

FPT INDUSTRIAL REVEALS ITS TRUMP CARD AT CES 2022 IN LAS VEGAS

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What do future mobility and industrial transportation mean? And what changes will they bring to the daily lives of people and businesses? FPT Industrial has a lot to say and show on this matter, as it joins the world's most innovative companies gathering from **5 to 8 January 2022** at the Las Vegas Convention Center for CES 2022.

Following its participation at the 2020 edition, at which the Cursor X 4.0 Power Source Concept was presented, FPT Industrial has turned that inspiration into concept solutions that combine open innovation, electrification and the inclusion of start-ups to design its energy transition path. In line with this approach, the brand's new 2200 sq ft stand (**booth #9643 North Hall**) is divided into **four Innovation Areas dedicated to the latest projects for its on-road, off-road, marine and power generation engines and systems**.

FPT Industrial shares its exhibition space with the start-ups that took part in the development of the presented innovations, further evidencing its strategy focused on continuous innovation and on taking solutions to the next level.

On-Road Innovation Area – Commercial transport runs on electric

FPT Industrial is responding to the crucial challenges of transport sustainability, energy transition and CO₂ emission reduction with a complete range of innovative products.

In line with its multi-application, multi-power and modular range, at CES 2022 FPT Industrial is showcasing **two e-axes and a battery pack with a Battery Management System customized to meet customer needs**. Designed to fully integrate all ePowertrain elements in a compact solution to easily house both the commercial load and the battery packs, the new e-axes, one for heavy-duty Nikola trucks and the other for LCVs, will guarantee outstanding performance and reliability according to the mission application.

The integrated electric axle is suitable for heavy-duty, 4x2 / 6x2 articulated 44-ton GVW (Gross Vehicle Weight). Delivering high performance (840 kW) and outstanding efficiency, the e-axle for HCVs (Heavy Commercial Vehicles – Class 8 Trucks) has been developed thanks to a joint venture between Nikola, IVECO and FPT Industrial for the version of the **NIKOLA TRE BEV (Battery Electric Vehicle)**, the first units of which will be delivered in the US in 2022. FPT Industrial's HCV e-axle also features in the recently unveiled FCEV (Fuel Cell Electric Vehicle) prototype of the NIKOLA TRE that will enter production in Ulm (Germany) by the end of 2023.

FPT Industrial's high-performance, reliable and top-quality ePowertrain range is completed by state-of-the-art energy storage and management solutions.



PRESS RELEASE

In collaboration with Microvast, a Texas-based company and market leader in ultra-fast-charging, long-life battery power systems, FPT Industrial has started internal battery pack development and production. The 37 kWh version on display at CES 2022 is the compact design version for light commercial vehicle and minibus applications, featuring a multipack option for both goods and people transport missions.

FPT Industrial's commitment to high-performance and reliable electrification solutions is completed by its range of cutting-edge Battery Management Systems, customized to get the longest battery life according to mission requirements, thanks to the acquisition of Potenza Technologies.

Off-Road Innovation Area – The world's first grape harvest with a zero-emission tractor

What's new in a winery founded in 1858 by the first king of Italy? **The partnership between FPT Industrial and Fontanafredda**, a historic winery located in the Langhe Region (Piedmont, Italy), will result in a **more eco-friendly 2022 Barolo wine cultivation** thanks to an innovative zero-emission tractor fitted with FPT Industrial's **F28 Natural Gas engine**.

In 2021, the first prototype New Holland TK Methane Power crawler tractor was delivered to the Fontanafredda vineyards. Powered by the F28 NG engine running on biomethane, this is the first crawler tractor enabling CO₂ net-zero vineyard operations ever used for the production of a Barolo cru, permitting an **important step towards sustainable wine production and representing a ready-now solution for energy transition in agriculture**. Named "**Engine of the Year 2020**", the F28 engine that powers the tractor operating on the Fontanafredda estate ensures a carbon footprint of zero, since it is fueled by biomethane, a renewable energy source produced by the anaerobic digestion of agricultural waste, representing the main enabler of the circular economy in agriculture. On this tractor, the F28 NG provides a power output of **75 hp with peak torque of 360 Nm**, ensuring the same performance as diesel.

A **three-year partnership between FPT Industrial, New Holland and Fontanafredda** is supported by the Region of Piedmont, which funds the collaboration between FPT Industrial and local business for the "Tobia" project, an acronym for biomethane traction for a circular production chain in specialized agriculture.

The **cornerstone of the whole project is the F28 engine** and the choice of biomethane to power the TK Methane Tractor, which is now operating in the famous **Vigna La Rosa cru**, renowned for producing a **Barolo included in the Wine Spectator Top 100**.

While the Barolo wine harvested with the first emissions-free tractor is aging in Fontanafredda cellars and we wait to taste this unique wine, **FPT Industrial natural gas engines for agriculture are available now**, the most feasible solution currently on the market to tackle the global challenges of climate change.

Marine Innovation Area – FPT Industrial powering startups

Can more than 100 years of expertise and technologies dialogue with future tech to start a revolution in marine propulsion? This is the starting point of the collaboration between FPT Industrial and the **Italian startup Sealence**, which, together at CES 2022, are presenting a **totally new and extremely innovative Hybrid Electric Marine Propulsion System Concept for pleasure and commercial vessels**.

As in the case of Potenza Technology, acquisitions and collaborations with startups accelerate FPT Industrial's **innovation, while taking new experimental solutions to the next level**.

The **FPT Industrial N67 570 EVO biodiesel engine** is coupled with a variable speed permanent magnet electric generator used as a range extender to re-charge the battery pack. The range extender and battery work together to provide maximum energy to the electric DeepSpeed Hydrojet developed by Italian startup Sealence. The core of the revolutionary Hybrid Electric Marine Propulsion System Concept is the **DeepSpeed Electric Hydrojet**. Designed like a plane's jet engine, through an integrated electric motor it sucks the water from the front and pushes it from the bow side to propel the boat.

A modern take on a more than 100-year-old technology, the ICE dialogues with a 30-year-old technology, the batteries, and together they interface with the future to create one of the most efficient, effective, environmentally friendly and silent – when operating in full electric mode – marine propulsion systems.

The new Hybrid Electric system is entirely geared towards maximum efficiency, as well as application modularity and flexibility.

With the same amount of energy, the DeepSpeed Jet generates more thrust and speed compared to a prop system, while consuming less. Since there is no need for transmissions and axles, there is more available space on board, giving shipyards the opportunity to optimize boat design and internal layout.

The DeepSpeed Jet can be positioned directly under the hull or in stern drive configurations. By varying the number and size of battery packs and generators, boat propulsion configurations can be customized according to their intended use: a mainly electric set-up is preferable for short-range trips, while long-range usage will require more generators and less batteries, since during this kind of navigation the electric motor is powered by the ICE.

FPT Industrial and Sealence are also developing a new generation of marine batteries, featuring a filling technology to make them totally fireproof and safe.

Power Generation Innovation Area – Power and independence for farmers

Goodbye fossil fuels, **welcome renewable sources. Is this feasible today? For farmers, certainly, thanks to the world's first variable speed, hybrid, multi-mode, 100% FPT Industrial genset concept.**

This innovative solution is based on the first F28 variable-speed, low-pressure methane engine for Power Generation, fueled by biomethane obtained by the anaerobic digestion of agricultural waste and cattle slurry.

The engine is coupled to an FPT Industrial Hybrid Control Management system, featuring an open configuration with batteries and inverter equivalent, depending on the mission profile.

The aim is to create a sustainable, carbon-net-zero circular economy, enabling farmers to become 'Energy Independent' from fossil fuels and able to generate additional revenue streams from biomethane surplus sales.

FPT Industrial's partner in this project is **Bennamann Ltd.**, a fast-growing British agricultural technology company in the field of clean energy, specialized in the supply and production of net-zero biomethane from organic waste.

In addition to fueling the genset, the biomethane produced on site can be used to fuel natural gas-powered tractors, such as the FPT Industrial-powered 2022 "Sustainable Tractor of The Year" New Holland T6.180 Methane Power, and cars, while the surplus of both electricity and biogas can be fed to the national grid.

Visitors can see "inside" the genset concept and, through the LED walls, watch the virtuous cycle which, starting from agricultural production, leads to energy generation and finally satisfies all the energy needs of both the farm and external users.

The hybrid multi-mode genset concept can meet different customer needs with **three main operation modes**. Designed for peak shaving with a high load response, the **Boosting mode** sees the engine working at full steam and the battery pack stepping in to deliver an extra buffer to satisfy the required energy peaks. The **Touring mode** is focused on the durability of the whole system, with alternating operation between the engine and battery pack in order to optimize efficiency and preserve the lifespan of both components. The full electric **Eco mode** is designed for fuel consumption optimization and its autonomy at low load can be extended thanks to the modular battery packs.

In comparison to standard gensets, the FPT Industrial genset concept delivers a wider power range with a 30-40-60-80kVA standard rating with just one generator, up to 20% lower fuel consumption, -22% engine displacement, and 2.5 times longer oil change intervals vs diesel constant speed gensets.

FPT Industrial is a brand of CNH Industrial, dedicated to the design, production and sale of powertrains for on-road and off-road vehicles, as well as marine and power generation applications. The company employs more than 8,000 people worldwide, in ten manufacturing plants and seven R&D Centers. The FPT Industrial sales network consists of 73 dealerships and about 800 service centers in almost 100 countries. A wide product offering, including six engine ranges from 42 hp up to 1,006 hp, transmissions with maximum torque of 200 Nm up to 500 Nm, front and rear axles from 2 to 32 ton GAW (Gross Axle Weight). FPT Industrial offers the most complete

lineup of natural gas engines on the market for industrial applications, with power that goes from 50 to 460 HP. This extensive offering and a strong focus on R&D activities make FPT Industrial a world leader in industrial powertrains. For more information, go to www.fptindustrial.com.

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