I f world leaders gathering at Davos this month are to live up to the theme of the 2018 World Economic Forum, “Creating a Shared Future in a Fractured World,” they will have to call on the full power of emerging digital networks that create new connections between people, companies and devices.

By linking up physical infrastructure to the digital world, these technologies have the potential to transform basic industrial processes and make the economy of tomorrow more inclusive and more sustainable.

“The fourth Industrial Revolution will completely alter how we produce, how we consume, how we communicate and how we live,” WEF founder and executive chairman Klaus Schwab has forecast. “It will allow, if we get it right, a much more human-centered approach, fostering not only material satisfaction but also genuine individual and societal well-being for all.”

Whether new networks are integrating household solar panels into national energy grids, helping car manufacturers predict and prevent traffic jams before they happen, or improving the efficiency and sustainability of the mining industry, digitalization is already having a profound impact across all areas of the economy.

In the energy sector, the Internet of Things and digitalization “will turn the whole industry upside down,” says Cedrik Neike, the youngest member of the Managing Board of German conglomerate Siemens, with special responsibility for energy management.

“Just as the arrival of the Internet meant that anybody could communicate with anyone else without having to go through a central telephone exchange, now the Internet of Energy is decentralizing the world’s energy system and making electricity greener and more affordable,” he adds. “Energy companies need to embrace a new mindset to respond to the emergence of millions of smart energy-generation units and to build a more sustainable, affordable and reliable grid.”

One of the most dramatic implications of the Internet of Energy is the so-called virtualization of the traditional power plant, the replacement of large generating facilities by aggregated small producers. At a major shopping mall in Helsinki, Finland, Siemens is installing solar panels, a microgrid and a state-of-the-art battery storage system. As a result, the shopping mall will soon be able to operate as a virtual power plant, generating its own power, selling surplus electricity back to the national grid and reducing the need for major investments in expensive and often polluting backup plants.

“Thanks to new technologies, whole neighborhoods could start producing and trading their own electricity,” Neike says. “This will not only make energy more affordable and more reliable, it will also give energy an emotional meaning for the consumers and producers of the future.”

With a start-up in Brooklyn, Siemens is developing a microgrid that will use blockchain to let local residents and businesses buy and sell solar power directly from each other, creating a completely self-sufficient energy network.

Across the Atlantic Ocean, Siemens is using another digital innovation to develop a business model that will take the energy revolution even further. Working with a start-up in Brooklyn, Siemens is developing a microgrid that will use blockchain to let local residents and businesses buy and sell solar power directly from each other, creating a completely self-sufficient energy network.
LEADING THE ENERGY TRANSITION

As the lifeline of modern economies, the energy sector plays a critical role in steering the world toward a low-carbon and digital future. Companies in the industry are now reinventing themselves to tackle a series of challenges that range from increasing access to clean energy to installing two-way charging points for electric vehicles.

“The extremely rapid changes that are transforming the entire energy industry are creating a new frontier of products and services,” says Francesco Starace, CEO of Italian energy company Enel. One of the world’s largest energy businesses, Enel has moved into vanguard positions on many of the industry’s varied frontlines.

In Italy, it first installed digital meters 15 years ago and is now replacing them with a second-generation smart meter that will enable innovative services for end users and energy operators alike. On the sustainability front Enel is committed to delivering on four U.N. Sustainable Development Goals (SDGs) aimed at ensuring quality education, access to affordable and clean energy, decent work and economic growth, and combating climate change.

Recently Enel has unveiled a new brand, Enel X, reflecting its strategy of opening up energy to new uses, new technologies, new partnerships and new services. The brand positions Enel at the heart of today’s fast-developing ecosystem of innovative services and shared value.

The energy sector is experiencing an unprecedented transformation, opening up new opportunities for utilities and communities.”

Francesco Starace, CEO, Enel

Q&A with FRANCESCO STARACE, CEO, ENEL

How well prepared is Enel for the transformation of the global energy industry?

We are leading in key areas for sustainable growth such as renewables and digitalized distribution networks. We can leverage the trends of urbanization, the electrification of transportation and other industries as well as decarbonization to capture the opportunities presented by the global energy transition.

How important is digitalization to the future of Enel?

Digitalization is the key to making the most of the energy transition and boosting efficiency and sustainability. That’s why we increased investments in digitalization to €5.3 billion in our 2018-2020 strategic plan. Digitalizing our grids, assets and processes will create new value for cities and for industrial and residential customers.

What are the main focus areas for Enel X?

We are focused on customers, which is why we launched a new global business line, it will come into the market under the new brand, Enel X. We set up four product and service lines to address new customer needs. E-Industry offers solutions to large commercial and industrial clients, while e-Mobility will turn Enel into a technology leader in electric mobility. E-City offers advanced and integrated energy services to public administrations and municipalities, such as fiber optic network connectivity. E-Home delivers innovative solutions to residential customers, such as the installation, maintenance and repair of smart home energy appliances.

How is Enel contributing to sustainable development?

Sustainability is deeply embedded in our industrial strategy. We gave structure and focus to our sustainability efforts by embracing the U.N. Global Compact approach, and we also sit on the G7 Board. The 17 U.N Sustainable Development Goals inspire all our companies’ efforts, and we have publicly committed to deliver on four SDGs. For each of them, we set specific and measurable targets to be achieved by 2020. Ensuring access to energy is critical to sustainable development.

Can you tell us how Enel is applying the Creating Shared Value (CSV) model?

CSV is an inclusive approach combining the understanding of social issues with the design of a profitable and sustainable business model. This approach opens up opportunities for local communities and for the companies involved. Recently Enel has announced its new brand, Enel X, reflecting its strategy of opening up energy to new uses, new technologies, new partnerships and new services. The brand positions Enel at the heart of today’s fast-developing ecosystem of innovative services and shared value.

Access to energy is critical to sustainable development.

Twenties said start-up. Forties said multinational. I say Arona.

The new SEAT Arona.
INNOVATING SUSTAINABILITY

Every business today cares about corporate social responsibility—or every business should, anyway. And on a global scale, one of the most pressing issues we currently face is the impact of runaway carbon emissions on the livability of our planet. New digital innovation is helping companies improve the sustainability of their operations.

Much of our carbon footprint results from the physical constraints of traditional work, which you can offset to what you have with you. To be productive, you’ve got to commute to a climate-controlled office and use applications delivered from a power-hungry corporate data center. To meet with people in other locations, you’ve got to travel there—burning carbon along the way.

Digital innovation can help erase physical constraints. When employees can access a complete digital workspace from anywhere, they can save time and reduce congestion in cities. When work is done remotely, you save on the energy costs of the city’s lighting system, and reduce CO₂ emissions significantly, by replacing traditional streetlamps across the city with 91,000 connected LED street lights from Philips Lighting. Using the company’s CityTouch system, operators can now dim and brighten individual lights remotely in response to changing conditions, rather than just turning the entire network on and off. Thanks to a digital dashboard provided by software company SAP, authorities also enjoy a complete, 360-degree view of their smart city infrastructure, including real-time performance data from the LEDs. This is helping the city improve planning and cost management.

PROTECTION FROM NEW THREATS

In the early days of the Internet, the first cybersecurity companies would detect one or two new viruses each week. Now, 30 years later, the scale of the threat has increased almost beyond comprehension. Ordinarily, Vlcek, CTO, EVP, and GM for customers at security firm Avast, says that the company currently identifies about 100,000 new viruses every single day. And as more and more devices connect to the Internet of Things (IoT), that number is set to rise even higher, Vlcek predicts. Hackers are already reprogram- ming IoT-enabled devices such as baby monitors and home security cameras to run their own apps or attack global services such as Twitter and Amazon.

To respond to threats of this magnitude, Avast is using the power of big data, artificial intelligence (AI) and machine learning to detect suspicious behavior and defend networks automatically. “The IoT is a ticking time bomb today,” Vlcek says. “I see our role as securing this new frontier of consumer computing.”

Q&A with LUCA DE MEO, President, SEAT

How do the awards you have received, such as Automotive News CEO of the Year and Business Insider’s Luminary of the Year, say about SEAT?

These awards recognize the turnaround that we have achieved in the last couple of years. The automotive press has been surprised by the strength of the SEAT brand in the market. From the CEO’s perspective, it has been made possible through the commitment of the SEAT brand in the market and the focus on local start-ups and global technologies. We are the first car company in Europe to develop a gateway for the Internet of Things, a platform that connects the car to the Internet of Things, and that’s the key to making the SEAT brand in the market.

What do you think you have played in the transformation of SEAT?

I see myself as a facilitator, one that’s helping people see and organize different things, giving new meaning to them. We’re focusing on unlocking innovation.
A SHARED FUTURE

To prepare for this world, Volkswagen is training its workforce in new technologies and reinforcing its IT resources, adding 1,000 software engineers, AI specialists and cloud computing experts. The company “will be both an auto company and software company,” Martin Hofmann, CIO, Volkswagen Group, says. “Quantum computers give us a completely new dimension. In 10 years, they will be orchestrating mobility in metropolitan areas, routing autonomous vehicles, predicting traffic flows and optimizing urban mobility.”

**Q&A with GREGORY GUILLAUME, VP Design, Kia Motors Europe**

**How did the GT concept car develop into the Kia Stinger?**

We showed the concept car at the Frankfurt Motor Show in 2011 and the reception was very positive. We were confident that there was a market for it to be built as production vehicles.

**What were your inspirations when designing the Stinger?**

I grew up in France in the early 1970s, when people used to work hard and make money in Paris and then go to Saint-Tropez to have fun. In the summer as a kid, we used to go to Saint-Tropez, and on the highway we would see all these sports cars. I wanted to replicate what those cars stood for: fast and powerful but also stylish, elegant and fun.

**What is your favorite feature of the Stinger?**

It’s not really a single feature. It’s the proportions. Proportions are very important to me. Because it is a Gran Turismo, no single element should be louder than the others. It is not only the shape of the car itself is the ultimate dream of mobility, and the car itself is the ultimate dream of freedom.”

“Quantum computing is opening up a completely new chapter of performance,” explains Martin Hofmann, CIO at Volkswagen Group. “Some computations that would take one year for a conventional supercomputer to carry out can be done in seconds by a quantum computer. In some cases, a solution will only be possible with quantum computers.”

**ONE SUPERCOMPUTER TO RULE THE ROADS**

Historic car manufacturers are moving into the front line of cutting-edge technologies and powering a new era in computing as they reposition themselves for a world of connected and autonomous transport.

At the end of 2017, German car giant Volkswagen teamed up with Google to develop a range of applications on a quantum computer. While classical computers store information in bits with the values either of one or zero, subatomic particles can exist in a state of superposition of both of these states, increasing their power exponentially. Before long, quantum computers may be able to perform operations that are beyond the reach of their classical counterparts.

“Quantum computing is opening up a completely new chapter of performance,” explains Martin Hofmann, CIO at Volkswagen Group. “Some computations that would take one year for a conventional supercomputer to carry out can be done in seconds by a quantum computer. In some cases, a solution will only be possible with quantum computers.”

Volkswagen and Google are focusing their initial research on three areas: traffic optimization, materials simulation for vehicle construction and battery research, and the development of new machine learning processes and artificial intelligence (AI) processes needed for self-driving cars.

Even before the Google announcement, Volkswagen had already taken its first steps into the use of quantum computing for vehicle design. As part of the LEP project in Beijing, the company deployed the technology to optimize the traffic flow of 10,000 cars. “We used quantum computing to predict traffic jams and then displace them before they happened by giving each car a different route,” Hofmann says. “Quantum computers gave us a completely new dimension. In 10 years, they will be orchestrating mobility in metropolitan areas, routing autonomous vehicles, predicting traffic flows and optimizing urban mobility.”

**Nissan Designs Intelligent Mobility**

It is not only the shape of the car industry that will be changed forever by the arrival of electric vehicles, connectivity and autonomous driving, but the shape of the cars themselves. While tailgates and driver heads already look as if they’re being consigned to history along with the internal combustion engine, new digital technologies are poised to have an even more dramatic impact on car interiors and exteriors.

“The Stinger is a car designed for our customers to fall in love with a car that can excite a new generation of car buyers. “Design is the best way to take a brand forward,” Martins says. “The Stinger is a car designed for our customers to fall in love with.”

**What impact do you think the Stinger will have on your market positioning?**

The Stinger positions the LEAF as having a sharper, more dynamic look and an overall sense of efficiency. “The new design is about efficiency, about the proportions. Proportions are very important to me. Because it is a Gran Turismo, no single element should be louder than the others. It is not only the shape of the car itself is the ultimate dream of freedom, and the car itself is the ultimate dream of human beings,” says Alfonso Albaisa, SVP for Global Design, Nissan Motor Co. Ltd.

“At the end of 2017, Japanese car manufacturer Nissan unveiled an all-electric concept car, the IMx, to demonstrate just how car design may change in the near future. “We are not just chasing the dreams of customers. We are chasing the dreams of mobility for whole societies and communities,” Nissan Motor Co. Ltd.

**How important is design to enhancing the Kia brand?**

Design is a tool that helps the brand achieve what it wants to communicate and where it wants to go. “The Stinger has a challenging brand. We came from nothing, and we have surprised a lot of people. We have pushed the bar higher. We are all about shaking things up, which is one of the reasons we launched the Stinger. We want to reach people in a different way. We want to reach their hearts.”

**What is your favorite feature of the Stinger?**

It’s not really a single feature. It’s the proportions. Proportions are very important to me. Because it is a Gran Turismo, no single element should be louder than the others. It is all about harmony. Everything in this car is about balance and the power, tension and muscle there, but it is only when you walk around the car that you sense that it starts to grow out ever so slightly.

**What were your inspirations when designing the Stinger?**

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DIGITAL DEXTERITY IN THE WORKPLACE

I may be a long way from the secluded mountaintops of Switzerland to the fast-paced, cutting-edge world of Silicon Valley, but for corporate and government leaders gathering at Davos this month there is no escaping the shockwaves of the digital revolution.

As developments in automation, artificial intelligence and cloud computing begin to transform the world of work, small and medium-sized enterprises are increasingly turning to the remote working abilities enabled by cloud computing, which releases them from the requirement to invent in their own on-premises IT infrastructure. “Our customers can use any device to connect to any application from any network security,” Reilly says. “We can provide them with a completely secure digital workspace.”

Meanwhile, the benefits of flexible working extend well beyond the standard metrics of cost savings and returns on investment. By minimizing requirements for physical office space and energy and for corporate travel, remote working technologies can also reduce an organization’s environmental footprint. At the same time, they play an important role in increasing social inclusion, making it easier for mothers and caregivers to join the labor market or remain in their positions.

The changing face of modern work

The revolution may be powered by the cloud, AI and the Internet of Things, but at the end of the day it will not eliminate people. So there needs to be a top-down approach, with organizations using these new technologies to empower their people and to support their aspirations,” he adds. In the workplace, there can be dramatic opportunities for companies adopting a culture that embraces the possibilities of technological change. At Baloise, a Swiss insurance business founded in 1833, the introduction of Citrix services that enable employees to use their own devices securely at work and at home has helped change the company culture almost beyond recognition. No longer desk-bound, Baloise employees are free to work with their colleagues across the organization as with outside partners. “There has been a real change in the way we work,” says Olaf Romer, the company’s CIO. “We have more of a start-up culture now, with an elimination of the hierarchy, which makes us a more attractive employer to talented young people.”

“Organizations from all sectors are using digital technologies to reimagine the physical workplace,” Reilly says. “They are creating physical and virtual environments that allow their workers, and in particular their millennial workers, to be more effective wherever they want to be.”

It is not only large multinationals and public sector organizations that are reaping the productivity rewards of the digital workplace. Small and medium-sized enterprises are increasingly turning to the remote working abilities enabled by cloud computing, which releases them from the requirement to invest in their own on-premises IT infrastructure. “Our customers can use any device to connect to any application from any network security,” Reilly says. “We can provide them with a completely secure digital workspace.”

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“Now we enjoy more collaboration and a more user-friendly environment.” Olaf Romer, CIO, Baloise

“Customers are using these technologies to employ a more diverse workforce and to help improve the work-life balance of their employees,” Reilly says. “We can help them build a simple framework that will not only improve people’s productivity but increase their happiness and improve their satisfaction with that work.”

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MINING INDUSTRY 4.0

Mining giant Anglo American has the recognized industry leader when it comes to increasing productivity and enhancing sustainability by investing in innovation and technology. CEO Mark Cutifani explains how new technologies are transforming the 100-year-old business.

What contribution has innovation made to the Anglo American turnaround story?

Today every person in our business is delivering 70% more saleable product than in 2012. Half of that improvement per person is a consequence of reining in the overall quality of our portfolio. The other half comes from different mining designs, new operating practices and the implementation of new technologies or technical improvements. Of the changes that we have been in control of, one third has been the result of technology.

We have re-tooled the organization and put the best technical brains together with the most practical operators. We want to find different ways to mine the ore body and more efficient ways to mine. The core benefits of new technologies are enormous because they require smaller equipment and smaller plants.

What new technologies are you working on?

To be more productive and cost-competitive as an industry, we need to develop new ways of extracting the ore without all the waste rock. Extractive technologies that we are looking at include using lasers for drilling and deploying microbes which digest the ore to produce an elixir full of mineral.

How are your investments in innovation helping support sustainability?

Innovation touches everything we do. It has made Anglo American safer, more productive, more cost-competitive and more accepted by our host communities. On the safety side, automation and new mining technologies are taking people out of dangerous areas into higher-skilled jobs. In the environment we are working on new processing technologies that eliminate the use of freshwater and reduce energy consumption. From the social development point of view, we are working with a whole range of stakeholders so that we can make local communities partners in the way that we develop our operations. Sustainable innovation is critical to our business model.

We are water stewards. And miners.

While investing in new technologies to save water by using less, recycling more and working to eliminate conventional wet tailings.

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One of the oldest industries in the world, mining has played a major role at critical stages of human development, from the beginning of the Bronze Age to the start of the Industrial Revolution some 250 years ago, and to all the mining crises that have enabled modern life today.

Now the industry is entering the Information Age, as digital and automated technologies transform the traditional process of extracting ore from rock. Mining companies have put the excesses of the commodity boom behind them and are refocusing their investments on innovation. They are introducing automated drilling into high-risk underground areas, turning microbes to work to extract metal from ore more efficiently and even using blockchain to trace mining designs, new operating practices and the implementation of new technologies or technical improvements. Of the changes that we have been in control of, one third has been the result of technology.

We have re-tooled the organization and put the best technical brains together with the most practical operators. We want to find different ways to mine the ore body and more efficient ways to mine. The core benefits of new technologies are enormous because they require smaller equipment and smaller plants. Extractive technologies that we are looking at include using lasers for drilling and deploying microbes which digest the ore to produce an elixir full of mineral.

Miners that embrace change will succeed. Those that do not will be left behind.”

Mark Cutifani, CEO, Anglo American

At the same time, we are also using big data to analyze truck movements around the pit to increase productivity and medical imaging of the extracted ore to adjust our processing in real time.

The rate of technological change in our industry is going to be quicker than we have ever seen before.

With local communities and other stakeholders to preserve their long-term licenses to operate. “Many of our members are working jointly with communities and local, regional and national governments to develop a shared vision about how to maximize the positive impact of their operations,” says Tom Butler, CEO of the International Council on Mining and Metals.

Mark Cutifani, EVP Corporate Affairs and Sustainability, Goldcorp; Elaine Dorward-King, EVP Sustainability and External Relations, Newmont Mining Corporation; Mark Cutifani, CEO, Anglo American
Q&A with ELAINE DORDOR-KING, EVP Sustainability and External Relations, Newmont Mining Corp.

**How has Newmont’s position as a leader in sustainability supported its financial performance?**

There is data suggesting that companies that deliver in social arenas also outperform in terms of value over companies that do not. If you are able to successfully manage the complexity of risks associated with the environment, community and political dynamics, then you will also be managing the financial and production side well.

**How does this focus help Newmont attract new talent?**

Newmont is in competition with every other industry for the brightest and best. We have seen in our recruitment process in the past couple of years that we are able to attract dynamic young people from all kinds of academic disciplines.

**What are you doing to create a more diverse workforce?**

One of the things that we are putting emphasis on at Newmont is inclusion and diversity. Inclusion is one of our core values. We recognize that having a diverse workforce is important, but diversity by itself is not enough. The people who are part of our workforce need to feel included and recognized for their contributions. We are actively working to increase diversity across the company.

Newmont is building a diverse mining workforce.

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Want to innovate with us? Together we’ll go far.

Check out the **Open Innovability** platform and share your ideas for our crowdsourcing project on the future of energy.

Open Innovability is Enel’s platform dedicated to innovators, startuppers, makers, university researchers and anyone who wants to share their ideas and innovative solutions to help make energy increasingly sustainable. With us, your ideas can go far.

Visit [openinnovability.enel.com](http://openinnovability.enel.com)

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