



## PRESS INFORMATION

# Pioneering electro-hydraulic solution significantly improving fuel efficiency in construction equipment

**Volvo Construction Equipment and Finland's Norrhydro have developed a digital hydraulic actuator that increases productivity while radically cutting fuel bills and CO<sub>2</sub> emissions in construction applications. If widely adopted, it could help the industry meet its sustainability ambitions while at the same time improving machine performance.**

Volvo Construction Equipment is committed to a sustainable future – achieved through internal developments and external partnerships. As part of this strategy Volvo CE, in cooperation with Finland's Norrhydro, is developing a new technology that is set to revolutionize machine hydraulic performance. When commercialized, the potential customer and climate benefits are expected to be radical, with machine fuel efficiency significantly increased and CO<sub>2</sub> emissions being cut.

While the full details of the revolutionary technology are closely guarded, the Norrhydro patented system, NorrDigi™, uses a multi-chamber digital hydraulic actuator that improves system efficiency that much of a machine's hydraulic system can be discarded or downsized. It removes the need for a main control valve – the heart of a traditional hydraulic system – along with excessive pump capacity, piping and hoses. It uses less energy and offers the prospect for downsizing the engine capacity.

**'It removes the need for a main control valve – the heart of a traditional hydraulic system.'**

The ongoing validations of the solution have demonstrated both efficiency improvement and an increased machine productivity. With carbon dioxide emissions reduced, it is making a radical cut in the machine's carbon footprint. Volvo CE and Norrhydro Oy have signed a multi-year agreement where Volvo CE will continue to develop the technology in partnership with Norrhydro, and subsequently aim for first mover advantage. Volvo CE has exclusive rights to its use in its products during the development process.



### Smart cylinders

Unlike traditional cylinders with two chambers – one pushing, one pulling – the digital hydraulic actuator uses four chambers that can be connected in up to 16 different permutations, depending on the load required by the desired operation. “It’s a bit like a 16-speed linear transmission,” says Peter Stambro, Vice President Business Development at Norrhydro. “Multi-chamber cylinders have been around for a while, but what makes our ones exceptional is the way they have been combined with advanced electronic control systems, whose complex algorithms and computational speed allow for instant response, but using only a fraction of the energy for the same machine maneuver or action compared to a traditional system.”

“This is a prime example of how partnerships with outside experts can accelerate our own sustainability journey through technical innovation,” says Thomas Bitter, Head of Technology at Volvo CE. “In research so far, the system shows greatest benefits in larger machines – in the case of excavators, those 30 tons and above. However, in the future, the technology could also be used in electric machines, where its much greater hydraulic system efficiency would effectively extend the battery life and operating window,” concludes Bitter.

‘In electric machines...it would effectively extend the battery run-time and operating window.’

### Entering field test phase

With a Volvo EC300E 30 ton excavator as a test bed, the revolutionary technology has passed its initial proof-of-concept phase and durability tests, and is now moving to a field test period, where prototypes are used in real world applications by selected customer partners. It is forecast that the revolutionary system will be offered on the company’s excavators by 2024 at the latest.

“The ability to develop this radical technology in partnership with a leading player in the construction equipment industry offers many advantages, including accelerating the time to market for commercialized products,” say Yrjö Trög, CEO of Norrhydro Oy. “We will invest in a new multi-million euro world-class manufacturing facility in support of the launch, and I look forward to the market introduction of the NorrDigi™ system together with Volvo CE.”

Ends

November 2020



### **About Norrhydro Oy**

Norrhydro Oy is a Finnish based, privately held hydraulic cylinder company, specializing in the most environmentally saving and intelligent hydraulic solutions for heavy-duty equipment. The company just celebrated 35 years and is in a strong growth phase.

### **About Volvo Construction Equipment**

Volvo Construction Equipment (Volvo CE) is a leading international manufacturer of premium construction equipment, and with over 14,000 employees, it is one of the largest companies in the industry. Volvo CE offers a wide range of products and services in more than 140 countries through its global distribution network.

Volvo CE is part of the Volvo Group. The Volvo Group drives prosperity through transport and infrastructure solutions, offering trucks, buses, construction equipment, power solutions for marine and industrial applications, financing and services that increase our customers' uptime and productivity.

Founded in 1927, the Volvo Group is committed to shaping the future landscape of sustainable transport and infrastructure solutions. The Volvo Group is headquartered in Gothenburg, Sweden, employs 105,000 people and serves customers in more than 190 markets. In 2018, net sales amounted to about SEK 391 billion (EUR 38.1 billion). Volvo shares are listed on Nasdaq Stockholm.