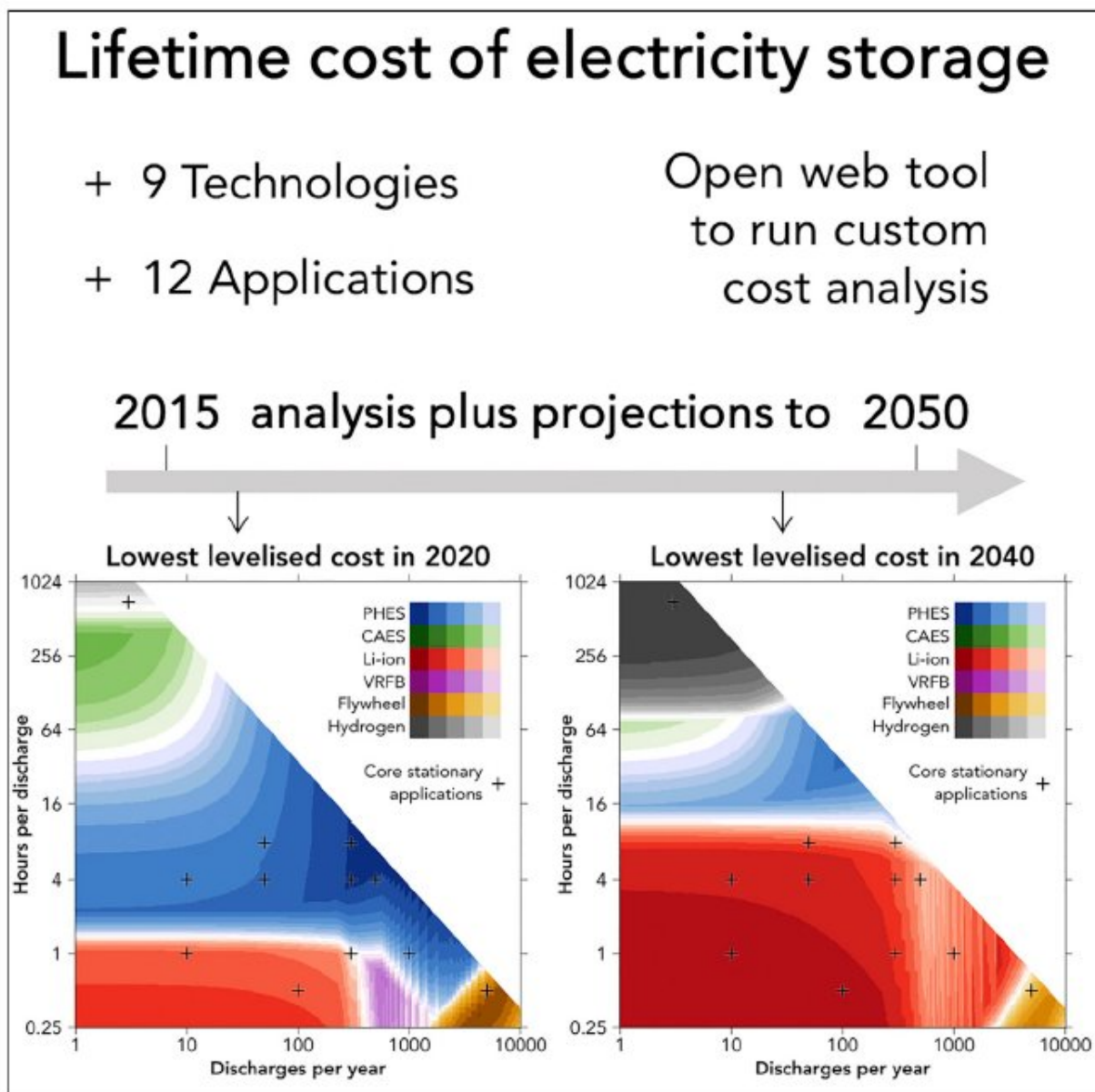


Model predicts lithium-ion batteries most competitive for storage applications by 2030

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This visual abstract depicts an analysis of 9 energy storage technologies between 2015 and 2050. Credit: Schmidt et al./*Joule*

When leasing or buying a car, it's important to consider not just the sticker price, but the long-term recurring costs, such as gas and maintenance. Deciding how we're going to invest in clean energy storage requires a similar analysis, say researchers at Imperial College London. They developed a model to determine the lifetime costs of 9 electricity storage technologies for 12 different applications between 2015 and 2050. The model, which predicts lithium-ion batteries to be the cheapest technology in the coming decades, appears January 9 in the journal *Joule*, and is available open access (<http://www.EnergyStorage.ninja>).

"We have found that lithium-ion batteries are following in the footsteps of crystalline silicon [solar panels](#)," says senior author Iain Staffell (@iain_staffell), a lecturer at the college's Centre for Environmental Policy. "Lithium-ion batteries were once expensive and suited only to niche applications, but they are now being manufactured in such volumes, their [costs](#) are coming down much faster than the competing storage technologies."

The model, which incorporates data from more than 30 peer-reviewed studies, shows that at present, the cheapest energy storage mechanism is pumped-storage hydroelectricity, where water is pumped to a higher elevation with spare energy, then released to harvest the energy when needed. However, as time progresses, pumped-storage hydroelectricity costs do not decrease, whereas lithium-ion battery costs come down, making them the cheapest option for most applications from 2030.

"Personally, I was always quite skeptical toward lithium-ion storage for stationary applications, but when it comes to the levelized cost of

storage—investment, operation and charging cost, technology lifetime, efficiency and performance degradation—lithium-ion combines decreasing cost with sufficient performance to dominate the majority of power system applications," says first author Oliver Schmidt, a Ph.D. researcher at Imperial and founder of Storage Lab. "I would have expected others to outperform in certain applications."

He adds that the model doesn't say anything about whether [lithium-ion batteries](#) are the best-suited technology for stationary storage, but because it has such a [head start](#) in the market, it is best poised to be the cheapest option in the immediate future. The researchers can't predict how [new materials](#) or advances will impact the market, but they hope their [model](#), which is available open access to test a variety of technology cost and performance assumptions, can help industry and policymakers make informed investment decisions today.

More information: *Joule*, Schmidt et al.: "Projecting the Future Levelized Cost of Electricity Storage Technologies"
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