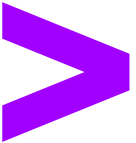
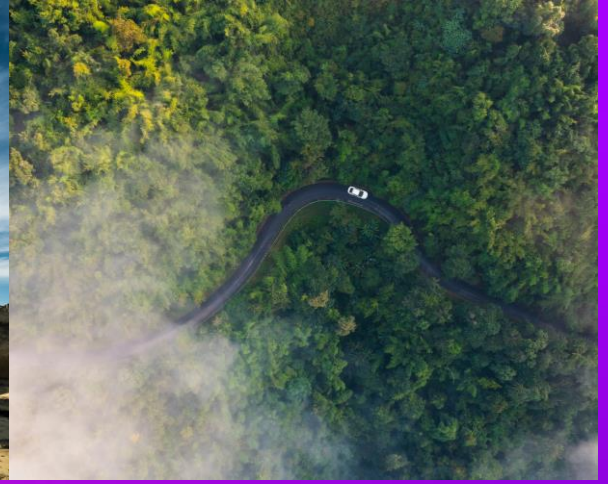


Innovate

Trends and innovations that matter





Learn about the latest announcements impacting the industry, from in-vehicle generative AI, to innovations on inductive-excited electric motors, digital twin for machine tool processing, and more.



**Industrial is
a front-runner
in combining
human ingenuity
with technology
and innovation.**

Thomas Rinn

**Senior Managing Director,
Global Industrial Lead, Accenture**

New industrial air control solution eliminates humidity and carbon

Munters and GreenCap have joined forces to combine dehumidification with carbon capture technology, paving the way for a production process that is virtually free from carbon emissions and humidity. This improves the quality and lifespan of manufactured products across many industries and is particularly beneficial for production processes related to the electrification of society. The efficiency of the solution also helps manufacturers reduce their carbon footprint. The first application of the system, which integrates Munters' DSS Pro for dehumidification and GreenCaps DAC process for carbon capture, has been implemented in Europe.

Solar-powered off-road car venture boosted by PPG partnership

Solar Team Eindhoven, a group of students from the Eindhoven University of Technology, has developed what it believes is the first entirely solar-powered off-road vehicle capable of long-distance travel. The vehicle, named Stella Terra, uses a lithium-ion battery pack to store surplus energy collected by its solar panels. Stella Terra weighs 1200 kilograms and promises a range of 630 kilometers in a single sunny day, reaching a top speed of 145kph.

The meticulously designed suspension system allows the vehicle to navigate rough terrains comfortably. Recently, it successfully completed a challenging 1000km test journey across Morocco on diverse terrains, without stopping at a charging station. The Solar Team has received a boost from the US coatings supplier PPG, which provided the students with a grant of \$37,000. PPG also treated the battery pack with its PPG CORACHARTM fire protection coating, to prevent spread of fire in the unlikely event that the battery overheats and ignites in the harsh conditions of the test drive.



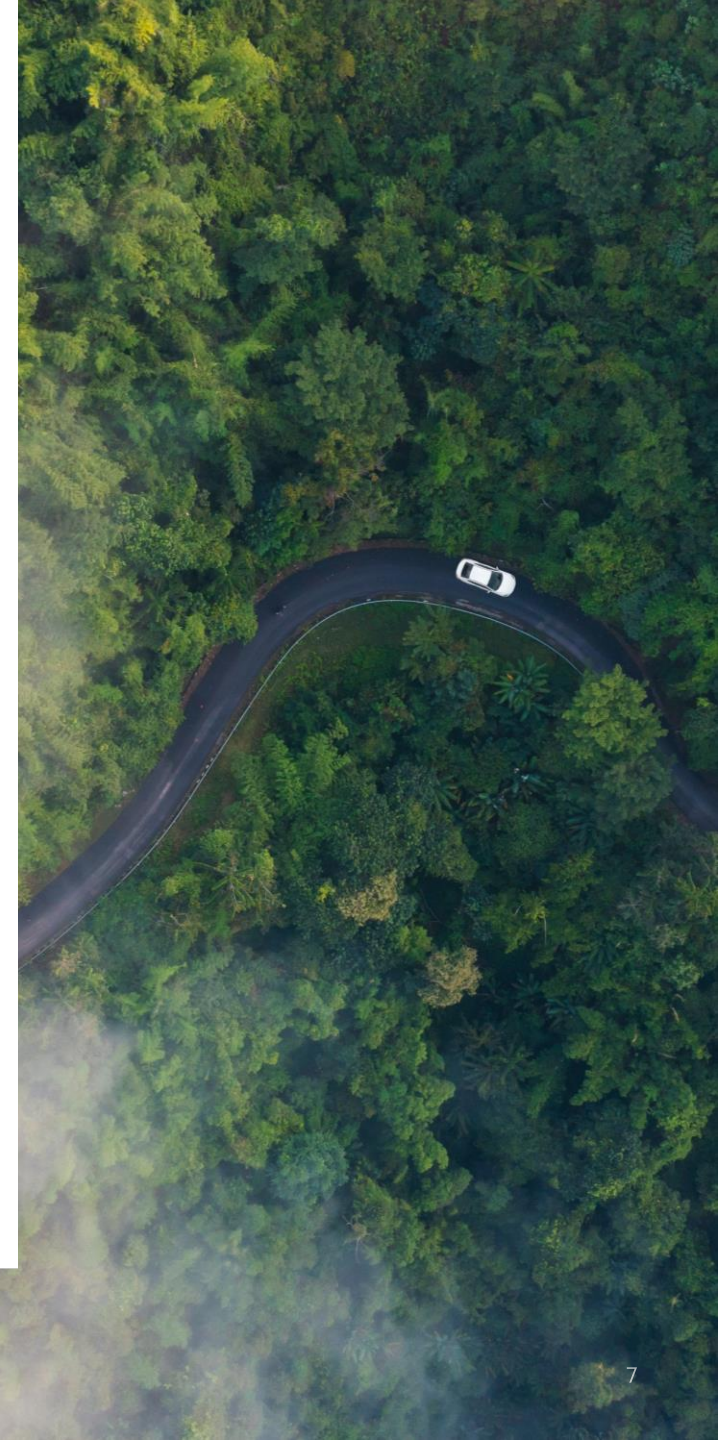
Komatsu launches two new electric mid-sized excavators

Komatsu Ltd., in partnership with the US manufacturer Proterra, has developed two new 20-tonnes class electric excavators powered by lithium-ion batteries. Komatsu will initially rent the new models to European and Japanese customers, to develop the market for electric construction equipment. The medium-sized excavators are commonly used across a wide range of job sites and applications, being one of the most versatile construction equipment. The new electric excavators can work for up to 8 hours on a full charge and match the performance and durability of engine-powered excavators while eliminating exhaust fumes and operating noise, heat and vibration. The launch of the two new models follows the recent introduction of Komatsu's 3-tonne electric mini-excavator.



ZF creates more efficient and sustainable magnet-free electric motor

ZF has developed an electric motor that uses no magnets, enabling greater efficiency and a more compact design. The new I2SM differs from other separately excited synchronous motors (SESMs), which are also magnet-free, by accommodating an inductive exciter inside the rotor shaft. This not only reduces energy loss by 15%; it also allows for ultra-compact e-motor design, maximum power and torque density. Further, production CO₂ emissions can be decreased by as much as 50 percent compared to PSM motors that use rare earth materials. According to ZF, the performance of the 400V and 800V I2SM motors is on a par with traditional permanent-magnet synchronous (PSM) machines, which are most commonly used to drive e-vehicles.



Caterpillar and Albemarle form partnership for green lithium mining

Caterpillar and Albemarle have formed a partnership to advance green lithium mining. The goal is to transform Albemarle's Kings Mountain mine into North America's first zero-emissions lithium mine site. The site will be using Caterpillar's battery-electric trucks. Further, Albemarle will be the primary provider of the metal for Caterpillar and making the North American-produced lithium available for the company's battery production. The partnership includes also potential collaboration on research and development of battery cell technology and recycling methods. According to Caterpillar's Rod Shurman, Senior VP, Electrification and Energy Solutions Division "The agreements will further build out a secure, resilient and sustainable value chain for electrified equipment across the Caterpillar portfolio, while also supporting Albemarle's journey to more sustainable operations."



Continental and Google Cloud team up to bring generative AI into cars

Continental has partnered with Google Cloud to integrate generative artificial intelligence (AI) into cars, making it one of the first automotive suppliers to directly incorporate Google Cloud applications into vehicle computers. The collaboration aims to create an intuitive user experience for drivers, allowing them to engage in natural dialogue with their vehicles. Through the Smart Cockpit High-Performance computer, series production is expected in just 18 months, bringing the vision of a software-defined vehicle closer to reality. The AI system enables drivers to ask questions about various aspects, such as tire pressure or points of interest on the route, with the underlying generative AI compiling relevant information directly from the vehicle into the dialogue. Drivers can also ask follow-up questions without needing to repeat the context. The system also supports continual learning, adapting to user preferences and generating new content.

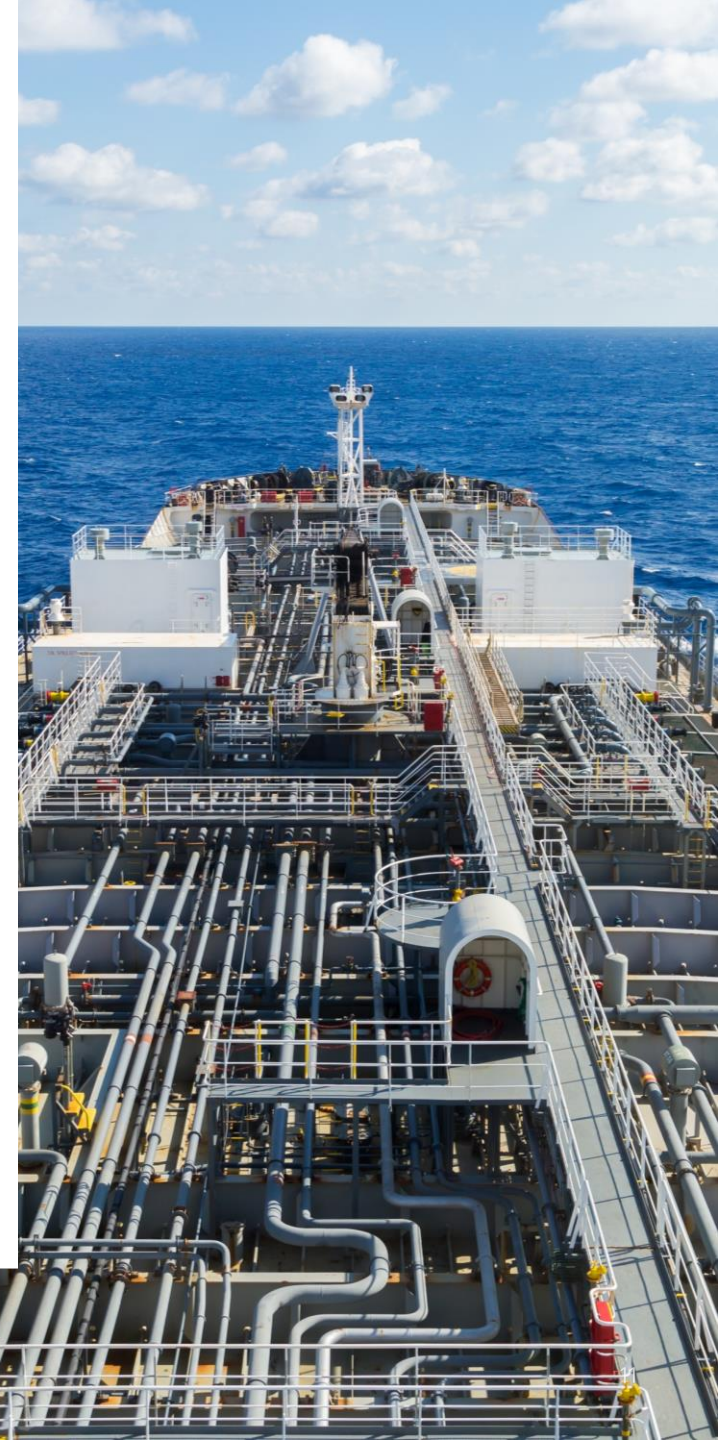


New machine-tool digital twin promises 'breakthrough' boost in performance

Siemens and DMG MORI, the Japan-based machine-tools manufacturer, have joined forces to introduce a groundbreaking digital twin for machine tool processing on the Siemens Xcelerator Marketplace. The digital twin encompasses the control system, machine tool, and workpiece, leveraging the Digital Native CNC Sinumerik One. This collaboration aims to enhance sustainability, flexibility and time-to-market. The digital twin allows customers to reduce scrap and machine damage, accelerate production ramp-up by up to 40%, cut down-time in unproductive testing on the machine by as much as 75%, and significantly reduce energy consumption. The partnership addresses the evolving needs of small and medium-sized businesses, providing a path to optimization through digital twins, fostering open collaboration, seamless integration, and driving innovation in the manufacturing landscape.

CO₂ capture collaboration for FPSO sustainability

SBM Offshore N.V. and Mitsubishi Heavy Industries (MHI) have entered a partnership to develop CO₂ capture technology for Floating Production Storage and Offloading vessels (FPSO), crucial in the oil and gas industry. The collaboration, following successful feasibility studies, uses MHI's Advanced KM CDR Process™ technology - a proprietary CO₂ capture technology jointly developed with Kansai Electric Power Co., Inc. By installing a CO₂ recovery module on an FPSO and recovering the CO₂ emitted from the power generation gas turbine, it is expected to reduce greenhouse gas emissions by up to 70% compared to conventional methods. The project, part of SBM Offshore's emissionZERO® program, combines MHI's CO₂ capture tech with SBM Offshore's Fast4ward® principles, contributing to global carbon neutrality efforts in response to the increasing demand for FPSO operations' decarbonization.



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