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Tratos and Enertechnos team up to develop new low-loss cable

New technology

Anglo-Italian cable manufacturer Tratos, is to manufacture and bring to market a cable using technology developed by pioneering UK tech innovator Enertechnos aimed at tackling energy loss.

Under the deal, Tratos will produce the cable following the successful completion of real-world testing and market it to customers in the UK, as well as globally.

Dr Maurizio Bragagni, CEO of Tratos, said: “We see a glaring need for a cable which can reduce excessive losses and support evolving infrastructure needs. The CTS provides a much-needed solution, and we look forward to showcasing its vast benefits to our global clients.”

Tratos has completed manufacturing the test piece and the cable is currently being tested at Pfisterer Group’s UK base in Sheffield. Once this is completed, the cable will be tested in a real-world trial at a site owned by UK Distribution Network Operator (DNO), Western Power Distribution. The 33kV live-grid test site will run 15 kilometres of underground CTS cable alongside a ‘standard’ underground cable to offer a direct comparison.

Once the live-test is successfully completed, Tratos will be able to manufacture and market the cable to its customers.

Dominic Quennell, chief executive of Enertechnos told CRU Wire & Cable News that the deal is non-exclusive, which means that other cable manufacturers will be able to use Enertechnos’

patented Capacitive Transfer System (CTS) technology, which the company has developed over the past few years. Enertechnos has patented the technology in the US, UK, Eurasia and China and several other countries.

Background to the CTS

Enertechnos' work was boosted in 2017 with a £1 million grant from Innovate UK's Industrial Strategy Challenge Fund. The grant allowed Enertechnos to work in partnership with Brunel University London, UK cable distributor Eland Cables and TWI (The Welding Institute) to take the technology further.

It worked with Brunel University to create a software simulation programme, to test the CTS on a simulated grid network. Eland Cables was tasked with finding cable producers to build the cable for the test and TWI developed the jointing techniques needed for CTS to be utilised in the UK and worldwide. The work between the partners allowed for a seamless progression from existing cable technology to the CTS.

The cable uses new long linear capacitor cable technology, dubbed the Capacitive Transfer System (CTS), and promises to slash power loss in the UK transmission, distribution and renewable generation sectors, yielding significant economic and environmental benefits.

Energy losses are a growing problem in the UK. Last year energy system losses totalled 26,554GWh, which is enough energy to power seven million homes and costs the UK just under £1.3 billion^[1].

According to Enertechnos, the CTS tackles these losses by providing a cost-effective solution to replacing existing outdated cabling and deploying new infrastructure. By balancing reactance and capacitance, the cable's technology significantly reduces voltage drop during transmission by as much as 50%, resulting in lower energy loss.

Material Benefits

Enertechnos outlined some of the benefits over existing conventional cable technology:

- Lower delivery losses – resulting in lower generation costs and carbon emissions: Up to 20% more power deliverable via CTS than with conventional cable from same power source (subject to power input and load factors).
- Lower capital costs: Reduced need for AC booster transformers or HVDC converter stations which can comprise up to 40% of project capex, since CTS has materially less voltage drop than existing wire and cable.
- Lower ongoing operating costs: Reduced maintenance requirements due to significantly fewer transformers and converter stations

- Expected lower earth leakage: More cable can be buried underground than via overhead pylons.

Market Entry Applications

The company outlines the market applications as follows:

- (i) national grids
- (ii) private wire networks or rural micro-grids, the latter particularly in developing countries
- (iii) links to isolated loads such as island or mining communities, or outback farms
- (iv) sub-sea power-from-shore (“PFS”) links to offshore oil & gas platforms and offshore-to-offshore links

In addition, CTS should also be suitable for potential game-changing applications such as:

- Offshore wind farms
- Repowering wind farms
- Smart grid
- Co-packaging with data / communications cables
- Grid reinforcement for electrification of vehicles (UK and French government mandates on prohibition of petrol- and diesel-only vehicles by 2040 will place significant additional burdens on grid reinforcement)

Notes:

[1] [Figures](#) from the Department for Business, Energy and Industrial Strategy show power lost in the transmission and distribution systems totalled 26,554GWh, representing a 1.8% increase from 2016 and accounting for 7.5% of total electricity demand in 2017.

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