

# Alternative Power Report

November 11, 2024

## News on Alternative Power Sources



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### Moving from ICE To Alternative Power

As manufacturers continue to shift their equipment production from ICE to alternative power sources, they need the latest information. That's why analysts at Power Systems Research continue to revise our global data and forecasts to provide the freshest picture available.

## EV Battery Costs Will Drop To Key Level In 2026

### *Lower Battery Costs Will Cut EV Costs*

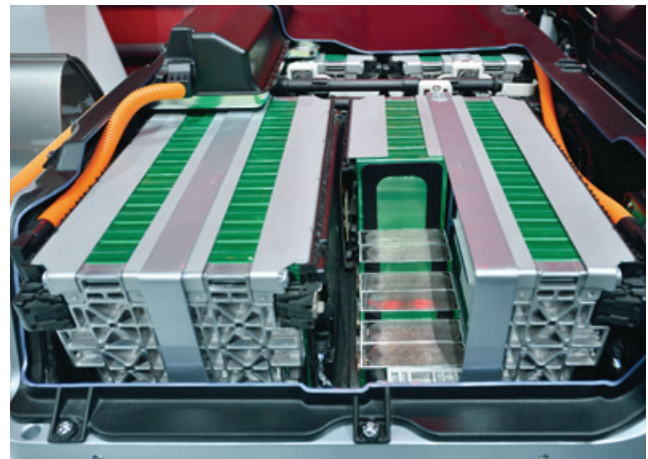
By *Guy Youngs*, Forecast & Adoption Lead



In 2008, batteries cost \$1,355 per kilowatt-hour, and the goal of an \$80/kWh EV battery seemed ridiculous. But today the cost of EV batteries is dropping within shouting distance of that \$80 goal, pulling the total cost of EV ownership down with it.

The total cost of EV ownership over time, including fuel and maintenance, has been close to, or at parity with, comparable gas automobiles for many years. The deciding factors for specific vehicles vary, but drivers in the US are owning their cars for longer periods — they hit a record average of 12.5 years in 2023 — so that long-term fuel and maintenance savings advantage for EVs can tip the balance.

Even with the total cost advantage and an assist from tax credits, getting prospective EV buyers over the hump of higher upfront costs has been a challenge. The high cost of EV batteries has been the main sticking point



According to a new analysis from Goldman Sachs, Global average battery prices declined from \$153 per kilowatt-hour (kWh) in 2022 to \$149 in 2023, and they're projected to fall to \$111 by the close of this year. They even could fall towards \$80/kWh by 2026.

**Source:** *Clean Technica* [Read The Article](#)

*Editor's Note: This monthly report includes news and analysis about EV and alternative power sources such as batteries and fuel cells from analysts at Power Systems Research.*

### CONTACT US

New power source installations vary across industry segments. Contact PSR for data on your specific application needs.

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**PSR Analysis:** If this is true, it would be great news for anyone purchasing an electric powered vehicle since the battery pack is a significant cost component of any EV. However, over the next few years there is expected to be a gap between available supply of lithium and demand. New lithium sources are being found and developed; however, these can take up to a decade to come to fruition.

## Trump Won – What Now for US Clean Energy?

Donald Trump has always pushed for more oil drilling and fewer regulations, left the Paris Agreement in his first term as president, says he hates “windmills,” has promised to scrap offshore wind on “day one” if he won the 2024 election, and calls climate change a “scam.”

And now that he’s won, this is a direct threat to the US’s pledge to reach net zero by 2050. After all, federal policy directly impacts the pace of renewable energy growth, especially when it comes to incentives and research funding

Donald Trump will push fossil fuels and undo renewable energy policies, but it ultimately won’t stop clean energy’s momentum

**Source:** *Electrek* [Read The Article](#)

**PSR Analysis:** The clean energy market isn’t solely driven by US federal policy. Over the last decade, solar, wind,

and EVs have become more cost-competitive and popular. State policies play a huge role too, and many states are committed to their own clean energy goals regardless of who sits in the White House. Only time will tell the true impact of Trump’s victory.

## Solid-State Batteries Costs Expected To Drop as Pilot Production Begins

The push to commercialize solid-state batteries is underway with industries from automotive to storage betting on the technology. But while the technology has been taking longer than expected to take off, semi-solid-state batteries, which use a hybrid design of solid and liquid electrolyte, have been making steady progress toward commercialization.

The latest findings from Taipei-based intelligence provider TrendForce show that all-solid-state battery production volumes could have GWh levels by 2027. This rapid expansion could lead to cell price declines, reaching the \$84-\$98 level by 2035.

**Source:** *PV Magazine* [Read The Article](#)

**PSR Analysis:** The benefits of solid state batteries (higher energy density leading to longer range, rapid charging, safety and lower weigh) are well known. If the costs can come down because of mass production, then this will become a significant game changer.



## Nevada Gets World's First Lithium-Sulfur Battery Gigafactory

Super materials trailblazer Lyten will invest over \$1 billion to build the world's first lithium-sulfur battery gigafactory in Reno, Nevada. The factory will be capable of producing up to 10 gigawatt-hours (GWh) of batteries annually once it's fully online. Phase 1 is set to go live in 2027.

Lyten's gigafactory will cover 1.25 million square feet on a 125-acre campus in the Reno Air Logistics Park. Initially, it will employ around 200 people, eventually expanding to more than 1,000 jobs

**Source:** *Electrek* [Read The Article](#)

**PSR Analysis:** Lithium-sulfur batteries are considerably lighter than lithium-ion batteries and use materials that are more abundant, so they should have a lower cost than Lithium ion batteries and their widespread use could reduce the pressure on lithium supplies. However, they are less stable and have a shorter lifespan, so unless Lyten has resolved these issues, this approach could backfire.

## Toyota's Hydrogen Cartridges Transform Energy Use

Toyota has showcased its groundbreaking portable hydrogen cartridges for the first time in Japan. These

innovative cartridges are crafted to revolutionize the future of hydrogen energy by providing a swappable power source for next-generation fuel cell electric vehicles (FCEVs).

Designed to resemble oversized AA batteries, they are ingeniously lightweight and portable, allowing for easy transportation by hand or in specially designed backpacks. Each capsule weighs 11 pounds (5kg) and is filled with hydrogen gas. Measuring 16 inches in length and 7 inches in diameter (400mm x 180mm), these capsules promise versatility, capable of powering fuel-cell electric vehicles (FCEVs) and even providing energy for cooking solutions.

The versatility of these hydrogen cartridges extends far beyond vehicle applications. Toyota envisions a wide range of uses, including supplying electricity to homes, powering cooking appliances, and serving as reliable emergency power sources during outages. Furthermore, the capsules' design allows them to be stored at existing gas stations, akin to the way barbecue propane gas tanks are handled, ensuring a seamless transition into regular use.

**Source:** *Hydrogen Fuel News* [Read The Article](#)

**PSR Analysis:** This is an interesting twist on hydrogen refueling which could have a significant market impact in the same way that Gogoro battery swapping has had in South East Asia.



## Hyundai Plans 300Wh/kg LFP Batteries for Affordable EVs

Hyundai Motor is developing ultra-high-capacity LFP batteries to power upcoming low-cost Hyundai and Kia electric vehicles, and they are aiming for an energy density of around 300 Wh/kg.

A Hyundai Motor Group official confirmed last fall that the company was working with domestic battery makers such as LG Energy Solution, Samsung SDI, and SK On, a subsidiary of SK Group, on the project.

**Source:** *Electrek* [Read The Article](#)

**PSR Analysis:** LFP batteries generally have a lower energy density than other Lithium batteries (such as NMC); however, they are much safer, so improving the energy density to this level (which is greater than NMC batteries) could significantly impact the volume of NMC batteries.

## Arkansas May Be Sitting on 19 Million Tons of Lithium

United States Geological Survey (USGS) researchers used water testing and machine learning to get an estimate of what might be found in an underground brine in the Smackover Formation in southern Arkansas. This is a relic of an ancient sea that is now a vast limestone formation that stretches from Texas, Louisiana, Arkansas, Alabama, Mississippi, and into Florida.

The researchers announced that it could contain anywhere from 5 million to 19 million tons of lithium

**Source:** *Electrek* [Read The Article](#)

**PSR Analysis:** Over the next few years there is expected to be a gap between the available supply of lithium and demand. New lithium sources like this one are great news and will help to keep battery costs down. But these sites can take up to a decade to come to fruition.

## China's GNE Develops Lithium-Sulfur Battery With Energy Density of 700Wh/kg

China's General New Energy (GNE) has recently announced a significant breakthrough in lithium-sulfur (Li-S) battery technology, unveiling a prototype with an energy density of 700Wh/kg.



According to GNE, this new battery far exceeds the energy density of existing lithium-ion batteries and also offers substantial improvements in both mileage and safety.

These batteries, using sulfur as the cathode and lithium metal as the anode, represent a promising alternative to traditional lithium-ion batteries. Theoretically, Li-S batteries can achieve energy densities of up to 2,600Wh/kg, which is over five times that of their lithium-ion counterparts.

**Source:** *PV Magazine* [Read The Article](#)

**PSR Analysis:** Sulfur is abundant, inexpensive, and environmentally friendly, and this gives Li-S batteries a cost and sustainability edge over existing Lithium Ion batteries. This could, if commercialized, have a significant impact on the electric revolution.

## A Final Note

China “requests” its domestic automakers stop plans to expand EU sales – [Click Here](#)... The solid-state EV battery journey has only just begun – [Click Here](#)...In a first, the US approves massive new lithium mine in Nevada – [Click Here](#)...Which form of transit has the smallest carbon footprint? – [Click Here](#). **PSR**



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