

THE MACHINIST

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A portrait of Nitin Gadkari, Union Minister, Ministry of Road, Transport and Highways, Government of India. He is wearing a brown checkered blazer over a light blue shirt and is standing with his right hand resting on a dark surface.

INDIA DOES NOT NEED AN ARTIFICIAL PUSH FOR EVs

An exclusive interview with **Nitin Gadkari**, Union Minister, Ministry of Road, Transport and Highways, Government of India

A NEW STRATOSPHERE

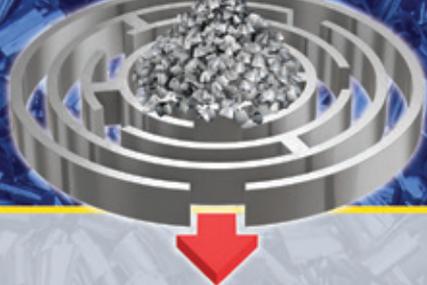
An in-depth look at the Economic Times Aerospace and Defence Summit 2021, a virtual dialogue for the aerospace & defence sector.

COMBINED STRENGTH DELIVERS SUCCESS

An interview with the COO of Volvo Eicher Commercial Vehicles reveals the company's recipe for success

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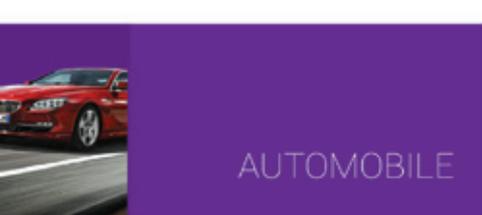
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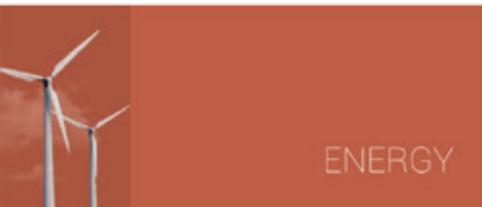


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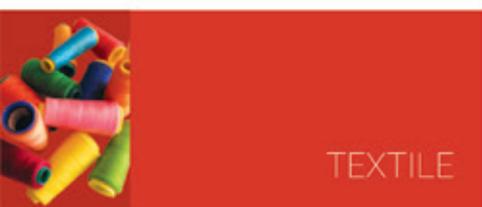
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UNLIMITED POSSIBILITIES, UNLIMITED POTENTIAL

A wise man once said, don't be content easily, don't set boundaries because there are skies upon skies just waiting for you to take flight – only if you should dare to. Only if you would just try.

It was with this immense sense of not being content with just playing the cards in hand that the team of The Machinist set out to do some amazing things in the recent past – organising and executing a curated virtual event on the aerospace and defence sector; executing an on-ground event on plastics in automotive and the cherry on the cake – an exclusive interview by Rahul Kamat, Editor, with **Shri Nitin Gadkari, Union Minister, Ministry of Road, Transport and Highways, Government of India.** In the interview, Mr Gadkari also pursues the theme of limitless boundaries by talking about an emission free India and a mobility which is electrified.

We also spotlight the continent of Africa in this issue. As the world's youngest and fastest-urbanising continent, Africa will have 24 million more people, on average, living in its cities each year between 2021 and 2045 – more than India and China combined – according to a McKinsey & Company estimate. This implies major increases in consumption. Already, spending by consumers and businesses in Africa totals \$4 trillion. Altogether, the McKinsey report predicts \$5.6 trillion in African business opportunities by 2025, a major chunk of which is manufacturing. Which means, in the words of Shakira, *'This is the time for Africa!'*

Also covered in the issue are a range of topics from the latest in Artificial Intelligence for automated factories to evolving control on the shop floor.

We stand on the cusp of a new year, with the old one still leaving us unsure about the changes the pandemic has wrought or will continue to wring out. What we would be well reminded to do is- embrace evolution and change and believe in the unlimited possibilities, unlimited potentials out there. We wish all our readers a Happy Christmas and look forward to seeing you all in the New year.

Kruti Bharadva



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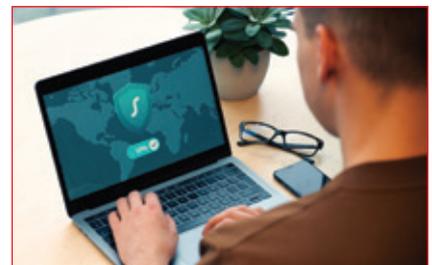
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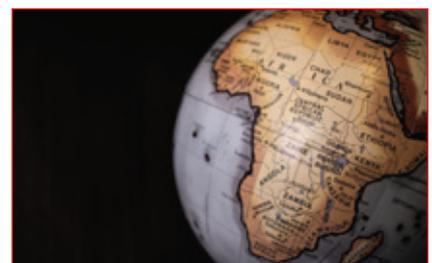
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AP&C Inks New Agreement with Airbus

AP&C – A GE ADDITIVE company has announced it has signed a new agreement with Airbus to provide Titanium powders (Ti-6Al-4V) for use in metal additive manufacturing applications. The new multiyear agreement to provide Ti-6Al-4V powders deepens AP&C's working relationship with Airbus, which dates back several years.

“The adoption of metal additive technology in aerospace continues to gather momentum. And one of the challenges of matching that pace in a highly-regulated industry like aerospace, is building a robust supply chain that can meet both the industry standard for conventionally and additively manufactured parts, but also add value,” said **Alain Dupont, CEO at AP&C**.

“Our approach is to be more than just a supplier of metal powders to our customers. To scale metal additive manufacturing, acceleration can only be achieved by sharing knowledge best practice to lower risk and increase stability. One way we have supported Airbus in recent years, for example, has been to



help its in-house additive manufacturing team establish its own methods and processes to qualify Ti-6Al-4V powders,” added Dupont.

AP&C is a world-leader in the large-scale production of plasma atomized titanium, aluminium and nickel powders. The company continues to invest in its plasma atomization technology that allows new materials to be produced and ulti-

mately reduce the cost of plasma atomized powders, while maintaining the high quality required by metal additive manufacturing users in the aerospace industry.

AP&C has grown its capacity to more than 1,000 tons of titanium powder per year. This large-scale production is performed in more than a dozen powder production lines at two manufacturing sites.

MuleSoft Unveils New Universal API Management Capabilities

MULESOFT has announced new universal API management capabilities that enable IT teams to securely create, manage and govern any API across any environment and technology.

The universal API management capabilities — including Anypoint Flex Gateway, API Manager, API Experience Hub, API Designer with event-driven capabilities, and API Governance — are built directly on Anypoint Platform™, MuleSoft's unified platform for integration, API management, and automation. Together, these capabilities transform MuleSoft's end-to-end platform into a more open, flexible, and scalable solution, so businesses can accelerate innovation and create seamless digital experiences faster.

With the proliferation of digital touchpoints and the need to create seamless experiences for employees and customers, companies are creating more APIs than ever before. In fact, organizations today use over 800 applications on average, and 96 per cent of them currently use public or private APIs — up from 80 per cent last year.

At the same time, hybrid, distributed ecosystems have become the norm, which adds complexity to the IT landscape. According to Deloitte, 97 per cent of IT managers are planning to take a best-of-breed approach by distributing workloads across two or more clouds to boost resilience and support regulatory requirements. These distributed ecosystems result in data silos, limited reuse, inconsistent governance and security across services, and limited visibility with many management consoles across cloud vendors.

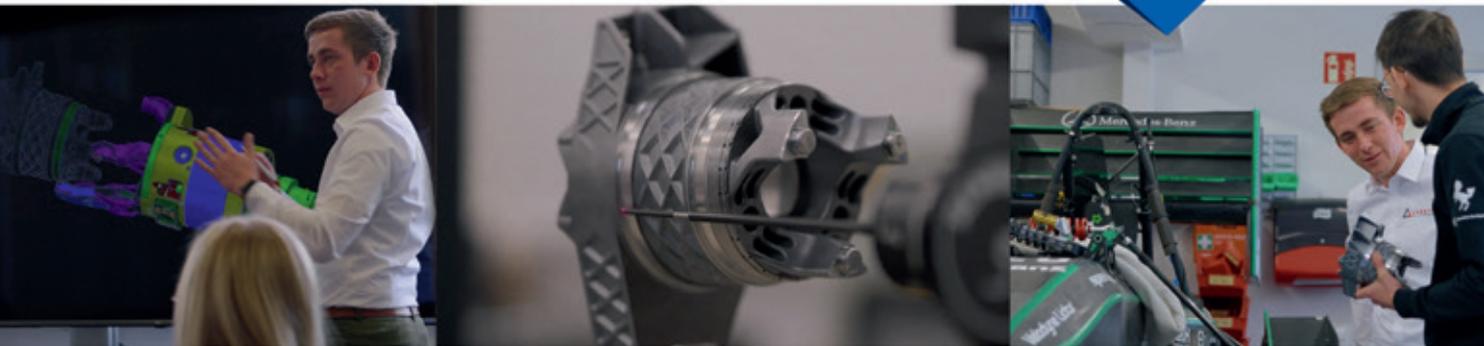
LTI Launches Fosfor, Data-to-Decisions Product Suite

LARSEN & TOUBRO INFOTECH has launched Fosfor, the Data-to-Decisions Product Suite. Fosfor helps businesses monetize data at speed and scale by providing best-in-class capabilities. The Fosfor suite of products has extensive set of go-to-market and technology partnerships with leading cloud companies and has been recognised by leading industry analysts.

The Fosfor suite consists of five products:

- Spectra - a comprehensive DataOps product enabling the fastest way to harness data;
- Optic - an autonomous data fabric product to facilitate discovery-to-consumption data journeys;
- Refract - a data science and MLOps product automating operations across entire lifecycle;
- Aspect - a no-code, unstructured data processing product; and
- Lumin - an augmented analytics product that provides a search-like interface for all types of insights.

Sanjay Jalona, CEO & Managing Director, LTI, said: “We are in the age of Data Commerce, where data is not just a business enabler or differentiator, but also ‘the business’ for every enterprise. As an integrated suite of products across the data-to-decisions lifecycle, Fosfor is uniquely positioned in the market for AI-driven data products. We are confident that Fosfor will be a quantum leap in unlocking value for our clients.”



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Hexagon Collaborates With 3D Systems

HEXAGON'S MANUFACTURING INTELLIGENCE DIVISION has collaborated with world-leading additive manufacturing company 3D Systems to enhance its 3DXpert® design for additive manufacturing solution with Hexagon's generative design technology. Integration of HxGN Emendate – Hexagon's best-in-class generative design technology unlocks new levels of performance and confidence for users of the comprehensive 3DXpert solution which supports both metal and plastic-based additive parts.

3DXpert, which is now part of Oqton's expanded portfolio, is a platform-neutral, integrated solution that enables users to prepare, optimise, and 3D print high-quality parts in record time. Hexagon enhances the solution by helping customers with high-performance design needs accelerate the transition from concept to an optimal, fully-engineered and manufacturing-ready design.

The speed and accuracy of HxGN Emendate boosts the design-to-manufac-



turing process for additive manufacturers in any sector by acting as a 'co-pilot' in the 3DXpert system, ensuring designs are engineering-validated, highly optimised and print-ready. This accuracy and reliability of design is of particular benefit to industries that demand high performance and precision, such as the aerospace and medical sectors. Users will

have the option to utilise the Hexagon engine's high-end part optimization in 3DXpert to shortlist and refine design candidates with unrivalled speed and efficiency, all while remaining within the same solution.

Ben Schrauwen, Co-founder and CEO, Oqton said, "We are excited about this collaboration and the potential it holds for existing and future customers looking for the best-in-class additive manufacturing software, now with the generative design engine that makes Hexagon the go-to for enhancing the speed and optimisation of 3D printed designs."

"This partnership is a great step to ensuring that manufacturers worldwide have the opportunity to implement Hexagon's generative design capabilities," said **Thomas Reiher, director, generative design at Hexagon**. "We're excited to contribute to such a trailblazing system as 3DXpert, to help improve outcomes the most demanding customers and facilitate industrial adoption together."

Hyundai Showcases Commitment To Electrification In India



HYUNDAI MOTOR INDIA LIMITED (HMIL), country's first smart mobility solutions provider and largest exporter since inception, today announced its roadmap to drive the electric mobility revolution in India with the expansion of its line-up to 6 Battery Electric Vehicles (BEV) for the Indian market by 2028. Further, Hyundai will also introduce its dedicated BEV Platform – E-GMP in India, showcasing its commitment towards smart Indian customers.

Commenting on the corporate announcement, **Mr. S S Kim, MD & CEO, Hyundai Motor India Ltd.**, said, "Hyundai has been at the forefront of

the electric mobility revolution in India, with the introduction of India's 1st Electric SUV - KONA Electric in 2019. Hyundai Motor India has been delighting customers with the most innovative and technologically advanced mobility solutions over the last

two and a half decades. As we continue to redefine the mobility space, today we are yet again showcasing our commitment towards Indian customers with the announcement of expanding our BEV line-up to 6 vehicles for the Indian Market by 2028. At Hyundai, we are taking experiences Beyond Mobility and are strongly focusing on Intelligent Technology, Sustainability and Innovation. Keeping in line with this thought, we will introduce our dedicated BEV Platform – E-GMP as well as modified platforms for battery electric vehicles in India. By driving the adoption of electric mobility at scale in India, Hyundai will

become the fulcrum for transformation of a brighter and better tomorrow."

Hyundai Motor Group globally showcased its E-GMP dedicated BEV platform for future electric vehicles, marking a new era for the brand. Driving the pump-to-plug revolution, Hyundai will pioneer the development of future electric vehicles with this dedicated BEV platform that comprises of vehicle chassis that includes the battery, motor and power electric system. With scalable dimensions, this platform will form the backbone of different types of vehicles. With an innovative interior packaging vehicles developed on E-GMP will feature a flat floor, slim cockpit and a flexible & spacious cabin.

Catering to the diversity of the Indian market, Hyundai's line-up of 6 Battery Electric Vehicles will cater to multiple segments including Mass market and Mass Premium segments in India. To further delight customers, Hyundai will introduce these BEVs in different body styles including SUV body shape by 2028, thereby offering a wide range of models for customers to choose from.

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Vedanta Aluminium Invites Partners for Aluminium Park at Odisha

VEDANTA ALUMINIUM

BUSINESS, India's largest producer of aluminium and its value-added products, extended an invitation to aluminium producers at the Enterprise Odisha 2021 event for partnering in its Aluminium Park project which will come up at Jharsuguda, Odisha.

With an aspiration to 'Make in India for the world', Vedanta Aluminium has partnered with Odisha Industrial Infrastructure Development Corporation (IDCO) to set up the Vedanta Aluminium Park, near its aluminium smelter in Jharsuguda. Vedanta Jharsuguda is one of the world's largest aluminium smelters, equipped with global best technologies for producing high-quality aluminium products. An Aluminium Park is a facility in the vicinity of an aluminium smelter, where downstream industries set up their manufacturing units and draw hot metal from the smelter to manufacture their end-product.

Inviting aluminium producers to set up shop at the Vedanta Aluminium Park, **Mr. Rahul Sharma, CEO**



– **Aluminium Business, Vedanta Limited**, said, "Odisha is crowned as the aluminium capital of the country. With the objective to develop a thriving ecosystem of aluminium-based SMEs and MSMEs in Jharsuguda, Vedanta is committed to supply 3 lakh metric tonnes of aluminium to companies who set up their facilities in our Aluminium Park. The project brings with it three-fold benefit to the state – investments by MSMEs from across the country in the state, creation of large-scale employment opportunities for the local talent, and significant revenue in the form of taxes and duties for the state exchequer."

The Aluminium Park will offer

facilities such as water, power, hot metal supply, dross processing plant, as well as other benefits to companies that set up their manufacturing units in the park. More importantly, proximity to Vedanta's Jharsuguda smelter will ensure that the companies have access to Vedanta's Centre of Excellence and R&D Centre for downstream aluminium products. Furthermore, availability of high-quality molten metal directly to

their processing units will reduce input costs significantly, making the final products cost-competitive and at par with global quality standards. This model also ensures that the carbon footprint of the entire value chain is substantially reduced.

The project is expected to attract investments of over INR 2,000 crores to Odisha and engage thousands of MSMEs in the ecosystem, thereby bringing in additional economic value to the tune of INR 4,500 crores to the state annually. The park has potential to create over one lakh livelihood opportunities in the state, with a community outreach of more than 4 lakh.

Uber Announces Winners Of The Green Mobility Innovation Challenge

UBER recently announced the five winners of the Green Mobility Innovation Challenge, its partnership with the Government, in support of ideas to help drive the adoption of electric vehicles across the country. The winning startups are: **Bodycast Innovators Pvt. Ltd. Virya Batteries Pvt. Ltd., Racenergy, Kazam EV Tech Pvt. Ltd. and Emuron Technologies.**

Run in partnership with Startup India, the Indian government's online support portal for entrepreneurs and startup incubator iCreate, the challenge attracted more than 150 entries from innovators and startups from across the country.

The winners will receive a grant of INR 7.5 Million from Uber to develop their ideas, along with six months business incubation at iCreate. The Runners-up shall also be eligible to

receive two months of incubation, mentorship support by Uber's leaders, access to labs, and co-working spaces at iCreate.

The five member Grand Jury for the final round comprised industry experts Mahua Acharya, CEO, CESL; Prof. Anadi Saran Pande, Head of Enterprise Incubation Centre, IIM-Lucknow; Anupam Jalote, CEO, iCreate; Nandini Maheshwari, Senior Director & Head of Asia Pacific Business Development, Uber; and Venkatesh Kancharla, Director, Engineering, Uber.

Shri Amitabh Kant, CEO, NITI



Aayog said, "Organisations which are green will prosper and progress in future. It is important for everyone to reduce their carbon footprint, and that is what Uber is doing by promoting startups in the EV space. I would like to congratulate the winners and wish them success in the future"

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Greta Electric Scooters To Expand With 50+ Touchpoints By FY22

GRETA ELECTRIC SCOOTERS, a wholly-owned subsidiary of Raj Electromotives Pvt Ltd has announced its plans to expand its dealer network to 50+ touchpoints with a mix of dealer showrooms, Experience centres and experience studios to ensure word class experience for its customer.

Intending to reach every part of the country, including the remotest of areas, Greta Electric Scooters announced aggressive plans to strengthen its dealer network. In Stage 1, the company intends to reach cities where self-owned 2-wheelers form the backbone of commute rather than public transport. The recent opening of a showroom in Leh, Ladakh, was one step in the direction. For FY22, plans are afoot for presence in key tier-II cities, with 50+ touchpoints. A recent experiment in Ahmedabad highlighted the need for education among consumers on EV vehicles and how well they match- up or exceed in



their deliverables against ICE vehicles. To address this gap in awareness, the company will complement its dealer presence with an Experience Centres / Experience studios. The Experience Centre / Studios will have trained staff, who will give customers a first-hand experience of the product, educate them on the benefits of EV's and address their concerns regarding E-vehicles. There will also be training imparted to dealer front end salespeople on EV technology

and product information to help them address customer queries. In parallel, a process has been initiated, to capture queries across touchpoints to ensure a consistent response and help dealers with answers, to questions they fail to address. Greta Electric Scooters is determined to change the face of daily commute for families in the smaller towns with its state-of-art features at affordable prices.

Speaking on the announcement, **Raj Mehta, Founder and Managing**

Director, Greta Electric Scooters, and Raj Electromotives Pvt. Ltd said, "We are all set to change the 2-wheeler landscape. Our intention is to reach many people as possible with our initiatives. I visualize Greta Electric Scooters being available to customers in every nook & corner of the country. Hence the focus on dealer expansion is in cities where scooters are one of the main modes of transportation. We believe we will change how people commute daily."

AEROX 155 gets a more Aggressive Appeal with Metallic Black Colour

CONTINUING TO GROW within its brand direction, 'The Call of the Blue', India Yamaha Motor Pvt. Ltd. today announced that soon after the launch of the AEROX 155, the maxi-sports scooter has received an overwhelming response in the Indian market. To further build on this excitement, the company has launched

the AEROX 155 in a new shade of Metallic Black. Adding to the appeal of the AEROX 155, the new Metallic Black colour is sure to give the maxi-sports scooter an even more aggressive look as it showcases sharp and aerodynamic body lines that are inspired by 'R-Series' motorcycle range. The Metallic Black colour version of the AEROX 155 is priced at Rs. 1,29,000, Ex-showroom Delhi, and will be available across all Yamaha Blue Square showrooms in India, from December 2021 onwards.

With the addition of the new colour, the AEROX 155 will be available in 3 colours now – Racing Blue, Grey Vermillion and Metallic Black. Yamaha will continue to make

the AEROX 155 even more exciting with such upgradations, enhancing the overall ownership experience of racing aficionados in India.

The AEROX 155 is powered by a new generation 155cc Blue Core engine equipped with Variable Valve Actuation (VVA). Mated to a CVT transmission, the liquid-cooled, 4-stroke, SOHC, 4-valve motor produces a max power output of 15 PS at 8,000rpm with 13.9 Nm of peak torque produced at 6,500rpm. The AEROX 155 also gets a Smart Motor Generator System for quiet engine starts, whereas the Stop & Start System, boosts fuel efficiency.

On the feature front, the AEROX 155 showcases LED headlights and a tail light with 12 compact LEDs, a Single Channel ABS, 14-inch wheels with Wider 140mm rear tyre, Bluetooth Enabled Yamaha Motorcycle Y-Connect App, 5.8-inch Multi Information Display, 24.5 Litre Under seat storage and an External Fuel Lid.



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Meltio Signs a Strategic Partnership with BFW

BHARAT FRITZ WERNER AND MELTIO; a disruptive laser metal deposition technology manufacturer have recently announced that BFW is going to play a key role in the development and support of the Meltio metal 3D printing and the BFW CNC brand hybrid manufacturing solutions in the Indian market, as an official value-added partner.

Meltio offers a pioneering metal 3D printing solution that enables industrial applications with a process built around welding wire, the safest, cleanest, and most affordable metal feedstock in the market. BFW is the leading CNC machine tool manufacturer and industry 4.0 solution provider in India.

“The world is changing and this



strategic partnership between Meltio's innovative technology and BFW's strong position in India (one of the world's most important markets) will bring forth cutting-edge solutions for the next industrial revolution 4.0,” said **Ángel Llaveró López de Villalta, CEO at Meltio**

This strategic partnership will widen BFW's product portfolio and application range by introducing additive and subtractive processes in a single step. The synergy of the two companies will also provide a sustainable alternative for the aerospace, defence, automotive, and mining industries.

“We are very impressed with Meltio's Innovative Additive Technology. Our partnership opens doors for developing an array of industrial applications yielding a competitive advantage to customers. We are very excited about the future as Bharat Fritz Werner and Meltio both share a common vision of providing futuristic solutions to customers,” commented **Ravi Raghavan, CEO at BFW.**

igus Announces Strong Growth Plans For India

igus, the global leader in Motion Plastics, has announced an aggressive growth plan and strategy in the backdrop of 20 successful years of operations in India. As the 9th largest market globally and the 3rd largest market in the APAC region, igus India has consistently been recording double digit growth over the last many years (except the pandemic year) and in the current year is growing at 30 per cent above the previous record year on average. igus India hopes to double its revenues to INR 300 crores in the next 3-4 years. Among a host of plans to drive growth in the next phase, the company announced the introduction of a “virtual show booth” replete with its entire set of products which is available for customers to be viewed, tried and tested both via virtually and physically.

The innovative virtual booth aims to give customers an immersive experience similar to a face-to-face expo with an option to interact with product experts. The first such innovative virtual trade show was set up at igus's global headquarters in Cologne, Germany. After the great success of the virtual expo spanning 400 sq.m in Germany, which hosted more than 100,000 visitors from across the globe, igus India

creates its own IMPS virtual show booth exclusively for its customers in the Indian Sub-continent.

Announcing the launch of the virtual product expo titled Igu Motion Plastic Show (IMPS), **Deepak Paul, Managing Director, igus (India)** said, “India is one of the key markets in the world for igus, occupying one among the top 10 positions, globally. Having achieved an impressive double-digit growth for the last 20 years in India, igus India's range of motion plastics with its motto ‘tech up; cost down’ has been widely accepted across all manufacturing industries. With businesses chugging back to normalcy and the buoyancy in the economy on its way to returning it to the hey days, the path ahead looks promising as manufacturers look for cost effective ways to drive their businesses.”

Santhosh Jacob, Country Manager and Director, igus India



said, “as a technology focused organisation, innovation has always been igus's cornerstone and prime focus. The company's investment of nearly 2 Million INR into The Igu Motion Plastic Show (IMPS) is yet another innovative offering to enable customers visiting the virtual stall to not only witness new products, product extensions and new service offerings, but also interact with an igus's product experts who can share more insights, global experience and also directly discuss their relevant applications of interest virtually.



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Type	2920	2940	2910	2900
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Total Travel	3 mm	4.5 mm	2.25 mm	1 mm
Linearity	± 0.3 %	± 0.3 % (in ± 1 mm range)	± 0.3 %	± 0.5 %
Repeatability	0.02 µm	0.02 µm	0.02 µm	0.15 µm
Environmental Protection (IEC529)	IP64	IP64	IP64	IP64
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2nd Edition

THE ECONOMIC TIMES

AEROSPACE & DEFENCE
SUMMIT 2021

A NEW STRATOSPHERE

An in-depth look at the Economic Times Aerospace and Defence Summit 2021, a virtual dialogue for the aerospace & defence sector.

The Indian aerospace defence manufacturing sector has seen exponential growth in the last few years and in this light, The Economic Times Aerospace & Defence Summit 2021 (ET ADS 2021), held virtually on November 16th 2021, aimed to bring together industry experts on one platform to deliberate on the growth opportunities while dealing successfully with the challenges.

The summit featured strategy-driven discussions focused on renewal, opportunities, parallel industries, digital and security. The summit also provided a platform for learning and networking as part of the most

influential gathering of defence and aerospace professionals from India. The summit covered the most pressing issues facing the sector across an agenda of keynote speeches and industry interviews, high-level panel discussions, and sector-specific conferences. Today, the sector is on the verge of transformation, powered by important Government initiatives like 'Make in India' and 'Atmanirbhar Bharat' Abhiyaan (Self Reliant India Campaign). According to Government estimates, the Aerospace and Defence industry in India is likely to reach a market size of US\$70 billion by 2030.

PARTNERS & PANEL DISCUSSIONS

The event was honoured to have as its metrology partner **Carl Zeiss India** - an internationally leading technology company operating in the optics and optoelectronics industries.

igus India - the wholly-owned subsidiary of igus GmbH, the motions specialist, was supporting partner while **Exxon Mobil** was lubricant partner. Exxon Mobil is a pioneer in lubrication technology.

BFW Advanced Manufacturing Pvt Ltd (BAM-



There comes a time in the history of every sector that is its time to take off and I can say confidentially that NOW is the time for the Indian aerospace and defence sector

Dr Ajay Kumar

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The Esteemed Speakers

1. **Dr Ajay Kumar**, Defence Secretary, Ministry of Defence, Government of India
2. **SP Shukla**, Chairman – Mahindra Defence, Mahindra Aero & Mahindra Sanyo Special Steels and Chairman – FICCI National Committee on Defence & Aerospace
3. **Dr Sudhir Kumar Mishra**, Scientist & Director General (BrahMos), DRDO, Ministry of Defence and CEO & MD, BrahMos Aerospace
4. **Mr Sunil Misra**, Director General, Society of Indian Defence Manufacturer (SIDM)
5. **Wing Commander Shashikant Koppikar**, VM, (Retd), Indian Air
6. **Mr R Madhavan**, Chairman and MD, Hindustan Aeronautics Ltd
7. **Mr Kaustubh Shukla**, Advisor & Former COO, Godrej & Boyce
8. **Mr Erik Goedhart**, Senior Vice President, Global Head of Aerospace, Kuehne + Nagel
9. **Mr Rajinder Bhatia**, President & CEO, Kalyani Group
10. **Mr Bhushan Gokhale**, (Retd) Air Marshal, India Air Force
11. **Lt Gen P R Shankar**, PVSM, AVSM, VSM (Retired), Former Director-General of Artillery
12. **Mr JD Patil**, Whole-time Director and Senior Executive Vice President, (Defence Business & Smart Technology Businesses), L&T, Chairman, Indian Space Association [ISpA] and President, Society of Indian Defence Manufacturers (SIDM)
13. **Mr Puneet Kaura**, Managing Director & CEO, Samtel Avionics Ltd
14. **Mr Anuj Prasad**, Head-Aerospace & Defence, Cyril Amarchand Mangaldas
15. **Mr Rachit Bhatnagar**, CEO, Aerospace & Aviation Sector Skill Council
16. **Mr Ramachandra R**, Vice President from BFW Advanced Manufacturing Pvt Ltd (BAMPL)



The industry has reciprocated to the government initiatives towards the sector by ensuring capacities and capabilities are fully available to meet the demand of the domestic defence sector

SP Shukla



The setting up of the defence industrial corridor has come at a very appropriate time, with the ambitious 'Skill India' program also coming into effect and the government aiming to train at least 40 crore Indians- a considerable chunk of which will train in the defence sector

Dr Sudhir Kumar Mishra

PL), a wholly owned subsidiary of BFW was also a supporting partner and **amace Solutions Pvt Ltd** was the event's Additive manufacturing partner. amace is a part of the Ace Micromatic Group (AMG), the largest machine tool conglomerate in India.

The Panel discussions covered:

- **How is the aerospace sector changing the business model to adapt to the post-COVID business environment?**
- **Panoramic Overview – Policies, Plans, Challenges at National Level**
- **How have technology adaptations and a new market landscape opened new channels for growth in the sector?** 

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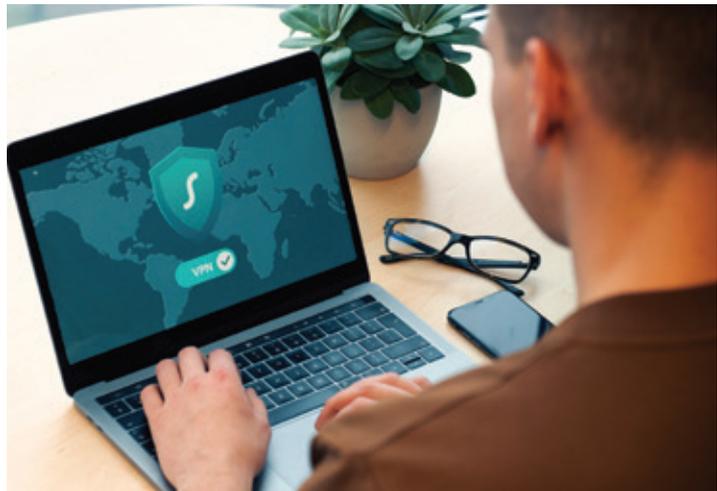


By Sushil Nahar, GM, Head of Risk and Compliance Practice, Happiest Minds Technologies

A NEW WAVE OF CONTINUOUS CONTROLS MONITORING IS HERE

Continuous Controls Monitoring (CCM) comprises a set of technologies that work to help an organisation cut down losses by constantly monitoring controls. This insightful article takes us through ‘Traditional Controls Monitoring Vs Continuous Controls Monitoring’

Continuous Controls Monitoring (CCM) comprises a set of technologies that work to help organisations cut down losses by constantly monitoring controls. These technologies automatically and continuously inspect controls, thereby bringing down audit costs. While the CCM concept is new to some organisations, a few others are still contemplating its implementation. However, quite a few companies have realised the many tangible benefits CCM offers. The new wave of continuous controls monitoring is already here.



TRADITIONAL CONTROLS MONITORING VS. CONTINUOUS CONTROLS MONITORING

Organisations have been identifying and implementing cybersecurity controls to protect their assets, ensure business continuity and stay compliant with mandato-

tored via various department-based, division-based, or activity-based controls. A team monitors these controls regularly, but not continuously. Discrepancies are identified and addressed periodically. Furthermore, auditors perform audits on a quarterly, half-yearly, or annual basis to identify gaps and escalate them to the respective teams to resolve.

Let's consider the example of an organisation's data backup process. All critical data is set to be backed up on a daily, weekly, or fortnightly basis. But how can the organisation be sure that the predefined controls are working effectively at any given point in time? Instances of backup system failure could go unnoticed. The same logic may be applied to different critical activities such as security system batch management, firewall monitoring to validate policy implementation, and access disablement when employees leave the organisation. When any of these controls fail, there could be a data or system breach, or unauthorised access to enterprise assets.

When risk assessments are performed manually at a



However, despite being well-documented and deployed, these controls may not be well-monitored, leading to lapses. In many organisations, control monitoring is exception-based

ry regulations. However, despite being well-documented and deployed, these controls may not be well-monitored, leading to lapses. In many organisations, control monitoring is exception-based.

If we consider the traditional scenario, change management, financial processes, HR, incident management, and general IT controls — SoD, access controls, configuration controls, exceptions, etc. — are moni-

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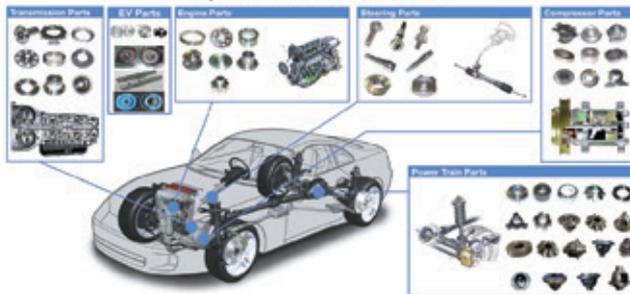
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MOTORUM series punch presses are available in various models to meet diversified needs of sheet metal industry. These machines are worldwide popular for its design features, rigidity, high speed productivity, environment friendly design features of minimum power consumption, low noise and high profitability to customers. MURATEC the leading name in automation is fully prepared to offer sheet metal automation solutions to meet the growing production demands in India.

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By Kruti Bharadva

COMBINED STRENGTHS DELIVERS SUCCESS

R S Sachdeva, COO - Eicher Trucks And Buses gives us in-depth insight on the inner workings of the joint venture between Volvo & Eicher and maps out their recipe for success

Tell us briefly about the joint venture between Eicher motors and Volvo group – VECV?

With a common vision to drive modernisation in the business of commercial vehicles, Eicher Motors and Volvo Group joined hands in 2008. Besides being a leader in the light and medium-sized vehicle segment, Eicher Motors is known for frugal engineering, considerable after-sales infrastructure, and cost-effective operations. If you add Volvo Group's global expertise, leadership in product technology, well-defined processes to that, you get a winning combination. Over the years, the partnership, which was branded as Volvo Eicher Commercial Vehicles, has been complementing each other by leveraging their combined strengths to deliver effective solutions that favourably impact the finished vehicle's ecosystem. Today, the brand includes a complete range of Eicher-made trucks and buses, Volvo buses, engine manufacturing and exports for Volvo Group, exclusive distribution of Volvo Trucks in India, non-automotive engines, and Eicher component business.

Tell us about your production capacities and manufacturing plants in India

We have nine state-of-the-art plants located across the country. All these manufacturing facilities are equipped with best-in-class technology working with the most sustainable solution. Most recently we inaugurated our plant in Bhopal which is built according to Industry 4.0 norms. This plant is equipped with a completely automated manufacturing process with MES control along with connected machines and supply systems.

With a combined production capacity of over 1,30,000 vehicles per annum, VECV is continuously spearheading the future of Indian trucking with next-gen vehicles and innovative solutions. Besides this, we also have an engine hub called VE Powertrain, which started operations in India in 2013 and caters to the engine requirements of Volvo Group across Europe and Asia. The current capacity stands at 75,000 units. The



Volvo Buses manufacturing facility can roll out up to 15,000 units annually on a two-shift basis.

We also have Eicher Engineering Components (EEC), a leading transmission, aggregate, and component business of VE Commercial Vehicles Limited. Under this, we have 3 plants in Dewas, Thane and SEZ Pithampur.

Tell us about this growth, challenges faced in the past year in terms of sales

Since the end of the COVID 19 Wave 2, the CV industry is now witnessing steady month on month recovery. This is welcome after a dip in sales of 40 per cent in 2019-20 and another dip of 30 per cent in 2020-21. VECV has reported positive sales during October 2021 to 5,805 units as compared to 4,200 units during the same month last financial year.

Improvements are seen across all segments, with the bus industry still restricted by constraints on movement of people. The revival is aided by a recovery in consumer sentiments, increased preference for personal mobility, macroeconomic tailwinds and government

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push on construction and infrastructure development.

Rising fuel prices, increasing input costs, continued supply chain constraints and any subsequent COVID waves could act as possible headwinds for the sector.

VECV recently launched luxury buses. Please tell us about these new buses and any other new launches coming up in the future.

VE Commercial Vehicles Limited launched the industry-defining coach and sleeper bus range. This is the first milestone in our drive to offer a complete range of market-adapted economy, mid-premium and premium buses across all market segments. The new bus range synergises Eicher brand's extensive local presence and expertise in value engineering with Volvo Buses India's competence in premium bus segment. This product truly combines the 'best-of-the-both-worlds'

These custom-developed buses have been designed and built in Volvo Buses India's factory in Hosakote. The performance of the front engine Eicher 6016 R LPO 12.4 m chassis sets a brand-new benchmark for bus travel in the country with its design and interiors.

The sharp sculptured Tall Boy design and the modern aerodynamics have an instant aesthetic appeal. The air-conditioned buses really maximise the comfort as well as the safety of passengers. The range is equipped with the reliable 5.1 litre VEDX5 engine which is derived from Volvo Group's global powertrain family. It can deliver maximum power of 210 HP and flat torque of 825 Nm @ 1200-1600 rpm. The vehicle delivers an unmatched performance for drivers while ensuring best-in-class fuel efficiency for operators.

Value-added features like fuel coaching, cruise control, intelligent engine protection system and Mboost-

er+ make our bus the preferred choice for intercity, route permit and staff applications. This new range is supported by Eicher buses pan-India service network with over 500 touchpoints which offer a one-stop-shop for both chassis and body service requirements. Further, lifetime support solutions, ensure seamless and hassle-free experience across the ownership period.

VECV is leading in the commercial vehicle segment in the use of IoT and industry 4.0 solutions – tell us how the company is leveraging the same for efficiency, sustainability and connectivity

With its industry-first proposition of 100 per cent connected vehicles across its entire product portfolio, VECV took a giant step towards modernising the CV

industry. The portfolio was powered by our connected vehicle solution – Eicher LIVE. Our trucks and buses are equipped with pre-fitted hardware which enables them to be completely connected on the road along with our industry first ecosystem. Our solution help extract the maximum possible fuel efficiency while ensuring savings of up to 10 per cent in fuel costs.

Moreover, VECV started operations at the new truck plant at Bagroda (near Bhopal) last year for the assembly of new engines for the Pro 2000 series. This manufacturing facility is built to meet industry 4.0 standards. In line with VECV's vision of modernising the CV industry, this plant is a fully digital facility complete with advanced technology such as MES control, automated manufacturing process and integrated command centre, which allows us to achieve robust production processes and high utilisation rates. The plant will be able to deliver world class engines for its wide range of EUTECH6 enabled BS VI trucks and buses and will export vehicles to over 40 countries across the globe.

How are the customers, driver, fleet owners benefiting from these technologies in terms of productivity, TCO, profitability?

At VECV, we always take care of all our stakeholders hence, all our functions are curated to benefit each component of the ecosystem including customers, drivers, fleet owners, and the internal team. Our recently launched connected technology which is available across our fleet helps the customer in knowing the status of its vehicle. The vehicle can be fixed before a possible breakdown enabled by predictive diagnosis. The technology also helps the customer know the status fuel and consumption pattern which due cost will



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again. The fleet owner will be able to track, trace and know the pattern of driving this will help them in improving the efficiency of their business. The cost of BS-VI vehicles is only 8-15 per cent higher than BS-IV and this is in addition to the hike in the fuel price, the connected vehicle will bring overall efficiency. Likewise, drivers will be able to access their performance and avoid unwanted halts. This technology is especially useful for fleet owners as they will have access to details such as over speeding, real time fuel status, alerts for fuel and harsh usage will be made available to the driver and fleet owners. Unlike the other telematics systems, Eicher's advanced telematics system is fully integrated into the vehicle electronics and is engineered as a part of it. It is connected to the CAN, the trucks electronics backbone of the truck and hence has access to comprehensive vehicle data generated by sensors, ECUs and any exceptions through fault codes. Leveraging the data available with the internal, our engineers can identify the faults come out with better ideas for product innovation, superior service support, etc.

How has the connectivity technology evolved for commercial vehicles and where do you see this trend leading to in the coming years

The technological revolution in the CV space happened owing to the push in the logistics sector. Initially, trucks used to be conventional and simple, the revolution started happening when there was a need to deliver the goods on or before time hence the telematics system come into being. Eicher added its telematics system in the vehicles back in 2012. It offers service support with a team of diagnostic experts offering Remote Diagnostics, Predictive Diagnostics and specialised field support to all BS-VI Eicher vehicles. This is in addition to the 24x7 Eicher On-Road Service (EOS) to provide highway assistance across the country. The team of experts are equipped to communicate in various languages including English, Hindi, Marathi, Telugu, Tamil, Kannada and Malayalam.

How is the Uptime centre transforming the CV industry?

The Uptime centre has the potential of revolutionising the commercial vehicles industry. By mapping the vehicle performance, we can ensure a seamless experience for our customers. The technical team at the Uptime centre recognise the expected fault and fix them beforehand avoiding unnecessary stoppages. The data mined from the vehicles can be used for product development and other service infrastructure.

VECV launched Uptime Centre in March 2020 to provide specialised support to all VECV vehicle owners. The Uptime centre provides round-the-clock remote telematics-based real time support along with 24x7 remote diagnostics, which means this centre can offer predictive maintenance data and other diagnostic-related advice on the go. With our IoT analytics platform, we have significantly advanced our Predictive Uptime Services. We detect potential issues on the truck and take action on the truck in coordination with the driver. With the latest version named Uptime 2.0 VECV has stepped up its ante and moved ahead to offer predictive vehicle maintenance by utilising telematics. The data sourced is put into the rule engine software programme and subsequently analysed to predict vehicle behaviour as well as avoid product failure by dynamically organising service plans.

In last one year we have served more than 2500 customers from Uptime Centre and it is continuously on upward trend.

The government cleared the PLI scheme for the auto industry with an outlay of Rs 25,938 crore, which is expected to speed up India's efforts to move towards electric vehicles at a faster pace. How is VECV leveraging this?

The recently announced PLI scheme will have a long-term impact by boosting domestic manufacturing and enhance our global reach by incentivising incremental production. It will enable the Indian auto industry in becoming price competitive along with boosting exports. Incentivising automakers and component manufactures will help them cover the losses faced during the past few years by increasing cash flow. This will enable the OEMs to invest in new technology and enhancing product quality. Further, it will push the existing scheme such as Atamnirbhar Bharat and Make in India solving our export problem. Moreover, the scheme is said to create additional employment for 7.6 lakh people ultimately facilitating economic growth. VECV absolutely wants to be part of it and we will look into electric, fuel cells and related technologies. 

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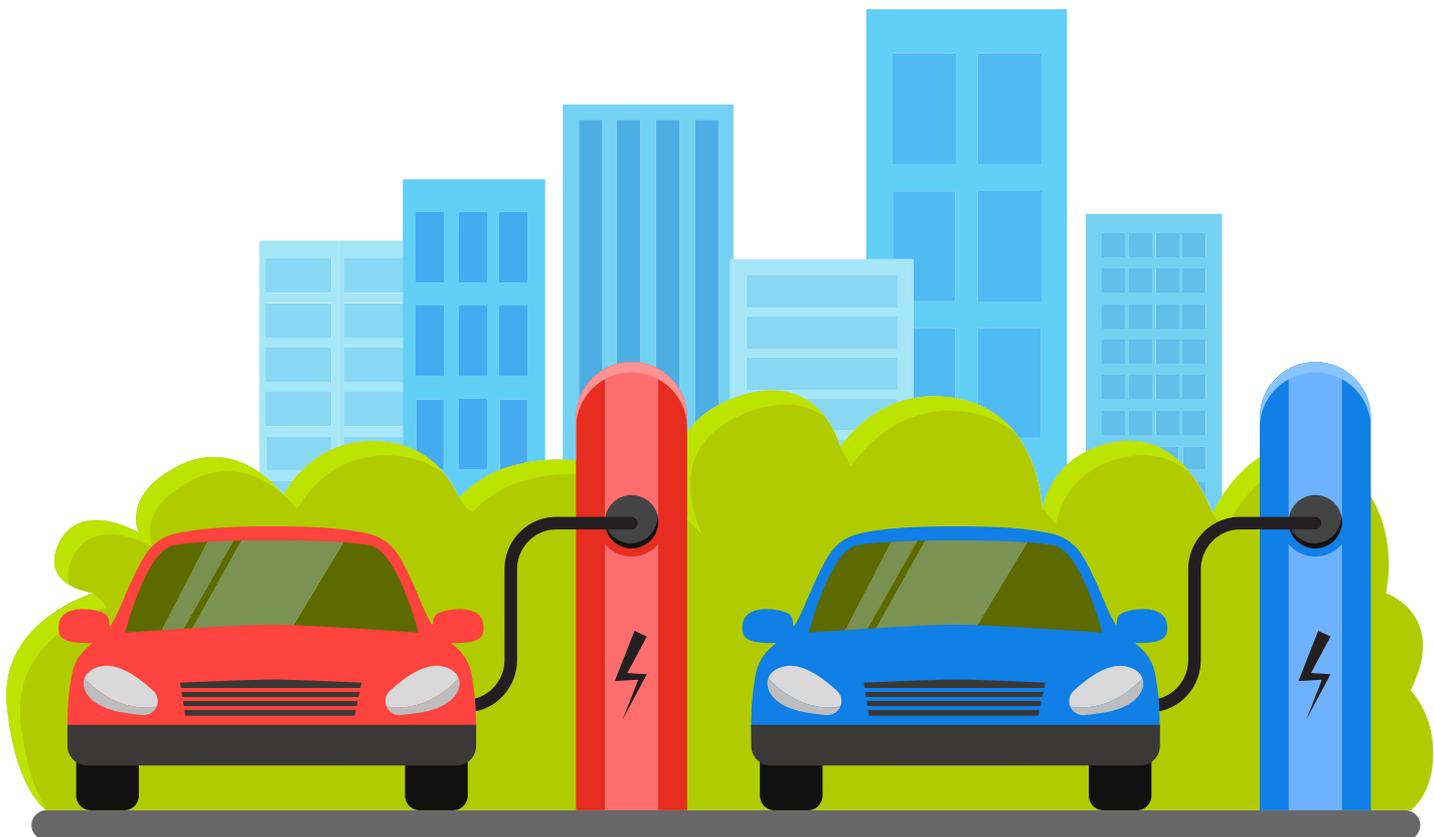
igus.in



By Rahul Kamat

“INDIA DOESN'T NEED ARTIFICIAL PUSH FOR EVs”

He is the most passionate ministers of the current Modi regime. He is responsible for India's dream run to achieve 40 km per day road infrastructure and also connecting India through his ambitious national waterways plan. For him, now, e-mobility is the future. In an exclusive interview **Nitin Gadkari, Union Minister, Ministry of Road, Transport and Highways, Government of India** talks about range of issues – from charging infrastructure to government's assistance at various stages– that will take India's e-mobility dream to a next level. While speaking with **Rahul Kamat**, he urge India's automakers to ensure maximum recovery of plastics and other composites materials on scrapping of vehicles



What is your vision and efforts for e-mobility in India and how soon we could see India moving from a country powered largely by vehicles with fossil fuels to predominantly run on electricity?

E-mobility is the future for us which is a highly safer, cleaner and eco-friendly mode of transport. India has surplus electricity and the government intends to have EV cells penetration of 30 per cent for private cars, 70 per cent for commercial vehicles, 40 per cent for buses and 80 per cent for two and three-wheelers by 2030. We don't need any artificial push for the sale of electric vehicles in India. The economics is so good that due to the low per-kilometre cost, the consumer should naturally shift to buying EVs. Per-kilometre cost of petrol best vehicle is 10/ km, for diesel its 7/km, and for EV its mere 1/km. And, there is a

“Our focus is to make Indian vehicles at par with international standards in terms of crash safety, body design and permissible emission norms”

large-scale in-house production demand for small battery-operated EVs like bikes, autos, cars, bicycles in the market. More and more Original Equipment Manufacturers (OEMs) are offering domestic chargers along with the EVs, making it very easy to charge respective EVs at home. Many world-class EV carmakers are available in India and now the battery capacity, driving range and charging mechanism of electric cars are significantly improving.

Central and state governments are promoting and supporting the EV ecosystem in India through favourable policies, incentives, subsidies, tax exemption, loan facilities on both supplies and demand sides. All the regulations and incentives for the manufacturing of electric vehicles are also in place. Battery operated vehicles have been



exempted from payment of fees for issuance of renewal registration certificates and the government has also increased the subsidy by 50 per cent of Rs 15,000 per Kw, on electric two-wheelers to promote its cells.

How the government is supporting EV sector with its friendly policies?

We have facilitated the cell registration of two and three-wheeler EVs without batteries to reduce their upfront costs. We are supporting domestic manufacturing, encouraging localisation of all the EV parts via schemes like production-linked incentive (PLI), our faster adoption and manufacturing of hybrid and electric vehicles (FAME II) scheme with an outlay of Rs 10,000 crore supports electric two and three-wheelers, buses, and four-wheelers with incentives for commercial registration. The efforts are going on in the development of indigenous and low-cost EV battery technologies. Research is also in full swing for hydrogen fuel cell technology. The government has allocated Rs 18,000 crore for the manufacturing of advanced battery cells. We intend to shift

public transport mode and logistics on electricity. The government has sanctioned Rs 18,000 crore to support the expansion of public bus transport services where the procurement of electric buses seems to be the more economically viable choice. In the next two to three years mass production of EVs will lead to the same capital cost compared to petrol and diesel versions today due to economies of scale. I am confident that by the end of this decade, there will be a significant penetration of electric vehicles in the Indian transport sector.

One of the challenges for e-mobility is charging infrastructure. Companies say it's a chicken and egg situation. How government is addressing this concern on a mass scale and how private players could work with the government?

The government (Central) is promoting two important measures to manage the EV charging load. The first measure promotes the use of renewable energy to charge the EVs, which will reduce the load on transmission and distribution networks. The FAME



Man with many firsts:

- Nagpur was the first city to explore alternative biofuels for transportation including bio CNG, bio ethanol and LNG
- Introduced flex engines to be run on 100% ethanol
- Launched first ever tractor run on bi-CNG
- Introduced the first ever Vehicle Scrappage Policy
- Push for R&D in electric vehicles for developing alternative battery chemistries



Although there has been a significant reduction in battery prices over the last few years, still EVs are not able to achieve cost parity with their equivalent IC engine vehicles

II policy also links renewable energy sources with electric vehicle charging infrastructure. The second measure includes introducing the time of day charge for EV charging, and we have abundant solar energy and solar-generated electricity charges are low and ensure a zero-carbon emission cycle.

The cost of generation of electricity from solar energy is less than Rs 2/kw hour, and we can fulfil the domestic EV charging infrastructure through a rooftop solar system. Ministry of Power has now allowed the sale of electricity as a service for charging electric vehicles and notified EVs charging guidelines and specifications. This has allowed a way to bring massive investments into envisaged charging infrastructure. The Ministry of Housing and Urban Affairs has made amendments in Model Building Bylaws and Urban Regional Development Plans Regulations and Implementations Guidelines making provision for electric vehicle charging infrastructure.

We have now made it compulsory to include EV charging stations along highways in this regard. Energy Efficiency Service Ltd (EESL), has entered a Memorandum of Understanding (MoU) with the National Highways Authority of India (NHAI) to facilitate the establishment of EV charging solutions and stations in the next five years. It is planned to develop charging stations or infrastructure at 600 locations. The government has permitted to set up EV charging points across 69,000 petrol pumps across India.

Department of Heavy Industries has already awarded work of establishment of EV charging stations for 16 national highways and expressways. Feasibility studies are underway to identify more such locations along the highways. The private players need to explore alternatives such as battery swapping services, EVs on rent and we can also develop alternative charging options by utilising the existing electrification infrastructure at metros, railways, and solar parts. It is ultimately a game of economies of scale. EVs will be viable due to their low-cost economics and similarities. The charging stations would also be equally viable and effective due to the same economics.

What is the government's plan to become Aatmanirbhar in electric batteries?

One of the major barriers to switching to EVs is cost. In

that cost, lithium batteries account for 50 per cent. Although there has been a significant reduction in battery prices over the last few years, still EVs are not able to achieve cost parity with their equivalent IC engine vehicles. The main focus to make EVs more affordable is the life cycle cost of lithium as an element per Kw hour. The current pricing of lithium is in the range of \$140-150 per kw hour. The moment this cost comes down in the range of \$100, EVs will be as competitive as petrol and diesel engine vehicles. Our research and academic institutions like ISRO, DRDO and IITs are working hard for the development of indigenous and low-cost battery technologies for EVs and we can generate an 81 per cent value of lithium oil batteries in India. Further, I am personally pushing for research on alternative battery chemistries such as sodium ion and aluminum ion batteries and hydrogen fuel cells. Low-cost raw materials can be made available from the scrapping of old vehicles metals like aluminium, lithium. Rare earth metals such as neodymium are also extracted which is used as NDFE magnets in EVs.

What about the ongoing research on hydrogen fuel as an alternative to lithium batteries...

We are aggressively pursuing research on green hydrogen as a transport fuel. For this, the government has allocated Rs 18,000 crore for the manufacturing of advanced battery cells. Recently, the government has announced a PLI scheme of Rs 26,000 crore for the auto industry to adopt battery operated and hydrogen fuel cell EV technologies. Our current efforts in research and development boosting of local manufacturing capabilities for battery and EV components would make up Aatmanirbhar in EV space. I am confident India will soon attend a leading and prominent role in the global EV market.

Is the government encouraging the application of plastics and advanced composites in automotive vehicles which would make the vehicle more energy-efficient through lightweight engineering, together with providing more durability and design flexibility at a low cost?

Our focus is to make Indian vehicles at par with international standards in terms of crash safety, body design and permissible emission norms. The government is



The cost of generation of electricity from solar energy is less than Rs 2/kw hour, and we can fulfil the domestic EV charging infrastructure through a rooftop solar system

firm on adhering to the corporate average fuel economy (CAFE) regulations where automakers are required to keep CO₂ emissions less than 130 gms per km till 2022 and below 130 gms per km thereafter. To achieve the desired emission target as per CAFÉ regulations OEMs have to increase the use of plastics and advanced composites in automotive vehicles which will help to make the vehicle lighter and fuel-efficient. We are also committed to using ethanol as a fuel for vehicles and insisting automakers manufacture vehicles with dual engine technologies. These technologies are already available in Brazil, Canada and the USA. According to a recent study in Brazil, a hybrid flex engine using 100 per cent ethanol emits 77 per cent less greenhouse gas emission as compared to Euro-VI compliant ICEs. By appropriate modifi-

cations in IC engine materials, ethanol can be used as a blended fuel, which will help automakers to better comply with the CAFÉ norms.

Automakers have to ensure maximum recovery of plastics and other composites materials on scrapping of vehicles. As per the set norms, these materials should be replaceable or repairable at an affordable cost for the consumer. The vehicle designer and manufacturers need to use eco-friendly plastic polymers, ABS sheets, and fire-redundant materials for passenger safety purposes. Automakers have to strictly comply with the notified automotive industry standards such as AIS and Bus body code. My ministry has already made provision in the Motor Vehicle Amendment Act about the recall of vehicles and their components in case of defects. 



ENERGY, FLEET MANAGEMENT AND LAST MILE CONNECTIVITY TAKE THE SPOTLIGHT

Energy, fleet management and last mile connectivity take the spotlight at Volvo India Innovation Award 2021

Tech Mahindra was conferred with the 2021 Volvo India Innovation Award for their innovative energy and fleet management solutions for Indian market. The Award, adjudged by an eminent jury, was presented at the Volvo India Innovation Summit held in Bengaluru on 10th November 2021. Zypp Electric also conferred with the Volvo India Innovation Award under the SME category for their last mile connectivity solutions that aim to uberise same day delivery using EV Fleet. Meanwhile, Department of Urban Land Transport, Karnataka, was honoured with a special recognition for its project on improving Quality of Life (QoL).

The 2021 Volvo India Innovation Award was judged by a distinguished Jury comprising:

- **Mr. Kris Gopalakrishnan, Chairman Axilor Ventures, and Co-Founder, Infosys**
- **Mr. Vinayak Chatterjee, Infrastructure Sector Expert**
- **Ms. Zarin Daruwala, CEO Standard Chartered Bank, India**
- **Mr. Lennart Börjesson, SVP Volvo Group HQ, Sweden**
- **Ms. Helene Niklasson, VP Volvo Group HQ, Sweden**

Smart Energy Management can play a key role in reducing the CO2 footprint in the country. Tech Mahindra's eNetra is a frugal nonintrusive IoT device that offers the ability to turn millions of regular energy meters in the country into smart and intelligent ones, without replacing them. It connects regular meters to the internet, captures the consumption metrics and sends data to the cloud. Both individuals and enterprises can manage and monitor their energy consumption in real time using Mobile App as well as a Web portal through data analytics and insights.

Zypp Electric's last mile connectivity solution not only aims to uberise same day delivery in the B2B segment, but also promotes aspects of sustainability. It deploys electric 2 and 3-wheelers along with innovative charging solutions; is socially inclusive, providing potential employment



Tech Mahindra conferred with the 2021 Volvo India Innovation Award for their innovative Energy and Fleet Management solutions for Indian market

to low-income groups; provide higher utilisation levels through AI, Machine Learning & IoT tools thus building a last-mile solution that is optimised and economical.

"Today, the need for innovation is greater than ever before. We are standing at crossroads, where on one side, we face challenges to our planet and people, while on the other, we are seeing boundless opportunities arising out of emerging technologies and changing consumer demands that lead to new business models. Clearly, innovation through co-creation, is the vital way forward to accelerate meaningful adoption and use of these technologies for common good and sustainable future. This indeed is our inspiration behind the Volvo India Innovation Award. We believe that this will help to spotlight and encourage an innovation culture in the country, which in turn would inspire us all to develop solutions for our collective future," commented **Kamal Bali, President & MD, Volvo Group, India.**

The Department of Urban Land Transport [DULT], Government of Karnataka, was honoured with a special recognition for their initiative in turning Church Street in Bengaluru into a testbed for future solutions in pedestrianisation, clean air and electric micro-mobility. The initiative has attracted 14 start-ups to test their products and has also become a platform for artists & performers to connect with their audience. DULT has now embarked upon development of a toolkit for pedestrianisation in Bengaluru. 

By Kruti Bharadva

AS CLEAR AS CRYSTAL

An insightful look at a new generation of capable robotic products, built from the ground up to operate based on computer vision input and AI rather than rigid programming

It is impossible to overestimate the critical nature of keen and constant visual inspection in any production process. That's why an advanced vision system is vital for any of today's advanced production lines – as well as for “yesterday's” older and more issue-prone lines. When a defective process, fault, or crash occurs in a system, time is at a premium and even a slight delay can cascade into a costly defective product pile up. As such, an advanced visual inspection system must be deeply intelligent, instantly accessible, immediately actionable, impenetrably secure, and easy to operate.

While cloud computing has led to a paradigm shift in how industries operate, many businesses have taken a gradual approach to adopting and adapting to a cloud-based architecture. Current outdated systems are tied to one computer or workstation for their programming and operations. For many industries outside of manufacturing a transition to the cloud has been an easy decision. But, due to the complexities of manufacturing processes and how inspections are performed, using cloud tools has been a low priority and a heavy lift. Increasing demand for higher volumes of goods while maintaining low fallout rates has forced the conversation to include smart tools to increase productivity. Now, the combination of cloud tools, reliable platforms and ease of operation for the user has exponentially enhanced key factors including security, monitoring production, accounting, management operations, and overall efficiency. With a cloud-based (SaaS) system, creating or managing vision-based hardware and software is greatly simplified and helps dramatically lower expenses when compared to the cost of housing, maintaining, or staffing in-house systems. This coupled with high availability, reliability and the decreasing cost of cloud services, makes it possible for a company to efficiently manage its visual inspection technology for operation at any



Advanced Vision System

time and from anywhere in the world. Machine vision is becoming commonplace in passive applications such as quality inspections by helping to transition from sample-based checking where 10 per cent of product is typically inspected, to 100 per cent checking without decreasing quality. Most machine vision systems rely on multiple technologies and systems integration that include both hardware and software products, as well as human resources, actions, and expertise, but it's the Artificial Intelligence (AI) element that is quickly helping vision systems become fast and accurate while requiring minimal training.

Cloud-based vision system scan be quickly deployed with no SI or team member involvement to inspect just about any product, and leverages AI to improve point-to-point quality assurance and streamline workflows.

A UNIQUE APPROACH

Many production systems managers conflate machine vision with AI vision, but the systems are distinct from each other. While machine vision gives a computer the ability to see, AI vision can look at a series of images

and attempt to gain an understanding of what it sees, much like a human would. The approach is becoming the preferred method for addressing evolving processes in industrial automation, bridging the gap from rules-based machine vision to more intuitive quality checks allowing for AI vision to cover complex use cases that rules-based machine vision hasn't been able to in the past. Current vision systems also typically require rigid configuration of hardware and software which may include hard-coding. Such configurations take time to set

up and if a camera gets jostled or damaged, production can be interrupted. The result is a costly, time-consuming restart often involving specialised personnel or outside experts. Adding an AI vision system with an intuitive user interface and no-code programming tools, coupled with the ability to quickly re-deploy machine learning models by anyone quickly delivers ROI by eliminating the risks associated with rigid setups.

DATA YOU CAN USE

Many companies have a traditional vision system in place, but the data is siloed and therefore not being



Radian Inspection Camera

enhanced automation implementation will improve business and the bottom line. Now it's possible for multiple production lines to operate in facilities around the world and have all aspects of the line observed in real time. 

Source: Elementary Whitepaper

The work Elementary does goes beyond building cutting edge technology. Research shows that the best outcomes produced are from human and machine interactions. The company designs automation products with a human-in-the-loop approach that improves working conditions while delivering maximum result

GRUNDFOS LAUNCHES LARGE RANGE OF CR PUMPS IN INDIA

Grundfos, the world leader in pumps and water solutions, has announced the launch of its new generation of large CR pumps in India. Designed with world class efficiency upgrades to provide customers with improved flow performance and pump pressure, the range of CR 185, 215 and 255 caters to a wide range of applications water supply, water treatment and almost all industrial solutions – including those for high-pressure, hot, dangerous, flammable, and aggressive liquids.

Industrial operations across different sectors, from automotive manufacturing to food and beverage processing can be water and energy intensive. Industries in India also account for about 56 per cent of total energy consumption of the country. The level of industrial energy and water efficiency varies widely across the country. With the need for a constant flow of large quantities of water while simultaneously being energy efficient, Grundfos' new CR range is the most efficient way of handling these production process.

This new large range of CRs bring an increased maximum water flow of up to 320 m³/h and has been designed for maximum energy efficiency and performance across the board. With its optimized hydraulic design

- from impeller and guide vanes to inlet, discharge port, sleeve and diffuser - the new generation of Grundfos CR offers world class energy efficiency. Due to its small footprint, it is much easier and less costly to install than other pump designs. The new generation includes even more options such as predictive monitoring, higher pressure, lower NPSH and the use of standard motors.

The improved shaft seal design makes it apt for high pressure and hot liquid operations in industries. The pumps are also efficient in handling difficult liquids for industries such as chemical and petrochemical, refineries, and distilling plants. These pumps are also ideal for industrial cooling processes.

Commenting on this launch, **Burak Gürkan, Senior Regional Sales Director, Industry - IMEA, Grundfos** said, "Grundfos' range of CR pumps are the world's first vertical multistage centrifugal inline pumps, and are since its inception, over 3.5 million CR pumps now serve industries around the globe. We are always striving towards moving the limits with our products and solutions. With the launch of the new large CR range, we want to provide our customers more reliability, options and cost-efficient solutions."

By Kruti Bharadva

THIS TIME FOR AFRICA!

Over the past two decades, low-cost manufacturing has transformed China, India and a group of other developing countries. Now, it's Africa's turn.

That will sound unlikely to the many people who see Africa as synonymous with extreme poverty, conflict and instability. But anyone who understands the nuances of the vast continent knows that African countries are well placed to grab a bigger share of global manufacturing in the coming years

To understand Africa's potential as a manufacturing hub, it's important to stop seeing it as a monolith. The continent groups 54 economies and societies with variations as wide, if not wider, than those in Europe and Asia. Three of the five most fragile countries in the world are African, among the many nations there that suffer from high levels of corruption, violent conflict and low levels of education.

But then there are countries like Senegal, Rwanda, Mauritius, Cote D'Ivoire and Botswana that have a strong track record of economic growth, stability and education. Six of the 15 fastest-growing economies in the world are in Africa and the continent has become a must-visit destination for the titans of the U.S. tech industry. African countries have talent in multiple languages and the youngest population of any continent. By 2055, the continent's 15-24 year-olds are expected to be more than double the 2015 total of 226 million.

Investment in manufacturing in Africa has long been subdued by the region's generally poor infrastructure and its sometimes deserved reputation for corruption and crises. Manufacturing's share of African GDP has hovered around 10% over the past decade. Africa as a whole only meets about half or less of its \$130-170 billion annual infrastructure investment needs, according to the African Development Bank.

But there are signs of change, especially for the region's economic stars. Between 2005 and 2014, manufacturing production in Africa more than doubled



from \$73 billion to \$157 billion. The strongest growth has come in countries such as Uganda, Tanzania, and Zambia that have track records of prudent economic management and business-friendly reforms.

Already some countries are gaining footholds in oil refining, garments and textiles, agriculture processing, automobiles and pharmaceuticals. For instance, the Spanish drug maker Grifols announced a manufacturing plant in Morocco and Volkswagen is building assembly plants in Ghana and Nigeria and doing skills development labour force work in Ethiopia.

General Electric, which has had operations in Nigeria for four decades, plans to spend \$1 billion there by 2023 to strengthen its manufacturing and product



But anyone who understands the nuances of the vast continent knows that African countries are well placed to grab a bigger share of global manufacturing in the coming years

services, in particular power generation as well as oil & gas exploration and production.

Sweden's H&M and Ireland's Primark already source much of their garment materials from countries like Ethiopia and even luxury producers are starting to acknowledge opportunities for small-scale production in Africa, such as New York's Beyond Good chocolatier, formerly Madecasse, which has expanded its workforce in Madagascar.

Among policymakers and scholars alike, a robust manufacturing sector is broadly understood as a fundamental path to economic growth and development. The most recent illustration is the launch of the African Continental Free Trade Area, a single market for goods and services in Africa that aims to unlock manufacturing potential and facilitate industrialisation, driving sustainable growth and jobs among other objectives. The key boon of manufacturing is that it absorbs large swaths of workers and places them into productive and decent paying jobs. Throughout history, this exact recipe has transformed the United States, United Kingdom, France, Japan, and Germany into some of the world's wealthiest nations. Most recently, a new age of industrialisation has helped push China into one of the world's fastest growing economies boasting the largest middle class, with other Southeast Asian countries following closely behind. These are all examples of how industrialisation can generate rapid structural change, drive development, and alleviate poverty and unemployment.

However, this narrative seems to exclude many African nations. Despite their manufacturing potential and promising trajectories, most African countries have remained relatively dearth of factories. This limited industrial development represents a missed opportunity for economic transformation and quality employment generation that alleviates poverty.

The silver lining is the potential. Business-to-business spending in manufacturing in Africa is projected to reach \$666.3 billion by 2030. This trend creates a huge opportunity for the continent, not only for countries such as South Africa, Egypt, and Nigeria (all regional outperformers in the Global Manufacturing Competitiveness Index), but also for newer players such as Ethiopia, Morocco, Rwanda, and others (all of whom have recently adopted policies enabling manufacturing and industrial development).

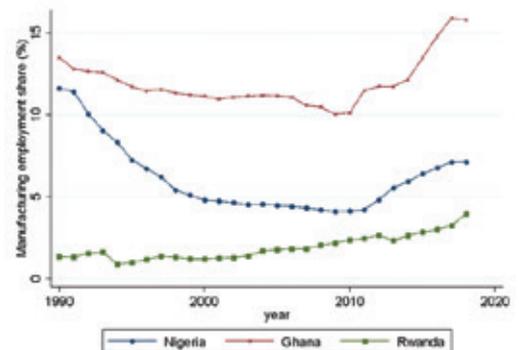
THE COVID SITUATION

The COVID-19 pandemic has wreaked havoc on the global economy, with world output contracting at 3.5 per cent in 2020, and no recovery likely before the next year. Like other developing regions, sub-Saharan Africa recorded a 2.6 per cent decline.

Unfortunately, this comes at a time when the region has been experiencing a surprising and very welcome manufacturing renaissance. Historically, industrialisation has been associated with rapid technological improvements and sustained growth in the western world, and more recently east Asia, gainfully employing millions of workers and helping it to close the income gap with richer countries.

Until the 2000s, sub-Saharan Africa was de-industrialising: the mood was gloomy as the little manufacturing activity that did exist was disappearing, and with it the traditional route to development and poverty reduction. In northern Nigeria's biggest city, Kano, for example, textile factories, leather tanneries and ceramics plants were visibly falling into disrepair. There were reports of empty industrial parks in Ethiopia, while South Africa's footwear industry had collapsed.

But recently the trend has reversed across the region. The graph below shows how this industrial renaissance affected the share of manufacturing employment in three countries, namely Nigeria, Ghana and Rwanda. Manufacturing in Ghana and Nigeria started to expand from around 2010 onwards, while in Rwanda it had been steadily increasing as a share of employment since the 2000s. Rwanda's industrialisation includes the opening of its first car assembly plant by Volkswagen in 2018, for instance.



One major question that stems from research is how this trend towards more industrialisation in sub-Saharan Africa is likely to have been affected by COVID-19. Various economic activities have taken a hit, particularly travel and tourism, as lockdown policies have put a break on commerce and travelling. Fundamental drivers of long-term manufacturing growth have also been held back – especially education, with schools closed in many countries for extended periods.

On the other hand, since the recent manufacturing growth has mainly been serving a domestic and not an export market, it is at least not primarily depending on demand from other countries. But as far as exports are concerned, the initial indications are that commodity exports in sub-Saharan Africa were hit harder than manufacturing – vividly illustrated by the collapse in oil prices in 2020 (which has since bounced back). The recently created African Continental Free Trade Area might also boost regional trade in manufactured goods in the years to come. So all in all, the manufacturing renaissance in the region may be relatively resilient.

Today, leaders are increasingly realising that manufacturing is a major factor in helping Africa achieve their goals of successfully reaching the next stage of economic development. The African Union has put the sector front and centre in its Agenda 2063. African governments are seeking new and innovative ways to attract investment and nurture industry, implementing strategies that involve targeted investment in infrastructure, improved regional integration, and the establishment of special economic zones (SEZs) for priority subsectors.

However, in order to reach its manufacturing and industrial potential, much needs to be done by the public and private sectors to increase Africa's economic complexity, diversity, competitiveness, and productivity.

TALKING THE NUMBERS

An African industrial revolution is underway as manufacturers ramp up production of everything from processed food to automobiles. It is calculated that African industries have the opportunity to double production to nearly \$1 trillion within a decade. Three-quarters of that growth is likely to come from manufactur-

ing to substitute imports and meet burgeoning local demand. But there is also an important opportunity to grow manufacturing exports and make Africa the world's next great manufacturing centre as industries shift away from China to lower-cost regions. The ongoing revolution among industries without smokestacks, such as tourism, agro-industry, and some information and communications technology based services, can serve as a development escalator as these industries share three key characteristics of traditional manufacturing—exportability, higher productivity, and high labour intensity.

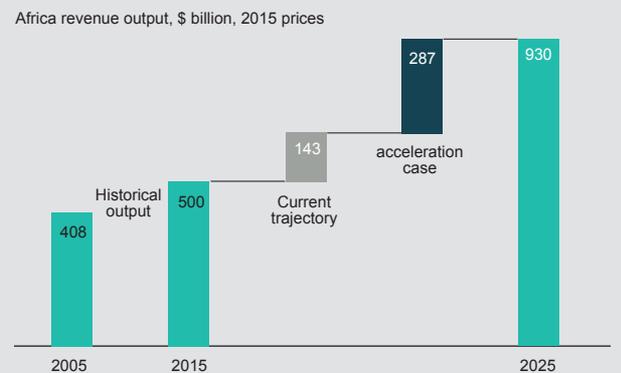
AFRICA AS AN AUTOMOTIVE HUB

Morocco is an emerging automotive manufacturing hub, while South Africa has a history of car making. But multinational vehicle manufacturers are also setting up production plants in Angola, Ethiopia, Ghana, Kenya, Namibia, Nigeria and Rwanda, and locally owned African producers are starting out on this road less travelled.

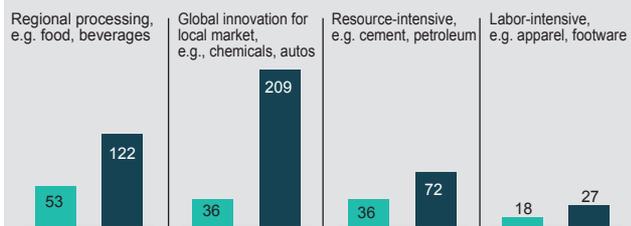
Africa has more than a billion people, 17 per cent of the world's population, but accounts for only 1 per cent of cars sold worldwide, compared with China's 30 per cent, Europe's 22 per cent and North America's 17 per cent, according to the Paris-based Interna-

Figure 5.1 Africa has an opportunity to triple historical manufacturing output growth rates, and to double output, in 10 years

Potential revenue growth from African manufacturers by 2025.



Current trajectory vs. acceleration case, by key sector, \$ billion, 2015 prices



Note: Figures may not sum, because of rounding
Source: IHS; UNCTAD; McKinsey Global Institute analysis.

tional Organization of Motor Vehicle Manufacturers (OICA). Africa has on average 44 vehicles per 1,000 people, compared with the global average of 180 and 800 in the United States, according to consulting firm McKinsey & Company.

In 2018, Morocco overtook South Africa as the biggest African exporter of passenger cars with exports in 2019 at \$10 billion (€8.5 billion). The two countries mainly make cars for foreign markets, but also have relatively large domestic markets. VW, Mercedes-Benz owner Daimler and BMW are among the biggest car companies in Africa, making up over 90 per cent of all passenger cars produced and a third of the cars sold in South Africa in 2019. Meanwhile, about 80 per cent of the 400,000 cars produced in Morocco are sold to Europe, with France, Spain, Germany and Italy the main destinations.

The Moroccan car industry directly employs 220,000 people, most of whom work for 250 suppliers. Annually, Moroccans buy 160,000 new cars, which is a small number for a population of 36 million.

In September, Stellantis — created in January 2021 after a merger of Fiat Chrysler and PSA — announced that its supermini electric car Opel Rocks-e would be produced at the PSA plant in Kenitra, northeast of Rabat, with a capacity to make 200,000 vehicles a year. Stellantis, the world's fourth-largest car manufacturer, plans to increase spending on parts made in Morocco from €600 million to €3 billion by 2025.

BYD, a Chinese electric vehicle manufacturer, signed a memorandum of understanding with the Moroccan government to also open a plant in Kenitra, while Hyundai, the Korean carmaker, is reportedly considering setting up shop in Morocco after leaving Algeria.

Meanwhile, STMicroelectronics, a US company based in Casablanca, has launched manufacturing of the main transmitter for Tesla vehicles in Morocco.

Perhaps the main reasons Morocco has been a success story are its location close to European markets and the free trade agreements it has signed with Europe, the US, Turkey, the United Arab Emirates and elsewhere. Locally based suppliers and staff and supplies are also important. Renault, for example, sources parts from seats to axles from local suppliers. Local content accounts for 60 per cent of the final product. Meanwhile, labour costs are about a quarter of those in Spain and lower than in Eastern Europe.

Before Opel's Moroccan shift, Egypt had been widely expected to become the region's next leading automotive manufacturing centre. Chinese automaker Dongfeng signed a framework agreement in January with the bankrupt Egyptian state-owned El Nasr Automotive Manufacturing Company to jointly produce electric vehicles in Egypt. There are also very small

production plants in Kenya and Rwanda. In Rwanda, Volkswagen is testing e-mobility.

European production facilities are planned in Ethiopia, Nigeria and Ghana. Ghana wants to limit the import of used and obsolete cars. It is also offering car producers 10 years of tax exemption. Volkswagen opened its first assembly plant in Ghana in August 2020. Up to 5,000 vehicles are to be assembled there per year, including the Tiguan, the Passat and the Polo. Nissan is also preparing to launch an assembly plant. In Nigeria, Kenya, Rwanda and Ghana, global carmakers are investing in assembly plants instead of full-fledged production units. In Kenya, a local company, AVA, assembles medium and heavy commercial vehicles for Mitsubishi, Fuso, Scania, Toyota, Hino and Tata.

IN CONCLUSION

Despite the recent manufacturing growth, several challenges still hold manufacturers back from venturing into Africa. Most African countries do not yet have the infrastructure capable of sustaining large scale manufacturing and relatively high labour and capital costs. As a result, manufacturing on the continent is concentrated in only a small number of countries.

The increasing automation of many low-skilled processes may also make Africa less attractive as a manufacturing destination since automation-heavy factories require an abundance of electricity. And with robots replacing human workers, companies might stop outsourcing production abroad.

Automation also creates opportunities. Manufacturing companies can strategically involve themselves in developing infrastructure on the continent and use the latest tools and techniques to build functioning roads and ports. Private investment in African infrastructure can yield profits while contributing to the continent's economic success. The trend away from production outsourcing should not affect manufacturing companies that focus on meeting the increasing demand for consumer products on the continent. Governments can choose to nurture specific sub-sectors, as Nigeria did with cement, to grow their competitive advantage. Entrepreneurs can draw on their creativity and innovation to face the infrastructure challenge and leapfrog over outdated production and distribution processes. Companies that enter the market now may well enjoy a first-mover advantage as they contribute to building Africa's long term production capacities. 

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A NEW COMPONENTS MANUFACTURING FACILITY

Alstom, a global leader in sustainable and green mobility solutions recently inaugurated its new components manufacturing facility in Coimbatore. This is the largest components manufacturing facility in Asia and is dedicated to improving industrial efficiency in manufacturing components for various prestigious national and international projects.

Alstom's industrial presence in Coimbatore has evolved across 3 sites since 1978. This new site is spread over a total area of 15 acres and has an installed capacity of 2.1 million hours, that will offer a higher degree of production diversity & complexity – integration & testing of tractions, auxiliary convertors, cubicles, driver desks and Rolling Stock looms. The site will create 10,000 direct & indirect jobs and currently has a gender diversity rate of 20 per cent.

The Coimbatore site currently delivers not just to Alstom's Indian sites but also to major sites across 5 continents – Asia, Australia, Europe, North America and South America. Some of the key countries include – France, Canada, Italy, Belgium, Germany, Netherlands, Saudi Arabia, Vietnam, UAE etc.

Speaking at the inauguration, **Alain SPOHR, Managing Director – Alstom India** said, “Our presence in Coimbatore dates to the 1970s and since then we've grown multifold. The opening of this facility is a testament of our commitment to the government's flagship 'Make in India' & 'Atmanirbhar Bharat' initiative. With our enhanced capabilities and a team of talented and dedicated employees, we are proud to be a catalyst in India's manufacturing led growth story. We have been the preferred mobility partner on various Indian projects and are keenly looking forward to becoming a leading supplier of components across Alstom's sites globally.”

Marveling at Alstom's commitment to India, at the inauguration of the large-scale setup with modern equipment and amenities, **Emmanuel LENAIN, Ambassador of France to India**, said, “French companies are fully committed to 'Make in India' and speeding



(L-R) - Lise TALBOT, Consul General of France in Pondicherry and Chennai, French Ambassador Emmanuel LENAIN & Alain SPOHR, MD Alstom, at Alstom's new Coimbatore site

ahead on the back of strong bilateral relations between the two countries. It is heartening to see India's manufacturing prowess powering global mobility. I salute the efforts and investments made by Alstom over the years in India towards building a strong base of sustainable mobility solutions and high localization, while creating a positive impact on the people and communities”

In line with Alstom's Sustainability Goals for 2025, this site has undertaken several sustainability measures like – targeting 80 per cent of regular activities to be run on green energy, utilize 100% of natural light during daytime, rainwater harvesting, reusing 100 per cent of the sewage treated water, etc. The factory also boasts of a stellar record in safety. Cumulatively, the factory has successfully achieved 10+ years of 'accident free' man days.

In line with its commitment to contributing sustainably to communities in need, Alstom is taking up various projects around the factory. With the objective of reaching out to a total of over 100,000 direct beneficiaries, the company has pledged INR 3 crores for various CSR projects in the next 3 years. Some of these activities include - Water conservation, sustainable rural living and youth skilling. With this stronger industrial and commercial base with the purpose to offer a broad range of components, Alstom is much stronger to address mobility needs of India and the world. 

NEW IGUS CABLE GUIDE FOR SCARA ROBOT

SCARA robots are ideal to perform pick-and-place or assembly tasks in the industry. However, these dynamics have a limited lifespan due to the corrugated hoses wearing out within a very short time. Therefore, igus has now developed an alternative, which can be retrofitted with the SCARA Cable Solution, which significantly increases the service life.

Watching SCARA robots at work can quickly make you dizzy. The horizontal articulated-arm robots work fast over four axes. The inner and outer arms pivot horizontally. The component for gripping objects, the ball screw, moves rotationally and linearly. This allows the robot arm to reach almost any point in its working radius. This is fast and precise, but it means that the externally routed cables and hoses have to be replaced or serviced frequently due to the high loads.

The SCARA Cable Solution consists of three components: the rotary bearing for the moving end



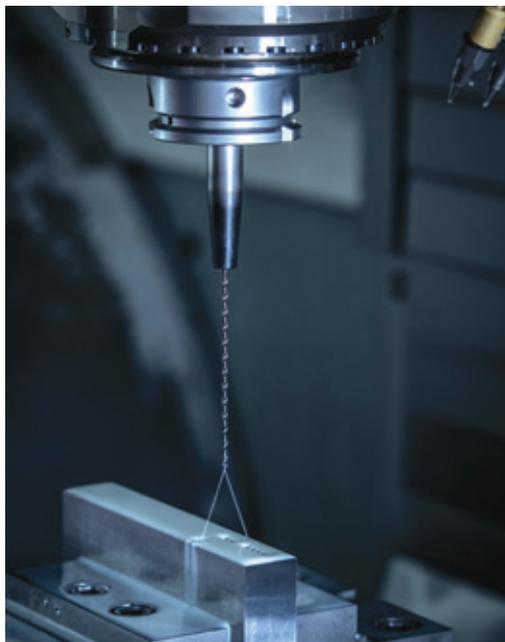
and the fixed end, as well as the corrugated hose with the e-rib. The special feature lies in the new rotary connection, which absorbs the torsional forces. Here, integrated ball bearings ensure a smooth-running energy supply system that is resistant even to high accelerations. The corrugated hose is reinforced with an e-rib so that it can only move in one spatial direction. The guide elements on the sides give the hose unsupported length.

HIGH-PRECISION MICRODRILLS

Drilling ultra-small bore diameters with low tolerances is unthinkable without high-precision tools – especially at depths over 20xD. With the new WTX-Micro drills, the CERATIZIT Group's Team Cutting Tools has developed the ideal solution from diameters of 0.8 mm for drilling deep holes with outstanding surface quality. And, thanks to the helicoidal through coolant system.

Drilling diameters this small can only be efficiently achieved if all process components are exactly tailored to one another: Will machinists have to contend with long or short chips with the material they want to machine? Is the coolant pressure sufficient to supply the drill's narrow coolant holes? Is the coolant sufficiently filtered and free from suspended and fine particles that could clog the coolant holes? "These are just some of the questions that our customers need to consider first if they want to get the most out of their micro drilling process. Then, whenever they need to tackle deep hole dimensions, expert knowledge is essential," stresses Product Manager Drilling Tools at CERATIZIT.

Although it may sound like a contradiction, the WTX-Micro from the WNT Performance range – the new drill range from the CERATIZIT group's Team Cutting Tools – is a specialist micro- and deep-hole drill that at the same time can be used universally. when it



comes to materials, this drill is anything but picky: whether it's steels, cast iron materials or heat-resistant materials and their alloys, WTX-Micro is ready for anything! This means it can be used in a variety of applications in a wide range of sectors.

Since the specifications in micro-machining are mainly

defined by low tolerances and, above all, absolute process security, the WTX-Micro has been optimally streamlined for use in this area. The ultra-fine-grained carbide used, which was developed and produced by CERATIZIT, the chip space geometry, ultra-smooth surfaces and the coating are precisely tailored to one another, ensuring the highest level of quality.

The WTX-Micro drill's helicoidal internal channels are optimised to ensure the maximum flow of coolant, which results in an improved surface quality for the holes. This is partly ensured by a power chamber, which is integrated along the entire length of the shaft in micro-drills of 5xD and above.

The WTX-Micro is available from a diameter of 0.8 mm in the lengths 5xD, 8xD, 12xD, 16xD and 20xD. From 1.0 mm to 2.90 mm, they are also available in 25xD and 30xD. Here, the optimised geometry with lapped surfaces and patented chip space openings, as well as the special micro drill point thinning ensure high cutting and process stability.

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