

In winter's chill, cold batteries mean trouble for plug-in cars

February 1 2010, By Jim Motavalli

Nobody worried about cold-weather performance of electric vehicle battery packs when it was warm outside, but now that Old Man Winter has descended, the problem is beginning to surface. When cars have a range of no more than 100 miles, the loss of 20 to 30 percent of that is a very big issue indeed.

Carmakers have long known to expect reduced performance from lithium-ion batteries in cold weather, but the early adopters now driving around in [BMW](#) Mini E and electric Smart cars (in Europe) are guinea pigs for what they do in the real world. There is teething pain here; some people are having issues.

Timothy Gill, a New Jersey computer consultant describes the 65 to 70 miles he gets from his Mini E as "pathetic." His experiences include needing a tow truck when the car was a mile from home -- and he thought he had plenty of juice left. But he still loves his Mini E, as do most of the people testing it in New York, New Jersey and California.

On a much-visited Facebook page for Mini E owners, there is considerable speculation about the best way to charge the car in cold weather, with no clear consensus emerging.

As Consumer Reports points out, Mitsubishi warns drivers of its i-MiEV electric not to use the heater because it will cut the range in half. And the heater is a likely factor in the BMW Mini E's range-loss, too. The Mini E uses ducting to direct warmed air at the batteries, but it's an experimental

program (with just 450 cars in the U.S. and 150 in Germany) so BMW is not likely to engineer a costly thermal management system for it.

A Mini E driver commenting on my New York Times story on the car's cold issues posted, "The reduced range in cold weather is mostly from the use of the heater, and not the fact that it is cold outside. I've done some experimenting with dressing very warmly and not using the heater (yeah, I know I'm crazy) and the range was almost as good as it was when it was warm outside. That being said, you do need to use a heater so the range is 20 to 25 percent less than it was in the summer."

But it's not just the heater. Automakers are discovering that lithium-ion [battery](#) packs need sophisticated management systems with both heating and cooling. Christi Landy, product manager at Chevrolet, told me the Volt (due later this year) will have both liquid heating and cooling and a well-insulated battery. "We tell people that, before they leave on a trip, they should remote start the car while it's still plugged into the wall," she said.

Donna DeRosa of Edmunds Inside Line (insideline.com) drives a Mini E in California (where cold weather isn't always an issue), but she reports it does get chilly there, and offers this harrowing tale. "This morning, I had 50 miles on the range gauge. It's a 20-mile commute to the office, so I thought I would have no problem. But it was cold and pouring rain, so I had the wipers on, the heat on low, the rear-window defogger, the CD player. You should have seen how I was busting through the estimated miles. I was down to 40 before I had gone five miles. The Mini was using them up double. So, I switched off the heat and the rear-window defogger. I needed the wipers and, well, I wanted the music.

"By the time I was halfway to the office, the power warning light came on, saying I only had 27 miles of range left. Luckily, I met up with some slow traffic and some downhill streets. I was able to build some power

back up by driving slowly and taking advantage of the regenerative braking."

She made it to the office, but got worried about the "poor soul" in a Mini E she saw getting loaded onto a flatbed.

Reporting in Wired, Darryl Siry (ex-Tesla) said the Nissan Leaf (also due late this year) lacks an active battery management system, which could affect battery life in hot climates. "Thermal management in [lithium-ion battery](#) packs is critical to the long-term performance and quality of the battery," Siry said.

Mark Perry of Nissan responds that the Leaf won't need [thermal management](#) in the U.S., but might get it for users, if any, in ultra-hot Dubai.

(c) 2010, Mother Nature Network

Distributed by McClatchy-Tribune Information Services.

Citation: In winter's chill, cold batteries mean trouble for plug-in cars (2010, February 1) retrieved 24 April 2024 from <https://phys.org/news/2010-02-winter-chill-cold-batteries-plug-in.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--