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Industry: Compounded
Disruption

Petronas Sets Net Zero
Carbon Emissions
Target by 2050

Strategic
Cooperation for
Safer
Photovoltaic
Systems

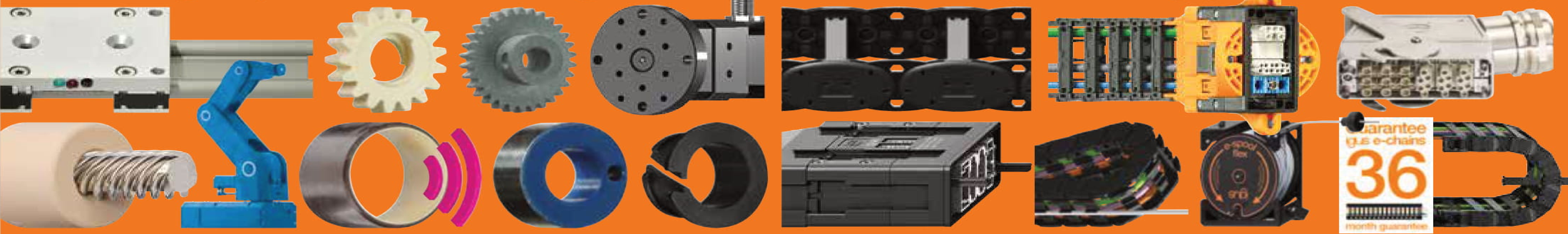


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Happy Diwali!

from our Home - Office to yours

2020 is a year that humanity record another history in mankind. Did we know that we now will actually work from home? Those that drives to work, have you been warming up your car engine? We've sure come a long way this 2020

This is our last edition of the year and it falls on the month of the Light Festival, a joyous and victorious celebration for our Hindu friends.

Oil and Gas sectors has been in a volatile situation since last year, this year has make everything more challenging. Coming to the last quarter, we are so glad to see new invention, merger and acquisition of company that come together to brave through this pandemic. Technology and Big Data has been deploy in many departments and workers too upskilling their knowledge.

Industrial Guide Asia is going through a major transformation as well. There will be 3 steps transition for us. We used to have 2 separate websites for Directory and News but was combined during the 5th years as we want the directory site to be comprehensive. We too, are evolving during this time of the year. We have channel back all news to be on One portal and our Directory search portal will now transit into an e-commerce market place with new feature like tender , job and barter posting.

We are very grateful for the support and encouragement we have receive to make this shift.

We anticipate to service and assist all our users closely in months to come. We have Lazada, Amazon, Shopee and now Industrial Guide Asia under www.iiga.shop will compliment Industrial Businesses and Factories to sell and GO further - of course directly to our Industrial community. We aim to segment and protect the interest of Industrial in mind, and this, we seek for further support from the community in publishing the best and latest news, to have trusted verified company that sell with integrity and most of all to assist company to buy and sell the Barter way with no money involve.

We are exciting as how this will be.

Thank you for taking us this far. In another month time, we will be in our 19th years serving you.

Here, wishing the Light of Diwali shines through and overcome all challenges and obstables. May all be victorious and safe.

Also, a Merry Christmas and Happy New Year!

Yours faithfully,

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Reinventing The Oil and Gas Industry: Compounded Disruption

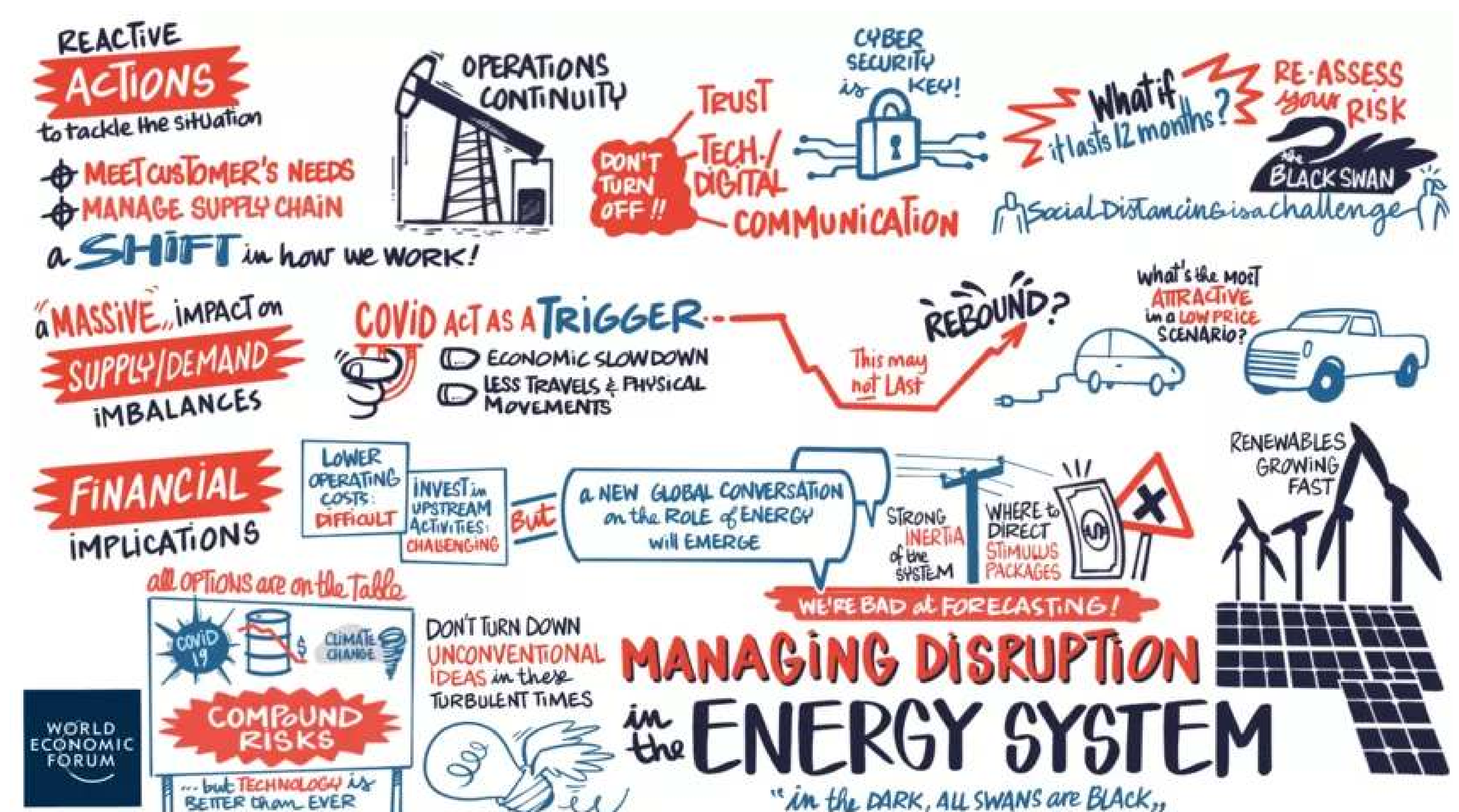


The global oil and gas industry has faced difficult times before, but the situation it faces in 2020 is unprecedented. It exists today within

a context of compound disruption – a first blow from worldwide oversupply, then a second blow from the destruction of demand caused by the COVID-19 pandemic together with pressures to improve its response to climate change, may herald a call for deep transformation.

Even before these events, the industry faced growing challenges. Despite prices averaging \$77 per barrel over the past 10 years, free cashflow from core operations has been insufficient to maintain shareholder returns as in the past. Industry returns are below the cost of capital, and – according to proprietary analysis by Accenture – capital expenditures have declined by 30% in response to COVID-19. The leverage ratio of total debt to total liquidity has almost doubled since the depths of the 2008 financial crisis, and the industry’s share of the S&P 500 has been cut by half over the past decade. In addition to these elements, consumers and investors have sought out alternative energy sources in response to climate change, affecting the supply of and demand for fossil fuels.

By 2030, however, some projections suggest that EVs could have the upper hand, particularly if the cost of carbon emissions is factored into the equation. Due to major improvements to the cost and efficiency of batteries, the TCO for EVs would drop sharply, putting pressure on the cost of fuel for ICEs. According to analysis by Accenture, it is estimated that the maximum gasoline price for ICEs to remain competitive will be about \$1.50 per barrel, indicating a crude price of \$10 to \$20 per barrel in 2030 in the absence of any carbon tax or fuel tax parity. Every \$1,000 of EV purchase price subsidy reduces the maximum oil price by another \$11 per barrel. If these subsidies are eliminated and there is parity in fuel taxes and externalities, crude would be competitive at a maximum price of \$40 per barrel.



Power generation is another major demand sector affected by competition from alternative energy sources. Penetration of increasingly low-cost renewable power sources is constraining the growth in gas demand. The demand for alternative and increasingly low-cost renewable power sources to replace coal and gas is increasing rapidly. The industry had been looking to liquid natural gas (LNG) to serve as a transition fuel in key markets such as China and India, but this role is predicated on gas displacing coal. In developing countries, the limited domestic infrastructure and cost of importing natural gas as LNG can favour coal, particularly when coal is sourced domestically (in China and India, for example), although in some settings air quality and emission concerns militate in favour of gas-fired power over coal-fired power.

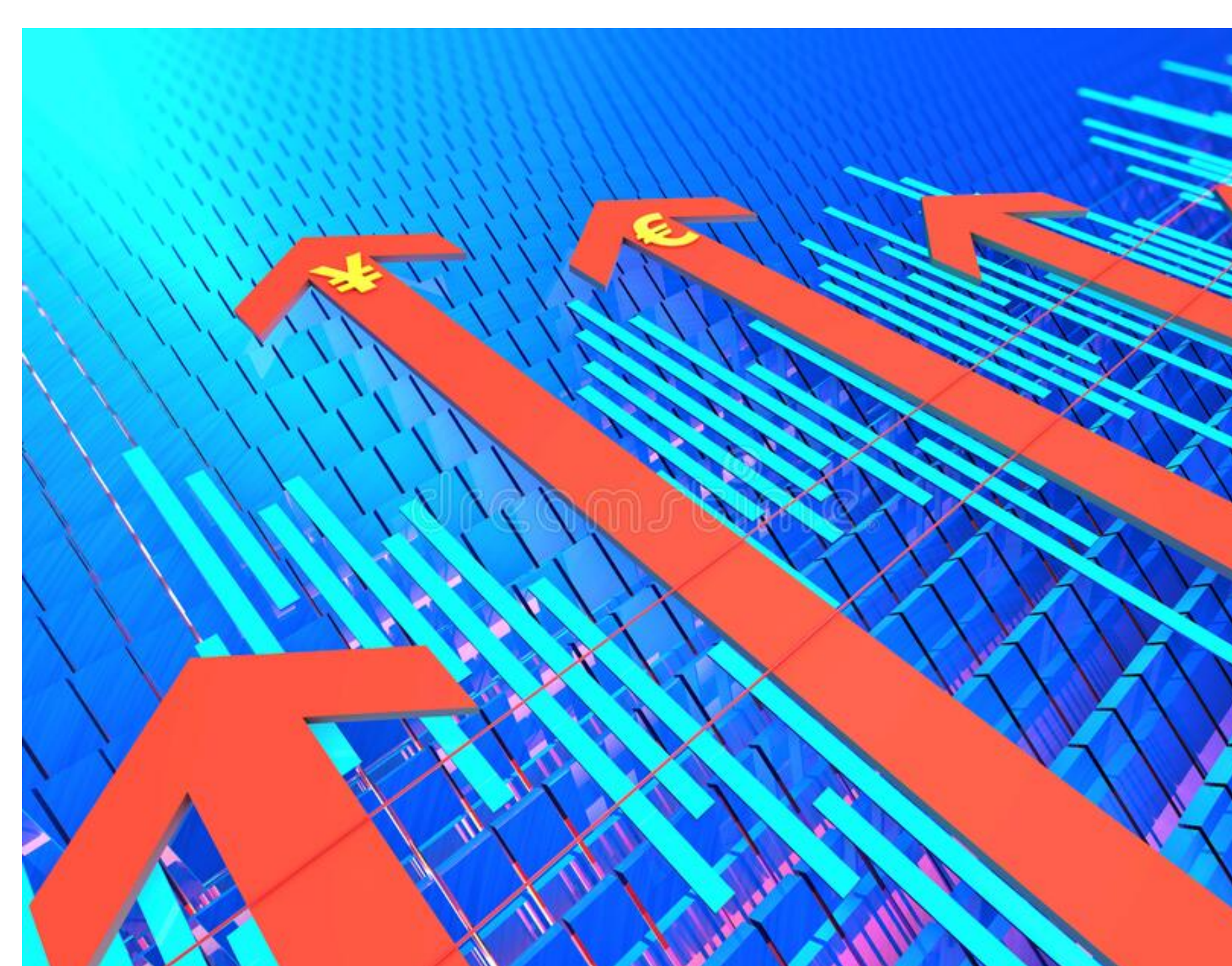
Other factors challenging the industry include:

1. **Increasing pressures to improve environmental performance.** Analysis by Accenture suggests that carbon taxes could increase oil prices by \$3 to \$8 per barrel of oil equivalent (BOE), changing the cost curve and reshaping oil company portfolios.

There are significant variations from region to region and from asset class to asset class due to differences in energy and carbon intensity. For example, North American shale flaring assets are likely to incur approximately \$5 billion in additional carbon taxes over non-flaring assets. Latin American assets, characterized by sour crudes requiring high energy intensity, will also incur higher carbon taxes.



2. **Increasing competition for capital.** Years of lower returns, climate-change driven divestments and the growth of alternative energy investments are decreasing oil and gas companies' access to capital. At today's level of invested capital, margins must



equal \$8/BOE under a \$40/barrel scenario (compared to current margins of about \$11/BOE under a \$60/barrel scenario) to deliver a return on invested capital (ROIC) of 12% and create value. Continuing returns below the cost of capital will further challenge the industry's ability to attract capital.

3. **Increasing scarcity of talent.** The industry is struggling to recruit and retain the next generation of workers and to attain a gender-balanced work force. The industry's recent cycles and its long-term outlook are deterrents to recruitment. It is estimated that more than 1 million jobs will be lost in 2020 in oilfield services alone due to the pandemic, representing a large loss in talent and human capital.



The Future of Liquefied Natural Gas: Opportunities for Growth

The COVID-19 pandemic has accelerated LNG market trends that were already underway. LNG players must pursue improvement in five areas to adapt to new conditions and seize opportunities for growth.

The liquefied natural gas (LNG) industry is experiencing low prices and oversupply. Even before the COVID-19 pandemic, the LNG market was set for oversupply in 2020 and 2021 as new projects continued to grow capacity well beyond steady demand growth. Reduced gas demand because of the pandemic has added to excess supply, creating market volatility. And a sustained period of lower oil prices and increased competition among gas supply sources as new supply reaches the market have combined to erode margins, putting pressure on gas and LNG producers.

The long-term outlook for LNG, however, is brighter than that of other fossil fuels because of its comparatively lower cost and lower emissions from production and combustion. But to find a true competitive advantage amid a volatile market, the LNG industry must move beyond what were once winning strategies (control of gas resources, reliability of supply). Instead, LNG players should focus their efforts in five areas: capital efficiency, supply-chain optimization, downstream market development, decarbonization, and digital and advanced analytics. If done successfully, LNG could ride out an unpredictable market and find opportunities for faster growth.

Challenges today and tomorrow

A sustained period of lower oil prices has reduced gas prices directly through oil-indexed contracts (which remain the norm in many Asian markets) and indirectly by decreasing the financial incentive for consumers of oil-based fuels to switch to natural gas.

COVID-19 has added to the severity of oversupply. Country-wide lockdowns and the suspension of industrial activity diminished demand in the second quarter of 2020. Depending on how COVID-19 affects importing markets, 2020 gas demand could fall by 4 to 7 percent—by far the largest demand shock in more than 50 years. As a result, spot gas prices have fallen sharply since the beginning of 2020, creating almost complete convergence between Asian, European, and US prices.

International gas prices have converged.

Gas prices in selected global markets, \$ per MMBtu¹



¹Million British thermal units. Source: Bloomberg; EIA; ICE Endex; Platts; McKinsey analysis

McKinsey & Company

Further challenges remain on the horizon for gas. In most developed economies, gas has a decreasing role in baseload power generation (power that is almost always online). In some countries, electrification is also reducing the role of gas in household and commercial heating and cooking. Finally, a rapid decline in the cost of battery technologies could make energy supply from renewable power less intermittent over time, challenging the role of gas as a peaking power generator (providing power only at peak demand times).

Opportunities for LNG

The same trend that contributes to LNG's challenges also creates an opportune landscape. Lower wholesale gas prices in end-use markets, for instance, mean the economics of gas use are increasingly favorable when compared with alternatives such as oil. Recent investments in terminals and pipelines to connect gas to consumers have also increased gas availability. Whether taken in combination or on their own, these and other factors create an opportunity for accelerated demand growth, particularly in Asia.

Improved economics

The economics of LNG relative to oil and coal in consuming countries have improved markedly over the past decade. From 2000 to 2018, LNG was priced at a small discount relative to oil—values varied between contracts, but savings of 10 to 20 percent were typical. That discount has roughly doubled for contracts signed during the past two to three years, and short-term LNG supplies available in the spot markets in 2020 have offered as much as 50 to 70 percent savings relative to the prevailing oil price. As the price discount relative to oil increases, consumers are incentivized to make the switch from oil and oil products to gas where practical. Industrial consumers have the biggest incentive, given their scale, but gas is competing with oil products even within the road- and marine-transport sectors.



LNG prices may recover somewhat over the next three to five years, though market fundamentals suggest its discount relative to oil will persist and its

premium over coal may be smaller than in the past. Wider use of carbon pricing could improve LNG's competitive position compared with coal and oil

Greater role of gas in the power mix



While most power systems can accommodate a small amount of

intermittent generation, renewable power—which makes up a significant share of energy supply—still requires firming capacity. In most markets, gas is by far the cheapest source of firming capacity in the power system.

Batteries can absorb hour-to-hour variations in demand, but they are two to three times more expensive than gas-fired generation. While this cost may decrease over time, it is unlikely that batteries will become an economically viable option to balance week-to-week, month-to-month, or season-to-season differences in supply and demand.

Technologies that can manage long-duration demand variations are being developed, but they are likely at least ten years from being deployed at scale.

Improved air quality



According to the World Health Organization, ambient air pollution accounts for an estimated 4.2 million deaths a year, with the greatest death toll in Asia.

Coal-fired power and liquid fuels for road and marine transport both produce major air pollutants: particulate matter, sulfur dioxide (SO₂), and nitrogen oxides (NO_x). A switch to gas can significantly reduce air pollution—gas consumption typically produces negligible particulates and SO₂. In addition, switching from coal- to gas-fired power reduces NO_x emissions by roughly 50 percent, while switching from oil to gas in the transport sector reduces NO_x emissions by roughly 80 percent.

Better access to LNG

A decade ago, only 23 countries had access to LNG. Costly import terminals that took years to build and inflexible supply contracts complicated the widespread adoption of gas—despite the attractive near-term economics. Concerns about the geopolitical risks of LNG dependence also stunted demand growth from existing importers, even when few other supply options were available.



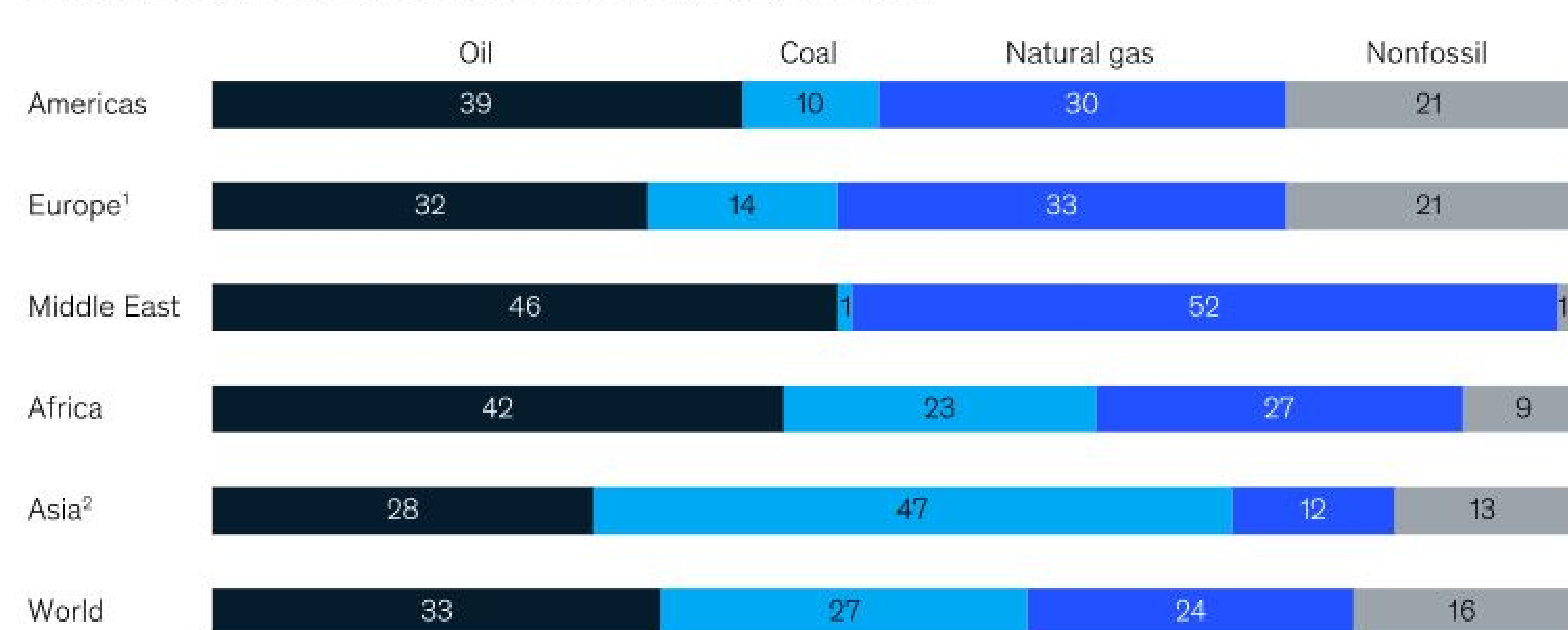
Today's market is very different. In 2019, the number of LNG importing countries reached 43. Rising competition among suppliers and increasing liquidity in traded markets created more room to cater to individual buyer needs for contract duration, size, and flexibility. And the development of floating storage and regasification unit (FSRU) technology means LNG supply capacity can respond quickly to changes in local gas demand and supply. Indeed, FSRUs allow any country with a coastline to access LNG supply within two years.

Accelerated demand growth in Asia

As the gas price premium over coal narrows, and the firming and emissions advantages of gas over coal become clearer, markets (especially in Asia) can rebalance the energy mix toward gas. Asia is the world's largest energy-consuming region and is also the most dependent on coal. Coal meets 47 percent of Asia's energy consumption; as a comparison, the next highest coal-consuming region is Africa, with coal meeting 23 percent of its energy consumption (Exhibit 2). Meanwhile, gas provides just 12 percent of primary energy consumption in Asia but more than 20 percent consumption in every other global region. Increasing Asia's share of gas energy consumption to 20 percent would add the equivalent of more than 400 million tonnes of LNG to annual gas demand, doubling the size of the LNG market.

Asia is more reliant on coal and less reliant on gas than any other region.

Primary energy consumption, breakdown by fuel, % of total¹



¹Figures may not sum to 100%, because of rounding.
²Asia here refers to all of Asia and Oceania, per the source material, though none of the trends in this article are driven by Oceania.
 Source: BP Statistical Review of World Energy, June 2020

Beyond power generation, gas could replace oil in the transport sector. In China, the transport sector accounts for more than 10 percent of current gas demand and it is the fastest-growing demand segment globally. If the rest of Asia were to use gas for transport as extensively as China does, it would add annual gas demand equivalent to 40 million tonnes of LNG.

Downstream Oil and Gas Amid COVID-19: Succeeding in a Changed Market

North American industry shapers will quickly develop strong market perspectives, adopt flexible staffing models, and deploy streamlined labor pools aligned with decisive strategic and operational choices.



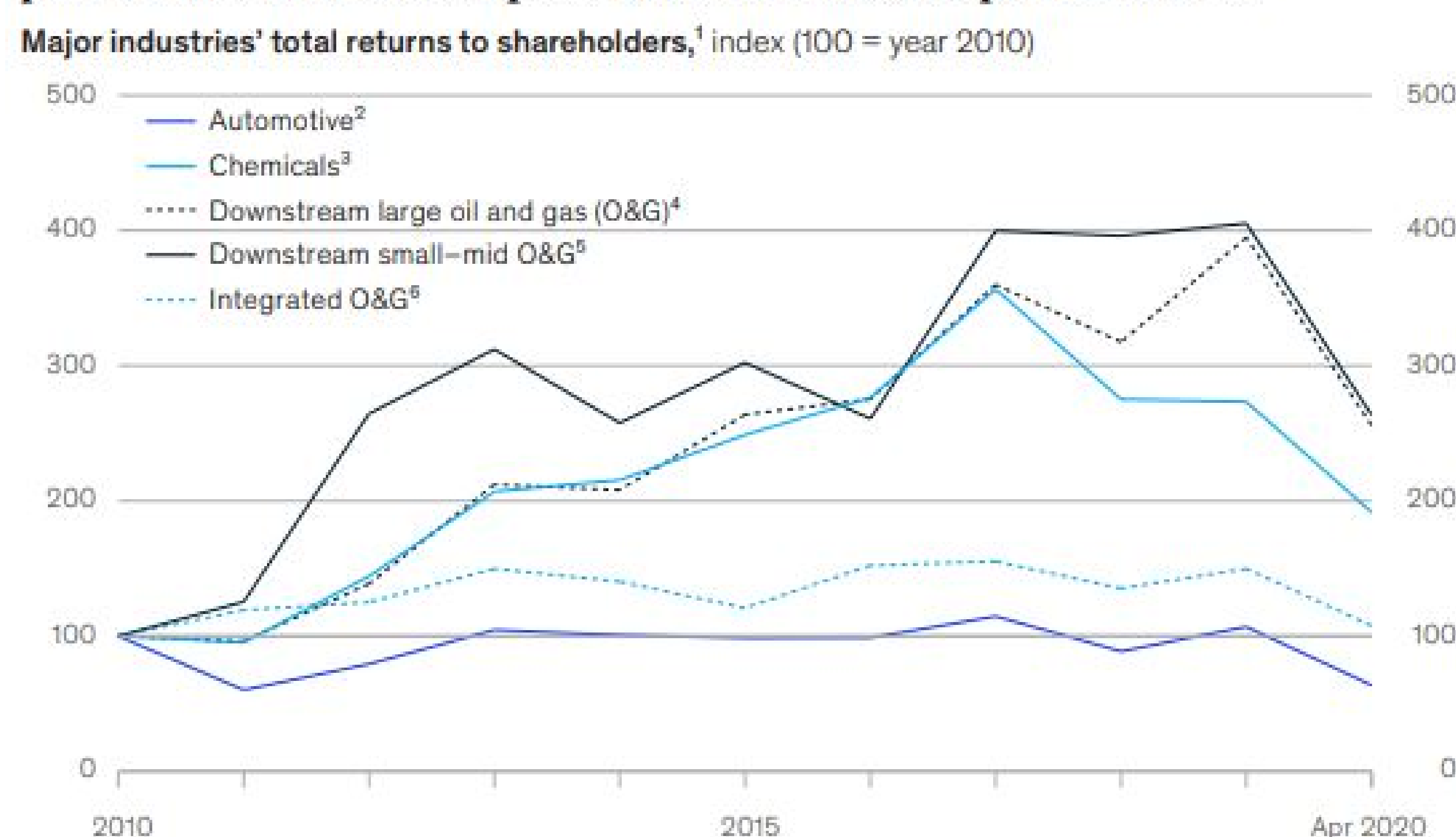
Entering 2020, the outlook for North America's downstream oil and gas industry was one of strong margins, a buoyant economy, and robust demand. The only cloud on the horizon was the potential impact of

the energy transition. Companies were building for a future of plenty.

For a decade, downstream companies in North America invested in capitalizing on booming North American shale, retooled their refining and transport capacities, and entered adjacent industries. The sector managed to outperform similar industries in total value creation over ten years (Exhibit 1 —and even as far back as the early 1990s. But there was also a downside. The North American downstream companies developed large, inflexible technical and engineering functions; loosened their control over administrative costs; and failed to seize new opportunities for margin improvement through digitizing refineries.

The global COVID-19 pandemic caught the oil and gas industry unprepared for a completely changed landscape. Planes were grounded and cars parked. Countries outside the Organization of Petroleum Exporting Countries (OPEC) that export crude oil known as OPEC-plus countries) initially turned up the spigots, and oil prices collapsed. Demand for transportation fuels fell by up to half, and storage tanks filled. That forced refineries to cut their rates or even stop production. Oil and gas companies experienced the sharpest shock they had ever seen, and it may also turn out to be their most enduring one.

Downstream oil and gas returns have outperformed similar industries for the past decade, with crisis impacts evident in the first quarter of 2020.



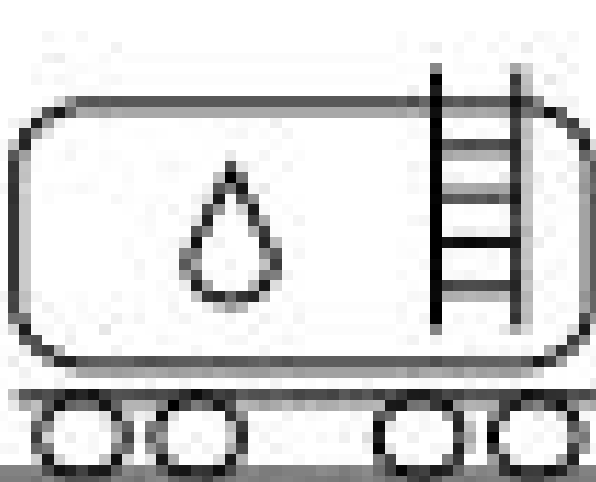
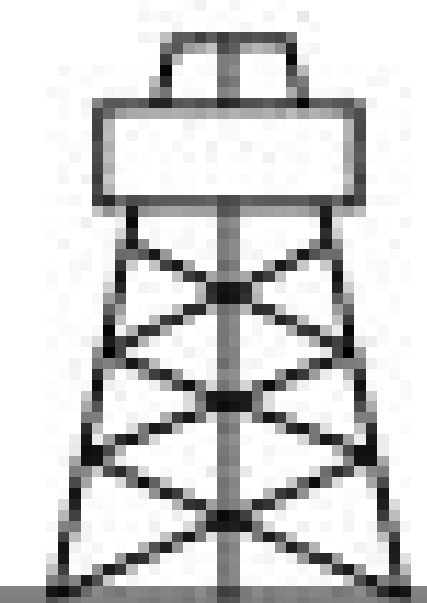
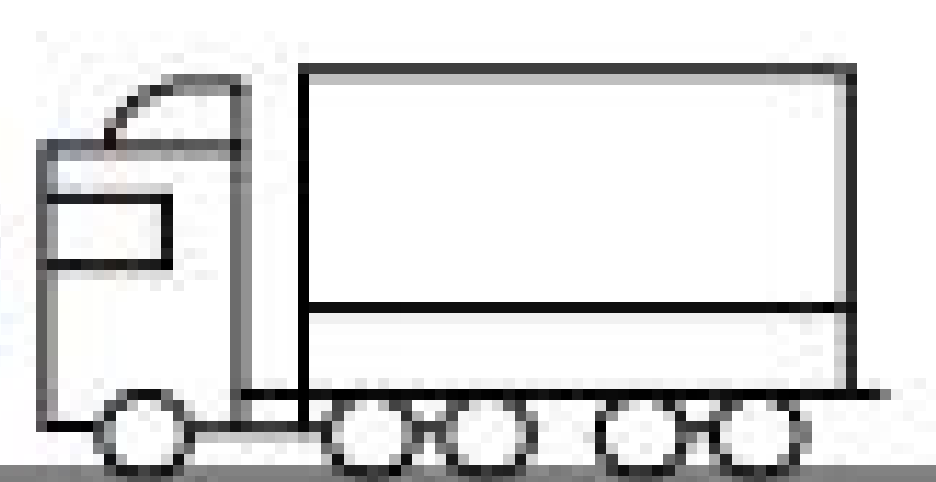
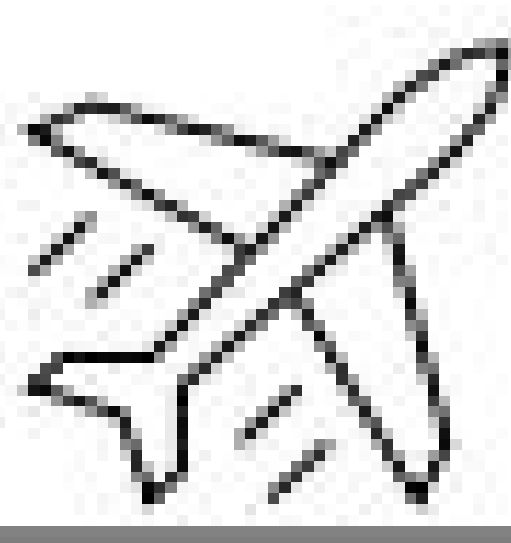
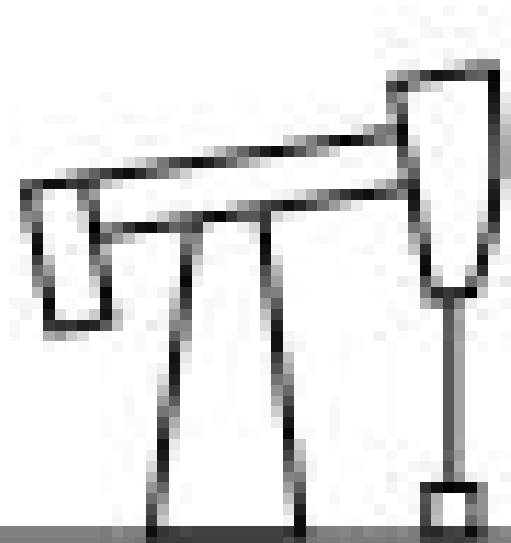
¹Market-cap average of major US players in each segment. ²Includes Ford and GM. ³Includes DowDuPont and LyondellBasell Industries Holdings. ⁴Includes Marathon Petroleum, Phillips 66, and Valero Marketing and Supply. ⁵Includes Detek US Holdings, HollyFrontier, and PBF Energy. ⁶Includes Chevron and Exxon Mobil. Source: Bloomberg

Five key structural challenges

Five structural changes have fundamentally altered North America's downstream oil and gas market. To adapt successfully to the new and volatile landscape during and after the COVID-19 crisis, companies will need to consider each of the developments as they formulate their short-, medium-, and long-term approaches.

Five structural challenges define the current downturn in downstream oil and gas.

5 key reasons downturn related to COVID-19 crisis is unlike any other

 <p>1</p>	 <p>2</p>	 <p>3</p>	 <p>4</p>	 <p>5</p>
<p>Ocean of inventories</p> <ul style="list-style-type: none"> • Abrupt demand shock has created high inventories of crude and product, which may require rest of 2020 to work off • Running more barrels when cracks turn positive will extend glut 	<p>Escalated license-to-operate costs</p> <ul style="list-style-type: none"> • Regulatory compliance costs have tripled since previous market pullbacks • ESG¹ and corporate social-responsibility impacts are driving conservatism and, in turn, high spend rates 	<p>Challenged consumption norms</p> <ul style="list-style-type: none"> • Telecommuting has proven successful • Airline-miles traveled are projected to remain down 15–20% in near term • Projections of vehicle-miles traveled vary 	<p>Uneven product return</p> <ul style="list-style-type: none"> • Muted jet-fuel demand to 2021 is likely to cause crack and yield challenges as rates increase • Reopening markets could cause geographic arbitrage and short-term instability 	<p>Limited price stability</p> <ul style="list-style-type: none"> • OPEC+² alliance is tenuous, with propensity for member nations to act in own interests • Streamlined Permian Basin activity will return and bring rapid supply and price feedback

¹Environmental, social, and governance.

²Countries outside Organization of Petroleum Exporting Countries that export crude oil.

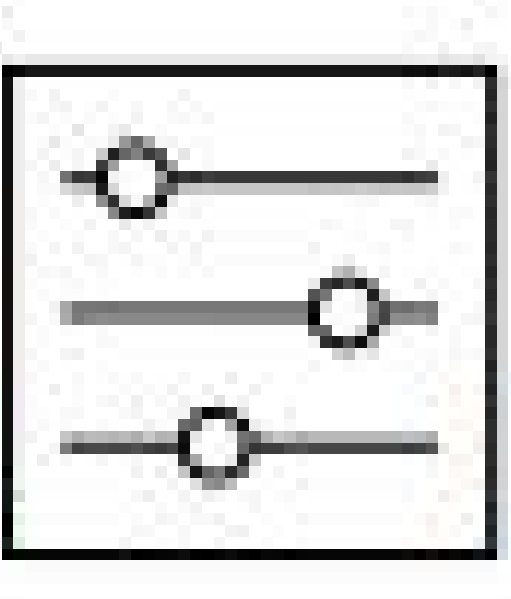

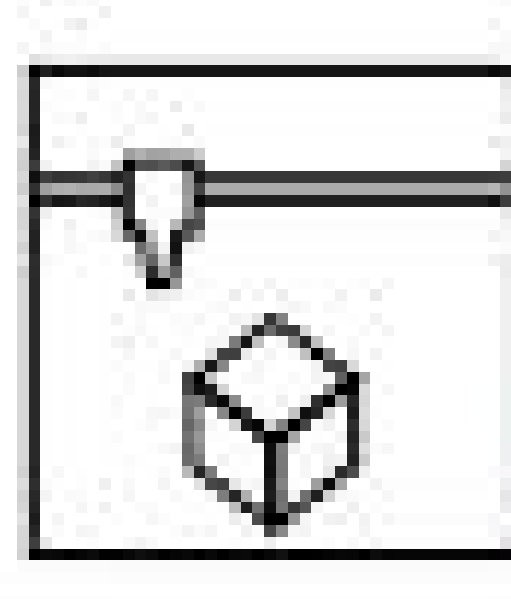
Source: Expert interviews; Energy Insights by McKinsey

A three-phase response

Our experience in the downstream oil and gas sector and in partnering with a variety of companies as they drive holistic transformations suggests that a successful response to the fundamental market changes seen in the COVID-19 crisis can be divided into three phases. Those phases build on each other chronologically and overlap.

Downstream oil and gas companies need to think and act across three horizons.

3-phase response to COVID-19 crisis

 <p>1 Readjust</p>	 <p>2 Reimagine</p>	 <p>3 Reform</p>
<ul style="list-style-type: none"> • Preserve cash 	<ul style="list-style-type: none"> • Rightsize general and administrative functions • Launch operations improvements • Reconsider supply chain and procurement • Optimize trading capabilities 	<ul style="list-style-type: none"> • Reimagine functional-support delivery • Deploy advanced analytics and machine-learning applications • Revamp planning processes • Reassess portfolio strategies

⁵ Per Energy Insights by McKinsey analysis.

⁶ We define an "average refinery" as one of midlevel complexity and average size.

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Aker Solutions to Provide Subsea Production System for Tommeliten Alpha Development in Norway

Aker Solutions won an order from ConocoPhillips to deliver the subsea production system for the Tommeliten Alpha development offshore Norway. The estimated contract value is about NOK 1.2 billion.

The scope of work covers a complete subsea production system including 10 vertical subsea trees, two manifolds, wellheads, satellite structures, control systems and tie-in equipment.

"We look forward to working together with ConocoPhillips to sustainably maximize the full potential of this field," said Kjetel Digre, chief executive officer of Aker Solutions.

The front-end engineering and design (FEED) starts immediately. The

engineering, procurement and construction (EPC) work is expected to start in the second half of 2021 and will involve Aker Solutions' facilities in Norway, Brazil, Malaysia and the UK.

Tommeliten Alpha is a discovery in the southern part of the Norwegian sector in the North Sea, approximately 25 kilometers southwest of the Ekofisk field. The water depth is 75 meters. The discovery was proven in 1977. The reservoir contains a gas condensate fluid and lies at a depth of about 3,000 meters.

The contract is subject to Norwegian authorities' approval of the plan for development and operation (PDO). The contract was booked as order intake in the third quarter of 2020.



Hess Announces Sale of Interests in Shenzi Field, Gulf of Mexico

Hess announced today that it has entered into an agreement to sell its 28% working interest in the Shenzi Field in the deepwater Gulf of Mexico to BHP Billiton, the field's operator, for a total consideration of \$505 million, subject to customary adjustments, with an effective date of July 1, 2020. The field produced an average of 11,000 net barrels of oil equivalent per day in the first eight months of 2020.

"Proceeds will be used to fund our world class investment opportunity in Guyana," CEO John Hess said. "This sale is aligned with our strategy to preserve cash and preserve the long term value of our assets in the current low oil price environment."

Petronas Sets Net Zero Carbon Emissions Target by 2050



Petroleum Nasional Bhd (Petronas) has set an aspiration to achieve net zero carbon emissions by 2050 as part of its holistic approach to sustainability that balances environment, social and governance (ESG) considerations.

In a statement, Petronas president and group chief executive officer Tengku Muhammad Taufik Tengku Aziz said as the world contends with the many challenges brought about by energy transition, Petronas is embracing its role in providing access to affordable, secure and sustainable energy to businesses and society.

“The group is committed to fulfill its purpose in providing cleaner energy and solutions that benefit both the world we live in as well as the customers we serve through reduced emissions,” he said.

According to Petronas, the net zero carbon emissions aspiration by 2050 is guided by the four lenses of the Petronas sustainability agenda, which demonstrates the company’s long-term commitment to continued value creation, safeguarding the environment, positive social impact and responsible governance throughout its integrated value chain.

With the target set for 2050, Petronas said it will continue to intensify its efforts towards reducing Scope 1 and Scope 2 Green House Gas emissions from its assets by delivering continuous improvements in operational excellence, and by deploying innovative operations and technologies.

Together with these efforts, Petronas will also pursue new avenues of revenue creation via investments in nature-based solutions as well as establish greater accessibility to cleaner energy solutions.

Complementing the new aspiration, the group also launched its new brand positioning, passionate about progress that demonstrates the company’s commitment to continue developing winning, progressive and sustainable solutions.

In navigating the challenges of the global energy transition, Petronas will continue to work together with its many diverse partners to deliver solutions that ensure the joint prosperity and well-being of all its stakeholders.

Rohde & Schwarz Communications Technology Supports Guardia di Finanza

Rohde & Schwarz has signed a contract with Italian shipbuilder Cantiere Navale Vittoria to equip the Guardia di Finanza's new offshore patrol vessels with external communications systems.

Rohde & Schwarz was awarded a contract by Italian shipbuilder Cantiere Navale Vittoria to supply line of sight (LOS) and beyond line of sight (BLOS) communications systems for the Guardia di Finanza's offshore patrol vessels. Guardia di Finanza is the law enforcement arm of the Italian Ministry of Economy and Finance.



Rohde & Sochwarz will equip the Guardra di Finanza's new OPVs with external communications system.

Customs authorities must often monitor long coastlines with patrol boats to prevent smuggling and illegal immigration. R&S M3SR Series4100 high frequency (HF) radios, R&S M3SR Series4400 VHF/UHF radios and a dedicated Coast Guard data link (an expansion of the information and communications system) enable authorities to monitor these large coastal areas.

“We have been supporting the Guardio di Finanza on land, sea and in the air for many years,” says Mario Zaccagnini, Managing Director of Rohde & Schwarz Italy. “Rohde & Schwarz and Cantiere Navale Vittoria have a long history of collaboration. We are very proud to have our equipment deployed in these Italian vessels. We deliver safe, future-ready investments for today’s coast guards on time and on budget.”

The final offshore patrol vessel (OPV) is the largest patrol boat ever built for the Guardia di Finanza and will be commissioned in 2022. It will join the large fleet already equipped with R&S Postman (integrated communications system) and external communications systems from Rohde & Schwarz. R&S M3SR Series4100 HF radios use the SOVERON communications architecture. They are innovative, versatile software defined radios (SDR) that can be upgraded with HF wideband functions. The powerful radio platform can be expanded at any time and is a safe, future-ready investment.

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Leading Energy Companies form Partnership to Accelerate the Development of Offshore Transport and Storage Infrastructure for Carbon Emissions in UK North Sea

bp, Eni, Equinor, National Grid, Shell and Total today confirmed they have formed a new partnership, the Northern Endurance Partnership (NEP), to develop offshore carbon dioxide (CO₂) transport and storage infrastructure in the UK North Sea, with bp as operator. This infrastructure will serve the proposed Net Zero Teesside (NZT) and Zero Carbon Humber (ZCH) projects that aim to establish decarbonised industrial clusters in Teesside and Humberside.

NZT and ZCH are at-scale decarbonization projects that will kick start decarbonization of industry and power in two of the UK's largest industrial clusters. Both projects aim to be commissioned by 2026 with realistic pathways to achieve net zero as early as 2030 through a combination of carbon capture, hydrogen and fuel-switching. If successful, NEP linked to NZT and ZCH will allow decarbonization of nearly 50% of the UK's industrial emissions.

NEP has submitted a bid for funding through Phase 2 of the UK government's Industrial Decarbonisation Challenge, aiming to accelerate the development of an offshore pipeline network to transport captured CO₂ emissions from both NZT and ZCH to offshore geological storage beneath the UK North Sea.



The £170 million Industrial Decarbonisation Challenge is part of the £4.7bn Industrial Strategy Challenge Fund set up by the UK government to address the biggest industrial and societal challenges using research and development based in the UK. NEP's application for funding is an important step

towards enabling the development of integrated offshore carbon storage for NZT and ZCH in the UK Southern North Sea.

The application follows the approval by the Oil and Gas Authority (OGA) of the addition of bp and Equinor alongside National Grid to the Endurance carbon storage licence. This affirms the strategic importance of the Endurance reservoir as the most mature and large scale saline aquifer for CO₂ storage in the offshore UK Continental Shelf, that can potentially enable industrial decarbonization from both clusters.

Gazprom Obtains Record-High Gas Inflow on Kara Sea Shelf

Another set of tests has been performed in the upper levels of the exploration well at the Leningradskoye field of the Yamal gas production center. Earlier, the well helped discover a new deposit in the lower levels.

In the course of the exploration activities, commercial gas inflow of over 1 million cubic meters per day was obtained. This is a record-high figure for the fields located on the Arctic shelf of Russia, which proves that the productivity of the Leningradskoye field is much higher than anticipated.



To secure the reliability of gas supplies to consumers in the long term, Gazprom consistently expands its resource base. One of the key targets in this area is to exercise a comprehensive approach to the research and development of the Arctic shelf. This approach ensures a high effectiveness of geological exploration performed in the harsh natural environment and climate of the shelf. The Company successfully copes with the difficulties caused by the lack of infrastructure and insufficiently developed services market.

ExxonMobil Plans Reduction to U.S. Staffing Levels



As part of an extensive global review announced earlier this year, the company plans to reduce staffing levels in the United States, primarily at its management offices in Houston, Texas. The company anticipates approximately 1,900 employees will be affected through voluntary and involuntary programs.

The workforce reductions are the result of ongoing reorganizations and work-process changes that have been made over the past several years to improve efficiency and reduce costs. These actions will improve the company's long-term cost competitiveness and ensure the company manages through the current unprecedented market conditions. The impact of COVID-19 on the demand for ExxonMobil's products has increased the urgency of the ongoing efficiency work.

ABB and Ericsson Partner to Realize Thailand's Industry 4.0 Ambition

ABB Thailand and Ericsson Thailand today announced a partnership, the first in Asia Pacific, to support ABB's customers and enterprises in Thailand with Ericsson's 5G solutions.

The announcement is part of a global strategic partnership between the two companies signed in 2019 establishing their joint vision and cooperation for future flexible production with automation systems and wireless communications as part of Industry 4.0 and digitalization.



With the agreement signed in Thailand, Ericsson will become ABB's 'Preferred Connectivity Partner' in the country. This agreement provides a framework and opportunity for ABB and Ericsson to jointly accelerate the digital transformation of diverse enterprises across Thailand and to enhance support for ABB's customers with 5G connectivity expertise.

The focus areas of the partnership include ABB's Robotics & Discrete Automation, Industrial Automation and Motion business areas, as well as ABB Ability™ Platform Services. The collaboration will for instance cover 5G enabled Augmented Reality Lenses for remote commissioning in manufacturing environments in addition to global NB-IoT connected motors and drives through Ericsson Communication Service Provider partners and its IoT-Accelerator platform.

Ericsson has been present in Thailand for 114 years and has supported Thailand through generations of mobility. "We are proud and honored to be able to support Thailand on its journey towards Industry 4.0. Given our experience in deploying 5G across 61 live networks; we are well placed to transform and digitalize the local manufacturing sector" added Allen.

In January 2020, ABB and Ericsson collaborated at the World Economic Forum in Davos, Switzerland, to demonstrate for the first time how easily and effectively robots can be controlled over wide distances utilizing the real-time communication capabilities of 5G.



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Harnessing The Secrets of Nature: The E4Q Energy Chain from igus Wins the German Design Award

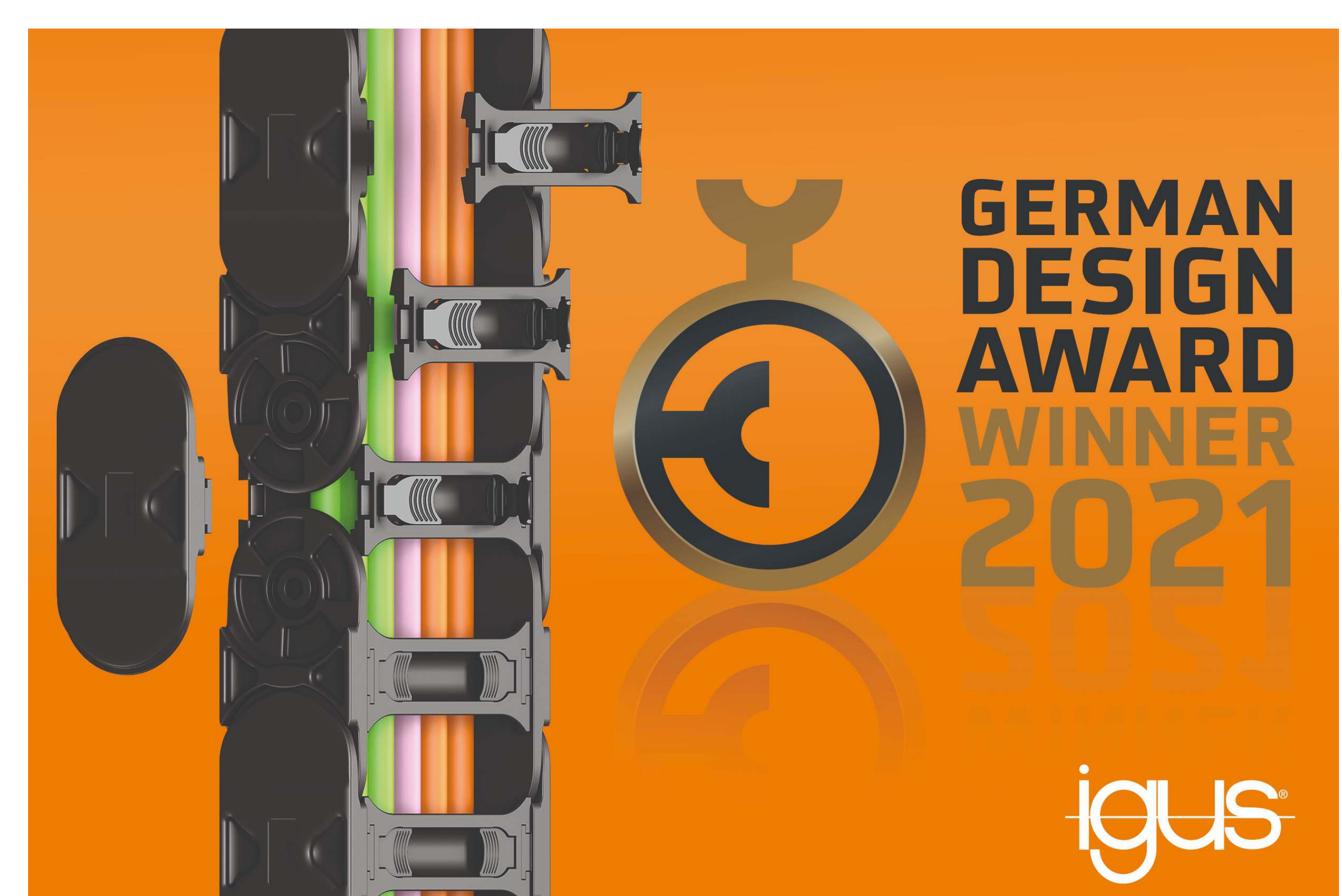
The latest energy chain generation design saves weight, increases strength and reduces assembly time by 40 per cent

The E4Q energy chain series was developed by igus to achieve the best possible solution for unsupported and long travels. In the process, shapes inspired by nature ensure very low weight, while a unique tool-free opening concept reduces installation time by 40 per cent. The E4Q has now received the renowned German Design Award for this pioneering design.

After winning a large number of awards in recent years, igus once again proves how progressive design can bring the user concrete benefits. This also applies to the E4Q energy chain. It is striking that igus has taken a new path here. "In order to optimise the material and thus the weight of the energy chain, our developers have been inspired by nature", explains Michael Blaß, head of the e-chain systems division at igus. "The rounded design is very organic and is found on the outside of the chain links and the stop-dogs. This reduces the weight by 10 per cent compared to the previous E4.1 series, and also the drive energy." Despite the material cut-outs, the new development has 20 per cent higher strength and stability. The chain links of this energy chain generation continue to have a completely new crossbar concept with locking straps. These ensure that the series can be opened and closed in seconds without tools. Filling is therefore particularly easy, and the installation time is reduced by 40 per cent.

German Design Award honours innovative design trends

The advantages of the E4Q have now been recognised by the international jury of the German Design Award. In the Excellent Product Design category, the E4Q was awarded as well as the innovative Module Connect Adapter, with which energy chains including cables can be connected to the machine by means of a click system. The German Design Award is the international prize of the German Design Council. Its objective is to discover, present and award prizes for unique design trends. 5,000 products/projects from 60 countries were submitted this year.



IBM Drives Capabilities for Clients to Run Business-Critical SAP® Software Workloads on Hybrid Cloud

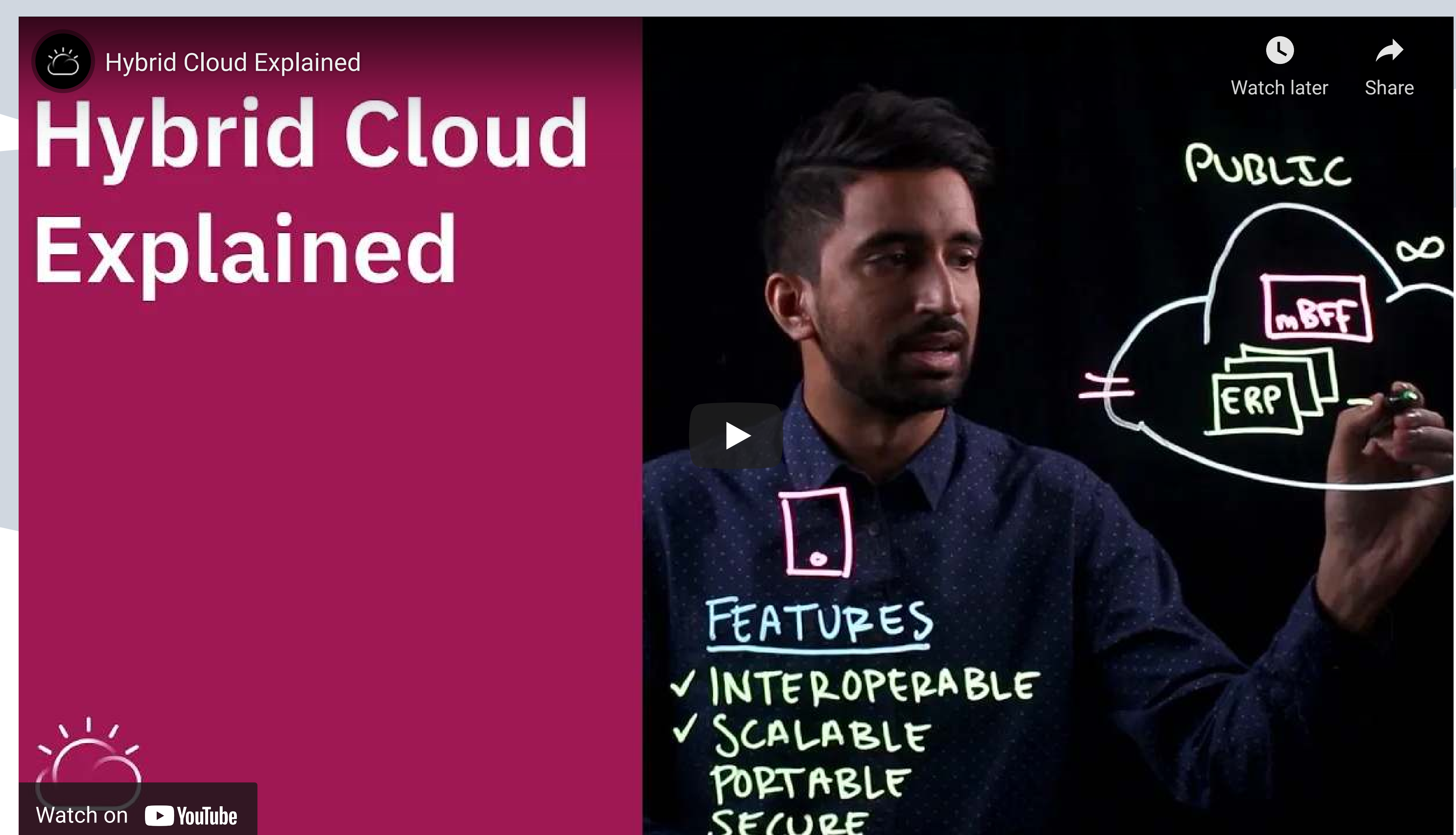


IBM announced new services, partnerships and capabilities designed to help clients accelerate their hybrid cloud journeys and deploy and run SAP® software workloads wherever they choose – from the IBM public cloud to on-premises. These new offerings expand on IBM and SAP's global alliance partnership to help clients optimize their SAP software workloads.

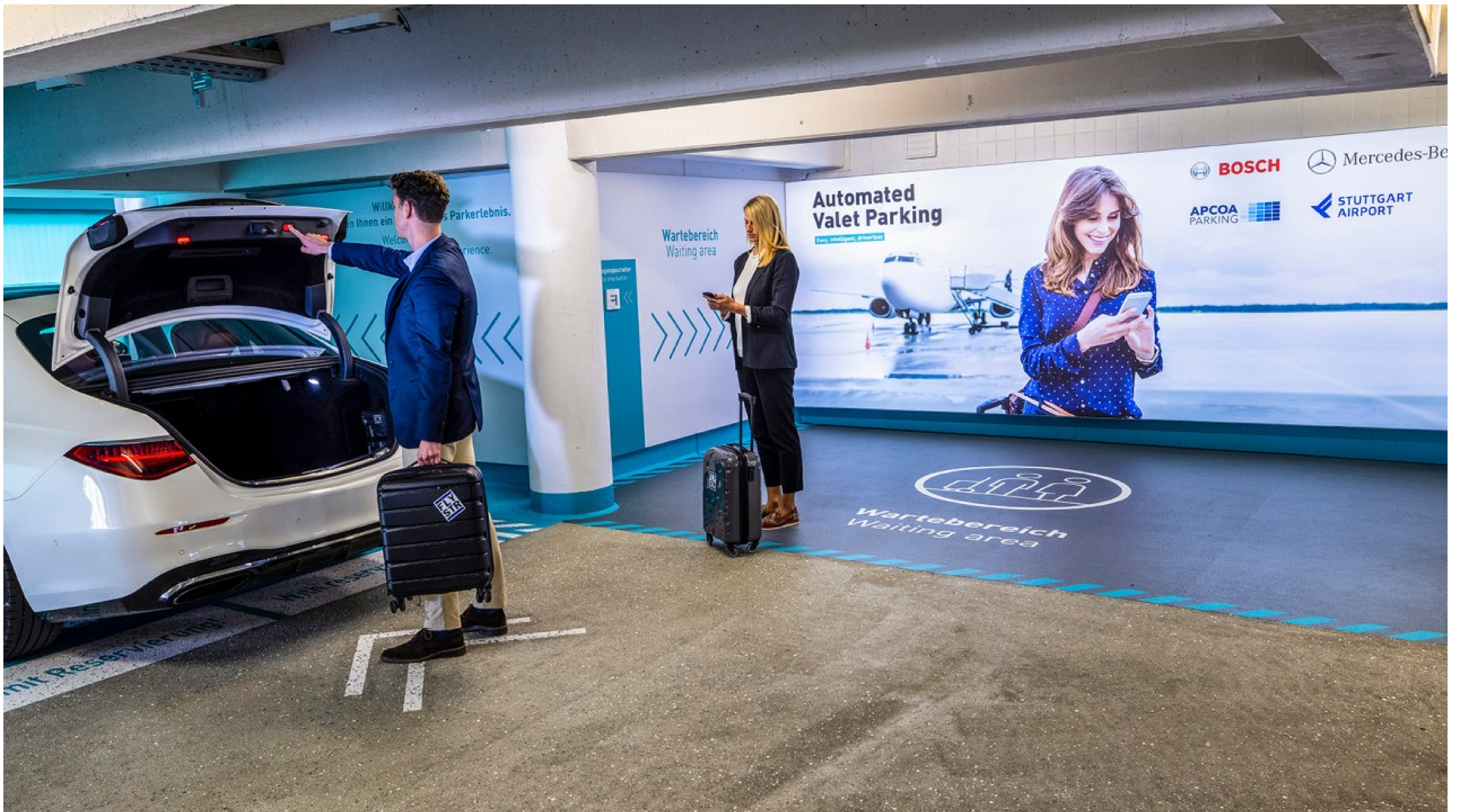
Global clients across industries are choosing to run their SAP software workloads on IBM Cloud, including Peruvian construction company Cementos Pacasmayo, Coca-Cola European Partners (CCEP), the world's largest Coca-Cola bottler based on revenue, and Italian fashion footwear retailer Primadonna Collection. Reinforcing IBM's commitment to investing in a hybrid cloud ecosystem, IBM and SAP are also expanding their ecosystem of GSI and ISV partners, to include Syniti, Tata Consultancy Services (TCS), Tech Mahindra and others, to help simplify and speed how clients run their SAP software workloads on IBM Cloud.

As the COVID-19 pandemic continues, enterprises around the world are looking to modernize their operations. According to a recent IBM IBV study, 64 percent of executives surveyed now plan to shift to a more cloud-based business model over the next two years. With this acceleration comes the need for deploying complex enterprise resource planning (ERP) and business process workloads in a way that provides clients with the industry's highest levels of security.

"The global pandemic has seen a year's worth of digital transformation efforts with the acceleration of cloud adoption compressed into months," said Harish Grama, general manager, public cloud, IBM. "Clients across industries are looking to shift to cloud and this is the core focus of our collaboration with SAP – giving our clients the ability to embrace the benefits of cloud without compromising on security and controls. This is all done through an open hybrid cloud architecture so our clients have a choice in how they approach their digital transformation, guided by the industry expertise needed to be successful in their journey."



Stuttgart Airport Set to Welcome Fully Automated and Driverless Parking



Automated parking to drive down the airport stress: Bosch, Mercedes-Benz, and the parking garage operator Apcoa want to introduce driverless and fully automated parking at Stuttgart airport in the future. To this end, the automated valet parking (AVP) system co-developed by Bosch and Mercedes-Benz is to be made ready for commercial operation. The new Mercedes-Benz S-Class is already geared up to accommodate it as the world's first production vehicle to feature the technology required for future infrastructure-based AVP. As an option, customers can buy the appropriate pre-installation for what the company calls the INTELLIGENT PARK PILOT, which makes the S-Class capable of receiving a smartphone command to drive itself to a reserved parking space. "With the new S-Class, it's not just driving that's a luxury, but parking as well," says Dr. Michael Hafner, head of automated driving at Mercedes-Benz AG. The P6 parking garage at Stuttgart airport will serve as the pilot for the planned commercial automated parking service. Here, the companies will test how the vehicle technology onboard the S-Class interacts with the intelligent Bosch infrastructure and APCOA FLOW, the digital platform provided by the parking garage operator Apcoa. This platform makes the whole parking process ticketless and cashless. "Apcoa, Bosch, Mercedes-Benz, and Stuttgart airport want to work together to make parking fully automatic," says Christoph Hartung, member of the executive management of Connected Mobility Solutions at Bosch. In the airport parking garage, preparations are currently underway to begin piloting the planned automated valet parking service. The aim of this trial with new S-Class vehicles at Stuttgart airport is to ensure that interactions between the vehicle, infrastructure technology, and parking garage operator run smoothly and are optimized for the customer.

Endress+Hauser Establishes Internet Security Standards

IETF recommends the SmartBlue CPace protocol for password-protected access to instruments



The cryptography working group within the IETF standards organization (Internet Engineering Task Force) has chosen the Endress+Hauser-developed CPace protocol as a recommended

method for use in internet standards. After undergoing extensive security analyses, the CPace protocol emerged as the winner in a competition among submissions from developers at several well-known companies.

Secure access to field instruments is of the highest priority for operators across all branches of the process industry. Modern plants contain hundreds or thousands of measurement and control instruments that must be accessed remotely with growing frequency. These field instruments also have to be installed, monitored or serviced on a regular basis. Secure password-based user authentication plays a special role today, especially when devices with digital interfaces are involved.

Security with user-friendly password lengths

In order to utilize Bluetooth communications technology in industrial environments, security experts at Endress+Hauser identified a need for additional protection. The result was the development of a solution called CPace, which belongs to the class of PAKE (password-authenticated key exchange) methods. Among other things, PAKE technology is used with the German electronic ID cards as a means of largely decoupling the cryptographic security level from the length of the password.

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Maari Acquisition Revised Long Stop Date



JADESTONE
ENERGY

Jadestone Energy Inc. (AIM:JSE) (“Jadestone”, or the “Company”), an independent oil and gas production company focused on the Asia Pacific region, has agreed with OMV New Zealand Limited (“OMV”) to amend the long stop date for the Company’s acquisition of a 69% interest in the Maari Project, shallow water offshore New Zealand (the “Acquisition”).

The parties have made substantial progress toward satisfying the Acquisition’s closing conditions, including obtaining the majority of third party consents. As a precautionary measure in acknowledgement of the remaining closing condition, being final New Zealand Government regulatory approval, and amidst the New Zealand 2020 general election, the Company and OMV have agreed to revise the long stop date from November 15, 2020 to January 31, 2021. Both parties remain fully committed to the transaction and the Company continues to anticipate closing the Acquisition by the end of 2020.

Jadestone intends to establish New Zealand as an extension to its Australia core area, and sees the Maari Project as a natural fit with its strategy to acquire and reinvest into mid-life producing assets.

Better Energy Better Life

Sinopec Star Petroleum Co.,Ltd. will take a part in developing a wind energy based decentralization power generation project located in Dali County, Weinan City, Shaanxi province in northwestern China. It is Sinopec's first wind power project and has total installed capacity of 20 MW.

The project, covering an area of 35 square kilometers, will set up eight 2.5 MW-wind turbines. After completion, the capacity to the power grid will reach up to 42.865 million kWh per year. It is equivalent to saving



13,200 tons of standard coal annually, which can effectively help to reduce carbon dioxide as well as smoke and dust emissions.

Dassault Systèmes Selected by Ball Aerospace for Multiyear Digital Engineering Contract

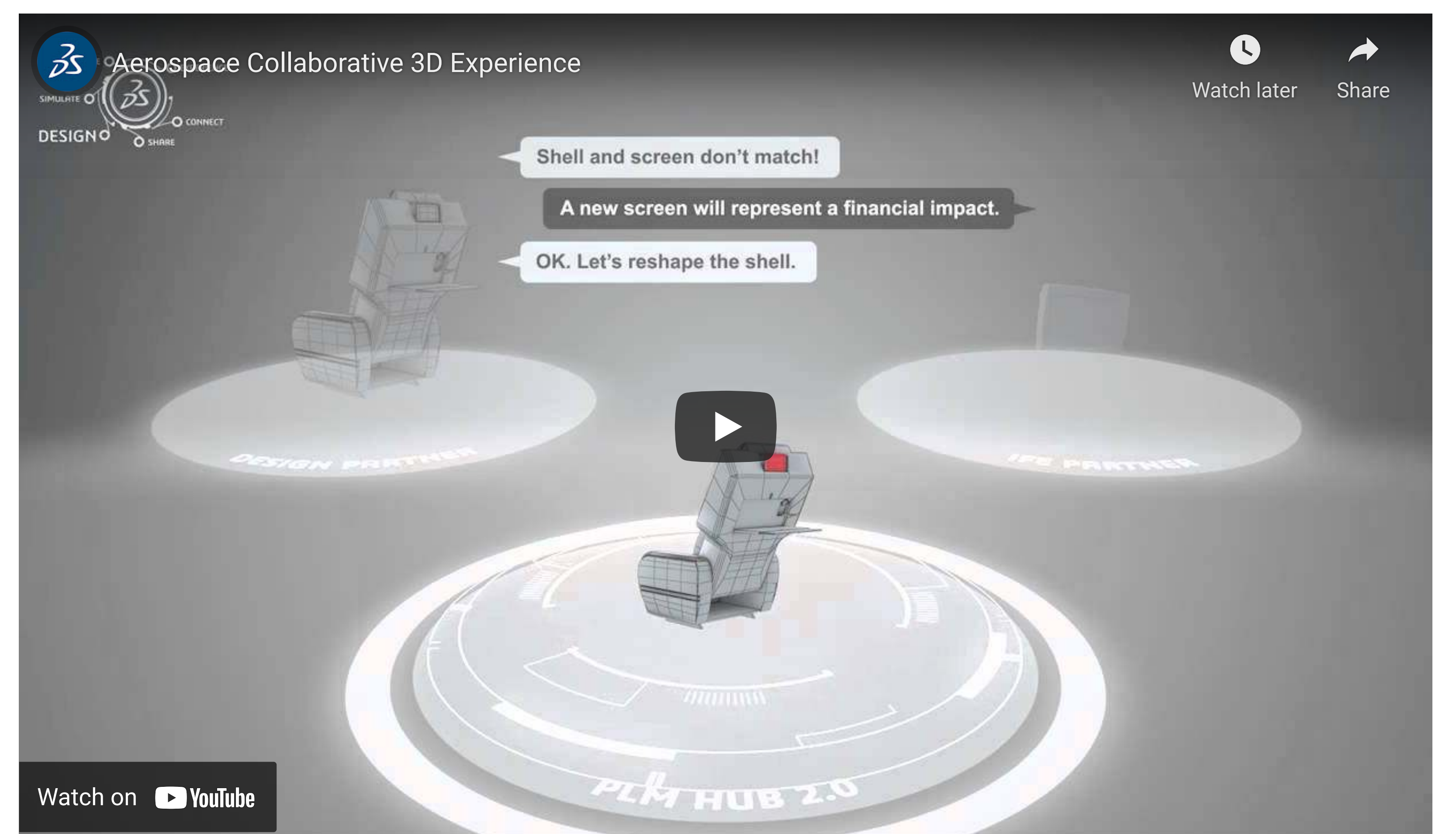
Dassault Systèmes (Euronext Paris: #13065, DSY.PA) was selected by Ball Aerospace to deploy the 3DEXPERIENCE platform as its digital engineering solution. Through this collaboration, Ball Aerospace will leverage Dassault Systèmes' integrated platform with a unified data model and single user experience, to complement the company's digital transformation, and promote digital continuity through the use of the virtual twin across its defense and space products. Accenture has been chosen to collaborate with Ball Aerospace on the implementation of the 3DEXPERIENCE platform.

Mainline Testing Begins on the First Hydrogen-Powered Train to Run on the UK's Mainline

Mainline testing has begun for HydroFLEX, the first hydrogen-powered train to run on the UK's mainline. Danfoss Editron has supplied a converter, which is connected to the train's fuel cell provided by Ballard Power Systems. The HydroFLEX project is a crucial milestone in the development of a zero-carbon emission propulsion system that could help to decarbonize the UK's rail industry. The UK government plans to remove diesel-powered trains from the country's rail network by 2040.



“Dassault Systèmes' 3DEXPERIENCE platform will support Ball Aerospace with its digital engineering goals to establish a single, integrated solution,” said David Ziegler, Vice President, Aerospace & Defense Industry, Dassault Systèmes. “Ball Aerospace joins the many industry customers that are leveraging the platform to speed timelines and improve efficiencies.”



HydroFLEX can store up to 20kg of hydrogen in four fuel tanks, which is lowered in pressure by a regulator before being combined with oxygen to create 100kW of electricity via Ballard Power Systems' FCveloCity-HD fuel cell module. The train also features two lithium-ion battery packs to store the electrical energy generated, an electrical traction control system and electric motors.



ADLINK and Sageran Expand Development of 5G Open Radio Access Network (RAN) Edge Solutions to Accelerate Time to Market for 5G Networks

The collaboration has already developed one of the industry's first highly compact, integrated 5G small cell sets

ADLINK Technology Inc., a global leader in edge computing, has signed an agreement with Sageran Network Technology to deepen collaboration in developing end-to-end 5G Open Radio Access Network (RAN) solutions. The partners will establish a joint lab for developing integrated 5G edge solutions based on open architectures for public and private networks, offering telecom service providers improved vendor interoperability, enhanced innovation and continued cost reduction.

“5G RAN is the most critical infrastructure driving 5G network rollout. Building 5G RAN in a cost-effective, sustainable way is equally as important as delivering network performance for wireless providers. This is where 5G Open RAN comes into play,” said Julian Ye, ADLINK’s Director of Networking and Communications. “Integrating ADLINK’s leading commercial-off-the-shelf (COTS) hardware with Sageran’s flexible 5G base station software provides an open architecture to build high performance, scalable 5G RAN solutions more quickly.”

The expanded partnership will accelerate the development of compact edge solutions needed for private 5G networks, and 5G-enabled solutions for industry specific applications such as vehicle-to-everything (V2X) communication and the industrial internet of things (IIoT).

The two companies have already developed one of the industry's first highly compact, integrated 5G small cell set featuring ADLINK's latest multi-access edge computing server series, MECS-7210/MECS-6110, and Sageran's baseband unit (BBU) protocol stack. The 5G small cell set provides a convenient, cost effective 5G integration solution to deliver complete 5G network functions with OTII compliant and validated NGC-Ready hardware.

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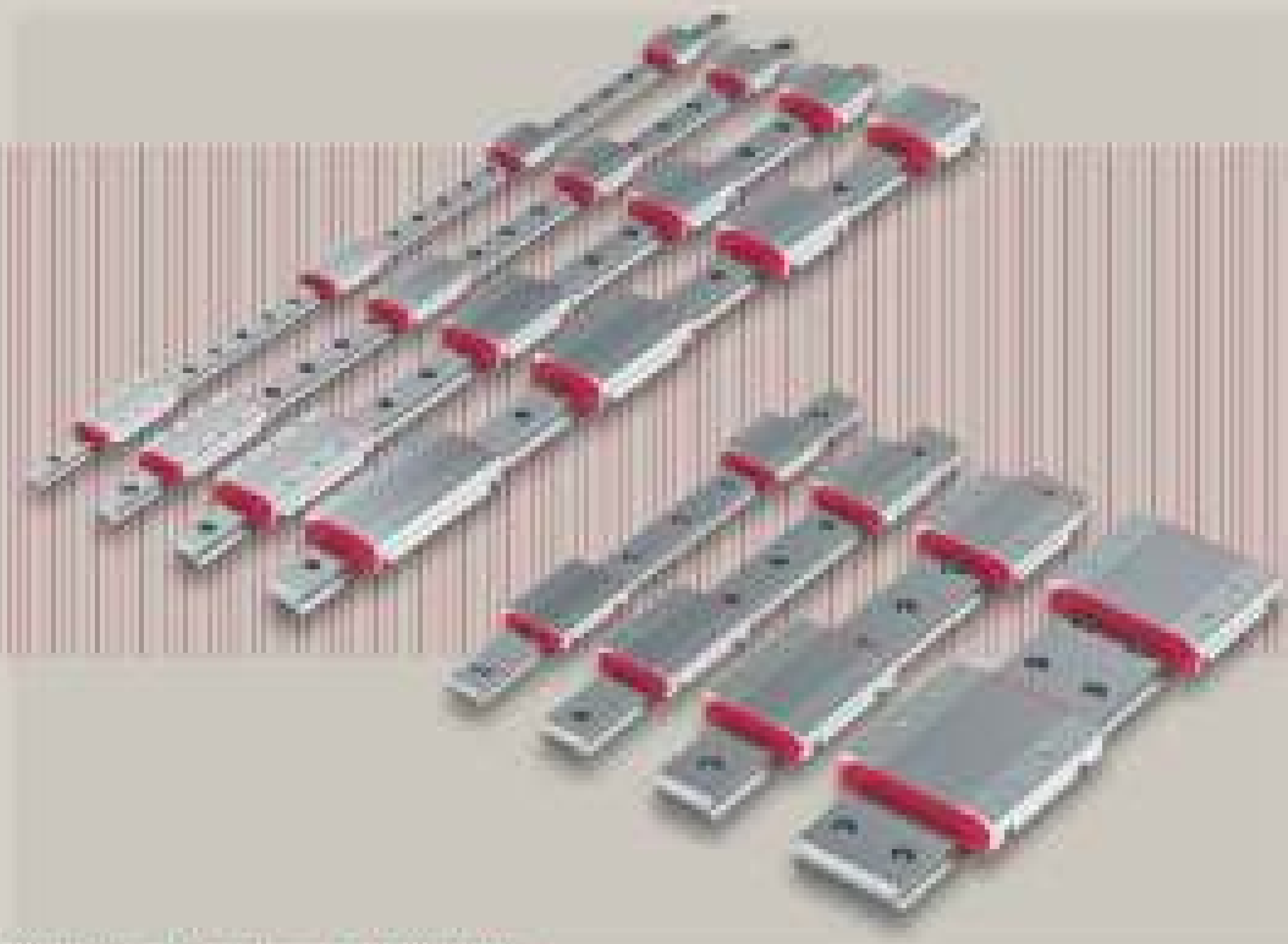


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Siemens Adds Multiscale Chemistry Modeling to Xcelerator Portfolio with Acquisition of Culgi

Siemens announced that it has signed an agreement to acquire Culgi, a computational chemistry software company with a focus on multiscale simulations in the process industries. Culgi will join Siemens Digital Industries Software, where its solutions will expand simulation capabilities of the Xcelerator™ portfolio with quantum and molecular chemistry models that seamlessly couple with the continuum approach in Simcenter™ STAR-CCM+™ software. This unique engineering workflow can deliver significant cost savings and accelerate innovation in the materials and process industries, increasing the potential for product and process transformations.

“Innovations in soft materials engineering begin at the quantum and molecular levels,” said Jan Leuridan, Senior Vice President, Simulation and Test Solutions, Siemens Digital Industries Software. “With Culgi technology as part of the Simcenter portfolio, process engineers will gain access to a comprehensive digital twin that combines micro-scale, meso-scale and macro-scale modeling. This tightly integrated workflow enables the design exploration of advanced materials in the context of product performance objectives, and we welcome the team to Siemens.”

The acquisition of Culgi builds on Siemens’ November 2019 acquisition of MultiMechanics, which added efficient prediction of solid material properties and behavior to the Simcenter™ portfolio. Through the addition of Culgi’s soft materials simulation, Simcenter can now offer a unique integrated CAE solution that enables performance-driven optimization of advanced materials.

“We are excited to join Siemens and help create the future of simulation software,” said Johannes Fraaije, Professor at Leiden University and CEO of Culgi. “Virtual screening of novel materials in an early stage of development is a key enabler of digitalization in the chemical industries. With the integration of Culgi molecular simulation software and services within the Simcenter portfolio, engineers have an extra handle to design materials efficiently and effectively, with desired properties all along the value chain from inception, to process development, to logistics and market analysis.”



Oil Demand Set to Peak in 2030 Predicts Mubadala's CEO of Petroleum and Resources Musabbeh AL KAABI

Global demand for oil is likely to peak around 2030, as the world recovers from the impact of COVID-19, according to Musabbeh Al Kaabi, CEO of Petroleum and Resources at the UAE's Mubadala Investment Company.

In a wide ranging interview, conducted as part of the ADIPEC Energy Dialogue series, Al Kaabi shared his outlook on the recovery of oil and gas markets and the long term impact of demand post COVID-19 on energy supply and demand.

Al Kaabi said COVID-19 caused oil demand to drop by 30 per cent in March and April, from a peak of 100 million barrels per day at the end of 2019. However, demand has started to recover, he added, reaching levels seen in the 1990s and will rise further over the coming 12 months.

Reflecting on the long-term impact of COVID-19, Al Kaabi said the post COVID-19 world be totally different, with fewer people travelling and lower activity in a number of sectors of the economy. And, while demand for energy will edge back to 2019 levels, some sectors, such as jet fuel, will take longer to recover than others.

Addressing concerns over future supply issues, Al Kaabi said climate change pressures, concerns over ESG and government policies are impacting the investment decisions by big international oil companies, which could result in episodes of disruption of supply. But he added, this would create space for national and privately owned oil companies to invest in the upstream sector.

"I see a similar trend in the petrochemicals sector, where it is critical companies address the plastics waste issue and not be in a state of denial," Al Kaabi said.

However, he added, he is optimistic emerging technology will help the downstream sector address this and other challenges it faces.

The ADIPEC Energy Dialogue is a series of weekly online thought leadership events created by dmg events, organisers of the annual Abu Dhabi International Exhibition and Conference. Featuring key stakeholders and decision-makers in the oil and gas industry, the dialogues focus on how the industry is evolving and transforming in response to the rapidly changing energy market.



SAP and Partners Expand Industry Cloud Portfolio to Retail, Professional Services and IM&C

SAP SE announced the expansion of its industry cloud solutions portfolio to serve the needs of three new industries: retail, professional services, and industrial machinery and components (IM&C).

SAP's industry cloud portfolio delivers specialized applications designed to address specific industry needs.



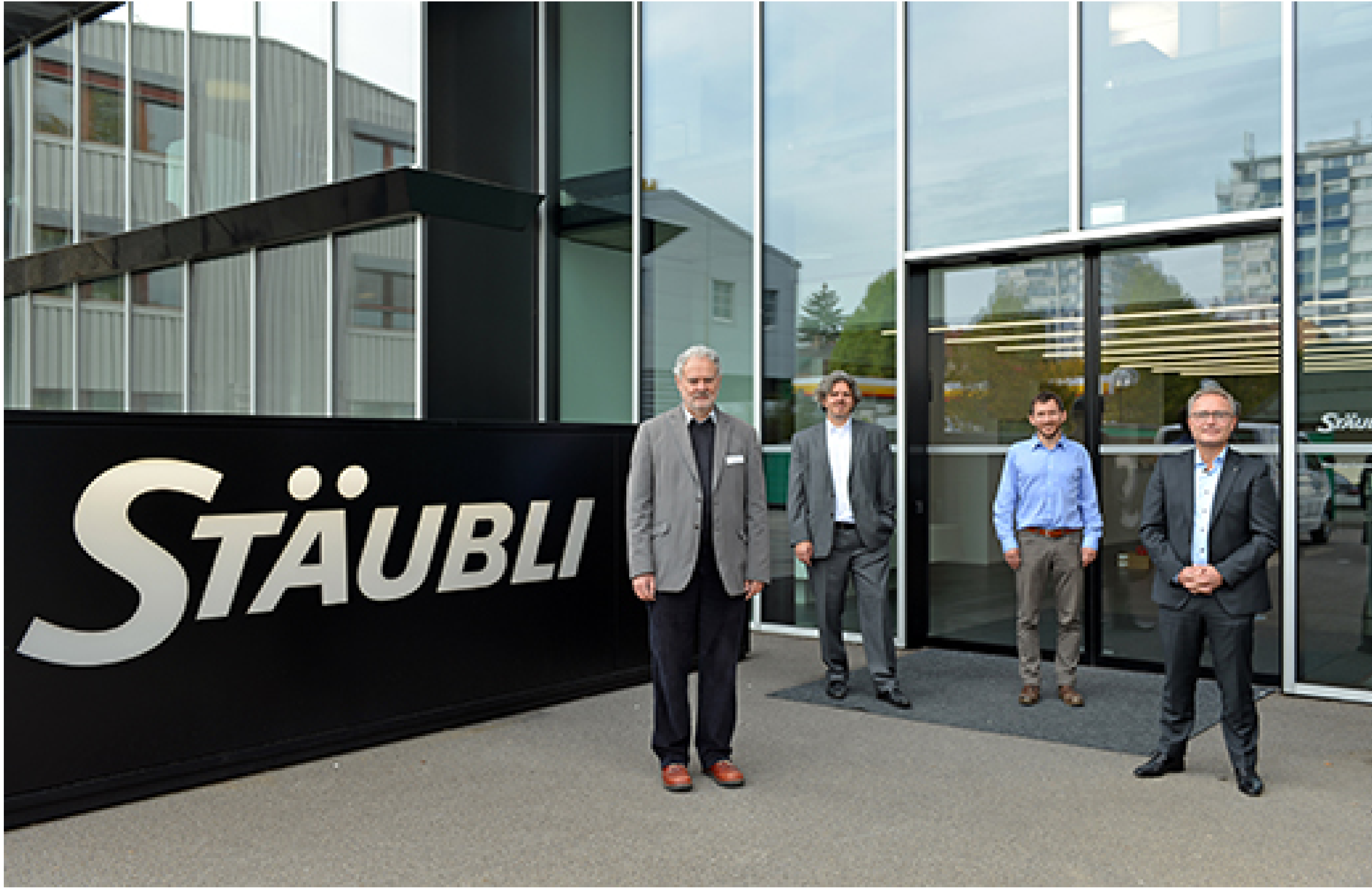
Built by SAP and partners on an open platform as a service, these solutions help customers to rapidly adopt innovations as part of their IT landscape.

“The speed at which companies have to operate today calls for technology-enabled agility,” said Peter Maier, president, Industries and Customer Advisory, SAP. “Innovative companies successfully strike the balance between optimizing their current business operations and innovating at the ‘vertical edge’ to discover and develop new revenue streams. Our industry cloud portfolio delivers solutions to help drive business transformation profitably and sustainably, enabling our customers to adapt to changing business environments in their industries.”

Industry cloud solutions are built and run on the open SAP Cloud Platform. They use intelligent technologies such as artificial intelligence and advanced analytics to create compelling user experiences and to digitalize and automate operations. SAP and partners focus on solutions for the core business of our customers in their industries to help optimize end-to-end processes and to enable the development of new and differentiating business models.



Strategic Cooperation for Safer Photovoltaic Systems



Prof. Urs Muntwyler, BFH, Head of PV lab; Matthias Schuerch, Stäubli, Head of Global Product Management for Alternative Energies; Prof. Dr. Christof Bucher, BFH, Dozent; Matthias Mack, Stäubli, Director of Global Alternative Energies

Stäubli, the pioneer and market leader in electrical connectors for photovoltaic systems, invests in application-oriented research and development. The Electrical Connectors division (formerly Multi-Contact) enters into a multi-year cooperation with the Laboratory for Photovoltaic Systems (PV Lab) of the Bern University of Applied Sciences BFH.

Stäubli Electrical Connectors is an expert in reliable, dependable electrical connection solutions for many industrial sectors. The Original MC4 PV connector set the standard for photovoltaics (PV). With a proven track record of more than 330 GW of installed photovoltaic capacity, accounting for almost 50 percent of the total global PV capacity, Stäubli has more than 25 years of experience in this area.

The Department of Engineering and Information Technology at the Bern University of Applied Sciences BFH integrates forward-looking topics like alternative energies, new technologies and digitalization into its research, development, and teaching. Its photovoltaics laboratory, under the supervision of Prof. Urs Muntwyler, has carried out research in the area of “photovoltaic system technology” for 30 years. Since 1985, Prof. Urs Muntwyler has been a committed pioneer and expert in solar energy. He is also part of a body of experts on safe PV installations in the building insurance industry.

Matthias Mack, Director of Global Alternative Energies, confirms: “We see this long-term cooperation with the BFH as another step in making the quite young PV industry safer in the long term, with quality products and education in the area of application or installation as a contribution to decarbonization of the energy industry.”



Medidata Launches myMedidata LIVE: Patient-Facing Video Visit Capability Built Directly into the Rave EDC Platform

Medidata, a Dassault Systèmes Company, the global leader in creating end-to-end solutions supporting the entire clinical trial process today announced the availability of myMedidata LIVE, a new feature on the myMedidata patient portal. myMedidata LIVE is a web-based, live video conferencing capability connecting patients virtually with their clinical trial study staff. Built on the industry's leading Rave EDC (electronic data capture) platform already in use at more clinical research sites globally than any other system, myMedidata LIVE gives researchers and patients a way to engage in remote site visits within the platform of site and patient-facing technologies they are already using on the study.

myMedidata is Medidata's newly released patient portal solution that provides patients with virtual access to all of their study needs in a single web application. It is built using responsive design principles -- as well as input from Medidata's Patient Insights team, a group of patients and patient advocates -- and made to be accessible from any device with an internet connection. Particularly relevant during the current COVID-19 pandemic when in-person visits might be restricted, myMedidata LIVE video visits between patients and sites can replace scheduled site-based appointments and allow the study team to complete its data entry in Rave while the patients remain engaged offsite through myMedidata.



"The COVID-19 global pandemic represents a pivotal moment for virtual care as healthcare organizations seek ways to triage COVID-19 patients while minimizing exposure between patients and clinicians and continue to see patients fearful of catching COVID-19 if they visit the hospital or their physician's office," said Lynne A. Dunbrack, group vice president, IDC Health Insights.

The latest version of myMedidata also includes two other important clinical tools, which have been redesigned for virtual use and can now be used through the web with a patient's myMedidata account: myMedidata eConsent and myMedidata eCOA (clinical outcomes assessment). Both tools give sites the ability to maintain a consistent and traceable process, since they are directly integrated with Rave EDC, and use the same advanced, trusted technology previously accessed through the eConsent and eCOA apps. In addition, myMedidata eConsent now provides patients the opportunity to learn about and consent to clinical trials at home or at a remote location, and myMedidata eCOA easily and accurately captures patient outcomes.

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Global Chemical Producer Makes The White Choice in Data Management Systems

Naturally occurring in only a select few parts of the world, the pigment is obtained through a highly specialised extraction and production process. There are only a handful of manufacturing companies with the expertise to do this.



One such company is Czech Republic-based Precheza. It's a major producer and supplier of inorganic pigments and has been producing titanium dioxide for more than 50 years. Precheza exports around 90% of its produce to meet global demand for this essential chemical, while committing to globally recognised standards in the areas of occupational health and safety management systems, quality, environmental protection and energy management. To remain consistent with these standards, Precheza relies on robust data management and analysis processes that drive operational efficiency and plant safety.

Casting the dye

Having the right software in place plays a critical role in effective plant management, enabling the capture and analysis of massive volumes of historical data for better present-day decision-making.

This led to exploration of our historicisation system, Factory Talk (FT) Historian SE. Operators were also seeking better reporting tools with enhanced analysis and visualisation. FT Historian provides users with access to historical data for progressive optimisation, for which they typically need to process and analyse several years of data.

Precheza's IT team used a temporary license to make sure our solution met their needs. Having satisfied its selection criteria, Precheza began working with us to transition from the legacy platform to FT Historian.

Right on schedule

The implementation itself was a simple process. A schedule of work with deadlines for implementation was created, preceded by a one-year preparatory period, which included clarifying the technical requirements, verifying them at the testing site and agreeing on the terms and conditions of the entire project.

The installation and configuration process began in August 2018, providing ample time for the installation of client applications, operator training and the transfer of original historical data into the new system. This led up to the production-ready implementation of FT Historian SE in January 2019. A three-month decommissioning period was put in place so that the two systems were operating in parallel, leading to the termination of the legacy platform.

In with the new

The biggest challenge faced over the course of the transition was the conversion of five years of data from the previous system into the FT Historian. As the software used in the two systems was incompatible, choosing the right method for converting this data into a new system would be crucial. After several tests, a solution recommended by Rockwell Automation was chosen, but even so, this procedure required manual intervention by Precheza staff and, in particular, verification of the transferred data, which took approximately 20 days of work.

Slovak company M.D.J s.r.o. already had extensive experience in the FT Historian solution and led the whole project to a successful end. The company also provided the benefit of its FT Historian know-how and responded flexibly to other requirements that arose during implementation.

Exploring new capabilities

Precheza now operates an environment predominantly equipped with control and visualisation systems from Rockwell Automation. Its users appreciate the openness of the system and the simplicity of integrating data from various sources, allowing them to manage application requirements in-house without being heavily dependent on our support.

The greatest benefit for Precheza, however, has been in how it's able to use its data. Operators now have access to a range of features that help them to orchestrate the analysis and visualisation of production processes. This allows the user to gain far deeper insight into the state of production and offers superior reporting capabilities.

AN-10 Wireless Lighting Control System for Liverpool Heart & Chest Hospital



The design of the Outpatient's Department featured three separate hallways which intersected to form a crossroads leading to the reception and waiting area. Each hallway had lighting which ran on separate circuits meaning it could not be controlled simultaneously. To address this problem, the project consultant wanted to use a same circuit solution, so lights could be switched on and off simultaneously, whichever entrance hallway was used.

Solution

The lighting in the hallways could be activated simultaneously, we used the CP Electronics wireless PIR presence detector, EBDSPiR-AT. Using the wireless option reduced the amount of wiring required on the project and enabled a quick and easy installation process. We also used the DALI dimmer switch, DA-SG-4PM-W, and a Vitesse Modular™ in the main reception area to control the linear light fittings in the waiting area. These solutions can be activated manually or pre-configured to a specific pre-set scene, so users can activate the chosen scene without having to dim up and down

Measurlink® Transforms QC for Pinnacle Machine Works



Located in Houston, Texas, Pinnacle Machine Work is a manufacturer of oilfield couplings ranging in size from 4.5” to 10.625”, as well as a provider of threading services of full-length pipe in the same size ranges. Established in 2013, Pinnacle Machine Works has more than 100 employees and is housed within a state-of-the-art facility licensed by API to API 5CT and to API Q1 standards.

Challenge

As Pinnacle grew, in late 2017 they embarked on a mission to transform and improve productivity. This involved a re-organization of the manufacturing plant, the rollout of lean initiatives and an investment in new tooling. As this transformation progressed, it unveiled additional opportunities for improvement. In particular, it became clear that quality still needed to improve and inspection only, as a means of improving the quality of their product, was not possible. The traditional inspection/QC (quality control) techniques of writing measurements down and not doing much with that valuable information were too slow and limited any potential manufacturing gains. Every product produced was already inspected dimensionally and visually, culminating in thousands of inspection points per day. More costly measuring equipment was not going to solve that. This prompted Pinnacle to investigate new QC options.

Solution

In reviewing options related to improving and streamlining QC processes, Pinnacle realized they could either go the manual route and add additional QC personnel or go the digital route and invest in an electronic gaging solution. The company decided that switching to an electronic gage was the only logical choice—it would enable Pinnacle to maintain an accurate and increased product flow without increasing labor costs. In addition, it would allow for real-time data collection and the use of SPC (Statistical Process Control), which to this point had not been possible, to make serious improvements to the manufacturing process to improve quality. Mitutoyo’s Measurlink® Quality Management Software turned out to be the only product that fulfilled the company’s criteria and aligned with their future goals.

Results

Measurlink® has now been used on the coupling shop floor for over a year, with full implementation occurring within the last six months. As a result of installing Measurlink®, Pinnacle has seen their reject rate drop from 3 percent to 1.3 percent. At the same time, overall shop productivity has increased by 45 percent. To date, their reduction in the instance of non-conforming product has saved the company more than \$180K in lost material alone. Pinnacle is beginning to utilize control (Cpk Ppk) measures/targets to better control the process. Run charts and control charts allow machine operators to visualize their work.

The Rohde Schwarz Factory at Teisnach Opts For One Software For all 3D Measuring Devices

At their factory in Teisnach, Rohde & Schwarz carry out cutting and non-cutting processes, surface treatment, printed circuit production, tool making and other processes. The company is able to meet customers' requirements quickly and flexibly on the basis of this extensive production depth. Hexagon Metrology's 3D coordinate metrology is essential for the release of initial samples, for optimising processes in ongoing quality assurance during production and for the final approval of products.

These instruments can be found in the measuring rooms at Rohde & Schwarz: Optiv Performance, an optical system for printed circuit board production, Optiv Reference, a multi-sensory device used in precision manufacture, and tactile coordinate measuring instruments such as DEA



GLOBAL or Leitz PMM-C. The Teisnach factory even boasts a portable ROMER measuring arm to ensure that products reach as close to perfection as possible.

PC-DMIS: Common Denominator



All these devices are handled by the PC-DMIS software, which is used to compare the effective measured data from all Hexagon Metrology measuring devices with the CAD model. Not only does this save training expenses, but it also stops these machines from becoming bottlenecks: when work piles up, users can simply switch to another measuring device.

With the help of the additional offline function, the metrology engineers can start producing their programs as soon as the production of the first development parts commences. Since then, it has been possible to reduce the throughput time of parts by up to 30 percent. In order to cope with all their measuring requirements, the company makes good use of PC-DMIS with its user-friendly operating features. The metrology engineers are professionals in this specialist field and work out their measuring programs and clamping plans.

The Whole Range of Measuring Device

Stationary coordinate measuring machines with tactile measuring heads can be used for larger steel sheet and milled structures which are used as frames for various radio and transmitter systems. And talking about size: at its factory in Teisnach, Rohde & Schwarz uses a portable ROMER measuring arm to check aerial radomes with dimensions of up to two meters. In this instance, the accuracy lies within the functional range.

Finally, all these devices for optical, tactile, multi-sensory, stationary and portable measuring are all brought together by the PC-DMIS measuring software. And that will not change in the future as Rohde & Schwarz plans to integrate new systems into the PC-DMIS landscape in Teisnach.

Unique High Capacity Benchtop Multisensor Measurement System

SmartScope® Flash™ CNC 300 is one of the most versatile benchtop systems OGP offers. With an expansive Z-axis of 250 mm to accommodate large parts, it combines state-of-the-art video and autofocus to deliver high productivity.



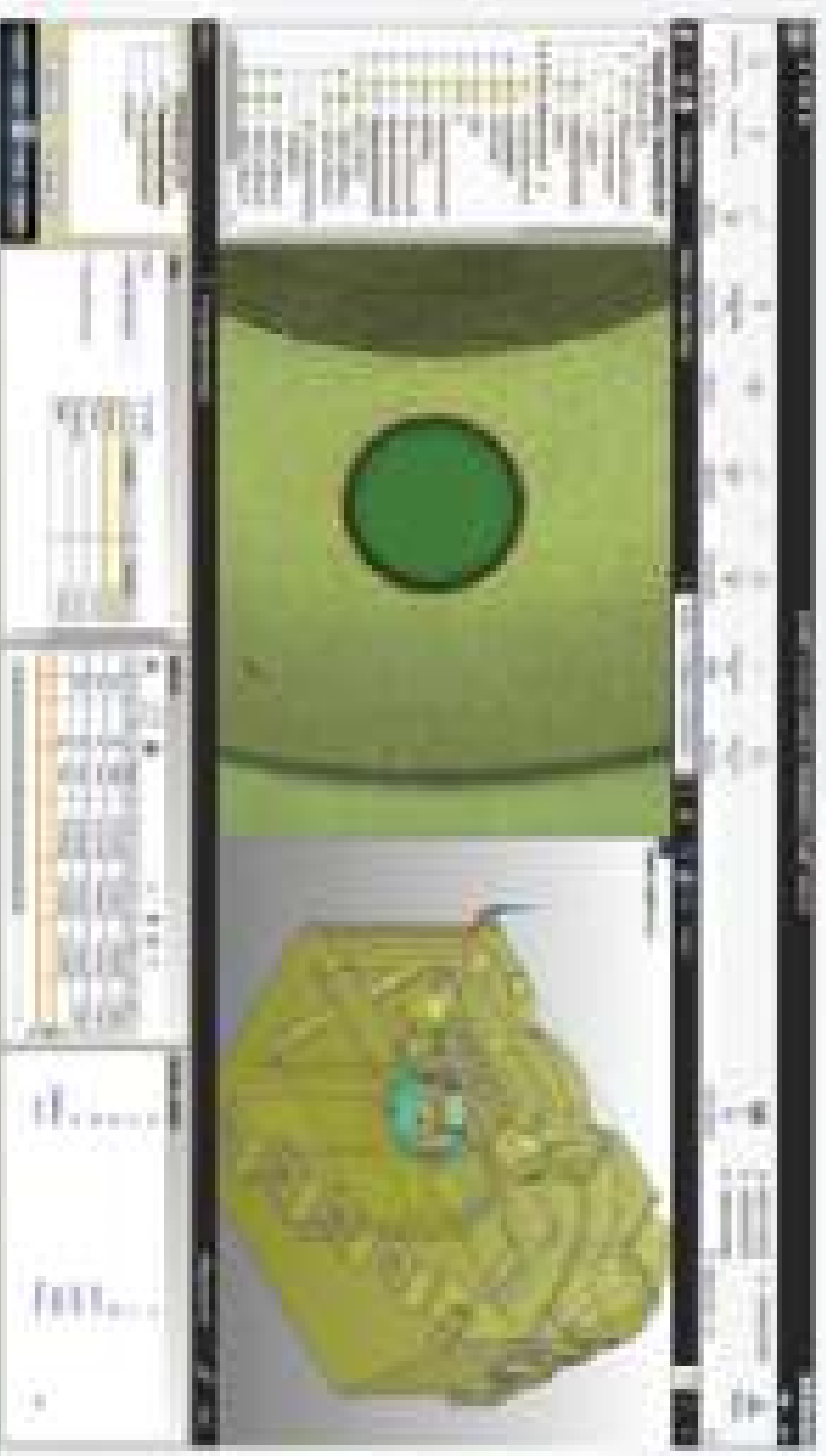
SmartScope® Flash CNC 300

The World Most Comprehensive Metrology Software

ZONE3 Metrology Software represents a totally new way of working with multisensor measurement systems. Its interface clearly displays relationships between parts, sensors, datum alignments, and machine tooling.

ZONE3 uses CAD models and other innovative features to automatically and effortlessly generate measurement routines.

ZONE3® Express/Pro



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Tel: +65 6741 8880 | Fax: +65 6741 8880

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NSK Develops Low Friction Hub Unit Bearings for EV

NSK's advanced grease technology reduces friction to increase EV range. NSK Ltd. has developed new low friction Hub Unit Bearings (HUBs) ideal for electric vehicles, hybrids, and new energy vehicles. The new bearings maintain the high reliability of conventional products despite offering lower friction. The lower friction of the new HUBs improves fuel economy (reduces energy consumption), contributing to longer travel range in EV and other vehicles. NSK is targeting 30 billion yen in sales by 2026.

Hub Unit Bearings (HUBs) are unit components that integrate bearing and attachment structure. HUBs connect the wheels and vehicle body, and enable the wheels to turn freely and smoothly.

Protecting the environment and reducing CO2 emissions is vital to the continued prosperity of global society. To enhance sustainability, the automotive industry is accelerating the development and production of electric vehicles, hybrids, and other new energy vehicles. However, the limited range of these vehicles remains a significant barrier to adoption.

Reducing friction is an effective method of increasing maximum vehicle range on a single charge, especially in HUBs, which support the vehicle body and are a component vital to the smooth rotation of the wheels. Accordingly, NSK directed development efforts to focus on reducing friction in HUBs with the aim of contributing to increased vehicle range.

Reducing friction while maintaining high reliability

NSK implemented improvements to the base oil and thickener components of the lubricating grease used in HUBs, achieving a 30% reduction in friction without undermining the reliability compared to conventional products.

Improvements include reducing the base oil viscosity to reduce friction caused by resistance arising from balls rolling inside the bearing. A different type of thickener was adopted, further reducing resistance. This also made the grease harder, which facilitates the grease shifting to a more optimal position within the bearing, thereby reducing stirring resistance when the balls are rolling.



Profitability and Management of Planned Maintenance

Based on its global and decades-long experience, TGM enables an efficient planned shutdown



“Time is money”, said Benjamin Franklin, and this is even more evident on programmed shutdowns. In an increasingly competitive and constantly changing environment, an excellent maintenance management, flexibility and knowledge are essential. The planned purchase, which is, the anticipated purchase of parts and

maintenance services, allows a quick service and enables the delivery of equipment within the established terms with quality assurance, from disassembly to commissioning tests

The main benefits of Planned Maintenance are: operational reliability, cost reduction, less time in field assembling, improvement in the machines' efficiency, contributing substantially to the continuous quality and safety improvement and increased availability in turbines, gearboxes, medium and large generators and motors.

Good manufacturing, maintenance and overhaul practices are frequent at TGM, aiming to extract the maximum utilization and operational availability of each equipment, both TGM and other brands.

Highlighting its commitment, TGM promotes a differentiated service and apply total reliability in the work performed to raise the profitability levels of the plants in the 2021 harvest.

Based on its global and decades-long experience, TGM enables an efficient planned shutdown, with services for prevention, recovery, modernization and replacement of parts, increasing the equipment lifetime, profitability and reliability of your company.

New Metguard PRO

The New METGUARDPRO METATARSAL PROTECTOR is a safety footwear attachment which protects the metatarsal area of the foot. Extended design compliments steel toe cap and regular safety footwear. In addition to covering the metatarsal area of the foot, it extends to the toe area as well to give a more complete upper foot protection. Same patented design as the original METGUARD, the METGUARDPRO can be used with existing foot laces or option straps. The METGUARDPRO helps protect the upper foot by deflecting and dispersing the impact of falling loads.



Han-Modular® - New (Shielded) Modules for Future-Proof Power, Data & Signal Transmission

Han-Modular® stands for the combination of power, data and signals – like no other connector. In fact, the series established the trend towards modular connectors. The system is not only highly versatile, but also flexible and future-proof. New and future requirements can be rapidly and conveniently integrated into the existing modular system.

Higher power transmission with up to 300 A / 1200 V

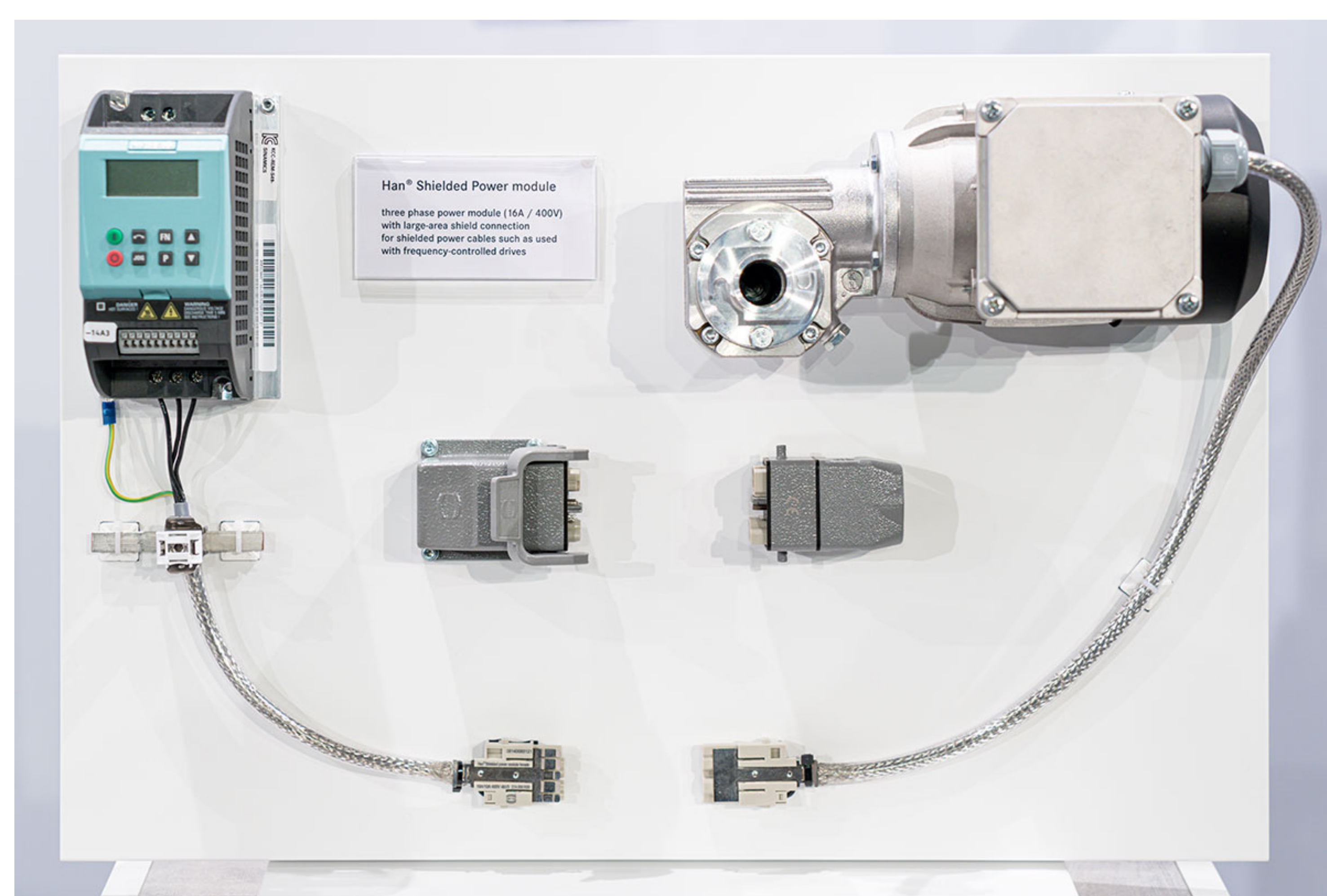
The market for energy storage systems is currently undergoing a very dynamic phase. Existing requirements are changing, new requirements are being added, while power density is on the rise and systems must become more efficient at the same time.

With these demands in mind, HARTING has developed the 300 A module, which is downward compatible with the proven 200 A module. Consequently, the new

module can also be plugged into the 200 A module (in which case only the lower rated power would be available). Therefore, existing systems can be easily upgraded. The new module is designed so that both direct connections to a busbar and installations in slide-in systems are easily possible. The market requirement for the module to be touch-proof on both the socket and pin sides is also met.



Creating modular interfaces for shielded lines



The new Han® Shielded power module has three power contacts and one PE contact for connecting typical three-phase loads. It also has two signal contacts for temperature monitoring, brakes, etc., as well as a large shield that allows EMC-compliant connection of the cable shielding directly to the module. It represents an alternative to the hardwiring of shielded power lines while also allowing such connections to be made

alongside other modules in the Han-Modular® series in one hood or housing. HARTING has tested the new module in practical applications in the EMC laboratory: the EMC characteristics of the shield in the Han® Shielded power module are entirely suitable for typical drive applications such as frequency-controlled three-phase motors or other loads. This makes it possible to plug in shielded power lines and it is easy to use and allows direct connection of the shield to the module. As a result, installation times for machines and systems are shorter, whether in a factory or at the end customer's site.

Tungaloy's New HPC-SpinJet Ramps Up RPMs for Small Cutters with Higher Coolant Pressure

Tungaloy has expanded its SpinJet coolant-driven, auxiliary high speed spindle series to include the HPC SpinJet line that utilizes coolant pressures of up to 7 MPa (70 bar, 1,015 psi).



Easily adaptable to the spindle of existing CNC machines, the SpinJet provides instant enhancements in machining performance using small diameter cutting tools. No additional machine purchase or modifications are required: the SpinJet utilizes the machine's existing through-spindle coolant supply as a pressurized power source to drive the

internal turbine for cutting tool rotation, eliminating the cost and nuisances of external air or electric power supplies. This feature gives the SpinJet a compact and smart design, allowing it to be stored in a machine's ATC or tool magazine when it is not being used and installed on the main spindle as with any other standard tool.

The new HPC SpinJet harnesses higher coolant pressures in a range of 4 to 7 MPa (40-70 bar, 580-1,015 psi), rotating the turbine as fast as 45,000 RPMs. With enhanced internal turbine and bearings for higher torque output, the HPC SpinJet can handle various rotating tools in up to 3 mm diameter.

HPC SpinJet boosts productivity when compared with conventional spindle setups. For example, with a conventional spindle setup, a small tool cutting process had to be done using another dedicated high speed spindle machine due to insufficient spindle rotation. HPC SpinJet will eliminate the need for workpiece transfer, thereby keeping the process chain intact for better machine downtime and operation efficiency.

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KEMET Releases New Tantalum Polymer Capacitors for Applications Requiring High Capacitance and High Voltage



KEMET (“KEMET” or the “Company”), a subsidiary of Yageo Corporation (“Yageo”), a leading global supplier of electronic components, continues to develop and design solutions suited for alternative energy, industrial/lighting, medical, defense and aerospace, and telecommunications applications with the new Tantalum Stack Polymer (TSP) O 7360-43 and the 82uF/75V rated voltage extension in Polymer Hermetically Sealed. The TSP series is designed to provide the highest capacitance/voltage (CV) ratings in surface mount device (SMD) capacitors with its innovative stacking construction. These new capacitors are well suited and sized for use in high voltage power management applications such as buck boost converters, filtering, hold-up capacitors, and other high ripple current applications that require a small form factor, stable performance, and long operational lifespan.

KEMET’s KO-CAP® High Reliability Series T540, T541 and T543 are all available for stack configuration in the TSP series. When stacked, these capacitors allow design engineers to customize for capacitance, voltage, and low ESR (equivalent series resistance). This feature makes the TSP series ideal for devices using Gallium Nitride (GaN) semiconductor technology, including radar applications based on the Active Electronically Scanned Array (AESA) systems. The TSP series also offers improved derating conditions and larger capacitance to ensure a low failure rate for typical voltage levels, as well as multiple failure rate options when utilizing Series T540 and T541 in a stack configuration.

The TSP series is qualified for numerous applications, including airborne, grounded, and naval equipment where GaN radio frequency (RF) semiconductors are part of the design. According to a May 2020 report from Yole Développement*, the total defense market for GaN radio frequency (RF) applications is expected to grow at a CAGR of 22% and surpass USD 1 billion in 2025, while the total GaN RF market will reach over USD 2 billion in 2025. The report also states that application in AESA systems for radar and demand for lightweight devices for airborne systems are the main drivers of the GaN RF defense market. Furthermore, the TSP series can fully support other high power, high frequency, and long-life requirement designs in telecommunications and industrial applications.

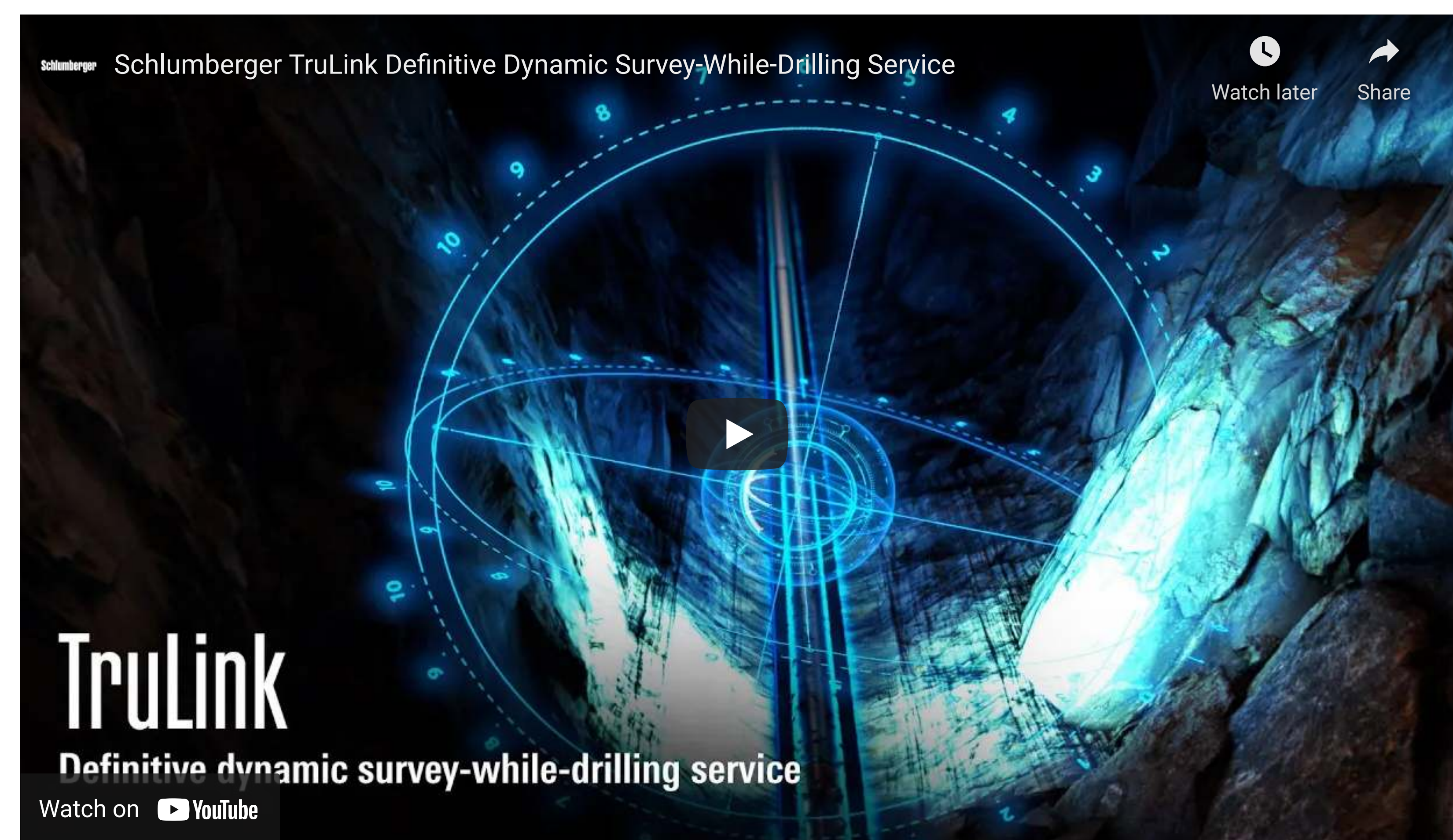


Schlumberger Launches Definitive Dynamic Survey-While-Drilling Service

TruLink service provides high-definition wellbore architecture surveys to enhance end-to-end well construction operations

Schlumberger introduced the TruLink* definitive dynamic survey-while-drilling service. The new service helps operators to enhance end-to-end well construction operations and reduce overall drilling costs by performing definitive dynamic surveys while drilling on bottom that are used to identify and mitigate potential drilling risks.

“TruLink service advances well construction operations and improves overall drilling performance through its unique, industry-first ability to perform measurement-while-drilling surveys on bottom without stopping drilling operations,” said Jesus Lamas, president, Well Construction, Schlumberger. “In addition, the new service delivers borehole data in real time, through every point of the well, which enables operators to react to potential drilling risks before encountered, thus improving overall drilling efficiency.”



The new dynamic survey-while-drilling service eliminates the need to stop drilling when taking a survey to map wellbore paths. This dynamic survey capability provides real-time trajectory control, which improves the accuracy of wellbore placement, reduces dogleg severity and creates smoother curves and laterals in the most complex well profiles. TruLink service incorporates new telemetry innovations that refine survey accuracy using continuous six-axis directional and inclination sensors in combination with gamma ray. Conventional definitive survey technology takes nine to twelve minutes per stand, whereas this definitive dynamic survey innovation reduces all survey-related rig time to zero.

TruLink service has more than 70 deployments in the Middle East, North Sea, and South America. In the Middle East, for example, TruLink service enabled the operator to land an 8 ½-in curve section with directional control and near-pinpoint accuracy, comparable to static measurement while drilling. In another example, definitive dynamic surveys run in the vertical, curve, and lateral sections saved an operator an average of 41 pumping hours while acquiring 1,041 surveys.

ADS PA-100 Telephone Paging Manager



The ADS PA-100 Telephone Paging Manager offers voice paging via a telephone through a public address system. It can be connected to a 2 – wire analogue telephone extension port, or if a VOIP system is in use an analogue telephone adaptor is readily available. There is an RCA audio output to the public address system, plus relay output for contact closure for switched voice priority if available.

By using “Store and Forward” the ADS PA-100 eliminates the possibility of feedback caused by an omni directional microphone in the telephone handset. The user’s voice message is recorded and upon pressing a button on the handset is broadcast via the public address system.

The ADS PA-100 also offers many more features, including the ability to review a message before sending. In addition, up to 9 pre recorded messages can be stored on the internal SD card in MP3 format, for playback via the telephone keypad. This allows messages for school lockdown to be triggered, for example.

A single pre-recorded message can also be stored and triggered from a volt free contact (like a bell push) – this could be ideal for example for an alert for a caller at the door. The ADS PA100 features a built-in loudspeaker for monitoring messages as they are broadcast.

- Store and forward (max message length 40 seconds).
- 9 user messages selected from phone keypad.
- 1 user message triggered from volt free contact or button on device.
- Output to PA system.
- Access relay for PA input.
- User pre-announcement chime.
- Internal monitoring loudspeaker.
- Volume controls for recording, recording play and message play.

Emerson's New Motion Control Portfolio Delivers Flexibility, Scalability and Reliability

High-performance integrated motion control line designed to improve efficiency and throughput in range of packaging, printing and food and beverage applications



Emerson announced its new PACMotion™ servo motion control portfolio to offer an integrated automation solution for high-performance industrial applications. The portfolio includes a new motion controller that connects directly into the PACSystems™ RX3i programmable logic controller backplane for high-speed, high-precision performance with synchronized motion for up to 40 coordinated axes, enabling end users to scale up their motion systems without sacrificing performance.

The complete PACMotion portfolio includes motion controller, servo motors, servo drives and motion configuration software for applications in packaging, printing, material handling, semiconductors, food & beverage, and general manufacturing. The new PACMotion PMM345 motion controller operates exclusively with PACSystems™ RX3i controllers, simplifying the architecture for seamless integration, while enabling higher speeds and greater precision.

Emerson's patented technology enables precise, jerk-free positioning, preventing material slippage and production losses and improving machine efficiency. On-the-fly electronic reconfiguration allows users to implement rapid changeovers without stopping production to deliver shorter production runs and increased machine utilization.

"Our comprehensive control and motion portfolio simplifies design, development and commissioning with a single platform and toolset for discrete and hybrid manufacturers, and when combined with Emerson's industrial edge technology, enables customers to create intelligent machines with advanced IIoT capabilities for even greater productivity and efficiency."





Advance Canvas Industries Pte Ltd

Fabric bellows provide maximum protection in rugged industrial environments and prevent foreign particles from entering the hydraulic or pneumatic systems of the precision equipment inside.

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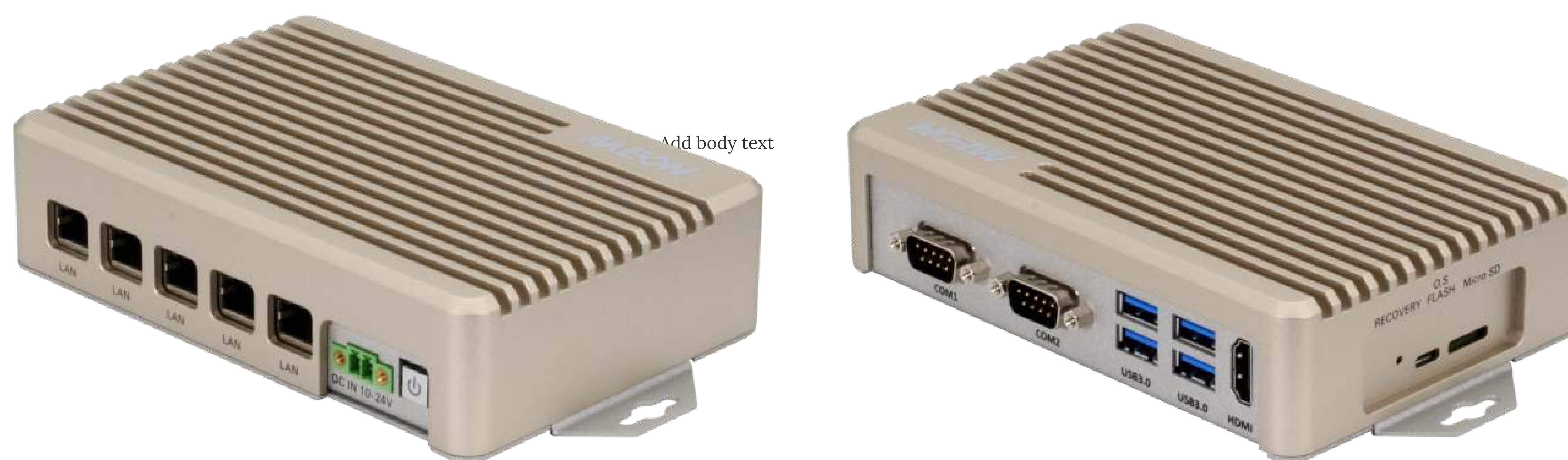
Website: www.adcanvas.com.sg

BOXER-8250AI: The Solution Built for Powering AI Edge Computing

The BOXER-8250AI brings the power of NVIDIA® Jetson Xavier™ NX in a flexible edge computing system built for AI acceleration.

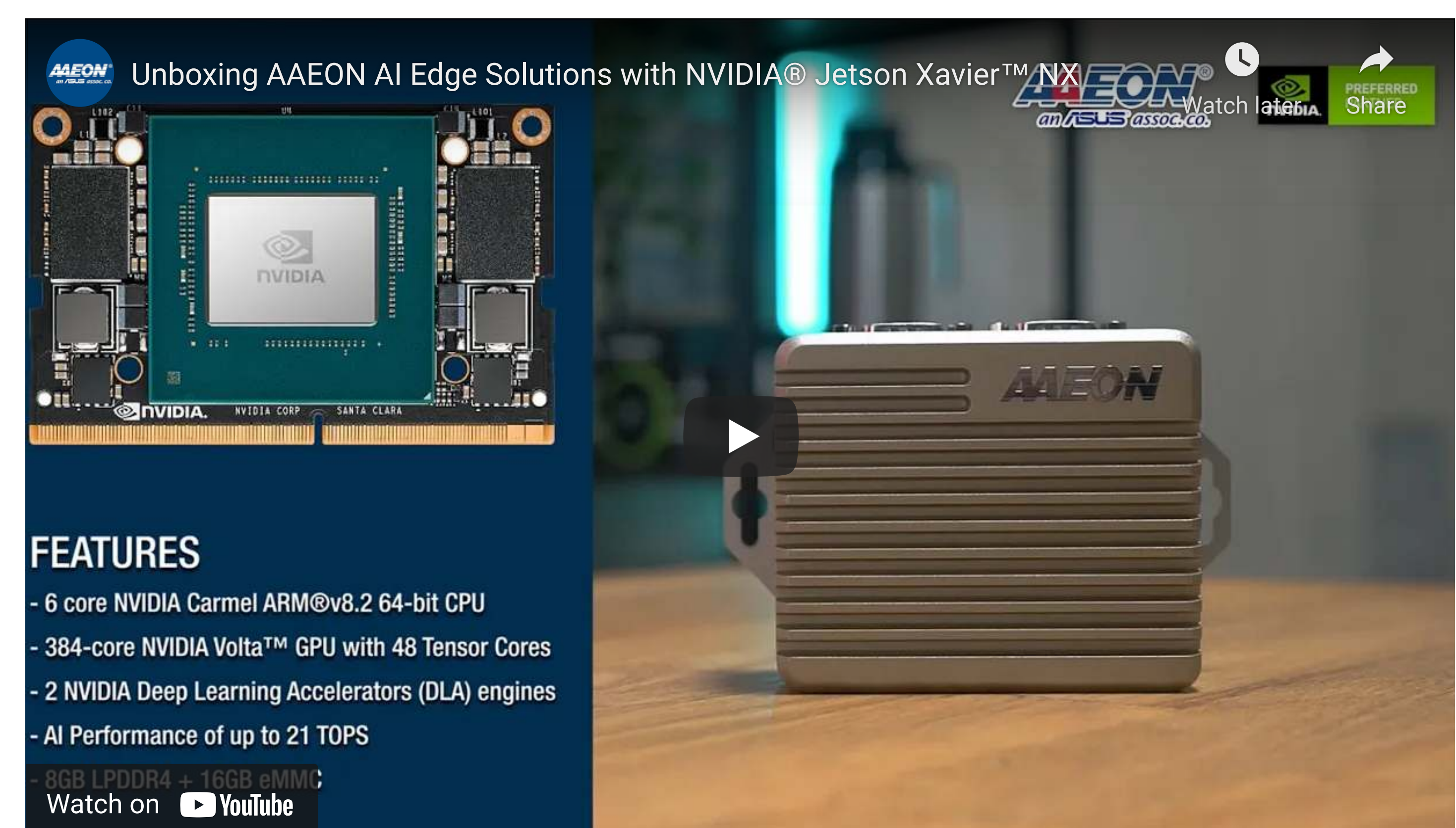
AAEON, a leader in AI edge solutions, announces the release of the BOXER-8250AI AI Edge box PC powered by NVIDIA® Jetson Xavier™ NX. With a rugged design and I/O layout featuring five Gigabit Ethernet ports, the BOXER-8250AI is perfect for powering edge networks and deploying intelligent applications from mask detection to virtual fences.

The BOXER-8250AI is powered by the innovative Jetson Xavier NX from NVIDIA. Featuring a six-core 64-bit ARM processor, it boasts 384 CUDA® cores, 48 Tensor Cores, and two NVDLA engines capable of running multiple neural networks in parallel, delivering accelerated computing performance up to 21 TOPS. Built to bring dedicated AI processing to the edge, the system also features 8GB of LPDDR4 memory and 16GB of onboard eMMC memory that's expandable through the Micro-SD card slot.



The key feature of the BOXER-8250AI is its five Gigabit Ethernet LAN ports, designed to interface with high-speed cameras without delay or compromise of stream quality. Each port is designed to deliver 1 Gbps speeds individually, maximizing overall quality of performance. With the power of the NVIDIA Xavier NX SoC, the BOXER-8250AI can process multiple inputs and inferences in parallel, allowing a single BOXER-8250AI system to provide wider coverage and greater control wherever it's deployed. The system also features four USB 3.2 Gen 1 ports and two COM ports allowing flexibility in connecting devices to the system.

AAEON brings industry leading embedded computing design to the BOXER-8250AI, creating an embedded AI Edge system that's built to deploy just about anywhere. Fanless design keeps dust and other particles out, helping the system to run reliably and reduce maintenance costs. The system also offers wide operating temperature range, providing consistent computing performance in temperatures from -10°C all the way to 65°C.



A New Generation of DC/DC Converters

Fuel cells play a key role in the transition to renewables in power and mobility. But the energy efficiency of these cells poses a major challenge, particularly in automotive engineering. The individual components need to be as light and small as possible, yet attain a high efficiency factor. One such component is the DC/DC converter that modulates the fuel cell's voltage to suit the drive and controls the flow of energy. Conventional wisdom held that it would be impossible to develop a smaller yet more efficient converter. Researchers at the Fraunhofer Institute for Integrated Systems and Device Technology IISB defied that convention, making the impossible possible by developing a new generation of DC/DC converters that meet precisely these requirements. This stride into the future has won the researchers the Joseph von Fraunhofer Prize.

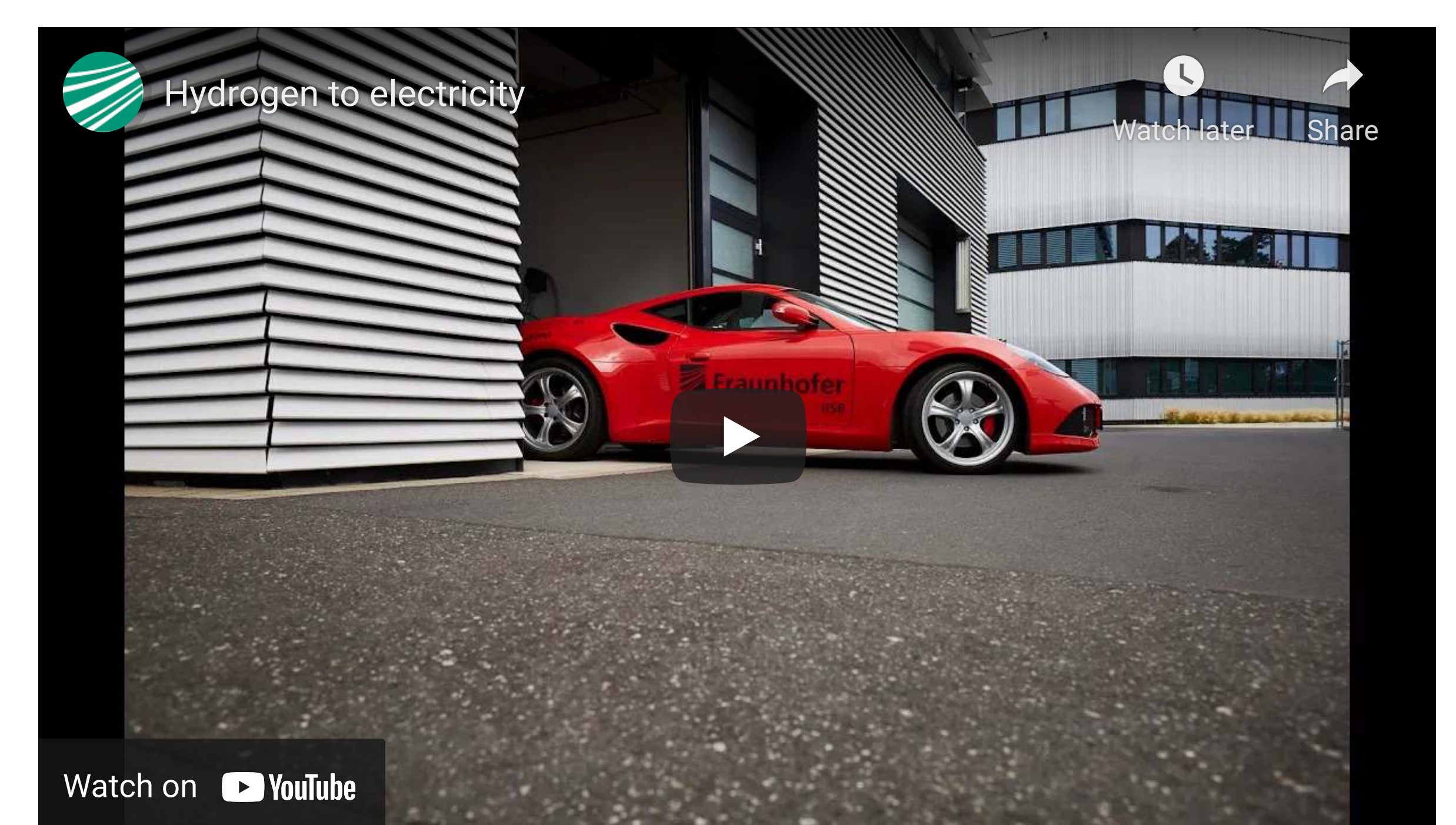


A quick trip to the supermarket or into the city? Battery electric vehicles get the job done well when it comes to short distances. But a fuel-cell drive that converts hydrogen into electricity looks to be the more promising prospect for commercial vehicles, aircraft and ships. However, this requires many components, and they all have to be smaller and lighter to

make the vehicle as energy-efficient as possible. One of these components is the DC/DC power converter. It adapts the fuel cell's voltage to the drive and controls the flow of energy.

Efficiency increased, losses halved

Dr. Bernd Eckardt and Dr. Stefan Matlok from the Fraunhofer Institute for Integrated Systems and Device Technology IISB in Erlangen have developed a DC/DC converter that achieves very high efficiency despite its extremely compact footprint – and have garnered the Joseph von Fraunhofer Prize for their accomplishment. The jury hailed the outcome of this effort for its future relevance and successful commercial application. “While conventional DC/DC converters have an efficiency of around 97 to 98 percent, ours achieves up to 99 percent,” says Eckardt. “This may not sound like much at first, but it means that the losses are more than halved – and every tenth of a percent matters.” After all, 200,000 watts of power flow through the converter. A loss rate of one percent would mean that two kilowatts of power dissipate in the form of heat.



IQD Launches New Variable Supply Voltage Oscillator



Many of today's industrial and consumer applications require batteries as power source. Therefore, products need to handle a change in voltage as the battery discharges. This can lead to design issues when using a standard oscillator with a fixed supply voltage. A discharging battery may cause a decrease in the source voltage, which consequently

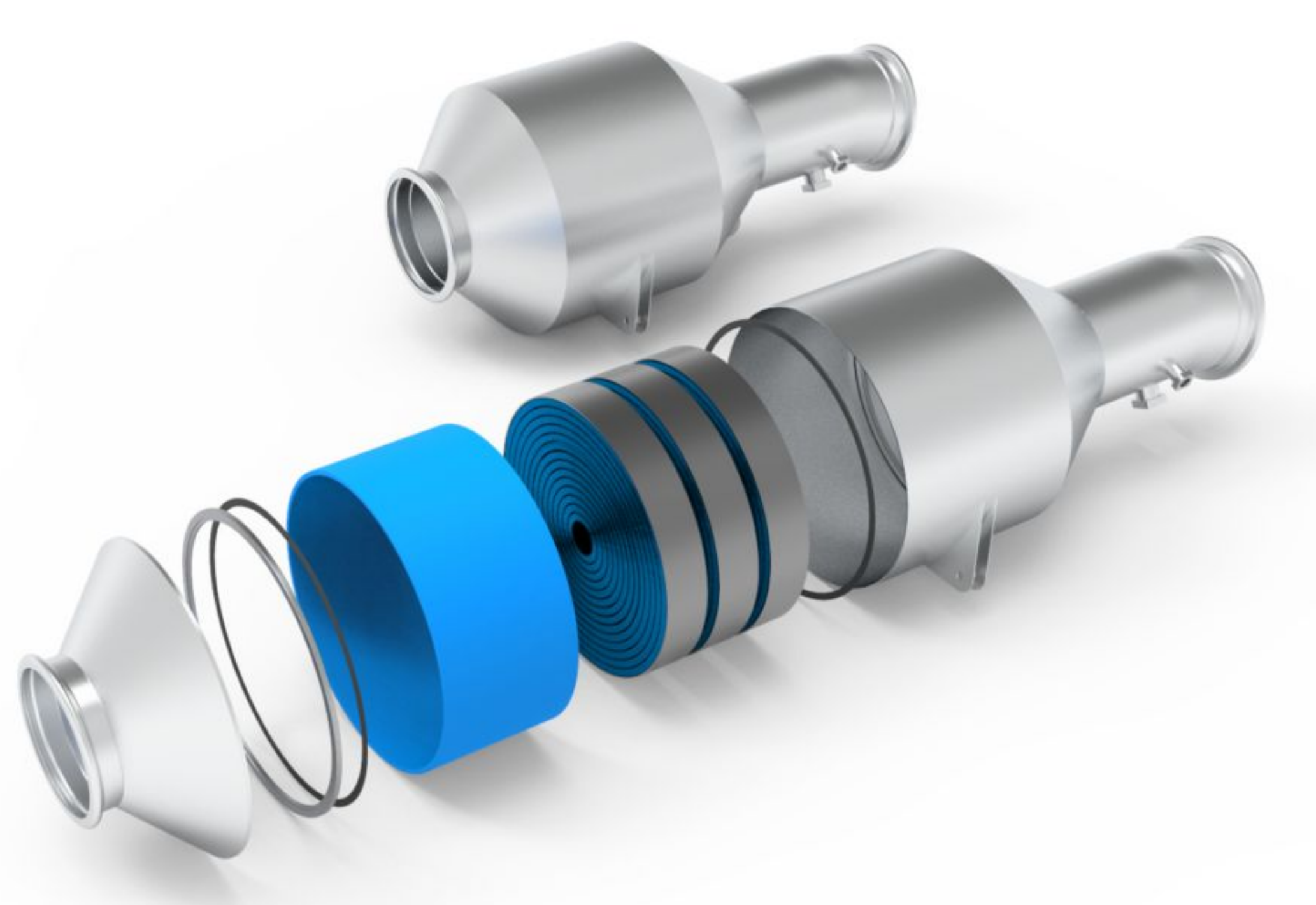
change the frequency of the oscillator. Following this, the timing accuracy within the application will decline.

IQD Frequency Products is pleased to launch its newest standard packaged clock oscillator series, the IQXO-951, which operates with a supply voltage range from 1.6 V to 3.3 V. The IQXO-951 is available in industry standard packages of 3.2 x 2.5 mm, 2.5 x 2.0 mm and 2.0 x 1.6 mm. It will allow electronic equipment manufacturers to benefit from standard stability of ± 25 ppm over the industrial temperature range from -40 to 85 degrees C. Moreover, parts are also available with extended temperature range up to -40 to 125 degrees C.

The new clock oscillators are suitable for most applications that are designed for battery-powered products. In addition, customers could reduce their BOM management by using a single part instead of multiple oscillators with fixed supply voltages. Common markets for these applications are Telecommunications, IoT, medical and many others.

Combined Hydrocarbon Ozone Coating (CHOC4)

The fourth-generation Honeywell Combined Hydrocarbon Ozone Coating (CHOC4) is a recoat/recore upgrade for ozone converters that eliminates ozone and significantly reduces odorous compounds from bleed air. This contributes to cleaner cabin airflow and safer, more reliable operations.



Our revolutionary CHOC4 technology is up to three times more efficient at odor reduction than existing ozone converters, eliminating greater than 90% of odor-causing Volatile Organic Compound (VOC) contaminants from bleed air. Further, it can operate at lower temperatures than legacy ozone converters and exceeds OEM ozone conversion life requirements.

TAIPEI CYCLE D&I Awards 2021

The TAIPEI CYCLE D&I Awards 2021, one of the most highly respected design competitions for the international cycling industry, now is opened for entries! This competition invites all manufacturers and designers from the cycling industry to enter their designs and innovations.

Categories

- ➔ Complete bicycle
- ➔ Parts and components
- ➔ Cycling accessories
- ➔ E-bikes & drive units
- ➔ Smart cycling services



Submission requirements

A short description of the product, its function and design in English and 2 product images will be used to help jury arrive at their decision. Entries of category "Smart Cycling services" must be submitted either as physical items or as digital media. For digital entries, please provide a PDF file or a media link (URL).

Prize

All winners will receive the TAIPEI CYCLE d&i awards 2021 logo and will be invited to receive certificates/trophies on stage at the award ceremony.

As well winners will be presented in the TAIPEI CYCLE and TBA official website as well as 'iF WORLD DESIGN GUIDE', the largest design platform worldwide.

Furthermore, winning entries will be published in printed materials such as postcards which will be delivered to international media representatives, buyers and visitors during the TAIPEI CYCLE show.

For more information: <https://www.infodesigners.eu/contests/taipei-cycle-d-and-i-awards-2021/7394#:~:text=The%20TAIPEI%20CYCLE%20D%26I%20Awards%202021%20%2C%20one%20of%20the%20most,enter%20their%20designs%20and%20innovations.>

The Engineering Medical Innovation Global Competition (EMedIC Global)

EMedIC Global is a global challenge in which teams of university students design and develop clinically-driven and client-centered engineering innovations for the future of medicine & healthcare.

For more information:

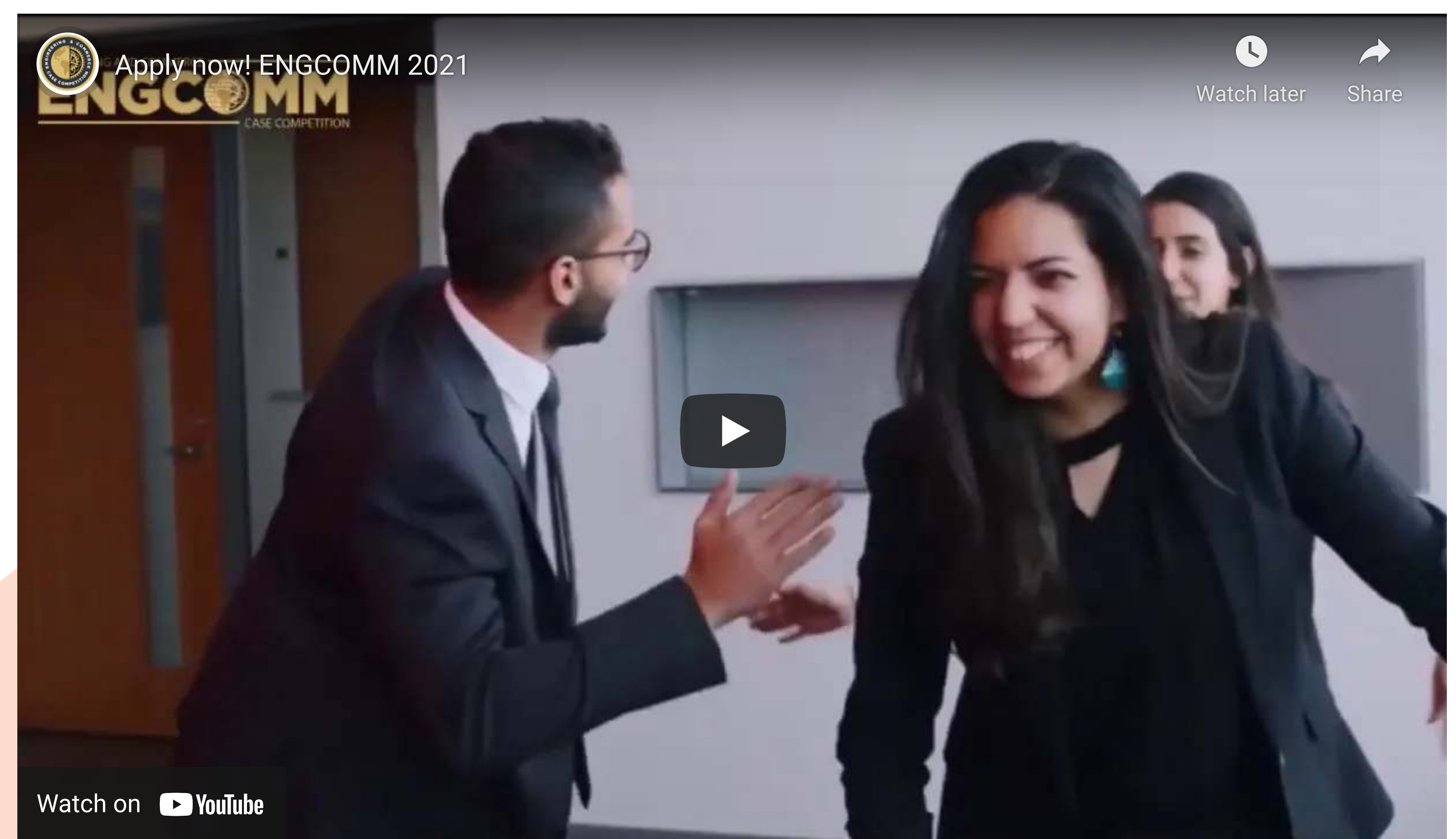
<http://www.emedicglobal.org/>



ENGCOMM 2021

ENGCOMM is the world's only student-led multidisciplinary case competition. Since 2013, we have been championing a worldwide effort to combine the technical field of Engineering with the interactive field of Commerce.

Schools from around the world will be able to participate remotely and will be able to experience the best that our competition has to offer, simply from a distance. Our team is working together to transform this competition, generally held in Montreal QC, to a new platform that allows for online case solving. We will be adopting new technologies and working towards the most innovative way to continue our mission of “bridging the gap” between the Engineering and Commerce disciplines. This decision was made as we value our participant’s safety, however given this competition’s mission holds values we strongly believe in, we are not ready to take a year off. Get ready for our 2021 competition, we promise it will be a year that goes down in ENGCOMM history.



For more information:

<https://www.engcomm.ca/>

The Challenge 2021: “Preserving Planet Earth”

The Spellman HV Clean Tech Competition is back and beyond excited for our 10 year anniversary Competition! It seems that every year the need for a sustainable future powered by clean technology becomes increasingly necessary and more apparent. While the overall story may seem negative, we at the Competition have immense hope for the future and that is powered by all the incredible entries we see submitted year after year from young scientists! Which is why we have chosen this years theme.

This year’s Categories are:

- Low Cost
- Abundant Resources

For more information:

<https://www.cstl.org/cleantech/the-challenge/>

Prize

- 1st lace - \$10,000
- 2rd Place - \$7,000
- 3th Place - \$5,000
- 4th - 10th - \$1,000 each



Green Product & Concept Award Call 2021

Green Product and Concept Award Call 2021 – Make it personal!

The awards are for products & services as well as concepts that stand out in terms of design, innovation and sustainability. The

awards offers a common platform for established companies, start-ups and students to introduce themselves to a professional network and to the public in Germany. Active matchmaking takes place among the participants and with the partners in order to initiate joint projects and cooperations, to create jobs and to promote the exchange of knowledge and the use of new methods.



Green Product Award

Award Timeline

1 Sept - 31 Oct 2020 11:59 PM

- Regular Bird submission phase

1 Nov - 30 Nov 2020 11:59 PM

- Late Bird submission phase

19 Dec 2020

- Publication of the nominees

19 Dec -31 Jan 2021

- Public voting period. Parallel: Jury evaluation

10 Mar 2021

- Award Ceremony in Munich, Publication of the Green Trend Book

10 Mar - 14 Mar 2021

- Exhibition at IHM – International Craft Fair, Munich

For more Information: <https://www.gp-award.com/en/blog/posts/award-call-2021>



ASME E-Fests® in 2021

ASME is excited to host an E-Fest Digital event in April 2021. E-Fest Digital will include career and professional development content, digital competitions (including the Human Powered Vehicle Challenge, the Student Design Competition, the Innovative Additive Manufacturing 3D Competition, the Oral Competition and the Elevator Pitch Competition) and much more!



All ASME conferences, meetings and events scheduled through December 2021 are being planned as virtual only, enabling everyone to enjoy the full benefits of participation via our virtual event solutions with no physical presence required.

For more information: <https://efests.asme.org/>



Fabrication Technology Indonesia

www.imt-indonesia.com

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Bosch Polls Europeans About The Future of The Powertrain: Respondents in Favor of Variety



BOSCH
Invented for life



According to a representative survey conducted in June 2020 by the market research institute Innofact on behalf of Bosch, no powertrain types have lost any of their relevance – whether batteries or fuel cells, gasoline or diesel engines. If the 2,500 survey respondents in Germany, France, Italy, and the U.K. had to decide on a new car tomorrow, one in two would opt for a stand-alone combustion engine for their primary car and around one in three for their second

car. However, when asked what would be the most prevalently used powertrain in 2030, some 68 percent of those polled see the electrical powertrain in pole position, ahead of hybrids and combustion engines. Survey participants acknowledged the potential of fuel cell-powered cars, with around one in three seeing the fuel cell as the future of mobility. “Electric mobility is on its way – and that’s good news. This year alone, Bosch is investing 500 million euros in this domain. At the same time, we’re also continuously refining the internal combustion engine – because it’s still needed,” says Dr. Stefan Hartung, member of the Robert Bosch GmbH board of management and chairman of the Mobility Solutions business sector.

Rohde & Schwarz Provides External Communications for RAN AORs

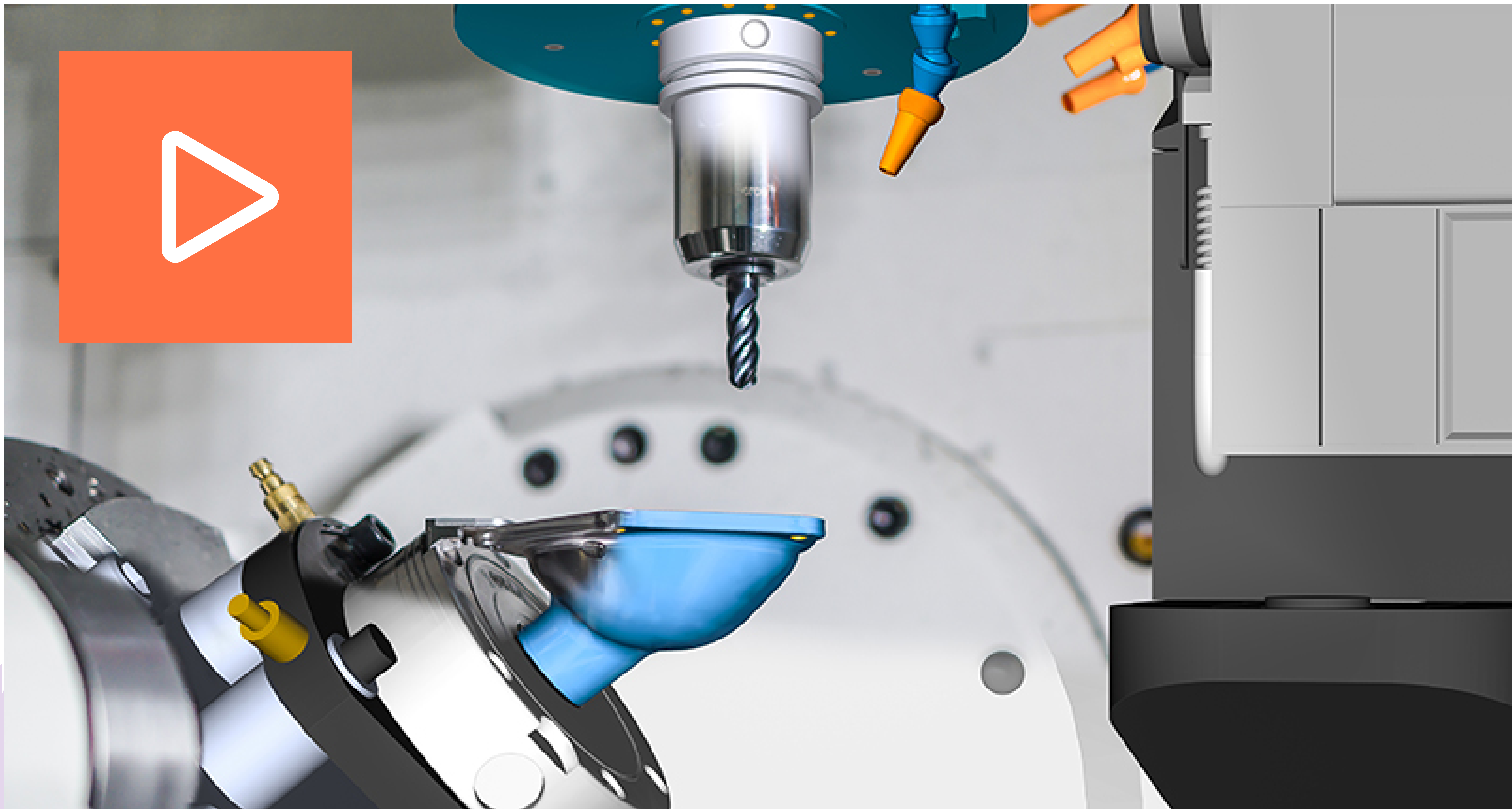
Rohde & Schwarz contracted by Navantia to provide secure communications for Royal Australian Navy (RAN) auxiliary oiler and replenishment ships (AOR).



Rohde & Schwarz successfully delivered the second external communications system for the Royal Australian Navy (RAN) auxiliary oiler and replenishment ships (AOR). Under a contract with Navantia, Rohde & Schwarz provides line of sight and beyond line of sight communication capabilities for RAN’s HMAS Supply and HMAS Stalwart.

The systems consist of R&S M3SR software defined radios R&S Series4100 HF and R&S Series4400 VHF/UHF). All HF transceivers and receivers are HF wideband ready for future data communications. System racks were delivered to Navantiás shipyard in Ferrol, Spain, for integration and testing onboard the ships.

Hexagon Enhances Its Smart Manufacturing Solutions Portfolio with The Acquisition of D.P. Technology Corp



Hexagon AB, a global leader in sensor, software and autonomous solutions, announced the signing of an agreement to acquire D.P. Technology Corp. (“D.P. Technology”), a leading developer and supplier of computer-aided manufacturing (CAM) technology. The ESPRIT CAM System, its flagship solution, is the smart manufacturing solution for any machining application. Supporting any class of CNC machine via a common interface and workflow, it provides high-performance CNC machine programming, optimisation, and simulation for a broad range of precision manufacturing applications. Well known for its machine-optimised, edit-free G-code (toolpath), ESPRIT leverages a digital twin simulation platform to model the finished part, tools, and CNC machine. AI-based algorithms eliminate manual data input and provide machine operators with greater assurance of what will happen on the shop floor. The result – simplified programming, increased tool life and utilisation, reduced cycle times and improved productivity.

“D.P. Technology is an innovator with a strong focus on building smarter, data-driven manufacturing solutions. When combined with our production software portfolio, it cements our market-leading position in CAM, particularly around CNC manufacturing processes, and accelerates the development of our Smart Manufacturing portfolio,” says Hexagon President and CEO Ola Rollén. “Additionally, the D.P. Technology team has built excellent working relationships with leading machine tool providers and other manufacturing technology experts, which will prove invaluable in our open and interoperable manufacturing ecosystem approach.”

Powering Toward A Zero-Carbon Energy System

Can tomorrow's energy supply be freed of CO2? Fraunhofer researchers want to answer that question with a consortium of partners in ZO.RRO, a joint project underway in the German state of Thuringia. They are developing a complex IT ecosystem to facilitate the systemic exit from fossil fuels – a package of IT solutions designed to slash greenhouse gas emissions. This research venture centers on system services, which account for up to 20 percent of CO2 emissions. Germany is off to a good start on its journey to renewable power generation. As the nation's exit from fossil fuels enters the second phase, the focus is shifting toward reducing energy consumption and carbon emissions. This is what ZO.RRO is all about. Short for Zero Carbon Cross Energy System, the joint ZO.RRO project aims to deliver carbon-free energy to the Free State of Thuringia. The partners in this project are looking at the bigger picture of interconnected electricity, heat and gas grids – which experts call sector coupling. Unlike earlier projects that focused largely on supplying power, this venture is also addressing the impact of system services. Studies have found that they account for 20 percent of carbon emissions. System services are essential to keeping energy grids up, running and stable, and to restoring safe operations after outages.



The perfect energy mix for Thuringia

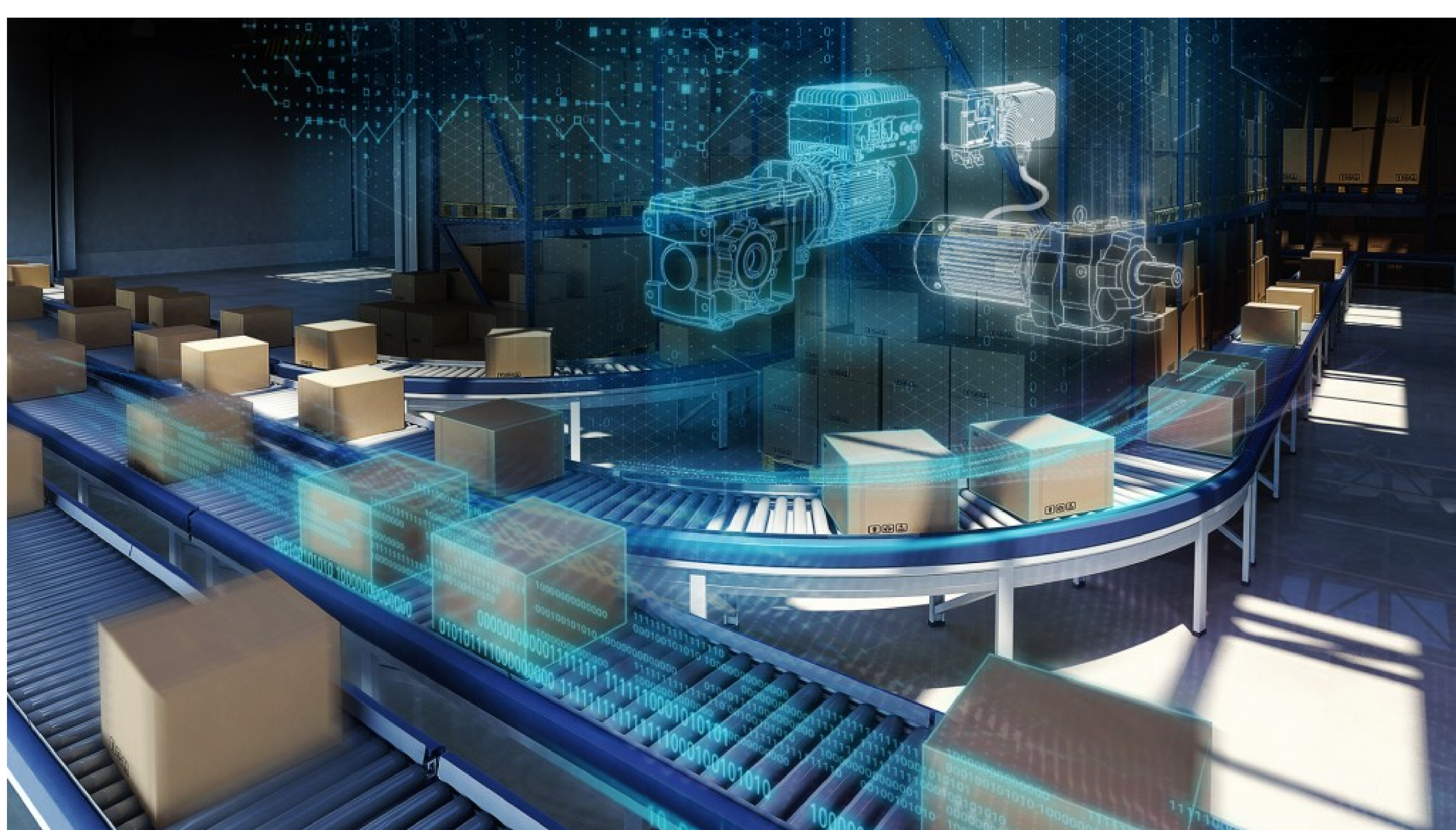
Researchers at the Advanced System Technology (AST) branch of the Fraunhofer Institute of Optronics, IOSB aim to make the most of heat, gas and electricity sector coupling to eradicate system services' carbon footprint. To this end, they are developing a complex IT ecosystem comprising hardware and software solutions. Their first step is to model the optimum mix of technologies for Thuringia. They are considering two scenarios: renewable energy systems and storage and hydrogen technologies figure prominently in the more innovative option. The conservative

alternative factors power-to-gas and gas-fired power plants into the energy equation. "Our goal is to make Thuringia's energy supply CO2-neutral by 2050 and to find the most cost-effective way of doing this. CO2 emissions are determined when the calculated cross-sector technology mix is sufficient for stable grid operations," says Steffi Naumann, a researcher and project manager at the Fraunhofer IOSB-AST.

New Sinamics G115D Distributed Drive System Specifically Designed for Conveyor Applications



With Sinamics G115D, Siemens presents a new, compact, and powerful drive system specifically designed for horizontal conveyor applications. The drive system comprises motor, frequency converter and gearbox in one unit and is offered in two versions – wall-mounted and motor-mounted. The Sinamics G115D drive system is characterized by a robust design with a high IP protection class (up to IP66) and is therefore also suitable for use in harsh environments. Thanks to its compact dimensions, the Sinamics G115D can be installed easily even in confined areas. The drive system can also be operated reliably over a wide temperature range of -30 to 55 degrees Celsius. The Sinamics G115D drive system is suitable for applications in intralogistics and airports as well as in the automotive and food & beverage industries and is available in the power ranges 0.37 to 7.5 kilowatts for wall mounting and 0.37 to 4 kilowatts for motor mounting. The drive system can be put into operation quickly and easily with comprehensive integration into the TIA (Totally Integrated Automation) portal including the Startdrive commissioning software, or the Sinamics G120 Smart Access Module (SAM) web server tool for setup and diagnostics. To be prepared for the digital transformation and to enable cloud-based analyses, Sinamics G115D is integrated into the entire MindConnect portfolio and is compatible with Mindsphere applications such as Analyze MyDrives.



Thanks to Profisafe, the Sinamics G115D has Safety Integrated in the form of STO (Safe Torque Off) SIL2, which standardizes and facilitates the certification process. For flexibility in terms of installation, service and maintenance, the solution is equipped with a plug-in connector and flexible connection possibilities. The device is particularly suitable for interaction with Simatic controllers such as the Simatic S7-1200 or Simatic ET200 for motion control. Siemens Offers Service Protect for the Sinamics G115D. As part of this service package, an additional one or two-year extension may be purchased for failure coverage. The package offers simplified processing under normal warranty conditions for the extended period.

Emerson Launches Unique Heat Staking Technology to Meet Growing Demand for Complex Plastic Parts

Branson™ GPX platform provides greater design freedom by enabling high-quality joins and superior aesthetics in a range of challenging applications

Emerson has introduced new heat staking technology designed to give manufacturers greater design freedom by enabling them to join more complex, delicate and sensitive components to plastic moldings. Using a unique pulse staking technology that optimizes the heat staking process, the Branson™ GPX platform produces high-quality joins, superior product aesthetics and energy savings in increasingly challenging applications.

Electronics, automotive and medical device manufacturers must produce more creative designs to meet rapidly changing market demand. This has led to an increase in challenging heat staking applications involving parts with more complex 3D geometries, closely aligned features and fragile or heat-sensitive components, such as soldered components or sensors, and using a greater number of blended, glass-reinforced, chromed and metallicized plastics.



The Branson GPX platform uses PulseStaker technology to provide instantaneous heating and cooling, with adjustable cycle times for optimized, low energy heat staking. The process creates no particulates or burn marks, and enables more delicate and sensitive parts, such as those with embedded electronics, to be joined with consistently high-performance finishes.

The advanced technology is suitable for all heat staking applications, including those with thermoplastic materials and metalized coated parts. A wide range of heat staking tip designs, which can be adapted to meet any stake welding requirement, and the ability to stake multiple points simultaneously provide manufacturers with greater design freedom.

“The automotive, electronics and medical industries require more complex, delicate and sensitive components to be joined to plastic moldings,” said Priyank Kishor, global product manager for Branson products at Emerson’s Automation Solutions business. “The unique heat staking process that the Branson GPX platform provides helps to meet this demand and offers manufacturers a broad range of benefits, such as superior product aesthetics and reduced energy use.”



Clark County Utilizes AI-enabled Solution to Help Residents Secure Critical Housing Assistance

IBM Watson Health Citizen Engagement is supporting Clark County to help thousands of residents struggling with housing payments due to the coronavirus pandemic get access to vital emergency funds

Clark County and IBM Watson Health (NYSE: IBM) today announced the deployment of the AI-enabled IBM Watson Health Citizen Engagement platform designed to help make vital social services, including housing assistance, available to residents impacted by the unprecedented shutdown of tourism, entertainment and dining in Greater Las Vegas. IBM collaborated with Clark County to deploy a suite of services including IBM Watson Health Citizen Engagement to help support Clark County's CARES Housing Assistance Program (CHAP) to allow citizens to register, apply, upload documents and receive funds set aside for emergency housing assistance.

The CHAP platform was designed and developed to adapt to the unique challenges presented by the COVID-19 pandemic. IBM Watson Assistant hosted on IBM Cloud provides residents with a dynamic AI virtual agent on the CHAP portal to ask questions and prescreen for the benefit program. Citizen Engagement portal design flexibility is designed to allow residents to apply and track their applications using various web browsers including mobile and tablets platforms.

The CHAP platform also supported remote processing – a priority given that most Clark County social services employees were forced to respond and process requests in a remote environment following the closure of government offices. The solution was deployed in just 11 weeks, a process that typically can take approximately eight months – a testament to the speed at which IBM technology can be deployed and the commitment from both teams to move fast and with a sense of urgency.

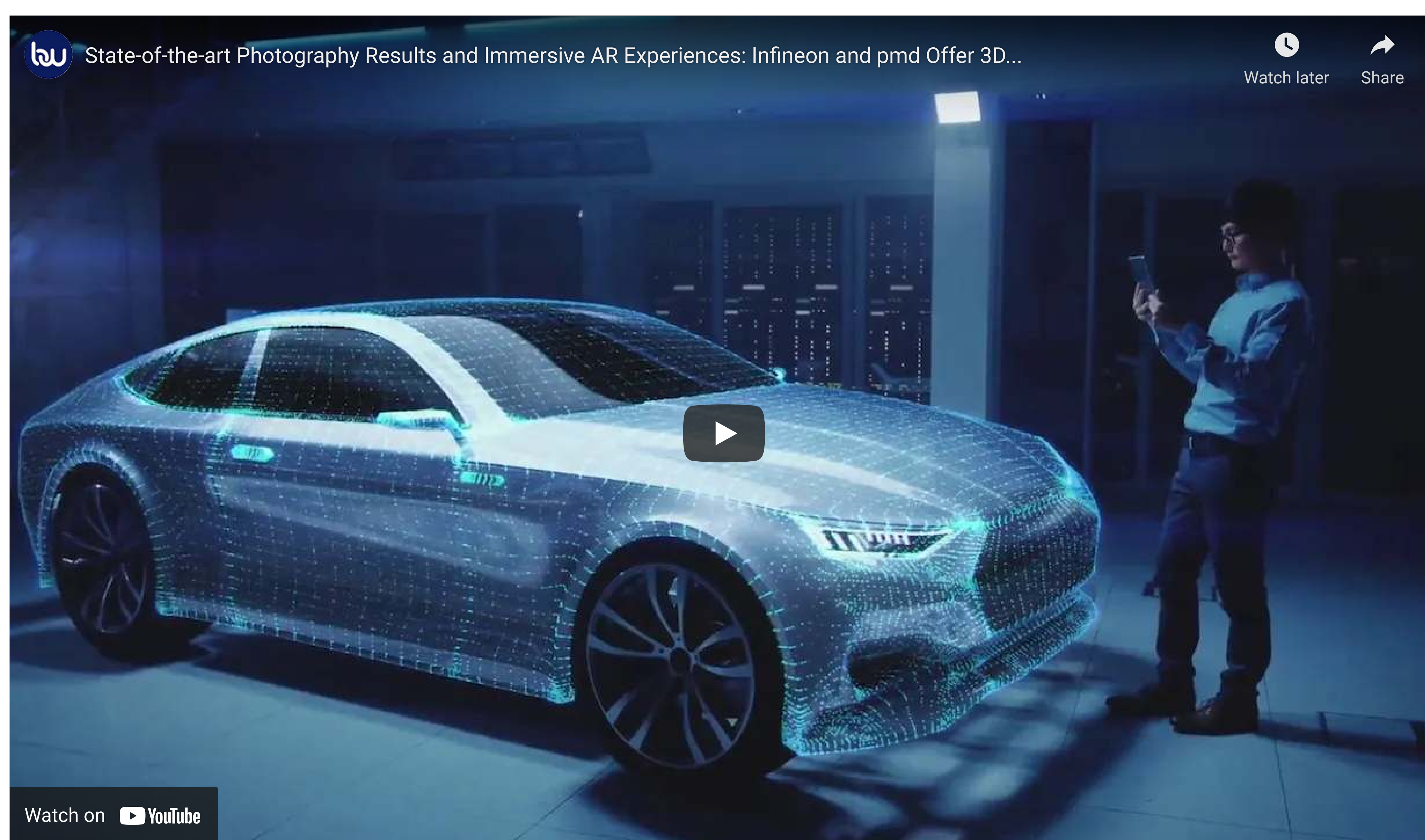
IBM Watson Health Citizen Engagement is a digital services platform for government that is designed to enable development and deployment of configurable, responsive and secured web applications built specifically for public services. Configurability provides the means to add, remove and modify functionality without costly and time-consuming coding – a key factor for emergency efforts. The solution is integrated with IBM Watson Assistant, which uses natural language processing to provide a human-centred experience and pre-built business processes for helping to manage citizens' interactions with government.

State-of-The-Art Photography Results and Immersive AR Experiences: Infineon and Pmd Offer 3D-Imager with Longest Range in The Market

Gaming, virtual e-Commerce, 3D online education: Augmented Reality (AR) applications with three-dimensional depth sensors link the real with the digital world and are strongly demanded. Infineon Technologies AG (FSE: IFX / OTCQX: IFNNY) and pmdtechnologies developed a 3D depth sensor based on the Time of Flight (ToF)-technology which outperforms other solutions in the market and aims for target applications that offer a wider spectrum of innovative consumer usability. The 3D sensor market in smartphones for rear side cameras is expected to grow up to more than 500 million units per year until 2024.

“The latest 3D image sensor from Infineon and pmdtechnologies enables a new generation of applications”, says Philipp von Schierstaedt, Senior Vice President Infineon Technologies AG. “It aims to create most immersive and smarter AR experiences as well as better photography results with a faster autofocus in low-light conditions or more beautiful night mode portraits based on picture segmentation. This latest chip development is truly setting standards when it comes to improvements of the imager, the driver and processing as well as unprecedented ten meters long range capabilities at lowest power.”

Extended photography features and AR usability on long range



Due to its flexible configurability the new REAL3™ ToF sensor enables differentiated camera performance in a wide variety of ranges, light conditions and use cases while saving battery's life in mobile devices. For various applications, the new sensor provides techniques like real-time augmented reality, long range

scanning, small object reconstruction, fast low power autofocus and picture segmentation. Effects such as background blur in videos and pictures from moving scenes are easily enabled without the need for post-photography processing and regardless of ambient light conditions.

Furthermore seamless augmented reality sensing experiences are being achieved, allowing for high quality 3D depth data capture up to a distance of ten meters, without losing resolution in the shorter range.

NEC and Analog Devices Collaborate to provide a 5G O-RAN Massive MIMO Radio for Rakuten Mobile



NEC Corporation and Analog Devices, Inc. (ADI) announced today that they have teamed up to design a 5G Network Massive MIMO Antenna Radio Unit for Rakuten Mobile. The radio unit

adopts ADI's fourth-generation wideband RF transceiver solution to achieve high precision Massive MIMO and possesses a 5G open vRAN (virtual RAN) interface corresponding to Rakuten Mobile's end-to-end fully virtualized cloud-native mobile network. It delivers large capacity transmission with high efficiency by using 3.7GHz frequency Massive MIMO and digital beamforming technology. The cloud-native virtual network heralds a major shift in how communications providers can offer high-speed internet access worldwide, at significantly lower costs, made possible without the maintenance, upkeep, repair and labor costs associated with the physical infrastructure that hinders conventional networks. NEC has already started shipping the 5G Network Massive MIMO Antenna Radio Unit to Rakuten Mobile.

ADI's fourth-generation wideband RF transceiver integrates quad channel transmitters, receivers and Digital Pre-Distortion (DPD) in a single chip. The radio is fully software reconfigurable and covers all sub-6GHz 5G frequency bands, simplifying radio designs.

"ADI's RF transceiver is expertly designed to support wireless applications such as Massive MIMO and small cell systems, simplifying system design, reducing size and weight, and minimizing power consumption," said Nozomu Watanabe, Senior Vice President at NEC. "Virtualization is a dependable and cost-efficient approach, and the world's leading telecom providers are pursuing it as the next evolution of communications. ADI's RF equipment allows us to provide the connectivity required to build an architecture that supports 5G full-spectrum systems."

NEC's 5G equipment utilizes highly accurate digital beamforming for efficient high-capacity transmission. The system also features seamless installation, achieved through circuit integration.

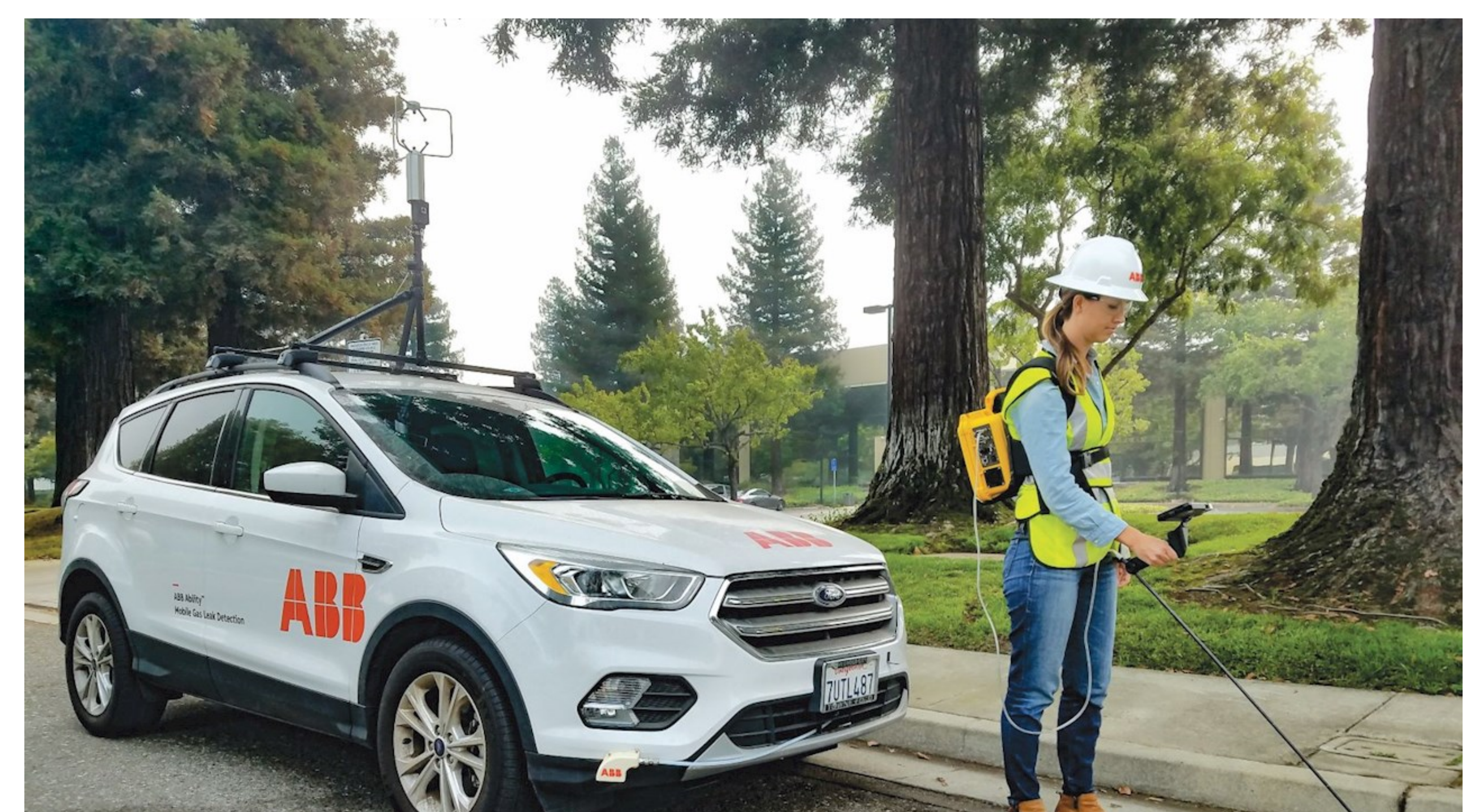
ABB Introduces First Comprehensive Gas Leak Detection Solution for Utilities to Help Safeguard City Populations

Leaking natural gas pipelines in urban environments can result in explosions and fires. The new ABB MicroGuard™ solution will work alongside ABB's MobileGuard™ to pinpoint dangerous gas leaks. Faster and easier detection with this patented laser-based technology will help reduce fatalities, environmental damage and material loss.

Governments around the world are seeking to reduce the inherent risks of gas leaks to public safety and the negative impact on global warming. ABB's new portable MicroGuard complements ABB's MobileGuard, the vehicle-based gas leak detection system currently used by many utilities globally. Combined, they provide a unique solution for an entire natural gas infrastructure. MicroGuard can be used as a stand-alone device but becomes even more powerful when reading the maps generated by MobileGuard to enable surveyors to quickly find leaks on foot, generally within minutes. LGR-ICOS™ laser absorption technology constitutes the analytical engine at the heart of MobileGuard and MicroGuard, and provides fast, highly sensitive measurements in air that enable us to distinguish quickly and reliably between naturally-occurring methane – from livestock or landfills, for example – and gases leaking from a buried pipe or other potentially dangerous source.

The solutions can generate and share digital reports in real-time on a user-controlled and secure Cloud server and, most importantly, continuously maintain rigorous cybersecurity protocols. The field data and comprehensive reports generated allow crews to intelligently prioritize resources and repairs.

The ABB patented technology has also been developed for ABB's HoverGuard™* that can be mounted on an aircraft or UAV (unmanned aerial vehicle) to survey locations that are inaccessible by vehicles or technicians, and ABB's EverGuard™* for fixed locations which can continuously monitor high-risk areas in well pads, gathering lines, pipelines, factories, distribution stations and storage facilities.



Intel’s Biggest Virtual Launch: Tiger Lake Unveiled Amid COVID-19

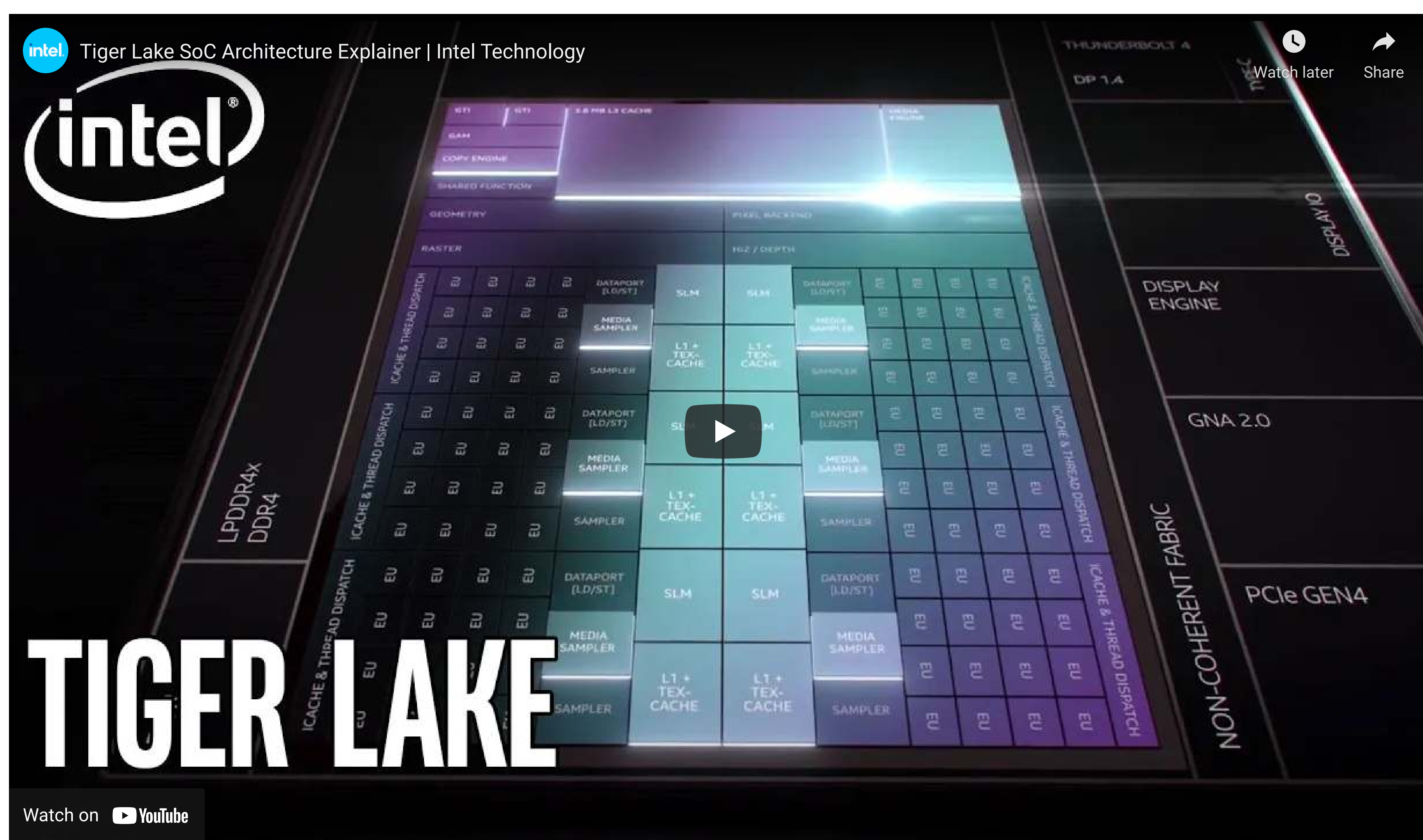
‘Extended Reality’ Now a Reality

Intel’s launch of its “Tiger Lake” processor was by far the company’s biggest virtual event since the global COVID-19 pandemic halted large in-person gatherings and added social distancing measures. And it was the industry’s first to be produced on a sophisticated extended reality – or xR – stage.

At Intrepid Studios, a production firm north of San Francisco, Bryant and his executive teammates relied neither on traditional PowerPoint slides nor on old-style “green screens” of the kind local TV weather people often use. Instead, they stood on an LED stage floor surrounded by more than 60 feet of 4K wrap-around LED-video walls that – combined with Hollywood-caliber cameras and lighting – created the highest-resolution xR environment in the world.

As Bryant and other Intel leaders Karen Walker, Chris Walker and Boyd Phelps presented on the stage – alongside display tables, laptops or other physical objects – they melded seamlessly into the virtual backgrounds, rendered in real time by the Unreal content engine. Disney has used similar xR tech recently to produce “The Mandalorian,” as have singers Katy Perry and Alicia Keys.

Large Virtual Crowd, Positive Feedback



For the Intel launch, there were a dozen producers and camera, light and sound people in the room for the pre-recording. But when Intel released the 11th Gen Intel Core virtual event online less than a week later, the audience numbered more than 20,000, with press, analysts, customers, partners

and company employees from around the lobe.

Leithner said the pandemic has given Intel events leaders the chance to fundamentally rethink what presentations are, and what they can be. Working virtually, she said, “forces us to think, decide and plan earlier. We are literally making a mini-movie. This requires more time for testing, shooting, editing and quality control.”





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ASEAN Super 8 Virtual Connect Highlights



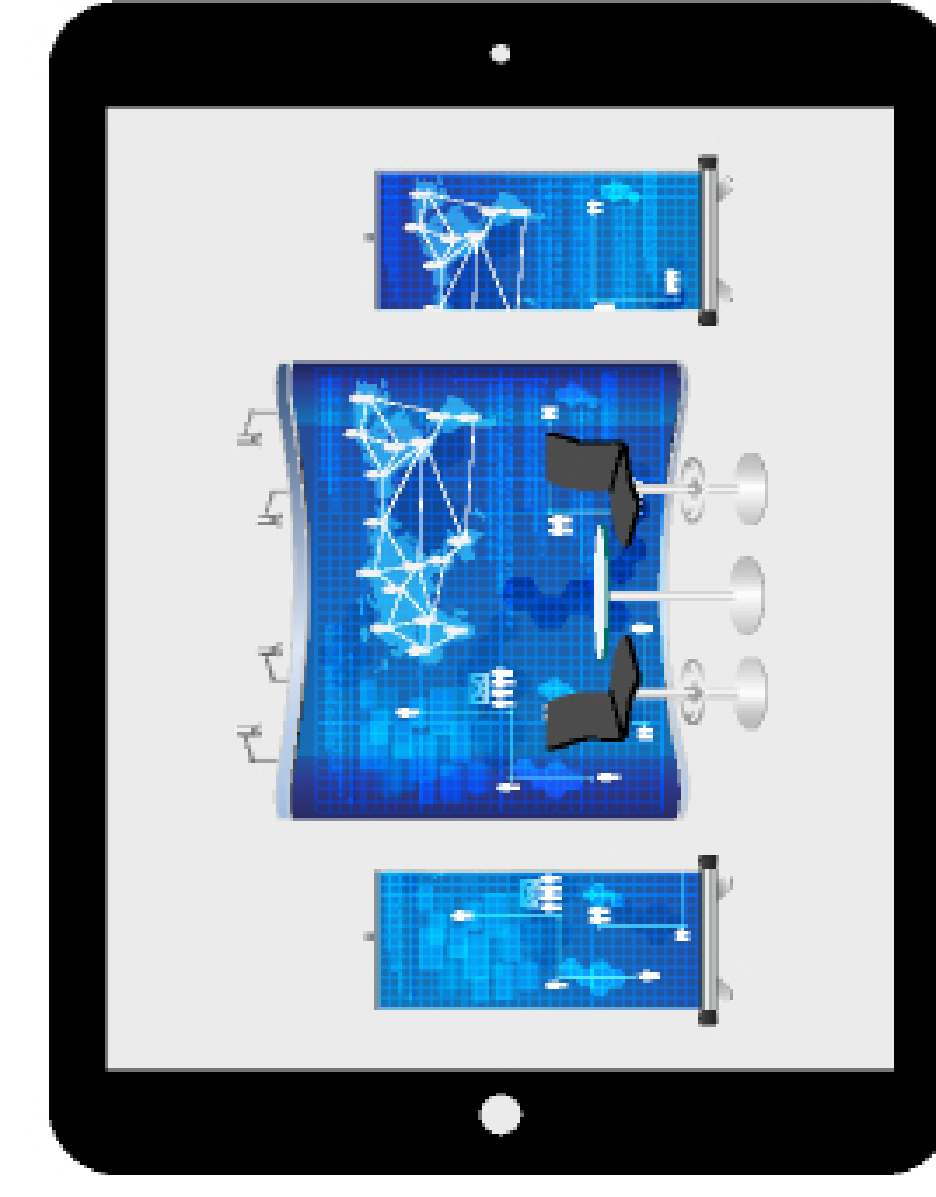
Business Matching



Innovation Tech Zone



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Webinar

Your Investment Is Amplified



Budget

Cost-effective approach to tap on emerging market without travelling



Branding

Building an expansive brand exposure beyond Malaysia and Southeast Asia



Business Matching

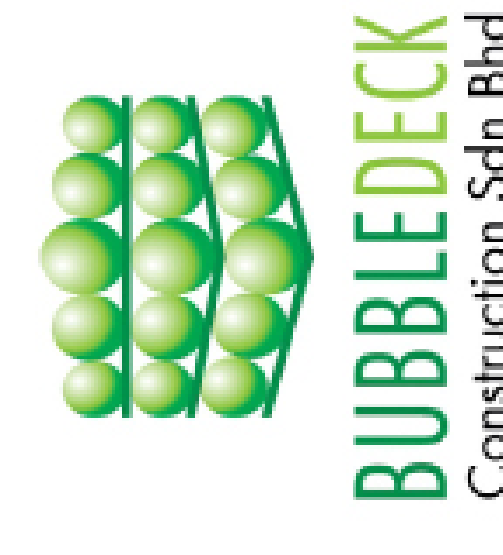
Premium Matching Platform to pre-schedule online meeting with potential buyers



Target

To reach out to prospective buyer in the built environment

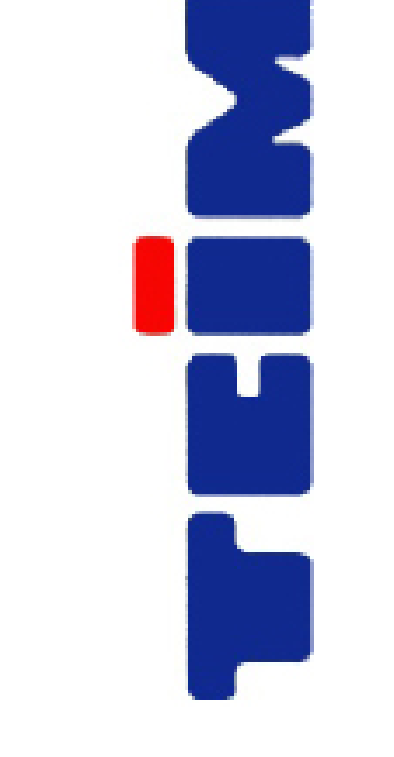
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NOVEMBER 2020

3-5 NOVEMBER 2020

Cosmex Bangkok

BANGKOK INTERNATIONAL TRADE & EXHIBITION CENTER (BITEC), BANGKOK, THAILAND

3-6 NOVEMBER 2020

PTC Asia 2020

SHANGHAI NEW INTERNATIONAL EXPO CENTRE, SHANGHAI, CHINA

4-7 NOVEMBER 2020

ProPack Vietnam Hanoi

HANOI INTERNATIONAL CENTER FOR EXHIBITION (ICE), HANOI, VIETNAM

4-7 NOVEMBER 2020

MTA Vietnam - Ho Chi Minh

S.E.C.C, DISTRICT 7, HCMC, VIETNAM

17-19 NOVEMBER 2020

ASEAN SUPER 8 VITURL

CONNECT

ONLINE EXHIBITION

<https://www.super8asean.com/virtual-connect-exhibition/>

30 NOV-2 DEC 2020

AsiaWater Kuala Lumpur

KUALA LUMPUR CONVENTION CENTER (KLCC), MALAYSIA

DECEMBER 2020

2-5 DECEMBER 2020

Tools & Hardware Indonesia

Jakarta

JAKARTA INTERNATIONAL EXPO, INDONESIA

2-4 DECEMBER 2020

Asia Warehousing Show

Bangkok

BANGKOK INTERNATIONAL TRADE & EXHIBITION CENTER (BITEC), BANGKOK, THAILAND

7-9 DECEMBER 2020

EMAX 2020

ONLINE EXHIBITION

<https://www.virtualexpo.emaxasia.com/>

10-12 DECEMBER 2020

Myanenergy Yangon

MYANMAR EXPO HALL, YANGON, MYANMAR

16-18 DECEMBER 2020

VIMAF & VSIF Vietnam

SECC SAIGON EXHIBITION & CONVENTION CENTER, HO CHI MINH, VIETNAM

JANUARY 2021

20-22 JANUARY 2021

PWB Expo Tokyo

TOKYO BIG SIGHT, TOKYO, JAPAN

27-30 JANUARY 2021

Food Pack Asia Bangkok

HALL 101-104 BITEC, BANGKOK, THAILAND

27-29 JANUARY 2021

NEO Functional Material

Tokyo

TOKYO BIG SIGHT, TOKYO, JAPAN

FEBRUARY 2021

3-5 FEBRUARY 2021

M-Tech Mechanical

Components & Materials

Technology Expo Chiba

MAKUHARI MESSE, CHIBA, JAPAN

10-14 FEBRUARY 2021

Autotage Hanover

MESSE HANNOVER, TOWER SAXONY, GERMANY

MARCH 2021

10-13 MARCH 2021

HanoiPlas

INTERNATIONAL CENTER FOR EXHIBITION (I.C.E.), HANOI, VIETNAM

10-12 MARCH 2021

BuildTech Asia 2021

SINGAPORE EXPO, HALL 3 & 4, SINGAPORE

30 MAR - 1 APR 2021

Indo Intertex 2021

JAKARTA INTERNATIONAL EXPO, KEMAYARAN, INDONESIA



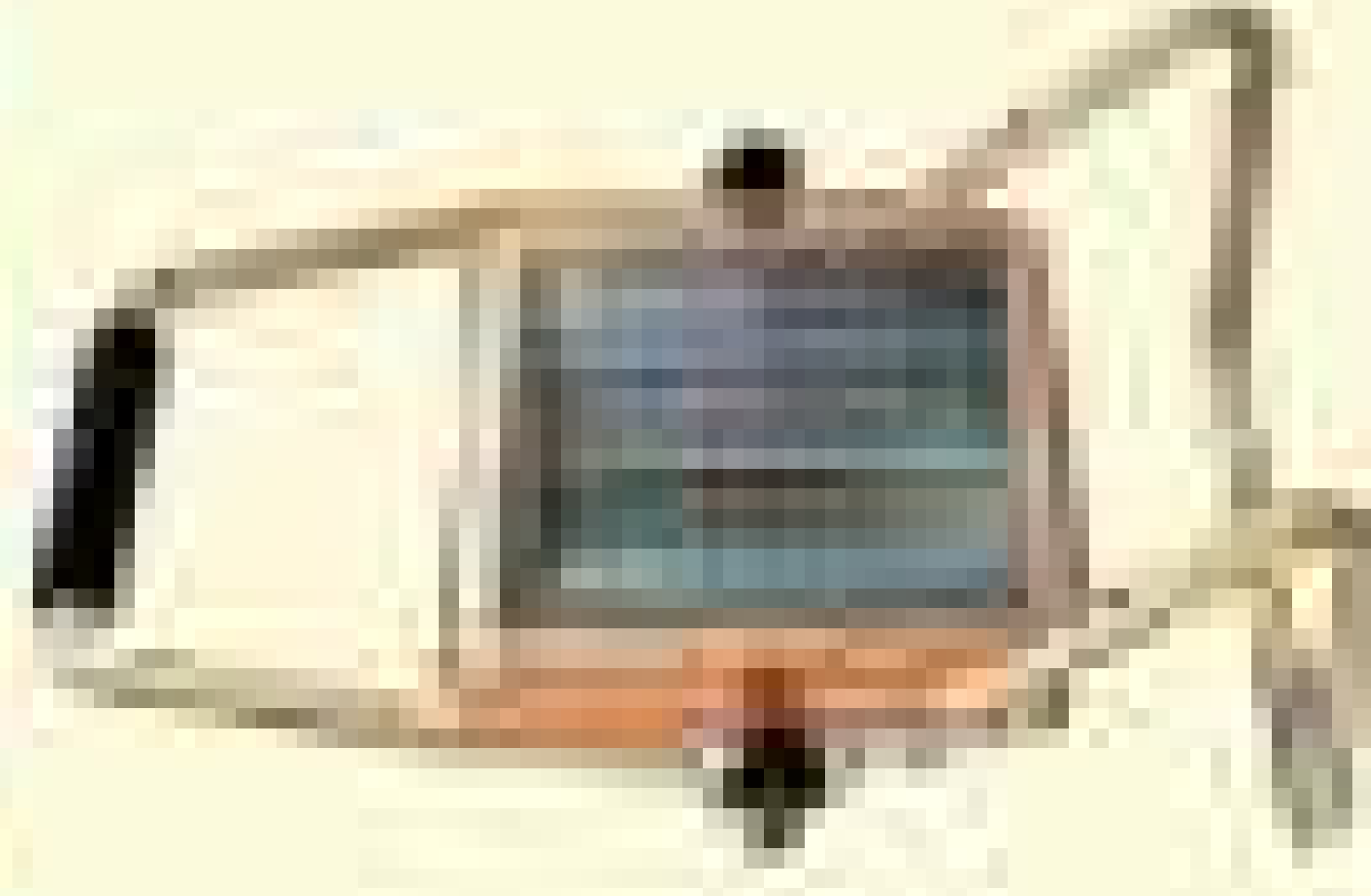
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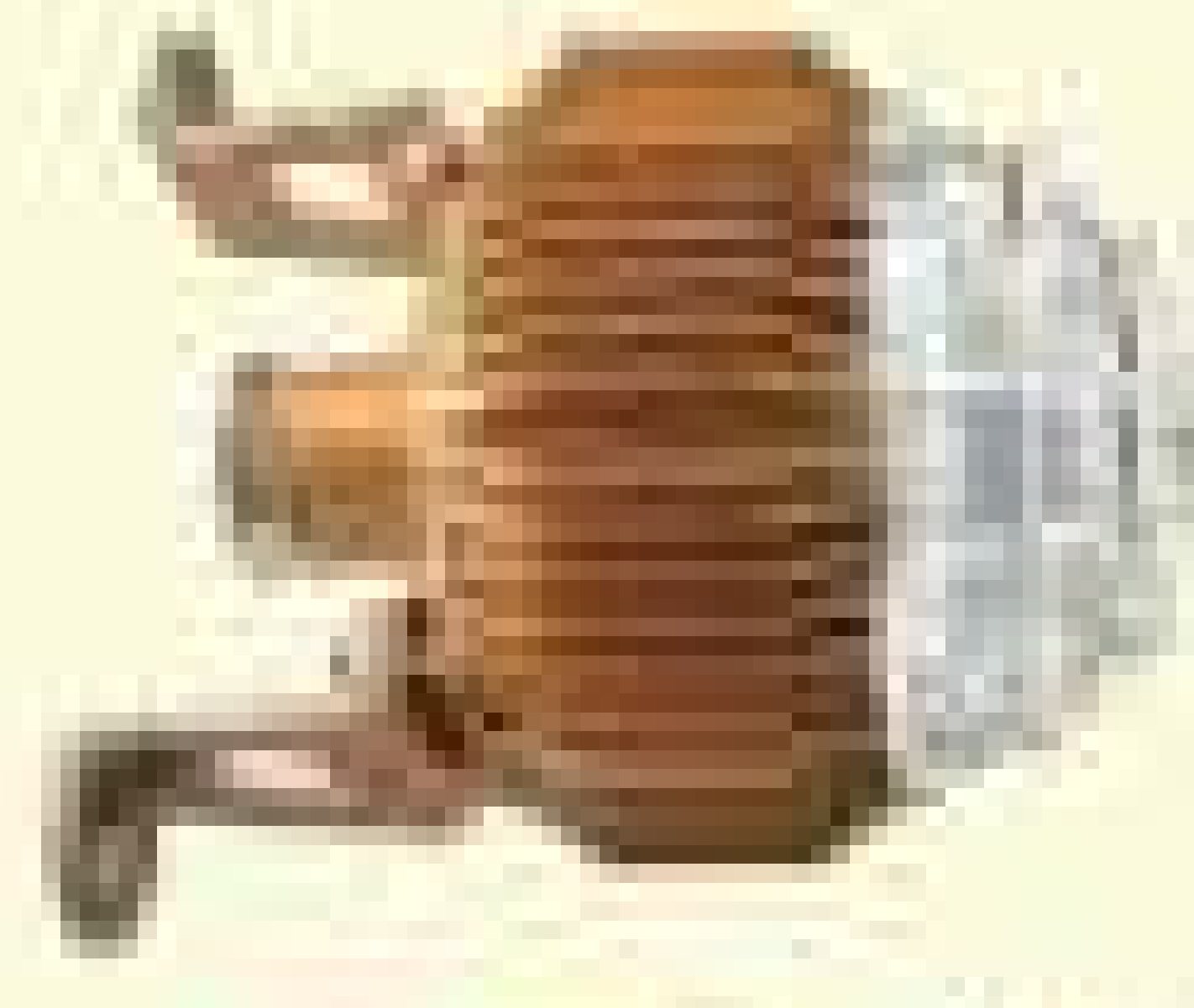
Ex-RETRACTED Series



Ex-REP Series



Ex-ECL Series



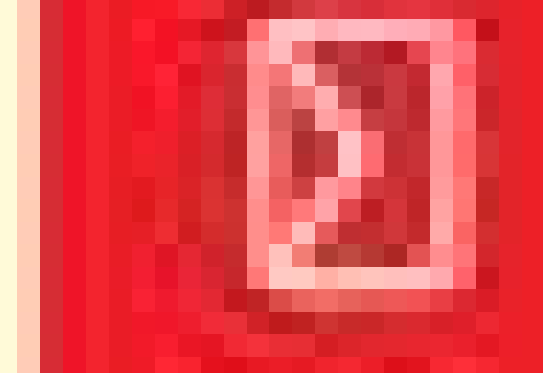
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CORE EXPERTISE : MARINE SERVICES, OFFSHORE/MARINE CABLE(ALL RANGE), AIR COMPRESSOR SYSTEM (FULL RANGE)
CORE SERVICES : OFFSHORE / ONSHORE MARINE SERVICES, ELECTRICAL ENGINEERING SERVICES (PNEUMATICS, HYDRAULIC, COMPRESSOR SYSTEM)

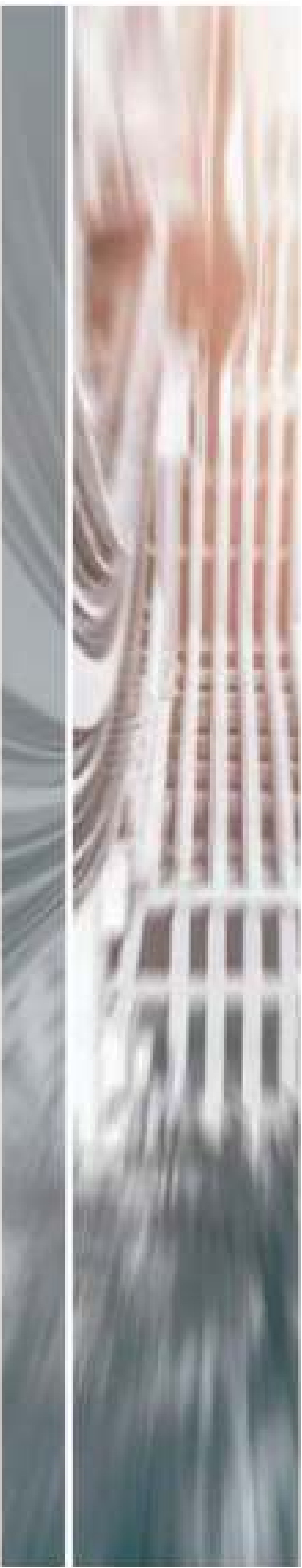
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