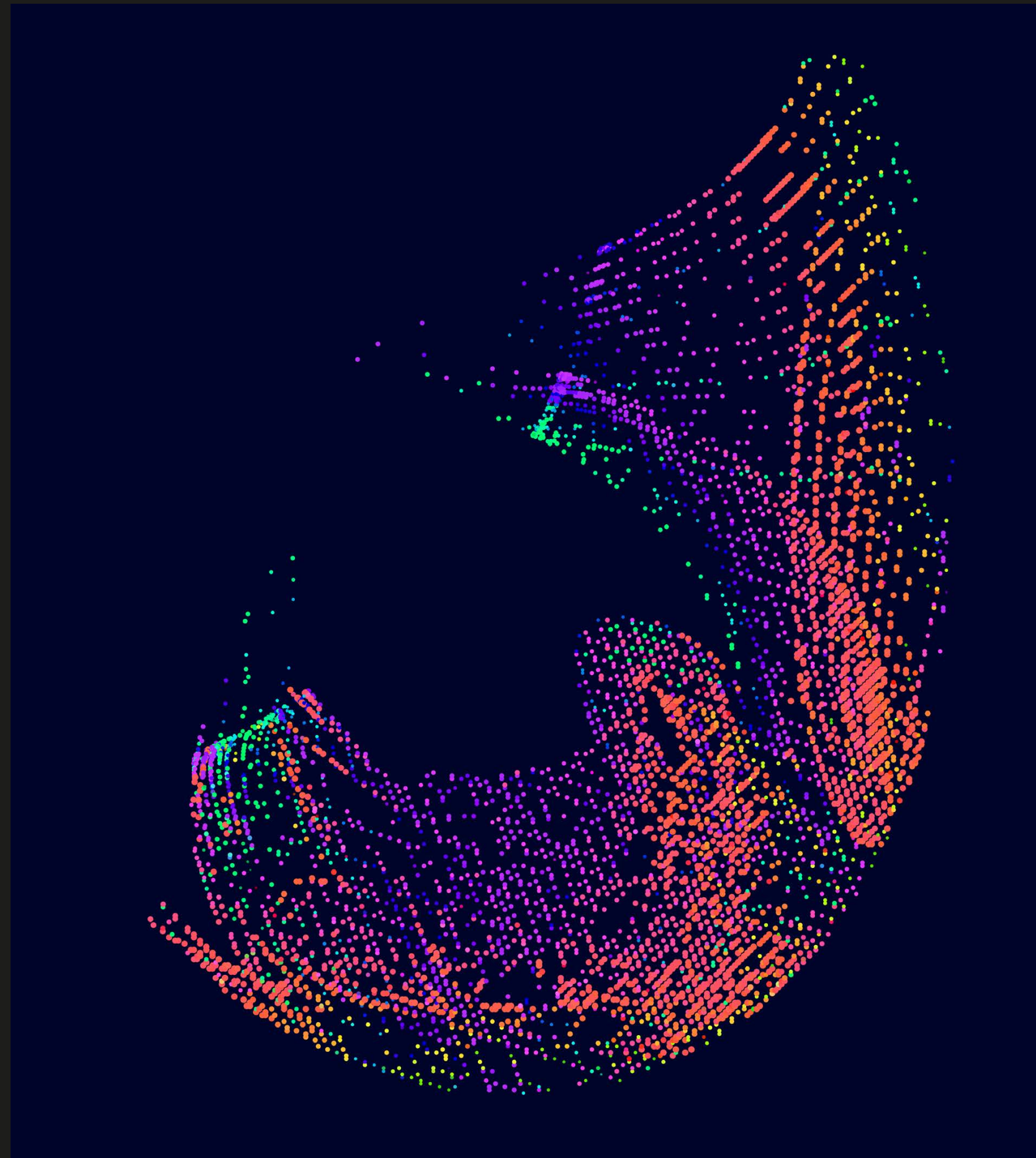
DR. FATIH BIROL
EXECUTIVE DIRECTOR
AT INTERNATIONAL ENERGY AGENCY (IEA)

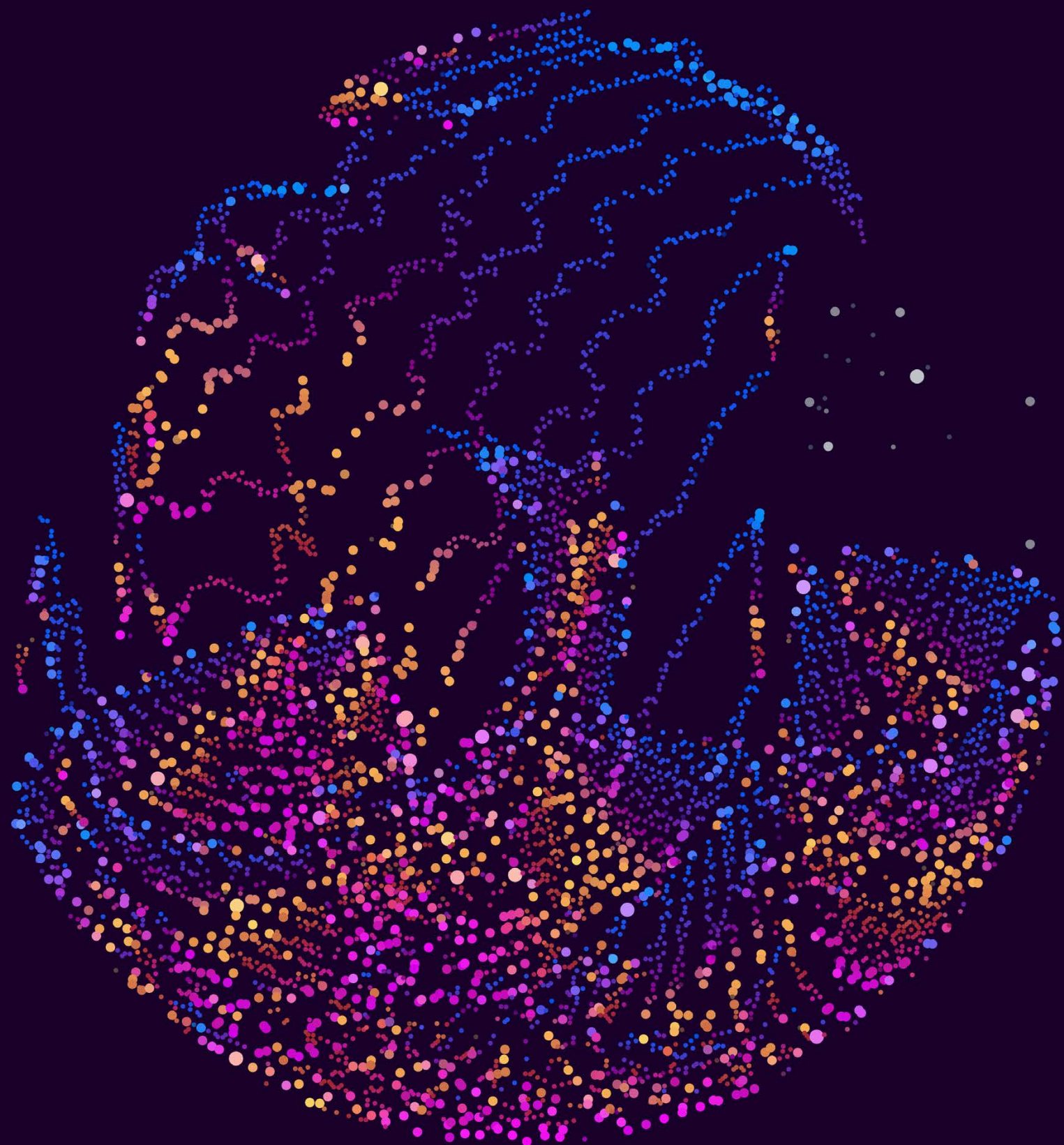
There is no doubt that the energy sector will only reach net-zero emissions if there is a significant and concerted global push to accelerate innovation. It is also clear that there is a disconnect between the climate goals that governments and companies have set for themselves and the efforts underway to develop better and cheaper technologies to realise those goals.

While we have witnessed tremendous progress in technologies like solar PV, wind turbines and lithium-ion batteries, the technological advances that will be needed demand

a step change in both the speed at which innovation occurs and the scale at which new technologies are deployed. And this progress must be achieved in a way that makes our energy systems more secure and resilient.

The energy innovation challenge¹ facing the world extends to sectors that have not significantly changed for many decades and that do not yet have commercially available low-carbon options. It also requires a rapid evolution of the technology mix, particularly in some emerging economies that are just starting out on their decarbonisation journeys. The un-





der-appreciation of these urgent challenges in today's energy debate is a real concern.

However, the IEA's new Energy Technology Perspectives Special Report on Clean Energy Innovation², which we released today, provides reason for hope. It pinpoints the areas where innovation is most urgently needed and, crucially, recommends that governments integrate clean energy innovation into the heart of their energy policy making. To help guide policy makers at this challenging time, the report offers five key innovation principles³ for governments that aim to deliver net-zero emissions while enhancing energy security.

This report represents a new chapter in the International Energy Agency's (IEA) work under the Energy Technology Perspectives (ETP)⁴ banner. It is three years since the IEA released its last ETP report, and we have used that time to reflect on the critical technology challenges that need to be addressed in such sectors as long-distance transport and heavy industry, which are all too often neglected.

The time away has also allowed us to develop improved modelling tools that now provide us with unparalleled capacity to answer key technology questions in more detail. This new report includes a comprehensive online tool⁵ analysing the market readiness of more than 400 clean energy technologies. You can explore it here.

The return of ETP, starting with this week's Special Report and continuing with the release of the flagship ETP 2020 publication later this year, could not come at a more pivotal moment as Covid-19 has further complicated efforts to accelerate clean energy transitions.

Since the crisis erupted, the IEA has mobilised

its resources to support governments and other energy stakeholders, notably with the publication of our Sustainable Recovery Plan⁶ as part of the World Energy Outlook (WEO) series. The plan shows how specific policies and targeted investments over the next three years could simultaneously boost economic growth, create millions of jobs and make 2019 the definitive peak in global greenhouse gas emissions. Our new ETP Special Report builds on that foundation by setting out the key priorities for innovation to continually drive emissions down from that peak, all the way to net-zero.

Together, the ETP and WEO reports will provide the foundation for the IEA Clean Energy Transitions Summit⁷ on 9 July, which will bring together dozens of ministers and CEOs, as well as leaders from the investment community and civil society, with the aim of driving economic development by accelerating transitions towards clean, resilient and inclusive energy systems.

It is my firm conviction that the efforts we are now making – including the revamp of the ETP series – are significant advances in the IEA's modernisation agenda that I launched in 2015, which is putting the Agency at the forefront of sustainable and secure clean energy transitions globally.

1 — <https://www.iea.org/news/reaching-international-energy-and-climate-goals-requires-a-sharp-acceleration-in-clean-energy-innovation>

2 — <https://www.iea.org/reports/clean-energy-innovation>

3 — <https://www.iea.org/reports/clean-energy-innovation/a-once-in-a-generation-opportunity-to-reshape-the-future#abstract>

4 — <https://www.iea.org/topics/energy-technology-perspectives>

5 — <https://www.iea.org/articles/etp-clean-energy-technology-guide>

6 — <https://www.iea.org/reports/sustainable-recovery>

7 — <https://www.iea.org/events/iea-clean-energy-transitions-summit>

Cyber Security in the Spotlight

Bertrand Aït-Touati,
Director Cyber Security,
Nexans

Hackers are increasingly turning their attention
to industrial systems. Why are the risks rising? →

Digitalisation holds the key to boosting efficiency and reducing costs. It's also the key to survival as businesses race to adapt in the face of continuing Covid disruption. According to Microsoft's CEO Satya Nadella, the first two months of lockdown saw uptake of digital technologies that would otherwise have taken two years¹.

While digital technology delivers real benefits, it must be carefully managed if new cyber security risks are to be avoided. Research shows that industrial systems – including smart supply chains and the Industrial Internet of Things (IIoT) – are emerging as top targets for hackers². The growing complexity of industrial systems adds to the risks. Factors include increased connectivity between businesses and their industrial partners, greater reliance on remote working, the proliferation of connected devices, and the growth of Operational Technology (OT) – the use of computers to monitor and control industrial processes.

All of this dramatically increases the “attack surface” – the number of physical and logical points where systems can be infiltrated by malicious actors.

Danger: hackers at work

Exposure to ransomware is one of the principal dangers facing industrial companies and attacks are increasingly common. In a ransomware attack, computers and servers are infected with malware that encrypts data to

prevent access until a ransom is paid. Attacks may also be accompanied by threats to release sensitive data.

Research by IBM shows that the average cost of a ransomware attack was US\$4.44 million (€3.76 million³) in 2019/20. But the impact in individual cases can be much higher: a ransomware attack on one major European industrial business in 2019 cost more than €40 million⁴. Not surprisingly, Europol recently highlighted ransomware as potentially the

“Research shows that industrial systems – including smart supply chains and the Industrial Internet of Things (IIoT) – are emerging as top targets for hackers.”

biggest cyber threat and a priority for investigators across the EU⁵.

Money is not the only motivation. Some hackers want data. Cyber espionage – using computers to gain illicit access to confidential information – is on the rise. Intellectual property, trade secrets and other commercially-sensitive data are prime tar-

gets. Research by Verizon shows that 25% of data breaches are motivated by espionage⁶.

Sabotage is also a major concern. Attacks are intended to disrupt operations and can be life threatening in some cases. Threat actors are often powerful and well-resourced. ENISA, Europe's cyber security agency, warns that attacks sponsored by nation states on the Industrial Internet of Things are increasing across key industrial sectors⁷. Attacks may be politically or ideologically motivated.

The consequences of an attack of any type can be devastating. Dealing with the after-

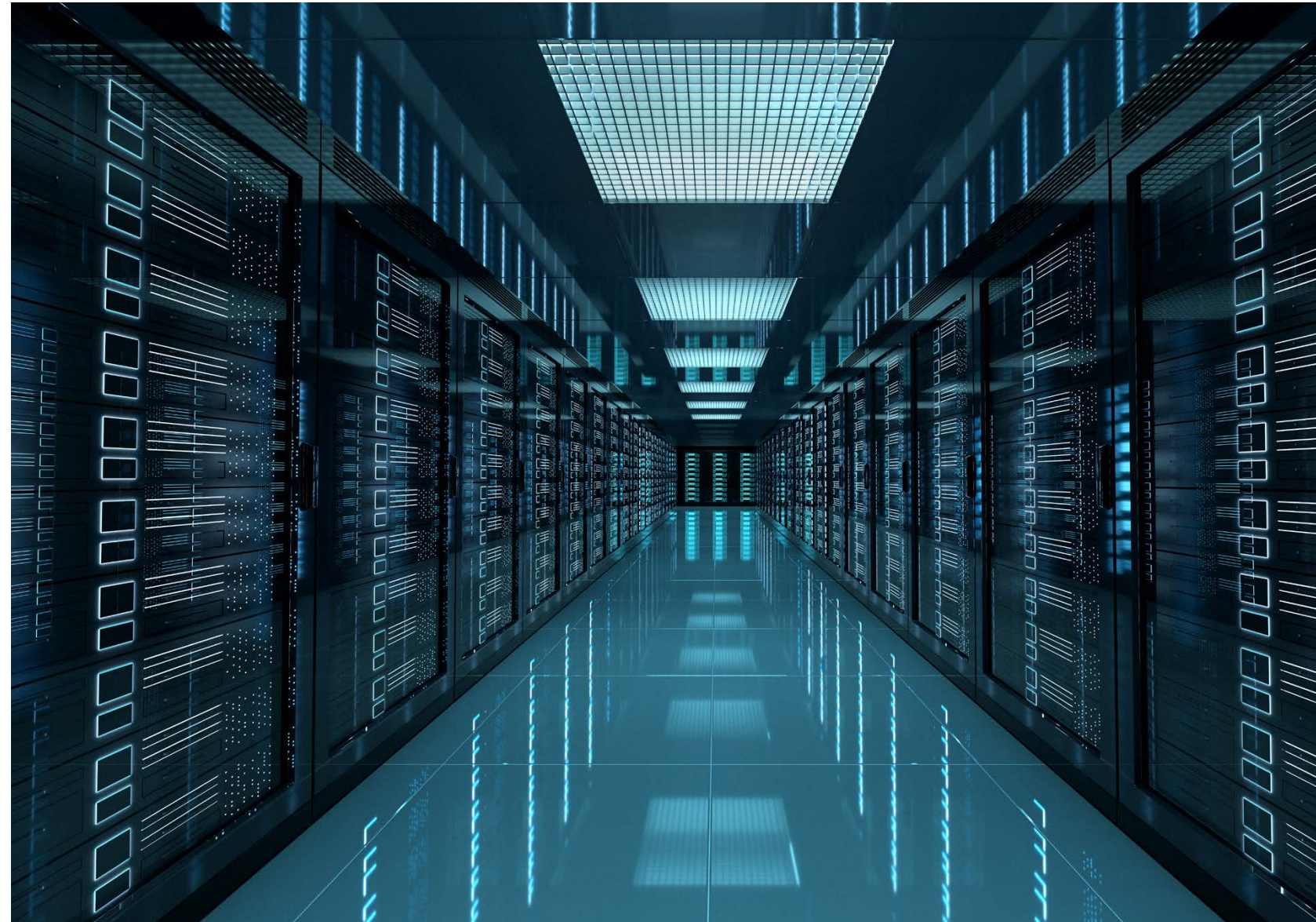
math of a breach is always expensive and disruptive. But there are often legal consequences as well, particularly if personal data is compromised under GDPR or if the target is bound by cyber security regulations, such as the EU's NIS Directive. There are also reputational impacts if breaches are not effectively managed.

“Cyber security is a strategic priority for Nexans.”

By your side

Cyber security is a strategic priority for Nexans. As a leading cable manufacturer, it is vital for us to maintain continuity of supply to

can take months to detect a breach. This point is underlined by research from IBM, which shows that it took an average of 302 days to identify and contain a breach in the industrial sector in 2019⁸.



our customers and to ensure that our operations and data are kept secure at all times.

Nexans is also a leading provider of digital services and solutions. The solutions we offer are increasingly connected and in some cases, they are embedded in our customers' IT infrastructure.

Maintaining rigorous standards of cyber security is therefore of the highest importance. Trust is key. So how do we achieve this?

First, everything we do is underpinned by the principle of Security by Design. This means that every service and solution we offer has been developed with security in mind from the very earliest stage.

Second, we perform rigorous cyber security evaluations on all of our key assets and processes, both internal and external. This includes regular security testing of our digital solutions and services. And thanks to our Security Operations Centre, we are able to provide real-time monitoring of both our internal operations and the status of the digital services we provide for our customers.

Third, we know that cyber security is as much about people as it is about systems. That's

why everyone at Nexans has cyber training, from the boardroom to the factory floor. This

is key to adapting everyone's mindset to new threats and new ways of working. Our e-training programme ensures that our people are able to detect and react to cyber threats. We have made our cyber awareness training

mandatory for all employees. All of these activities contribute to increasing our overall security maturity level and to providing our customers with peace of mind, now and for years to come.

"Everything we do is underpinned by the principle of Security by Design."

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Key Figures



US\$4.44 million
 average cost of
 a ransomware attack
 in 2019/20^a.



302
 days to identify and contain
 a breach in the industrial
 sector in 2019^b.



38%
 of malicious actors
 are connected
 with nation states^c.



25%
 of data breaches
 are motivated by
 espionage^d.

Innovative solar park solutions power the global energy transition

Olivier Dervout,
Nexans Global Market
Director Power Generation

Alain Robic,
CEO of Nexans Solar
Technologies

Greg Stask,
Nexans VP Asia Pacific
Business Unit,
B&T Southern

Nexans is fully committed to supporting the global energy transition by working closely with developers, installers and operators to expand our Nexans Keylios® solar products portfolio that provides full end-to-end energy, data cabling and tracker solutions. →

This includes solar copper cable, low-voltage (LV) direct current (DC) underground aluminum cable, medium-voltage (MV) alternating current (AC) cables for grid connections, pre-connected jumpers and solar trackers – all supported by a dedicated Services & Solutions team. The focus is on easy installation and decreased on-site risks to offer substantial CAPEX and OPEX savings.

The sun rises on Australia’s solar power market

Australia is enjoying a boom period with its solar power capacity set to almost double to over 12 GW. Nexans is playing a key role in this growth by supplying specialized power cables for the country’s solar farms. Recently, contracts have been completed for six major new projects in the states of Queensland, Victoria and New South Wales (NSW).

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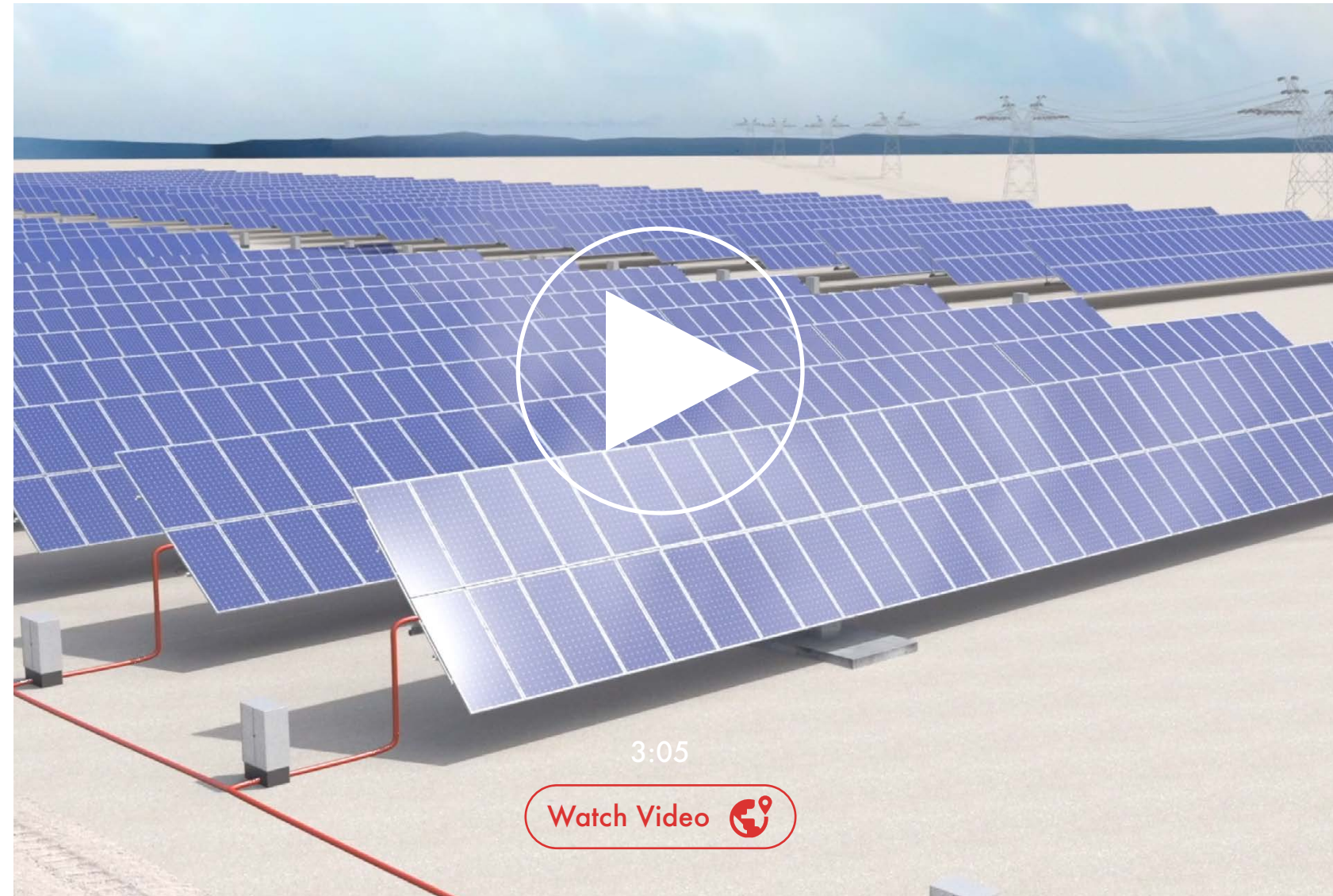
The six cable supply contracts were placed with Nexans Olex by Biosar Australia, a leading global solar farm EPC contractor. They covered the supply of medium voltage (MV) and low voltage (LV) direct current (DC) cables for the Kiamal, Susan River, Childers, Oakey II, Nevertire and Middlemount solar farm projects. The scope of supply covered a wide range of Keylios products including underground 33 kV cables, underground 1,500 V low voltage cables, photovoltaic (PV) under-array cables, underground data cables, inverter to transformer connectors, communication, tracker controls and associated accessories.

We worked with Biosar Australia throughout the design stages of all six projects to provide specialist engineering support, covering standards and specifications as well as cable and system design support. The power and control cabling was manufactured and supplied by our China plant in Yanggu and our Olex plant in Lilydale, Australia, supported by a range of Nexans Olex specialist manufacturing partners. All the underground power cables incorporate the Nexans Olex EcoTerm™ solution that provides an effective barrier to degradation from termites.

The generating capacity of the six solar farms will total 672 MW, enough electricity to power over 600,000 homes. They were commissioned between 2019 and early 2020 and we are continuing to invest in ongoing cable testing and innovation to meet the requirements of Australia’s renewable energy projects.

Harness solution for a 15 percent reduction in solar farm LV DC cabling costs

Building on our expertise in cables for solar projects, we designed the new Keylios Photovoltaic Harness to help developers, installers and operators of utility-scale solar farms cut the LV DC cabling costs for their photovoltaic modules. This is a key consideration because a solar farm can require huge amounts of LV DC cable, more than 4,000 kilometers for the largest sites. Less cabling makes it possible to reduce the size and cost of components, such



as connection boxes. Smarter use of materials also limits the overall environmental impact of the installation. Specifying a harness removes the need for cables to be cut to length on site, as the complete assembly of cables and connectors is manufactured under controlled factory conditions and delivered ready to fit. This offers both improved quality and reliability by reducing the number of connection points – 50 percent of all faults on solar farms are due to cables and connectors. Furthermore, the very significant reduction in installation time and material was-

tage can reduce the overall cost of LV DC cabling by up to 15 percent. Each Keylios Photovoltaic Harness is sized and manufactured on a bespoke basis and delivered as an easy to handle kit that ensures it will be a perfect match for the customer’s installation. It is also ready to connect, with no cutting or crimping required on site. To ensure maximum quality and reliability, the harnesses are manufactured under factory controlled conditions using Nexans’ Energyflex® cables designed specifically for use in solar plants. The cables are precision cut and

joints ultrasonically welded, decreasing potential defects significantly. Junctions and inline fuses are overmolded to meet the IP67 rating. Our global footprint means that Keylios Photovoltaic Harnesses can be delivered for any project worldwide. The harnesses can also be manufactured in-country for customers who need to maximize the local content of their projects.

Keylios solar trackers follow the sun

Nexans Solar Technologies (NST), Nexans' newest subsidiary, is an internal startup created in 2018 as part of our strategic plan for the global transition to renewable energies. It aims to offer added-value products and services to key players in the sector, notably power producers and investors. The Keylios Solar Tracker developed by NST features a



disruptive design that brings increased value to solar developers.

Solar trackers optimize the output of large scale commercial solar parks by enabling their solar panels to follow the sun's daily path across the sky. Typically, using trackers will increase the electricity output of a solar park by 15 to 25 percent compared to fixed structures.

A particular advantage of the Keylios Solar Tracker is the robust truss beam structure designed specifically to support a double vertical row of modules(2V) while withstanding the higher wind loading that results from this configuration. Climatic forces cause some 50 percent of the failures in solar parks, and this will therefore increase the reliability and life of the asset.

The second critical feature of the Keylios Solar Tracker is that it only needs two foundations for a typical 36 kW array, while a conventional design would need three to five times more. The design enables a firm concrete foundation to be used on unstable ground where it would not be feasible or permissible to drill piles down to the bedrock.

With a record 119 gigawatts (GW) installed, solar photovoltaic power was the world's largest new build energy resource in 2019. Yet, finding new sites for solar farms could be a limiting factor for its future growth. Nexans Keylios solar trackers could provide the enabling technology to answer this challenge. Indeed, the Keylios tracker opens up exciting possibilities to locate solar parks in locations that

were previously impractical, such as old land-fill sites or quarries and other unstable industrial wastelands, especially where the ground is sloping or uneven.

The Keylios Solar Tracker enables an array of solar modules to tilt through an angle from -60 degrees east to +60 degrees west along a north-south axis. In high winds, the array can be brought to a safe horizontal position to reduce its exposure and can also be tilted to a high inclination in winter to prevent snow ad-

hering to the modules or to help the cleaning operation. They also offer a better compatibility with upcoming bifacial modules.

A single-axis design like the Keylios Solar Tracker, when deployed on the utility scale, delivers the lowest Levelized Cost of Energy (LCoE) compared to any other power generation technology.

Solar trackers for Reden's solar parks in France

NST's first contract for solar trackers was signed with Reden, a major player in the development of photovoltaic projects and a supplier of fully integrated energy. Over 800 will be installed at Reden's next four solar parks, located in the southwest of France, with a combined peak capacity of 26 MWp.

The project is being carried out in partnership with Omexom ENR SO, the Toulouse-based subsidiary of Vinci group specializing in renewable energy that is responsible for the construction of the parks, including the assembly and installation of the trackers.

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