

# Climate versus charge: Unravelling the EV range mystery

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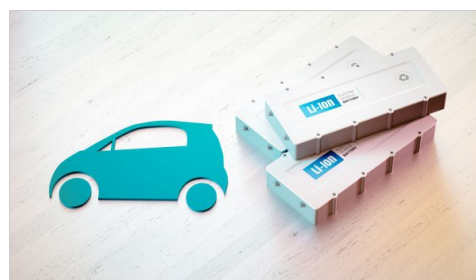
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**Effective thermal management of EV batteries presents a more nuanced, efficient solution to range anxiety, optimizing performance without excessive resource or cost demands.**

The thermal management of electric vehicle batteries is a crucial but often overlooked strategy that can optimize efficiency.



*Source: Getty Images/ Petmal*

Range anxiety remains a dominant theme in electric vehicle (EV) adoption. Much of the approach of the industry to date has been to simply increase battery capacity. There are obvious consequences for resources and cost. Another approach is to step up investment in charging infrastructure. Both methods are akin to using a sledgehammer to crack a nut.

Less prominent as a strategy, but just as important, is the thermal management of the battery. This approach can be extended to adopting different approaches depending on the EV's place of sale. To put it another way: there is no escaping the impact of climate, even when looking to manage an EV's thermal efficiency.

The drawbacks of this approach are twofold. One is the complexity it brings to product management. Second, it can be devilishly difficult to gather competitive intelligence and the shaping of product strategies for counter offenses. S&P Global Mobility's new All-Electric Range Forecast Suite goes a long way to meeting this need.

### **Beyond larger batteries**

Car manufacturers, especially in higher market segments, are installing larger batteries to address range anxiety. However, range is not solely determined by the size of the EV; factors such as aerodynamics, weight, rolling resistance, and drivetrain efficiency play crucial roles.

Climate conditions also have a significant impact on EV performance. Cold weather reduces battery efficiency, and the use of air conditioning zaps battery energy. Cold temperatures negatively impact EV batteries as they slow down the chemical reactions necessary for storing and releasing electricity. This slowdown restricts battery performance and leads to a loss in usable range.

Many EV models already offer the option to preheat the battery, either before driving or on the way to a fast-charging station. Preheating the battery ensures it reaches operating temperature without diverting power during charging. It is a feature on new EVs from the likes of Tesla, Chevrolet, VW, Audi, Porsche, Nissan, Renault, Ford, Jaguar, Hyundai, Kia, BMW, and NIO.

### **Decoding OEM strategies**

Different EVs come with different climate control systems that perform differently under various climatic conditions. S&P Global Mobility's latest forecast allows users to understand how OEMs are addressing these challenges and implementing diverse strategies to optimize driving range. Different thermal solutions also mean different costs, such as the differences in battery technologies and capacities. This forecast can assist in determining whether prioritizing larger batteries or investing in more efficient thermal system technologies would be more effective in alleviating range anxiety.

S&P Global Mobility's All-Electric Range Forecast Suite offers detailed insights into how OEMs are

enhancing EV driving range. Using advanced technology and proprietary tools, its database maps EV range under diverse climate conditions until 2029. Questions such as “What is the best refrigerant on the hottest day in Dubai?” or “Does a heat pump make any difference in Oslo?” can be answered. Other issues covering battery and thermal management aspects, crucial for driving range, can also be addressed. The new Forecast Suite takes the heat off planners and reduces anxiety when planning future EV portfolios.

***To learn more about S&P Global Mobility’s Component Forecast Analytics, visit <https://autotechinsight.ihsmarket.com/component-forecast-analytics>***

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