

Electric Vehicles

The Zebra

The High-Heat Sodium Nickel Chloride Battery May End the Power Cache Woes of Hybrid Buses
High-temperature Zebra batteries from Switzerland's MES-DEA may prove to be the answer for hybrid electric vehicle developers stymied by the need for a better reservoir for the power gleaned from regenerative braking.

The sodium nickel chloride Zebra is impervious to weather conditions and repeated cycling, and lends itself to parallel circuitry, making it more fundamentally modular than other batteries.

"They are the baseline battery that we use in our procurements," ISE ThunderVolt president Dave Mazaika says of Zebras. The San Diego electric drive specialist is using the Swiss batteries in vehicles including its latest gasoline-fueled hybrid transit buses for Southern California's Omnitrans, and in fuel cell-powered buses planned for AC Transit and SunLine Transit. All have Siemens drivetrains.

ISE & OCC, Santa Barbara Too

Also working with Zebras (and Siemens drives) is Thorndale, Ont.-based Overland Custom Coach. The Canadian company hopes to be able to offer a wide range of electric drive options, ranging from pure battery electrics to plug-in hybrids, some with multiple batteries for extended zero-emission range. Zebra, says OCC president Ray Dries, allows "the first practical system for all types of use."

"It's got to be practical," Dries says of electric drive technology. "I believe that we are as close as anybody to bringing out a practical hybrid drive. The Zebra battery is playing a major role." Zebra batteries are in use in electric buses in Santa Barbara too.

The Zebra technology derives from sodium sulfur batteries like those used in the Ford Ecostar, an experimental battery electric from the mid-1990s, with the key improvement that the Zebra's sodium nickel chloride chemistry is less corrosive. Like the sodium sulfurs it requires high temperatures to maintain its salt electrolyte in a molten state - some 300 degrees C, nearly 575 degrees F. That in turn requires robust insulation. Not cheap, but the insulation ensures that the battery functions at any ambient temperature, making the Zebra ideal for cold-climate use.

One battery specialist working with OCC says that

Late Breaking...

CleanFuel USA is staging the formal opening of its first three propane fueling stations in California tomorrow, **February 18**. The three California Energy Commission-funded card-reader pumps are up and running 24/7 in Santa Maria, San Luis Obispo and Paso Robles.

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while the Zebra battery is indeed extremely promising, "that does not mean that it can solve all of the world's stored energy problems."

Battery EVs, he observes, "present complex technical and economic issues. Hybrids cover an even broader spectrum also with no easy answers. For many years to come they will remain the realm of the niche markets for very good reasons... There is a school of thought that suggests we should focus on the problems we can solve," he continues. "This is starting to happen with hybrids..."

"The key question is, 'Are we willing to accept compromises in transit to achieve significantly reduced emissions?'"
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Another Zebra Candidate

Under New Ownership, Norwegian EV Firm May Opt for Something New for Better Range

Ford is believed to have stumbled with the new version of the made-in-Norway Think City commuter car in part because it insisted on using lead acid batteries imported from the U.S., but the new owners of the Aurskog-based operation may be more receptive to the nickel sodium chloride battery from MES-DEA.

The purchase of Think by Switzerland's Kamkorp Microelectronics (*F&F*, February 3) became effective January 31. Kamkorp claims particular expertise "in the development and manufacture of sophisticated electric and hybrid electric drivetrains."

"The drivetrain developed by Kamkorp is a perfect fit for Think Nordic," says Kamkorp European business development director Bernd Winkler.

MES-DEA, as previously reported (*F&F*, Nov. 18), has said that its existing Z23 model battery would yield a range of 125 kilometers and, on a life-cycle basis, be cost-competitive with lead acid batteries.

The new Think City has room for a Zebra battery yielding a range of 200 kilometers, which could be ready in four months, says Cord Dustmann of MES. His firm has proposed to lease Zebra batteries to Think City drivers.

Kamkorp, as expected, has secured rights to Ford's "Think" and "city" brandnames in connection with its purchase of the Think factory.

Kamkorp/Think Nordic Bernd Winkler, +41-7-9509-2334



the new, post-Ford Think City could have Zebra sodium nickel chloride batteries