

Alternative Power Report

March 15, 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.

Germany Drops Subsidies for Electric Semi-trucks and Buses *Follows EV Passenger Car Rebates*

By Guy Youngs, Forecast & Adoption Lead



Like it did with passenger EV rebates in December, Germany has decided to pull the plug on subsidy programs for electric semi-trucks and city buses. What happens to the nation's commercial EV market now?

When the German government established the funding program for climate-friendly commercial trucks in 2021, the subsidies were seen as a highly effective tool to drive up demand for electric vehicles in the medium- and heavy-duty truck markets.

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

PSR Analysis. Large orders suggest that subsidies have worked, but what remains in question is whether these orders will fall back without any subsidies like the EV Car market has.



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.

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Lithium-Air EV Batteries Tapped For Net Zero Economy Of The Future

Lithium-air batteries seemed destined for the dustbin of automotive history just a few years ago. But the US Department of Energy has tapped four different Li-air projects in a new round of funding aimed at developing new batteries powerful enough to move full-sized airplanes, locomotives, and seagoing vessels.

Lithium Air batteries are better than the Li-Ion batteries used in most EVs today because they breathe in air from the atmosphere for use as an active material in the battery, which greatly decreases its weight. Li-Air batteries also store nearly 700% as much energy as traditional Li-Ion batteries.

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

PSR Analysis. The great potential of Lithium air batteries remains unrealized but this investment by the US government of several hundred million dollars could be the start of something really big, even though its results will be some time away.

Shell Shuts Down Its US Hydrogen Filling Stations

The warning signs appeared last year when Shell scrapped its plans to build 48 hydrogen refueling stations for light duty vehicles in California. The company was in line for over \$40 million in state incentives to install those fueling stations, but even that was not enough to move the project forward. In September, Shell closed three of its five hydrogen stations in the state.

Now it's clear that the remaining two are being taken out of service.

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

PSR Analysis. This is possibly the most important article for a while. If a company as large as Shell, (with significant oil reserves that could be turned into hydrogen), pulls out of hydrogen, in California of all places, it sends a very serious message that questions the future of hydrogen for cars and trucks.

Why Are Hydrogen Fuel Cells So Expensive?

The technology involved in using H₂ as an energy source can be costly for several reasons. Their use is considered to have zero-carbon operations but only when green H₂ is used, meaning that it is produced using processes powered by renewable energy such as wind and solar. That said, the most common production method currently used involves burning natural gas, a fossil fuel.

Currently, costs of producing fuel cells and of producing H₂ are among the leading barriers to growth of H₂ use.

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

PSR Analysis. Until these costs come down significantly (and remain low after government subsidies end as they inevitably will) H₂ will struggle to compete with EVs.

Europe May Slap Retroactive Tariffs on Chinese EVs

In October 2023, Europe launched its formal investigation into the Chinese EV industry, as European companies continue to struggle to compete with the cheap, high-tech Chinese imports, made by low-cost labor, entering the European Union.

After months of investigation, the European Commission says it has found evidence that China has been “unfairly” subsidizing the EVs it exports to Europe. Possible “remedies” on the table include retroactive tariffs on Chinese EVs.

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

PSR Analysis. This article was mentioned in previous issues of the Alternative Power Report and now that the EU has found its evidence, we can expect tariffs to be raised, especially as the European car market continues to flounder.

Battery Heavyweights Reaffirm Commitment To Solid-State Technology

As lithium-ion batteries continue to improve in both performance and cost, it is becoming increasingly difficult for alternative technologies to challenge the incumbent technology. However, interest in solid-state batteries, which promise better energy density and safety, has continued



South Korea's Samsung SDI is moving toward mass production of its all-solid-state battery technology with an energy density of 900 Wh/L. The company expects to demonstrate that every aspect of its plan for mass producing all solid-state batteries in 2027 is well on track, from development to supply chain management.

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

PSR Analysis. Samsung is the latest battery giant to announce solid state batteries, and probably won't be the last. Solid state batteries show so much promise, but the real race to commercialization has only just started.

Magnesium Batteries Are Beginning To Yield Their Secrets

Since magnesium batteries have relatively low costs and a more robust supply chain than conventional lithium-ion batteries, magnesium batteries could power EVs and unlock more utility-scale energy storage, helping to shepherd more wind and solar energy into the grid. That depends on whether researchers can pick apart some of the technology obstacles in the way. The going has been slow, but recent developments indicate that things are moving in the right direction.

One particularly interesting piece of news involves the dendrite problem. Dendrites are the tiny fernlike growths that form inside rechargeable batteries, leading to short circuits and a shorter lifespan. Dendrites are a familiar challenge in the lithium-ion field, and magnesium batteries can suffer the same indignities. However, it's possible this particular problem has been resolved by a multinational research team based at RMIT University in Australia.

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

PSR Analysis. Resolving the problem of dendrites is good news but the solution leaves the battery with low energy density and this still remains a problem.

The Search for Gold Hydrogen, A Potential Game-Changer in Clean Energy

Hydrogen has long been regarded as the “fuel of the future.” The lightest and most abundant chemical element in the universe, hydrogen has been hailed for its potential as a clean, efficient, and sustainable energy source. Among the different forms of hydrogen, one has recently attracted significant global interest. It’s so-called “gold hydrogen.” This naturally occurring fuel, so named for its potential value, burns without producing carbon dioxide, offering a promising pathway towards achieving net-zero emissions.

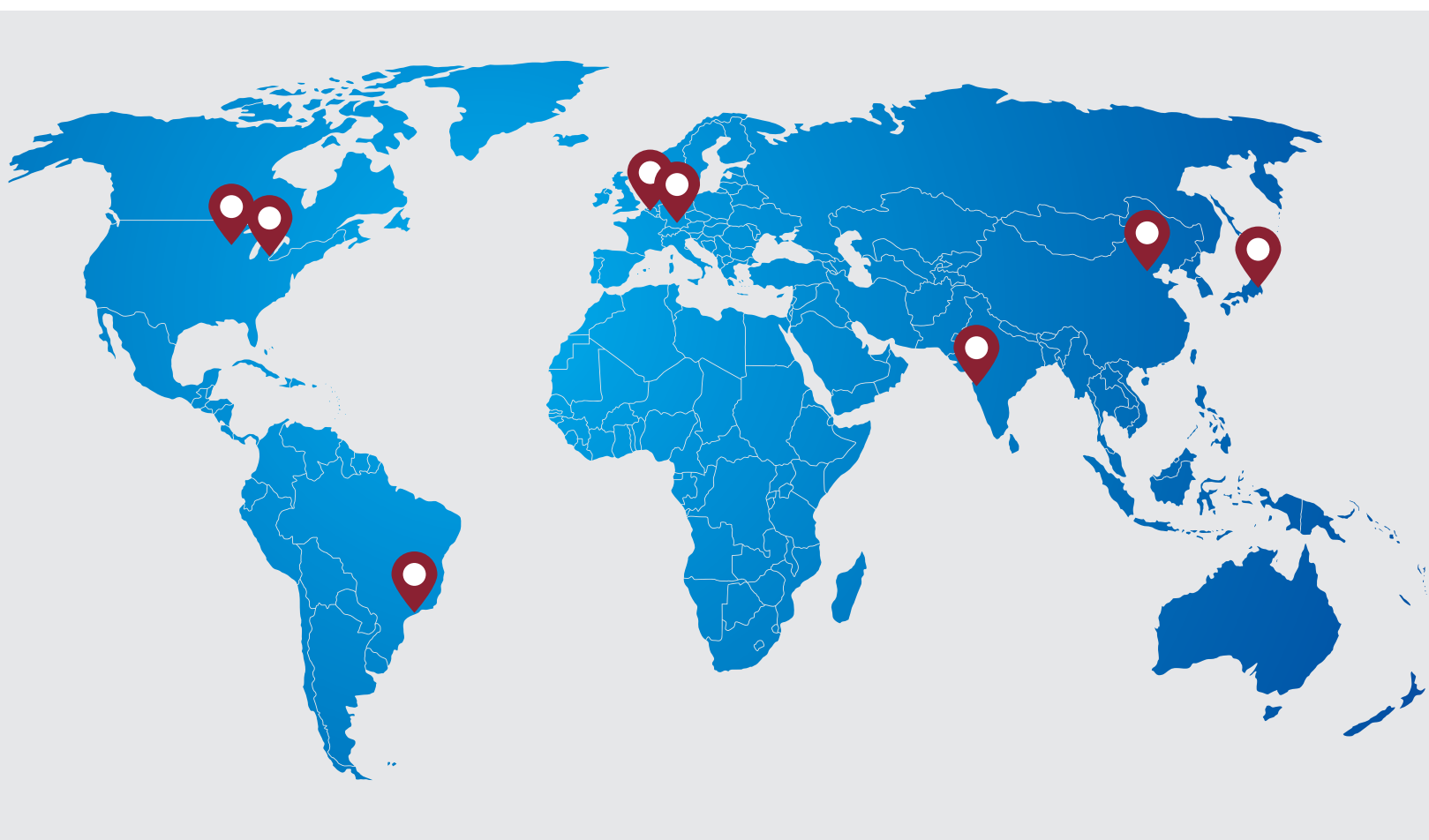
Source: *Hydrogen Central* [Read The Article](#)

PSR Analysis. If hydrogen is a fuel for the future (and this is debatable), the search for supplies is akin to an oil rush, but the question as to whether or not these natural sources are sustainable remains. Are we just replacing a finite resource (oil) with another (gold hydrogen)?

A Final Note

LG Chem is building a \$3B EV battery cathode factory, the largest in the US. [Click Here...](#) The particulars of **PM 2.5**: Why particulate matter ... matters. [Click Here...](#) The search for the **perfect solid-state battery** continues, self-healing sulfur edition. [Click Here...](#) British firm launches off-the-shelf **hydrogen FCEV powertrain**. [Click Here...](#) **NREL's** cost study on hydrogen for heavy vehicles fuel does not withstand scrutiny. [Click Here.](#) **PSR**





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