Special vehicles go electric

Neotec Green-E aerial platform

NEOTEC OWNER **PASCAL ROUX** TALKED TO *NEW POWER PROGRESS* ABOUT THE VALUE OF RELIABLE SUPPLIERS. BY **ROBERTA PRANDI**

Manufacturers of diesel-powered machines are now using hybrid solutions more frequently in new models. Pascal Roux, owner of Neotec, a French manufacturer of specialist machines, says that the transition has been almost seamless. But he adds that what we're seeing now is the culmination of an extended process of machine evolution, both in terms of application frequency and development of the supply base to deliver the required components.

BACKGROUND AND PRODUCTS

Neotec was founded by Roux in 1991. The company started out as a manufacturer of bogie axles and hydrostatic transmissions that were delivered to various OEMs, including Cat, Volvo, FIAT Agri and Same Deutz-Fahr.

The company still manufactures these products; marketed worldwide they make up more than 50% of Neotec's sales in the United States.

But the design and manufacture of special vehicles, such as aerial platforms for the aerospace and rail sectors, has come to dominate company activities. With the recent addition of distribution in Scandinavia, these are now available across Europe.

The company also sells smaller numbers in the US, Canada and Australia, although sales are reported to be growing.

HYBRID MACHINES

Since 2015 Neotec has been offering vehicles with hybrid power. These are divided into two ranges, as Roux explained: "There is the Hybrid-E series, which is an electric machine with a small diesel engine working as range extender; the diesel engine delivers about half the power that is available via the electric motor. This is an interesting concept that allows our vehicles to operate an entire working day on electric power and reach up to a week's work without the need for plug-in battery recharging. Most machine movement is done using the small diesel."

An example from this series is the Hybrid-E SKY C10 railroad lifting basket. This plug-in tracked vehicle features a special boom design which is powered by an electric motor delivering 10 kW continuous and 17 kW peak power. Diesel power comes from a 7 kW Yanmar engine. The hybrid configuration allows the machine to work in semi-enclosed spaces like tunnels and station concourses, and in urban areas with zero-emissions and noise regulations.

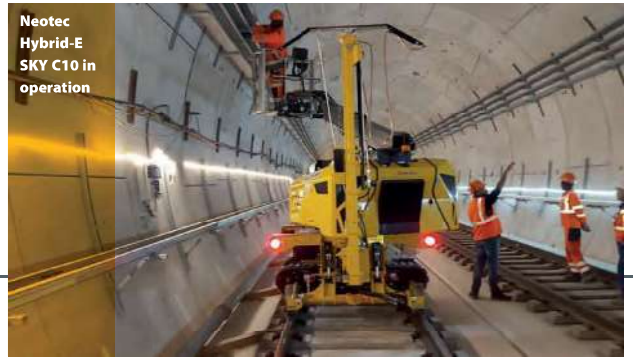
SUPPLIER SUPPORT

This machine was the first Neotec hybrid to use li-ion batteries supplied by Italian battery developer and manufacturer Flash Battery. The powertrain features a 10 kWh pack which has been mechanically and electrically adapted to the vehicle. Features include an integrated pack heating system to support operation in cold climates.

Roux explained that in addition to tailored battery solutions, another important element supplied by Flash Battery is the proprietary remote control system, Flash Data Center. This monitors battery state of health and provides analysis of how the packs are being used.

The other Neotec hybrid range is called Green-E. Roux explained: "Green-E uses a similar system to a hybrid passenger car; we keep the regular diesel engine and add a smaller electric motor - about 33% of the power comes from the engine. This is an ideal drivetrain for bigger machines that travel and work a lot outdoors. They can complete a shift in full-electric mode and then have the battery quickly recharged; a 50% charge can be done in less than 30 minutes. That's thanks to the battery's combined active and passive high-power management software, the Flash Balancing System."

Roux said that Neotec has found all the specialist help it needs from Flash Battery.



Neotec Hybrid-E SKY C10 in operation

"We are very happy with the cooperation. We are now working together on a project to develop a solution for higher-power battery applications."

According to Roux, the lithium chemistry used in Flash Battery packs (LFP, lithium-iron phosphate) is ideal for Neotec applications, as it offers high safety and efficiency levels. The battery supplier also offers scalable options which support using a single battery code for high-power applications with the same voltage. "Together, we have made sure that the same battery pack, equipped with a scalable system, can meet the needs of several of our machines, without having to modify the architecture of the vehicle," said Roux.

> "THIS IS AN INTERESTING CONCEPT THAT ALLOWS OUR VEHICLES TO OPERATE AN ENTIRE WORKING DAY ON ELECTRIC POWER"
>
> **PASCAL ROUX, Neotec**

PROJECT PARTNERS

Elisabetta Orlandi is Flash Battery's Business Development manager. As part of the Neotec project, she coordinated the company's development work with EFA, a French dealer group and powertrain system integrator that has partnered with the battery manufacturer.

According to Orlandi, the Green-E system could potentially be upgraded using a hybrid system featuring battery packs from Flash Battery. "Tests on the Green-E SKY C14 have now concluded and Flash Battery is eager to support Neotec on its journey to electrify the full range: from the Elan series of light railroad vehicles, through to railroad excavators," she said.

Roux confirmed that Neotec is conducting a second R&D round with plans to electrify its full machine range using hybrid tech. This could even see the introduction of hydrogen power to replace the diesel engines. "By 2025 we're expecting to convert our whole range into micro hybrid configurations," he concluded.

Currently Neotec produces between 60 and 100 machines per year. The company is forecasting that up to 50 Hybrid-E examples will be manufactured over the next two or three years. NPP