HITACHI ABB POWER GRIDS
Powering Good for Sustainable Energy
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Foreword: Powering Good for Sustainable Energy

Welcome to this first edition of Perspectives – a collection of insights, opinions and ideas from technology and business leaders across our industries and beyond.

Let’s start by recognizing that we are living through extraordinary and exciting times.

The 2020’s will go down in history, as an unprecedented social and economic global challenge and a time of human invention, innovation and societal progress. The current crisis has touched almost every human and organizational structure on our planet, but we have learned to collaborate more. It has rocked us on all levels; socially, environmentally and economically. It has shifted us into a ‘new norm’ requiring rapid adaption and adoption of digital technologies and processes, setting new ways of living and doing business across sectors and geographies.

Before the word ‘COVID-19’ became part of our everyday vocabulary, global forces were shaping – and continue to – shape our planet. Climate change action and decarbonization are forces for good. And if any good stems from the pandemic, it will be as a result of a more urgent call for real action on decarbonization.

Despite the pandemic, the world’s population will continue to grow. The World Bank forecasts that we will be sharing our planet with two billion more people by 2050. Simultaneously, living standards and the rise of the newly connected ‘prosumer’ are driving up global demand for energy. The IEA forecasts electricity demand to grow to at least twice the rate of primary energy demand by 2040, up from 19% in 2018 to 34% in the Sustainable Development Scenario.

As technology and market leader, we can and must make a difference by collaborating across stakeholders, innovating with customers and partners, and engaging with policy makers to adapt and adopt regulations that enable deployment of technology and business models supporting secure, sustainable and scalable energy infrastructure such as power grids.

Already, back in 1954, ABB introduced HVDC (High Voltage Direct Current) – a technology that is changing the energy world. Today, HVDC is the technology of choice for integrating large-scale renewables, connecting offshore wind farms, building interconnectors and efficiently and reliably transmitting clean energy across vast distances to hundreds of millions of consumers around the world. Continuous innovations have helped keep our pioneering and digital technology heritage alive and reinforced our commitment of powering good for a sustainable energy future.

A recent life cycle assessment study of the newest HVDC Light generation compared with previous generations showed that we have reduced our...
carbon footprint by two thirds. That corresponds to the annual carbon footprint of around a quarter of a million people.

During a recent IEA ministerial roundtable which I attended on ‘Mobilizing Investments for Secure and Sustainable Power Systems’ there was a clear and unanimous view: having proved its resilience during these extraordinary times, a reliable and efficient power sector is crucial for social stability and economic recovery. It will play a pivotal role for the sustainable energy future.

Whilst we continue investing in clean energy sources and energy efficiency/flexibility, we must also accelerate grid development across geographies. Technologies – be it for interconnected grids or distributed systems – cannot become the bottleneck due to obsolete and non-collaborative business models. Accelerating digitalization will enable our grids to become more flexible and reliable. And simultaneously, governments also need to set the right boundary conditions with new regulations and policies. Focused investment, leveraging technology and collaboration across stakeholders and countries will be key in supporting a secure, scalable and sustainable power grid.

But, investment in power and digital technology is also crucial across many sectors, like mobility, smart life (cities), industry and IT sectors (data centres). Within our new joint venture, we have more than 100 years of engineering know how in the power and industrial sector. We count on the largest installed base in the space of power systems for electric utilities and large industries. As an example, our Operational Technology (OT) systems control and protect around 30% of the electric networks globally and our software is used on a daily basis to manage over one million power assets globally – a unique knowledge base we continuously leverage in our innovation cycle.

Why Perspectives?

Now more than ever we all need to come together to solve the colossal challenges facing society. No player, no matter how good, can do it alone and this is a topic that is frequently discussed within the energy industry which needs to keep mission-critical infrastructure running without interruption. Perspectives provides an open, accessible and thought-provoking forum where we can exchange leading-edge thinking. Looking across the utility and energy, mobility, smart life (cities), industry and IT sectors – where we face common challenges – we can also benefit from diversity of ideas.

In particular, by fusing the latest in energy and digital thinking, combined with pioneering spirit and cross-sector, dialogue we can co-create solutions that deliver real breakthroughs. Together, we can close the gap for the billion people without access to reliable electricity and contribute to societal progress for everyone. Perspectives is a humble and inclusive attempt to further this process for collective benefit.

This first edition of Perspectives is focused on the UN’s Sustainable Development Goal 7: Access to affordable, reliable, sustainable and modern energy for all. Together, with customers and partners, we explore the importance of a reliable, resilient and flexible grid and take a closer look at how adopting digitalization can unlock growth through new business models that are vital for recovery.

Last but not least, I would like to personally thank industry colleagues and true thought leaders, Dr. Fatih Birol, Executive Director, International Energy Agency (IEA), Ms. Seema Gupta, Director of Operations, Power Grid Corporation of India Limited (PGCIL), Mr. KVS Baba, Chairman and Managing Director, Power System Operation Corporation Limited (POSOCO) and Agustin Delgado, Chief Innovation and Sustainability Officer, Iberdrola, for sharing their inspiring Perspectives.

Claudio Facchin
CEO, Hitachi ABB Power Grids Ltd.
The Covid-19 pandemic has delivered an unprecedented shock to societies and economies around the world. The disease has brought immense human loss and suffering, stretching health systems to breaking point. It has also caused massive disruption to global economic activity, including the energy systems that underpin it.

According to the IEA’s Global Energy Review 2020, this year is set to see the largest fall in global energy demand since the Second World War. The expected six percent annual drop – resulting from dramatic declines in transportation, trade and other economic activities – would be the equivalent of losing the entire energy demand of India.

The staggering impact of the pandemic on the energy world is even more troubling when we look at investment trends. At the start of 2020, global energy investment was on track for growth of around two percent, which would have been the largest annual rise in spending in six years. But after the Covid-19 crisis brought large swathes of the world economy to a standstill in a matter of months, global investment is now expected to plummet by 20 percent, or almost $400 billion, compared with last year, according to the IEA’s World Energy Investment 2020 report. This would be the largest drop in global energy investment in history, with spending expected to plunge in every major sector this year – from fossil fuels to renewables and efficiency.

"By making clean energy an integral part of their plans, governments can deliver jobs and economic growth while also ensuring that their energy systems are more modern, more resilient and less polluting.”
The slowdown in spending on key clean energy technologies also risks undermining the much-needed transition to more resilient and sustainable energy systems.

Global energy-related carbon dioxide emissions (CO2) are on track for a record decline this year, but this is nothing to celebrate. The decline is the result of premature deaths, widespread suffering and a great deal of economic hardship. If we are to achieve a lasting reduction in global emissions, then we will need to see a rapid increase in clean energy investment. The response of policymakers – and the extent to which energy and sustainability concerns are integrated into their recovery strategies – will be critical.

The power sector, a central part of clean energy transitions, is suffering considerably. Global electricity demand is set to decline by five percent in 2020, the largest drop since the Great Depression in the 1930s. The abrupt changes are putting new strains on electricity systems, highlighting the need for investment in new technologies and modern infrastructure. But global investment in the power sector is on course to decrease by 10 percent in 2020.

Electricity grids have been a vital underpinning of the emergency response to the health crisis – and of economic and social activities that have been able to continue under lockdown. These networks have to be resilient and smart to ward against future shocks but also to accommodate rising shares of wind and solar power. Today’s investment trends are clear warning signs for future electricity security.

Boosting the recovery by investing in clean energy

As countries emerge from months of lockdown, the world faces an enormous task getting people back to work and reigniting the engines of economic growth. Around the world, policymakers are drawing up massive economic stimulus packages. Some of these plans will provide short-term boosts, others will shape infrastructure for decades to come.

By making clean energy an integral part of their plans, governments can deliver jobs and economic growth while also ensuring that their energy systems are more modern, more resilient and less polluting. They can also learn from the response to the 2008 global financial crisis. The economic recovery that followed was highly carbon-intensive, resulting in the largest ever increase in emissions.

“As they design once-in-a-generation stimulus plans, policymakers are set to make hugely consequential decisions that are likely to shape our energy future for many years to come.”

Even before this crisis erupted, IEA analysis showed that governments directly and indirectly drive more than 70% of global energy investments. The IEA is committed to supporting governments with reliable data, rigorous analysis and clear policy advice as they make these critical decisions.

IEA data and analysis show that investing in clean energy technologies like energy efficiency and renewables brings benefits on multiple levels. It makes energy systems more modern, more resilient and cleaner, stimulates much needed job creation in the short term, and also enhances future economic competitiveness and productivity.

The current context is an inter-generational opportunity, where smart economic planning can enable us to put the world on track to meet our climate commitments, including the Paris Agreement.

We need to make the key pillars of energy transitions – such as energy efficiency, renewables and battery storage – top priorities for creating jobs, improving critical infrastructure and driving innovation.

#Perspectives
If we are going to unleash trillions of euros for the recovery, let’s spend it right and invest in a clean, competitive, resilient and inclusive economy for the 21st century.

Dr. Fatih Birol, Executive Director, International Energy Agency
Creating a new global leader in power systems

In this Perspective, we hear from the Chairmen of the Boards of Hitachi and ABB, as well as the President & CEO of Hitachi, and the Head of Hitachi’s Energy business.

We learn about why they believe that now is the right time to be creating Hitachi ABB Power Grids Ltd., a new global leader in power systems. And how combining capabilities in power systems and digital technologies, the new business is expected to contribute more value for customers and towards an overall sustainable society.
When I visited ABB Ltd. in 2011, I was inspired by their business philosophy and technologies. Since then, I have devoted myself to deepening the strategic partnership of ABB and Hitachi. Following the establishment of Hitachi ABB HVDC Technologies, Ltd. in 2015, I am very pleased that the partnership will again prosper through the establishment of Hitachi ABB Power Grids Ltd. with the world’s number one technology, and in expanding business globally.

The world is currently facing major challenges such as climate change and urbanization.

Society 5.0 aims for a human-centric society where everyone can live dynamically, and its realization coincides with the achievement of the Sustainable Development Goals (SDGs) advocated by the United Nations. Therefore, the Japanese business community, including the Japan Economic Federation, which I have the privilege to chair, is making an all-out effort to realize it.

“Society 5.0, advocated by the Japanese government, is a society that will satisfy both the resolution of such social issues and economic development by utilizing a variety of data, taking advantage of innovative sciences and technologies.”
An essential component in achieving a sustainable society includes a power system, which is modern, resilient and flexible. Power systems underpin the successful integration of renewable sources of energy that are required to realize the world’s energy transition. I am proud that the world’s top power technologies of ABB’s Power Grids business, in combination with Hitachi’s wealth of achievements in digital technologies, is optimal for globally delivering the required innovations in power grids.

This new company has launched amidst the unexpected challenges of COVID-19. However, the response to the pandemic includes the increased use of digital technology at an accelerated pace all over the world, and electric energy is becoming an increasingly important lifeline. In addition, movement towards a decarbonized society will accelerate rapidly.

“This new company will devote its energy to the realization of ‘Affordable, Reliable and Clean Energy,’ the seventh goal of the SDGs, by meeting such needs with innovations in power grids.”
The launch of Hitachi ABB Power Grids represents an exciting moment, and it comes at a critical juncture for its customers and society as a whole.

The world of energy infrastructure is changing rapidly, with a shifting customer landscape, a growing need for new financing strategies, and increased government involvement. In this context, ABB believes Hitachi is the best owner for Power Grids. As a stable and committed long-term owner, with which ABB has had a strong business partnership since 2014, Hitachi will further strengthen the business, providing it with access to new growth markets and financial offerings. Hitachi will guide Power Grids in the next stage of its development, building on the leading technology and digital innovation that have been the hallmarks of its past ownership under ABB. Both Hitachi and ABB can take pride in a long and rich heritage of groundbreaking power technologies, which have improved the lives of millions of people over the decades.

ABB will initially retain a 19.9 percent equity stake in the joint venture, allowing for a seamless transition and the continued focus on strategic execution. Our joint venture will significantly enhance Power Grids’ offering to customers seeking to adapt in this period of immense change. It will draw on the deep sense of responsibility for customer success that Power Grids has developed over the course of more than a century of technology leadership.

Digitalization opens the door to new opportunities across the entire energy value chain, enabling new business models and creating value on an unprecedented scale. Working with Hitachi will strengthen Power Grids’ ability to leverage these opportunities and pave the way for many more. I particularly admire Hitachi’s focus on social innovation, which has made valuable contributions on many levels.

In Hitachi ABB Power Grids I see almost boundless possibilities for better serving customers, while providing vital support for a more sustainable society and the prosperity of future generations.

“Digitalization opens the door to new opportunities across the entire energy value chain, enabling new business models and creating value on an unprecedented scale.”

Peter Voser,
Chairman of the Board,
ABB Ltd.
In 1910, Namihei Odaira, the founder of Hitachi Ltd., established the company to significantly contribute to the development of Japan, which was still an emerging nation at the time. His determination has been successfully passed down at Hitachi as the corporate mission: “contribute to society through the development of superior, original technology and products.”

Hitachi has been boldly innovating a variety of new technologies and businesses since its founding. It is characterized by the three elements of operational technology (OT), accumulated over more than 100 years; information technology (IT), which Hitachi has been cultivating for more than 60 years; and a variety of products leveraging its characteristics. This means business to achieve a sustainable society using Hitachi’s digital technologies in a wide range of social infrastructures.

For example, in the Copenhagen Metro project, Hitachi provided a railway system that automatically adjusts train operation diagrams according to passenger usage, in addition to providing train cars. As a result, this system has simultaneously improved the convenience of passengers, reduced environmental burdens, and increased profits for the railway operating company.

“In an environment where digital technology is dramatically changing society for the better, Hitachi is focusing on Social Innovation business,”

Toshiaki Higashihara, President & CEO and Director, Hitachi Ltd.
Hitachi aims to improve customers’ social, environmental, and economic values through its Social Innovation Business, and contribute to improving customer’s corporate value and people’s overall quality of life.

Due to the COVID-19 pandemic, the use of digital technology will accelerate in a variety of societal situations going forward. When creating a digital society, it is important to include certain features, such as convenience, peace of mind, and physical and emotional fulfilment.

To bring about this change, referred to as human-centric innovation, the process known as collaborative creation will create new value by sharing issues, visions, and a variety of data with customers and partners. This is a process that Hitachi’s Social Innovation Business emphasizes.

There is also Lumada CPS (Cyber Physical System) which creates new value from a variety of data.

Hitachi’s corporate message, “Hitachi Social Innovation is POWERING GOOD,” expresses Hitachi’s intention to devote its fullest commitment to realizing a sustainable society through its Social Innovation Business along with customers and partners. We look forward to achieving a sustainable society together through the power grids business. Let’s power good together.
With electric energy becoming an increasingly important lifeline, this new company will lead social innovation in power grids through collaborative creation by combining the world’s most advanced power grid systems with Hitachi’s digital technology, leading the achievement of a sustainable society in the aspect of energy.

Toshiaki Higashihara, President & CEO and Director, Hitachi Ltd.
How do you see the involvement of customers and partners within concept development in relation to “co-creation”?

To solve major challenges facing humanity, such as climate change and resource depletion, the perspective of how to enhance social value and environmental value through business in the earth’s ecosystem is important, instead of regarding business as a simple enhancement of economic value. To enhance these three values, collaborative creation through the process of bringing a challenge to its resolution, and the creation of new value together with customers and partners, is the most effective means.

What is the expected role for the new joint venture within the future-oriented platforms for Hitachi? (e.g. energy / digital platforms)

The new company will be able to create optimum solutions to resolve essential challenges by analyzing customer data through the combination of the world’s top products and systems cultivated by ABB and Lumada Cyber Physical System, and other digital technologies innovated by Hitachi. We want to contribute to the achievement of a sustainable society by building stronger, smarter, and greener power grids through the provision of optimum solutions to customers.

Finally, what is your expectation from #Perspectives?

We hope that #Perspectives will become a catalyst for making innovations happen in electric power by introducing the opinions of a number of leading figures who actively participate in the global power industry. I personally look forward to seeing #Perspectives become a place for co-creation.

How do you see the Hitachi culture and the Power Grids culture coming together? (Reference to diversity and inclusion)

Both companies were founded in a copper mine about 100 years’ ago, are proud of their technologies and products, and have grown into world-class companies by actively advancing into wide-ranging businesses. And I feel that the histories and cultures are similar. Since establishing a strategic partnership in 2011, we have already built a deep relationship of trust. We will make it a company that will create innovations in power grids by promoting fusion between the new company and Hitachi.
Achieving better renewable integration today for the power system of tomorrow

As Chief Innovation and Sustainability Officer for Iberdrola, I have the pleasure to be working at one of the world's leading utility companies at a pivotal moment in the energy sector's history: the emerging dominance of renewables in the energy mix.

In 2020, we are not only seeing renewables thrive – as previous technological investments take hold – we are on the cusp of an energy revolution. And this revolution will play a huge role in the delivery of the SGD7: to ensure access to affordable, reliable, sustainable and modern energy for all.

My vision: a world where renewables are the main source of power

To share my vision – in 20 years from now, I believe it is highly likely that renewable-powered electricity, particularly wind, hydro and photovoltaics, will be the predominant source of power in the world. The electrification and digitalization of almost all everyday services will be driving demand and efficiency, and the technologies we are investing in now will have transformed the sector, bringing reliance on fossil fuels down to a minimum. As part of this, I believe costs will have also fallen and become more stable, as the economic advantages of renewables are better realized in this decade, and the next.
This may seem ambitious, but even five years ago the renewables performance of today would have been predicted by very few people – and yet our past investments in technology and digitalization are now making big changes a reality.

Agustín Delgado, Chief Innovation and Sustainability Officer, Iberdrola
Change is required at all levels

But to realize the vision I’ve set out for 2040, the energy sector and governments still need to make some very deliberate choices and investments. And consumer behaviour must change too.

To explain – we firstly need to invest in existing power grids to ensure we maximise the integration of renewables into systems now, and into the future as renewables rise in prominence.

However, while maximizing the capability of existing grids is effective in the short to medium term, soon industry and governments must also embark on a programme of major upgrades to develop the next generation of this infrastructure. In all cases, governments need to recognize the value that good grids bring to society, while utility companies must increase their own-co-operation to create the interconnected and resilient grids we will need in the future.

Electrification of everyday services and digitalization – the driving forces for the integration of renewables

And to really accelerate this important evolution, I believe the electrification of more every day services will be needed – especially in transport and industrial and residential heating – and consumers must be encouraged to take up electric options.

I believe this change in consumer behaviour is achievable, and especially in the digital age. Here, Iberdrola relies on its industry partners to take the charge on introducing new technologies that will switch more domestic services to digital platforms. Smart meters provide a good example of how impactful this can be – already they are enabling better demand response and helping to reduce the cost of energy while increasing quality of supply, thereby helping electricity – generated by renewables – to become the resource of choice.

And while digital may present some challenges, such as cyber security concerns, these can be managed and the benefits of digital make it a more than a worthwhile investment.

“Indeed, digitalization will perhaps be the most important driving force in the greater integration of renewables into existing grids and also in enabling better distribution grid and transmission grid interaction.”
Looking to the future with optimism

I am optimistic about the future. With the right investment in the grid, focus on digitalization and encouragement of behavioural change amongst consumers, renewables will continue to go from strength-to-strength.

Evidently, achieving my vision is a huge challenge, and yet already in 2020, the harsh and tragic realities of the COVID-19 pandemic are spurring ingenuity and innovation in all walks of life. As part of this, the case for putting sustainability and renewables at the heart of the global recovery is gaining ground and we all now have a new perspective on the world’s reliance on oil and coal.

And this will be essential to the fulfilment of that all-important SDG7. With more effective grids and greater digitalization, we will be able to bring more ‘modern energy for all’, based on renewables, to countries experiencing economic hardship. At the same time, industry work to reduce its cost will drive uptake even further and will enable deeper electrification that drives efficient energy use for all people.

Infrastructures and societies across the are world are evidently different, but ultimately the challenge and solutions are shared, and I am personally relishing Iberdrola’s role in getting this right.
Flexibility and resilience: our ‘aces’ in extraordinary times

Jochen Kreusel
Market Innovation Manager at Hitachi ABB Power Grids Ltd.

What a global pandemic teaches us about the future of power systems

In last two decades the global economy has been gripped by the ‘disruptor’ – the nimble start-up that transforms an entire industry. But in 2020 we have all witnessed the arrival of the ultimate disruptor: COVID-19 – a global pandemic that in a few short months has changed every aspect of social, cultural and economic life.

Power grids are no exception. Dramatic changes in human behavior have produced huge fluctuations in demand for energy, prompting surprises for the sector and arguably accelerating steps towards the future of power by five, if not ten years. So, what have we learnt and what will COVID-19 mean for the future of power grids?
Lower demand does not necessarily mean easier operations

The first and obvious consequence of lockdown was a decrease in electricity demand. Fig. 1 shows the situation in selected countries in mid-April 2020, where falls in demand as high as 30% were seen in major economies like France and Italy. A loss of load in the range of 30% may be considered as a relief for the power system, but such fluctuations actually present a major operational challenge.
However, in India the situation was even more extreme. On 5 April, Prime Minister Modi asked the nation to switch off the lights for nine minutes as a sign of solidarity in the crisis. With just 48 hours’ notice, network operators faced a monumental challenge – the moment when a population of approximately 1.3 billion turned the lights back on in one go. Remarkably, and thanks to thorough preparation by the transmission system operators, there was no disruption to supply caused by the sharp ramp down and ramp up (from 117 GW to 85.30 GW) within a span of four minutes. And again: managing the extraordinary situation was possible, but only because there was still enough time for humans to take manual actions.

No technical limitations to further growth of renewables

An important realization for network operators that has been brought about by this crisis, is that in the future, it will be possible to operate power systems with even higher shares of renewable energies than today, and in a stable and secure manner. We have seen this in some of the countries most affected by the virus, who are also pioneers in solar and wind power. Lower demand in combination with continuously increasing capacity of renewable power resulted, for instance, in Germany, in a share of variable renewables of nearly 55% during the first quarter of 2020 [1]. In the third week of May 2020 the average share has risen above 69%, comparing to just 50% one year before (fig. 2). In fig. 3 we see the peak share of variable renewable generation in the load in several European countries – across all the proportion of renewable energy is notably higher on the year. Obviously, systems could be operated stable at these high shares of renewables, but experts should now analyze in detail, what they can learn from this unexpected experience, which opens in fact a window into a future about five to ten years ahead.

“The fact that power systems did continue to operate was thanks to a lot of interventions by the operators and shows us two things: systems could be stabilized in extraordinary situations, but at the price of many manual interventions.”
Fig. 2: Share of renewable energy in week 20 of 2019 and 2020 in Germany (daily energy) [2]

Fig. 3: Maximum percentage of renewable generation in current load (full year 2019, 2020 until May) (analysis by Hitachi ABB Power Grids Ltd. based on data from the ENTSO-E transparency platform, https://transparency.entsoe.eu/)

#Perspectives
International cooperation will need to back-up power

If the crisis has shown us anything it is the vulnerability of a globalized economy, reliant on global supply chains, power systems are not yet that global and during the crisis, electrons have continued to flow even as governments have closed borders. However, in the future we know that power systems with high shares of both distributed and highly concentrated renewable energies will depend even more on international cooperation than today. At that time, a COVID-19 style crisis could severely disrupt a region’s electricity supply.

COVID-19 the ultimate lesson: flexibility and resilience hold the key to the future

If we look at the learnings of recent weeks and months, it is clear that the power systems industry will need to embed two key assets into the future development of the grid: flexibility and resilience.

In terms of flexibility, COVID-19 has shown that traditional security concepts like fencing control centers struggled under the circumstances of the pandemic. Flexibility to enable operators to work from other locations, either at other network operators, at software vendors or even distributed at home may help and should be considered. Of course, this will require careful planning, particularly with regards to cyber security, but this will no doubt prove to be a worthwhile investment.

As seen in India on the 5 April, essential measures to shore up the grid had to be put in place manually, but in the future technology should help more in such situations.

The need for our second asset, resilience, is best derived from the vulnerability of global supply chains observed during the Corona crisis. Of course, energy systems are also based on global supply chains, but in contrast to other industries, national policies are used to mitigate the risk of interruption of supply by local reserves. Countries stored gas, oil or coal for weeks or even months, and conversion of these energy carriers to electricity used to be local. But with the increasing dependency on geographically concentrated renewable energy this concept needs to be reviewed. Future power systems will be more interconnected, and they will be operated closer to their limits – and by that be more vulnerable. And as there is no way to store wind, solar irradiation or also electricity in larger quantities, new concepts are required.
“**Flexibility should allow us to respond faster to unexpected situations. Autonomous grids should offer up solutions automatically and at least provide decision making support.**”

Resilience, i.e. the ability to ride through critical situations instead of focusing on avoiding them, therefore will become more important. This applies particularly wherever systems are becoming more complex and potentially vulnerable by more interconnection. In the future, more digitalized systems will be more dependent on communication infrastructures. Resilience in this case would mean, that they can still provide a base functionality in case these infrastructures are not available.

Maybe even more important, as indicated in fig. 4, power systems should be able to fall back in a mode using locally available sources in case the transmission grid is not available. Even if local generation capacity is insufficient to cover local load completely, supplying critical infrastructures, such as water supply, hospitals or telecommunication networks, would be essential as the minimum.

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**Fig. 4:** Increasing resilience by ability to fall back in local supply (source: Hitachi ABB Power Grids Ltd.)
Summarizing, if COVID-19 has taught us anything, it is that we have remarkable power systems across the world, led by talented people, that have been able to withstand the most extraordinary of circumstances.

These properties will be the ‘aces’ up our sleeves in ensuring affordable, reliable and sustainable energy – but we need to act now to make them happen. It’s a challenge I look forward to.

“But in the future, a more renewables-based system built on international co-operation will require even more flexibility and more resilience.”
Powering India: with a grid that is fit for the future

Following a period of impressive and continuing growth, the Indian power system has taken its place as one of the largest in the world. The nation has made huge strides forward to increase access to electricity, introducing ambitious and inspiring reforms to improve affordability, security and sustainability (e.g. growth in solar). What perhaps is even more impressive is that India has built one synchronized national grid to serve the entire nation.

An unexpected event: #9pm9min lights-out

The Prime Minister of India made a passionate appeal to all 1.3 billion citizens to switch off their electric lights and light candles for nine minutes at 9 PM on 5th April 2020. The event was a symbolic gesture to show the nation’s resolve and commitment towards fighting the pandemic with light and hope. However, it meant that India’s power grid operators faced a huge challenge – with less than 48 hours to prepare, how would the grids withstand the variation in power demand? In line with Prime Minister’s call, the ‘#9pm9min’ event received an overwhelming pan-India response.

“It was also truly unique, due to the rapid load drop followed by a sudden, steep load rise as people switched off and then switched on their lights.”
Indicating huge fall of power consumption happened during lights-off event and how preparation, proactive measures and technology helped in containing the frequency within the permissible range. Thereby preventing any contingency condition.
During the “#9pm9min” event, India’s power system witnessed in a few minutes 31,000 MW of demand ramp down and then up. This is unprecedented in the history of any power system in the world. The variation in demand recorded during the event was of the order of 4000 MW per minute – nearly 20 times the normal load changes encountered on a daily basis.
Q&A

Perspectives from India’s grid operators

We invited leaders from India’s grid operators, Seema Gupta, Director (Operations) at Power Grid Corporation of India Limited (PGCIL) – owners of over half of India’s transmission network, and KVS Baba, Chairman and Managing Director (CMD) of Power System Operation Corporation Limited (POSOCO) – responsible for the real-time operations of the grid – to share their perspectives. In separate interviews, they opened up on building the national grid, the power of technology, and how they managed to keep the grid stable during the extraordinary event.

Seema Gupta (S.G.),
Director (Operations)
Power Grid Corporation of India Limited (PGCIL)

KVS Baba,
Chairman and Managing Director (CMD) of Power System Operation Corporation Limited (POSOCO)
Q. Both PGCIL and POSOCO played key roles in achieving India’s mission of ‘One Nation’ – ‘One Grid’ – ‘One Frequency’ successfully. How big is the grid operation and what are the challenges you face?

**S.G.**

“The Indian Power Grid is one of the largest synchronous transmission grids in the world”

Of this, 163,000 circuit kms of transmission line – enough to encircle the Earth’s diameter at the Equator thirteen times - 248 substations, and a transformation capacity of about 4,120,000 MVA, has been established by POWERGRID. POWERGRID’s role has been to plan, execute, own and maintain high voltage transmission links across India.

This is very different to what the grid looked like two to three decades ago, where it was five regional grids connected by back-to-back High Voltage DC links with limited power exchange. Inter-regional High Voltage AC links were established to synchronously inter-connect the regional grids progressively with the final region – the Southern Region – added on 31st December 2013, thereby achieving the mission of ‘One Nation’ – ‘One Grid’ – ‘One Frequency’. By synchronising all regional grids, India as a whole, is now better placed to benefit from optimization of highly distributed resources.

Connecting such a geographically dispersed country comes with its own challenges, such as efficiently transmitting power from resource-rich regions to load-centric regions. The establishment of 765kV EHVAC and 800 kV HVDC links – allowing for more energy supply across the Grid – has helped to meet this challenge and in future, we will look to employ higher voltage transmission links to meet growing power transmission requirements. In addition, POWERGRID has invested in Voltage Sourced Convertor (VSC) based HVDC technology; the first such link is expected to be commissioned by 2021.

**KVS Baba**

At POSOCO, we have the responsibility of operating India’s power grid, managing the inter-state transmission of power to utilities across India, plus operating India’s electricity market through coordinating thousands of entities to balance demand and generate energy at any moment of the day. The Indian power grid has over 370 GW of generation capacity with highest demand reaching around 182 GW.

Technology has been a key enabler of reliable operation of the national grid. The visualization and situational awareness introduced by the state-of-the-art SCADA/EMS at regional and national load despatch centres, have allowed operators to understand real-time conditions, see early evidence of emerging grid problems, and better diagnose, implement and evaluate remedial actions to protect system reliability.
Q. India has tremendous potential in renewable energy, especially wind and solar. How do you see POWERGRID integrating them into the grid, further improving the environmental aspects as well as grid resilience at the same time?

S.G.
In the past ten years, the share of renewable energy (RE) in our generation profile has increased three-fold, growing from 7% in 2008 to about 21% in 2019.

To integrate more renewable energy into the transmission grid, POWERGRID has created Green Energy Corridors to transmit renewable power, and 11 Renewable Energy Management Centres have also been set up across India for forecasting of renewable power. Furthermore, a network of Flexible AC Transmission Systems (FACTS) devices in the form of STATCOMs and SVCs has been set up at various nodes to prevent and reduce reactive power deviation in the network.

“It is expected that by 2022, about 175 GW of RE capacity shall be installed and India shall stand as the third largest producer of renewable energy, behind China and the US.”
Q. As India realizes its renewable potential, what challenges is POSOCO facing to accommodate increasing renewable energy integration?

KVS Baba

Wind and solar energy generation has indeed increased steadily over recent years. Take last year (2019) for instance: annual wind generation grew by around 5% to 65 TWh while the annual solar generation increased by 28% to 50 TWh. Combined, wind and solar energy penetration is expected to rise to 35% by 2030 – which can cause challenges for grid operators. Large-scale penetration of renewable generation increases uncertainty and volatility, creating hazards such as potential grid instabilities resulting from diminishing inertia, as well as loss of visibility and control of the behind-the-meter resources. Additionally, day-to-day forecasting and scheduling of over 7.5 GW of renewables at inter-state level by Regional Load Despatch Centers (RLDCs) has been challenging. To overcome the numerous issues that we’re faced with – alongside other measures – we have harnessed the transmission flexibility provided by HVDCs to better integrate renewable energy into the grid.

Eleven Renewable Energy Management Centres (REMCs) co-located with the State Load Despatch Centres (SLDCs) in Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat & Rajasthan; and in RLDCs at Bengaluru, Mumbai and New Delhi; and at the NLDC, Delhi, were commissioned in February 2020. Presently, 55 GW of renewable (Solar and Wind) is being monitored through the eleven REMCs. REMCs serve as dedicated RE management systems to facilitate safe & secure grid operation in the area of responsibility. REMCs are equipped with Forecasting and Scheduling Tool & Real Time Monitoring of RE generation which enables safe, secure and optimal operations of the overall grid.

Q. Having established the one-nation grid plus connectivity with neighbouring country grids, how do you see India becoming a key player in establishing a transnational regional grid?

S.G.

In recent years, India has created several transnational links with about 5 GW cross-border power transfer capacity with Bangladesh, Bhutan and Nepal, and more are planned for the future. Interconnection makes sense as well: due to time differences within regions, countries experiencing hours of peak demand can be supported by the countries having off peak hours. It would lead to greater utilization of resources and provide greater energy security.

For instance, considering India’s position in the middle of South East Asia and Central Asia, the country’s power grid can act as a regional bridge between the two regions, helping to form a Trans-Asian Grid. However, to leverage such an opportunity, the geopolitical challenges will have to be managed with a collaborative approach.
Q. How do you see digital technologies and asset management helping operational elements such as real-time power flow, control, and protection?

KVS Baba

New products and services such as Real-Time Markets introduced since 1st June 2020 and the National Open Access Registry under progress, have both been made possible as a result of the data intensive Indian electricity market. On 1st April 2019, the pilot for Security Constrained Economic Despatch, was implemented by POSOCO. Robust, resilient, self-healing solution engines developed in-house run every 15 minutes. These determine the optimal schedule for over 60 Nos. of Inter-State Generation Station having 60 GW capacity without any human intervention in the entire process, enabling significant reduction in the overall generation cost.

Q. On a similar note, what does POWERGRID see as the key steps to end-to-end digitalization connecting with the system operation in real-time?

S.G.

POWERGRID has established a National Transmission Asset Management Centre at Manesar as a centralised remote operation centre. Among the key technologies integrated through the NTAMC project are the Remote Accessibility of Substation Protection Systems, Automatic Fault Analysis System for real-time fault data analysis and the Video Monitoring System for substation monitoring.

In terms of the Digital Grid, POWERGRID has implemented the latest “Process bus” based automation, paving the way for Digital Substations and end-to-end digitalization. Further, application of digital technologies like artificial intelligence, machine learning and digital twins would help to ease critical operation of the grid evolving with autonomous operation.

“Greater access to digital services has led primarily to a greater use of data points, which we’re able to harness to ensure excellence for our core functions – real-time operations, market monitoring, and planning and forecasting.”
Q. The ultimate goal is power 24/7, even in the most remote regions. What type of collaboration, technologies and operation management do you foresee POSOCO implementing to achieving this target?

KVS Baba
Achieving around-the-clock power to all areas demands a wholly joined-up approach. This starts with the Forum of Load Despatchers, a coordination forum for State, Regional and National Dispatch Centres, where best practice can be shared and aspects such as the proper implementation of grid codes and standards from all levels can be discussed. Operationally, every level would need to pass its demand forecast to the next higher level which would use the data provided to prepare its own demand forecast. With this in mind, implementing Phasor Measurement Units from the distribution level would help in making real-time assessments at all levels.

Q. How do you hope to achieve 24/7 power everywhere when considering the challenges posed by diverse trends such as renewable energies, electric vehicles and data centres?

S.G.
We see overcoming the unpredictable nature of new energy trends as a three-step approach: better adoption of technology, utilizing advanced forecasting tools, and leveraging the potential of Battery-based Energy Storage Systems (BESS) and decentralization from one unified grid to several microgrids. These microgrids can be individual in nature, yet by clustering them together, a single dynamic grid can evolve. Creation of these microgrids would help remote areas to meet their power demands locally. Thus, the grid would move from centralization to decentralization mode, while operating as “One Grid”.

#Perspectives
Q. How have you taken to protecting your assets through cyber security?

KVS Baba
Protection of mission-critical functions and their data requires unique cyber-physical security skills and advanced tools such as big data analytics to detect and mitigate an attack early in the attacker’s kill chain. Effective responses to cyber threats rely on intelligent devices and a strong communication network to provide the necessary data in a timely manner.

“In the future, cloud-based services to augment the capabilities of an integrated security operations centre may be needed.”

Certainly, moving forward, I see cyber-security certification becoming even more important when assessing vendors to work with.

S.G.
“We have implemented a collaborative, “People First” approach to cyber-security, engaging with multiple stakeholders to create the best outcome for all involved in the Grid.”

We are already certified with ISO 27001. For technical vulnerabilities, we have engaged with Computer Emergency Response Teams (CERTs) and experts in the area for necessary corrective measures, as well as working with associated government agencies to meet regulatory requirements. Simultaneously, we also work in tandem with Original Equipment Manufacturers (OEMs) to take joint responsibility for the security of the grid, encouraging and empowering our partners to continuously improve their internal processes and strengthen cyber-security awareness.
Q. Finally, congratulations for smoothly managing the ‘lights off’ (nine-minute) Covid-19 vigil. In addition to the coordinated planning, what grid features and technology supported you for this moment?

S.G.
Lights-off, as well as being a very important event, marked a time where we all came together in the face of this pandemic. To prepare for this unique event, mock drills were carried out one day in advance to ensure a swift response to any contingencies. Off the back of ‘lights-off’, we now feel more confident to tackle unplanned situations of the same nature. Integration of FACTS devices (SVCs and STATCOMs), Wide Area Management Systems (WAMS) and Phasor Measurement Units (PMUs) across the nation has massively increased our confidence in how resilient the Indian grid is to handle critical load changes.

KVS Baba
First of all, thank you for the kind words; I was very pleased and proud the event passed without any instability in the grid. It was really a combination of a number of elements.

It is pertinent to mention that flexible hydro generators provided about 70% of the ramping requirement during the event. The event was successfully managed by all power sector stakeholders with a high level of meticulous planning, preparations and close coordination. The flexibility in generation resources such as hydro, gas, coal and on transmission front including HVDCs and STATCOMs were harnessed to maximum extent.
Looking forward to the future...

According to Brookings India and Bloomberg New Energy Finance, India’s demand for electricity is expected to near triple by 2040, meaning that investment in infrastructure must continue on its determined and dynamic pathway. Furthermore, the nation is continuing to strive for ambitious growth targets in renewables as a share of the overall energy mix. And what’s especially impressive, is how India has been growing and improving simultaneously – and critically, without sacrificing reliability.

The “#9pm9min” event went smoothly – a solid testimony to how India is successfully incorporating state-of-the-art technology and ensuring that its investments are fit for the future – by anticipating the needs of tomorrow. On a global level, this proven and sustainable approach will enable India to play a central role within the interconnected regional grid developments.

Accelerating digitalization: realizing our sustainable energy future

Dave Goddard, Head of Digital, Hitachi ABB Power Grids Ltd.

In this #Perspective we explore how the power industry, enabled by digitalization, is unlocking social, economic and environmental value that underpins our sustainable energy future.

Delivering affordable, reliable, sustainable and modern electricity to all means driving for efficiency whilst consuming less of the world’s resources. This is an important social, economic and environmental objective at the heart of the strategies of the most responsible governments and companies today. In response to the major global trends shaping our planet and society – from climate change action to mass urbanization – the way we produce and consume energy is undergoing a phenomenal transformation.

Decarbonizing our energy system means delivering changes across the value chain. We are witnessing huge shifts to zero-carbon power generation and electrification, along with new patterns of energy consumption. In addition, the surge in e-mobility and development of smarter buildings and cities.

The global share of renewables has grown exponentially, and the International Energy Agency recently forecasted 167 GW of renewable capacity will become operational in 2020 – doubling that added ten years ago¹. Most of the grid’s large-scale renewable power plants are still connected at the transmission level. Nevertheless, the need for greater resiliency, a combination of price/performance improvements in technologies (such as solar photovoltaics and battery energy storage) along with favourable government policies and regulations, is driving the decentralization of our energy system.

Sources: ¹ Renewable Energy Market Update Report (May 2020), IEA
The continued decarbonization and decentralization will require tighter integration of transmission and distribution networks, and higher coordination of generation and consumption to achieve the goal of sustainable energy. Digitalization will be one of the most important enablers and will span across the whole value chain, from real time control, to operation and maintenance, to energy markets and customer engagement.

Massimo Danieli, Managing Director of Hitachi ABB Power Grids, Grid Automation Business Unit.
Transforming how we power the world

Digitalization is fundamentally about the journey towards more autonomy. Leveraging widely-deployed sensing, vast amounts of data and advanced analytics, the digitalization of the grid will drive improved reliability; by highlighting events that may lead to failure; predicting when critical assets will fail; and swiftly guiding the right people to the right place, and equipped with the right information to resolve them. It will allow us to simulate what will occur during events with greater levels of accuracy, informed by big data and analytics. The sharper insights and flexible control enabled through digitalization will allow for new business models, for example the development of transactive energy markets or peer-to-peer energy trading.

“Creating incremental value through the transformation of an end-to-end business process, optimizing or automating as the situation requires to ultimately change the way you interact with your customers.”
Digitalization – enabling greater autonomy to unlock more value

As the industry digitalizes more and more, together, we can cautiously move along the path towards greater autonomy. And by digitalizing across the whole value chain, everyone can better optimize the way of working, planning, building, operating and maintaining the businesses of tomorrow. The better this is implemented, the greater the economic and environmental value achieved.

As a consequence of the accelerated drive for decarbonization, decentralization and digitalization, the rate of change in energy and asset-intensive industries is exponential compared to past decades. However, with change comes the challenges of increased complexity and potentially decreased stability.
Adapting to the ‘New Norm’ and seizing the opportunity

As society adapts to the ‘New Norm’ and businesses adapt to a pandemic-shaped world and the looming global recession, we have witnessed an accelerated drive for innovation.

“Standing still is no longer an option and innovative solutions are needed to flexibly adapt and compete in an ever-changing world”

Just one small example, taken from Hitachi ABB Power Grids Ltd. own experiences, relates to remotely enabling the installation and commissioning of Live Tank Breakers for a substation in Russia from 3,500 kilometres away. By evolving the way we work, combined with leveraging advanced digital technologies, it’s possible to optimize how we do things – increasing efficiency and sustainability, whilst delivering customer value.

According to the IDC’s FutureScape Predictions Report: Worldwide IT/OT Convergence 2020 Predictions, ‘By 2022, a 10% improvement in asset utilization will be enabled by a 50% increase in new industrial assets having some form of artificial intelligence (AI) deployed on edge devices.’

Sources: 2. IDC FutureScape: Worldwide IT/OT Convergence 2020 Predictions, IDC
Fuelling efficiency through the Industrial Internet of Things (IIoT)

Industrial IoT is increasingly being used to remotely implement safety and security strategies, improve collaboration across teams, and manage important infrastructure assets and equipment. The introduction of IIoT will help reduce costs, maximise the value and lifetime of assets and perhaps most importantly, drive improved end customer value and engagement.

With a philosophy to ‘design-in’ cybersecurity from the ground-up in products, tools and processes and the adoption of standards-based cybersecurity technology, it is possible to reduce and manage the risk to acceptable levels. As an example, for customers using fiber optic networks for mission critical communications, the most advanced multiplexers now feature encryption with quantum technology – using true random number generation – providing extra security to repel access to unauthorized actors.

“Whilst concerns around cybersecurity have historically slowed adoption, there is a growing need to overcome the barriers.”
The ‘digital divide’ and sustainable competitive advantage

There is an emerging ‘digital divide’ in the energy sector.

Across the world, we are seeing the power industry players, who are investing in digitalization today, are leveraging a clear and sustainable competitive advantage derived from increased flexibility and cost efficiency.

While most industry players have begun their digital transformation journey, they are in very different places along the adoption curve. However, one thing is consistent – the successful companies that manage to leverage data, also generally improve the speed and agility of their decision making.
The measure of intelligence is the ability to change.

Albert Einstein (1879 – 1955)
One shared challenge commonly facing the industry is that even with significant amounts of data, it often remains siloed across many different systems and data structures. The answer is again digitalization combined with change management – the latter being a separate topic. Today’s most advanced software applications offer complete flexibility in the way that data is accessed. Instead of extensive efforts to integrate systems, the data remains in place and a very agile data fabric utilizing ‘reusable connectors’ facilitates more flexible access to the data. Enabling simplified access to the underlying systems and a modern modular architecture with a microservices based design, brings information to the fore from various underlying systems and through a single ‘pane of glass’ with a role or use-case driven interface.

It also opens up new opportunities, enabling faster innovation and breakthroughs in efficiency via process optimization. And by codifying and automating indispensable institutional knowledge, digitalization can help strengthen business continuity.

“Digitalization is enabling connectivity and visibility across previously siloed departments, allowing employees to take timely action, with the right information at their fingertips, thus making organizations more agile.”
Now is the time to accelerate the digitalization of energy

Accelerating and deepening the digitalization of our whole energy system will contribute towards greater social, economic, environmental value – that underpins our sustainable energy future.

At Hitachi ABB Power Grids Ltd., we are committed to driving customer value through digital transformation, co-creating pioneering technologies, which help to increase efficiency, productivity, agility, autonomy, safety and security.

It is well understood that true insights in the performance of power systems come from a combination of Digital and Energy engineering expertise. The convergence of IT and OT has never been more important – now is the time for action.
As Hitachi ABB Power Grids Ltd. embarks on its first chapter in these extraordinary and dynamic times, it aspires to nurture a forward-looking, diverse and inclusive culture. Fuelled by a compelling Purpose relating to ‘Powering good for sustainable energy’, the company aims to empower and energize its 40,000 experts across 90+ countries to give their best – and attract new talents to join in its mission.

With a long and rich engineering heritage (almost 2.5 centuries combined), the business, which has its roots in two iconic companies, Hitachi and ABB, is proud of its track record of pioneering new technologies. Going forward, it recognizes that to compete successfully, its Technology Mission of anticipating the future and a culture of continuous innovation, must also come with an open mindset: that the best ideas can come from anyone, anywhere and are even better when co-created together.

Now more than ever – as the new company seeks to leverage the power of digital and energy – it is driving hard to engage young talents. Born between the mid 1990s – early 2010s, Generation Z, who have grown up with climate activism in the headlines and who are instinctive digital natives, will play a greater role in pushing us forward into a sustainable future.

The Challenge: How can a company such as Hitachi ABB Power Grids Ltd. engage and attract ‘Generation Z’s’ to join in its cause and harness their fresh ideas needed to bring sustainable energy to the world?

Committed to the shared goal of engaging the future workforce, Mr. Hidenobu Nakahata (Senior Vice President and Executive Officer and Chief Human Resource Officer, Hitachi Ltd.) and Mr. Achim Braun (Head of Human Resources, Hitachi ABB Power Grids Ltd.) invited a group of young, aspiring talents from across the new company (India, China, Columbia, Germany, Sweden and Switzerland) to pose their questions as part of an online interactive session.

Enthusiastic, erudite and full of curiosity, the young talents showed excitement for the future of the new joint venture and the opportunities that it represents. You can read their questions and the answers given by both HR leaders below, which shine a light on the company’s approach.
Our generation (Generation Z) is described as both multicultural and individual. How do you see these aspects in the culture of Hitachi ABB Power Grids Ltd.? (Anna, Germany)

Hidenobu Nakahata, Senior Vice President and Executive Officer and Chief Human Resource Officer, Hitachi Ltd.

“I believe in the power of effective communication. Each person, group and generation will tend to have its own culture, own way of seeing and doing things.”

This is just the way things are, it is a natural part of life, and we can either focus on the differences or find strength in them by understanding each other. There are ways that these differences can complement each other – as long as everyone is willing to understand and learn from each other.

This year, Hitachi has launched a new set of competencies, which will guide our employees’ behavior. One of the competencies I particularly like is ‘Contribution’, which is defined as “speak up and listen respectfully to others.” I believe that as long as we are willing to share our thoughts openly and listen to others, we can understand and work well together. So, let us leverage our differences and find new value by collaborating with each other.

Today, we have a strong brand and heritage (originating from ABB Power Grids and Hitachi). How will we stay visibly present, using the right channels (e.g. social media), to attract new talent? (Daniel, Columbia)

Achim Braun, Head of Human Resources, Hitachi ABB Power Grids Ltd.

Yes, both Hitachi and ABB Power Grids have strong brands with a lot of integrity and a long history as technology and innovation leaders. We will carry this forward into our new company.

Whilst we have always attracted talent with a strong technical background, today’s Generation Z’s, who are starting out in their careers, do not want just a job working for a technology leader, they want a company with a strong purpose to do good in the world. This is a top priority for them and for us.

So to appeal to young talents (who may also be considering careers with dynamic tech. start-ups), requires us to adapt and focus our message far more on ‘impact’. It’s essential that we can clearly articulate our sustainability values, which we hope will have a greater appeal. In addition, to increase visibility, we are exploring new ways to leverage social media channels (e.g. Instagram) to connect with talent. Our goal is to create a meaningful, personal and informal dialogue, using engagement techniques such as gamification to excite and inspire. We know that many young people are also interested to talk to colleagues already doing the job and we hope to increase such opportunities.

By communicating more about our Purpose and through techniques such as storytelling (e.g. ‘My Power Grids Stories’), we can spotlight how our people get to make a real contribution. Together, with a more social approach we aim to attract a continued high level of talent from across the globe.
Today’s Generation Z do not want just a job working for a technology leader, they want a company with a strong purpose to do good in the world. This is a top priority for them and for us.

Achim Braun,
Head of Human Resources,
Hitachi ABB Power Grids Ltd.
How will we encourage even more creativity in the workplace? (Anton, Sweden)

Hidenobu Nakahata

“Having creativity and a strong innovation mindset, which emphasizes the “I will” spirit is one of the aims of the company.”

We realize this kind of initiative from employees should be encouraged and nurtured. To support innovation, in 2015, we launched our annual ‘Make a Difference’ project, a global ideas contest where anyone can submit their ideas freely, and all ideas are screened and judged equally. Winning ideas are then developed and supported for the possibility of commercialization.

Since Make a Difference started, we have received more than 3,800 ideas and have discussed a lot of possibilities with employees of diverse backgrounds, ages, and ethnicities. The most recent event was the “Challenge to COVID-19,” where we collected ideas focused on initiatives to overcome the global crisis. We collected around 1,400 ideas in just a few weeks, and we are currently considering the implementation of several.

Also, we are working with four teams in realizing and commercializing the ideas that were selected last year in the Make a Difference contest. Among those four teams, two consist of members from Generation Z that had just joined Hitachi. Our executives were very impressed by their passion and contributions. I believe that this initiative can and will be an important path to welcome and nurture creativity from all our employees.

What changes can we expect to see in our everyday working style and in our culture? (Anushka, India)

Achim Braun

“Our leadership team is firmly committed to ‘Diversity + Collaboration = Innovation’, which will create an environment that drives sustainable business success.”

Great question. Both ABB Power Grids and Hitachi have strong cultures and there will be considerable influences from both. In our new company, we are set on building a modern culture where individual differences are embraced and imperative to shape the future of sustainable energy.

What will endure will be our passion for technology and innovation, and our focus on people and our collaborative environment. We are putting a great emphasis on Diversity, which is at the heart of our new company. To drive this forward, we have kicked off our ‘Diversity 360’ initiative. This is all about championing an inclusive culture built on the commitment of equality for all – regardless of age, education, gender, religion, sexual orientation, ethnicity or background.

We are building Diversity 360 into everything we do to create a brilliant employee experience and we are focusing on four key areas:

Firstly, we are co-creating a new leadership model, which involves embedding our diversity and inclusion strategy into our leadership behaviours and decision making. This covers important topics such as interrupting unconscious bias.
We are also advancing our Female Acceleration Program to deliver clear targets defined at several levels, including key topics such as equal pay and how to increase gender diversity from 18% to 25% by 2025. Whilst this is not our final destination, it is a first conscious and humble step in building momentum for change.

Another key deliverable is our Hitachi/ABB Power Grids Talent Acceleration Program, which creates opportunities to progress extraordinary talents across the organization. And finally, our Attracting & Retaining Talent area includes our graduate talent programs.

By connecting these areas with our refreshed employee value proposition, which aligns everything with our Purpose and values, will help us to engage top talents across the world who want to contribute to Social Innovation.

How can we prompt more chances for young talents to learn, experience and make connections globally? (JiangKe, China)

Achim Braun

I’m glad this came up, as we are committed to providing growth opportunities for innovative young talent and open up even more doors for career development across divisions and regions. One key action we have initiated is our Hitachi/ABB-Power Grids Talent Exchange. These events involve employees from Hitachi and Hitachi ABB Power Grids Ltd. meeting up (both virtually and physically – when able) for cross-cultural and cross-teams networking and idea-sharing sessions. The goal is to establish an interactive exchange that will boost and enrich our internal talent networks and collaborations as well as our external partnerships.
What opportunities will be available for employees to develop their careers across Hitachi and Hitachi ABB Power Grids Ltd.? (Vanessa, Switzerland)

Achim Braun

I really see this new company as a rare and unique opportunity for young talents to grow and thrive.

“Joining a dynamic global organization that is involved in some of the most innovative projects in the world can give them a wide perspective on the business from many angles.”

We will actively promote career development, enabling talents to leverage all of the opportunities that will be available across teams and regions.

What is important for young people to know is that we are focused on recruiting those who are not only talented – but also driven. We have found that motivated people are more likely to tackle big problems and find holistic solutions – and they tend to create their own opportunities. To further develop talent, there will be an openness to seeing how our teams can benefit each other and how we can collaborate to enable sustainable energy and make the world better.

How will Hitachi and ABB collaborate in the future? How do we plan to engage in one another’s work (across the whole portfolio and scope) and create global opportunities for employees? (Anton, Sweden)

Hidenobu Nakahata

In November, 2019, the first Hitachi/ABB-Power Grids Talent Exchange discussion session was held between emerging talents from our two companies. It was a great opportunity for these high-potential talents to get to know each other and exchange their experiences and viewpoints on leadership. It was also a good way for them to get to know each company’s history and values.

On June 4th, a follow up session was held, this time virtually. Living in the “new normal,” we can adapt new practices to get to know each other and explore new methods of collaborating. Going forward, based on this model we have used so far, we can consider how to expand it further and maximize its output.
For the development of emerging technologies, a fresh approach could be regarded as being as valuable as experience. How can different skills or generations benefit from each other? (Anna, Germany)

Hidenobu Nakahata

“Hearing diverse ideas is key to developing new value”

It is also important for us to know our employees, their skills, experiences, and aspirations, and so Hitachi has launched ‘HiNext’, a human resource information system powered by Workday. There are now more than 130,000 employees who are using HiNext. By the end of FY 2020, we are projecting over 180,000 users.

To take full advantage of the diversity and individuality of each employee, this is a common HR platform which enables all employees to show their talent information, such as career history, expertise and aspirations. This will allow stakeholders to find suitable in-house talent for new roles. Aside from having a database of employees’ information, HiNext also houses Hitachi’s talent management system including performance management, talent reviews and succession planning. In this regard, HiNext is an enabler for talent visualization, and allows employees to showcase their skills and goals. Having this information is a powerful way to explore possibilities from a business and career point of view.

There are two more things that are important to emphasize. The mindset to understand and collaborate with each other is key for us to move forward. And also, equally important is having the infrastructure to know and understand our ideas, thoughts, skills and aspirations.

In closing, I would like to thank everyone in the Youth Panel forum who has shared their thoughts, insights and questions. I think this is the beginning of a good and open way of understanding each other. Let us all work together and look forward to a bright future.
With thanks to Hitachi ABB Power Grids Youth Panel — Generation Z Talents:

**Anna Vollweiter**  
Student working in the Market Innovation team (based in Germany).  
(© Carina Kircher)

**Anton Ter Vehn**  
R&D HW Project Manager for Bay Level Products, Grid Automation Business Unit (based in Sweden).

**Anushka H**  
Marketing Engineer, High Voltage Products Business Unit (based in India).

**Daniel Cardona**  
Material Planner, Transformers Business Unit (based in Columbia).

**JiangKe Huang**  
Associate Project Manager, Transformers Business Unit (based in China).

**Vanessa Schröder**  
Project Manager, Substation Automation Systems, Grid Automation Business Unit (based in Switzerland).
A final thought...

I hope that you enjoyed this first edition of #Perspectives, which is as fresh as our new company!

Big thanks to all our contributors, including customers and partners, as well our own executives, colleagues and Generation Z talents, for sharing their bold views and insights.

You could say that the making of this edition was the epitome of today’s extraordinary times – characterized by remote working (not one author sat in the same room) and exemplifying the pioneering spirit of co-creation and collaboration – all enabled by digitalization.

#Perspectives has hopefully spiked your interest and if it has initiated future-oriented discussions, also controversial, then it has achieved its humble target.

Through this publication, we aim to trigger the exchange of ideas around key energy and digital topics, generated from a variety of different perspectives and viewpoints around the world – across our industries and towards all its interfaces.

As a common thread throughout #Perspectives, we are keen to bolster the connection between technological innovation and societal impact, which is why we are anchoring the dialogue around the UN’s Sustainable Development Goals (SDGs) – with a major focus on SDG 7.

The next edition of #Perspectives will also adopt the additional theme of SDG 11 ‘Sustainable Cities and Communities’ and will spotlight emerging possibilities across the global energy & digital space.

Your feedback and ideas for future #Perspectives are highly appreciated. Only by means of lively and fruitful exchange of different perspectives and a mindset of ‘co-creation’ resulting in idea implementation, can we create social, environmental and economic value for business and society.

Please keep an eye out for the next edition in around six months time. Between now and then we will be sharing a constant flow of thoughts via Hitachi ABB Power Grids Ltd. online channels.

Gerhard Salge
Technology Editor, #Perspectives