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ALTERNATIVE POWER REPORT

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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.

HEADLINE:

News On Alternative

Power Sources

COPY HEADLINE:

Tesla Breaks Ground for Diner with Theatre and Supercharger

COPY SUBHEADLINE:

Combination facility provides many consumer services

Tesla has broken ground on the site of its planned futuristic diner with a drive-in theatre and Supercharger station. This project has been in the

works for several years. In 2018, Elon Musk said that Tesla planned to open an "old school drive-in, (with) roller skates & rock restaurant at one of the new Tesla Supercharger locations in Los Angeles."

A few months later, Tesla applied for building permits for "a restaurant and Supercharger station" at a location in Santa Monica. However, the project stalled for a long time, apparently due to local regulations. Nevertheless, Tesla still moved forward with a Supercharger at the location, but it had to move the diner project to Hollywood. Last year, Tesla filed the construction plans with the city, giving us the first look at what the automaker intends to build

Source: Electrek: Read The Article

PSR Analysis: Last year we ran an article about Tesla working to improve the charging experience and they even opened a swimming pool for use while drivers charge their vehicles. Now, Tesla is creating a charging destination, and this is blurring the lines – is it a restaurant with charging facilities or a charging location with added facilities? Either way it should improve the experience of charging your car.

Lithium Deposit In Extinct Nevada Volcano Could Be World's Largest

The Chinese were way ahead of the rest of the world when it came to recognising the value of lithium. While most nations slept, China was busy identifying lithium deposits around the world and either buying them or negotiating deals with those who may not have fully appreciated lithium's value.

It incentivized others to seek alternatives. New companies sprang up to extract lithium from salt brine, especially in the Salton Sea area of California. But these are years away from being able to supply America's and the world's needs.

On Aug. 30, 2023, three researchers published a paper in the journal *Science Advances* in which they reported the discovery of what may be the largest lithium deposit known to exist anywhere in the world--inside an extinct volcano in Nevada near the Oregon border.

Source: CleanTechnica: Read The Article

PSR Analysis: It is believed that 20 to 40 million (some say 120 million) tons of lithium metal lie within a volcanic crater formed around 16 million years ago. Either way, that's more than the deposits found beneath a Bolivian salt flat, which up until now has been considered the largest in the world. With mining potentially to start in 2026 this is a real game changer and could significantly reduce the price of lithium, and hence EVs

Both Battery and Hydrogen Fuel Cars Needed

When discussions take place about Alternative power systems, (hydrogen fuel cells or battery electric engines), experts often fall into one camp or the other.

Proponents of each technology have been vocal in spotlighting the benefits they have to provide. Often, they will compare battery electric to hydrogen fuel cell performances, particularly when it comes to vehicles. However, experts are now coming to the conclusion that it's not really a matter of deciding which technology will win out and which will disappear. Instead, each form of clean power will find its place, as each has strengths in specific areas. The main points of debate are Efficiency, Infrastructure and Environmental impact.

Source: Hydrogen Fuel News: Read The Article

PSR Analysis: It's good to see that experts are finally agreeing that both technologies will play a part – the conclusion is that each has its own strength – EV's for small to medium applications and FCEV for heavy duty application such as heavy trucks, trains and ships, and we can expect to see them each dominating in their own areas.

EU May Impose Tariffs on Chinese EVs

In her annual State of The EU address on Sept. 13, 2023, European Commission President Ursula von der Leyen suggested that Chinese manufacturers are dumping Chinese EVs on EU customers that are priced below what domestic manufacturers charge.

She suggested that the root cause of the problem is the heavy subsidies provided to Chinese automakers by the central government — subsidies that allow them to sell Chinese EVs at artificially low prices to the detriment of domestic companies. If so, she warned the EU would consider imposing new tariffs on Chinese cars to level the playing field.

Source: CleanTechnica: Read The Article

PSR Analysis: This is a complex issue with some industry experts luke warm about this. On one side we have cheap EVs, so that's a win for the environment, but on the other we may have state subsidies creating an unfair competition. At this stage all we can do is wait for the result of the investigation.

Electric Cars Transforming America's Truck Stops

According to the *New York Times*, truck stop operators are spending billions to make them more appealing to regular motorists, particularly those driving electric cars. It says many of those once grimy truck stops are now more like a mini-Walmart, filled with energy drinks, iced coffee, and healthy snacks like sliced fruit and veggies. Many now offer merchandise like purses and puzzles, as well as phone chargers and birdhouses.

Catering to the needs of those motorists seems like a smart business decision to many truck stop owners and operators. Pilot, which operates more than 870 Pilot and Flying J locations in the United States and Canada, started a $1 billion initiative last year to remodel 400 of its travel centers and upgrade others over three years.

Source: Clean Technica: Read The Article

PSR Analysis: Every truck stop that puts in car chargers will enable them to make money selling electricity in the same way they do selling fuel to build an ongoing, sustainable market, and in turn this will build the infrastructure that is needed for the EV revolution.

The Battery Cycle: NMC, LFP, LTO – What's the difference?

With battery storage such a crucial aspect of the energy transition, lithium-ion (li-ion) batteries are frequently referenced but what is the difference between NMC (nickel-manganese-cobalt), LFP (lithium ferro-phosphate), and LTO (lithium-titanium-oxide) devices and their underlying chemistry?

Source: PV Magazine: Read The Article

PSR Analysis: This article is a useful "explainer" article that gives the reader a basic understanding of Lithium – Ion batteries.

Hydrogen Research Ignites Extraordinary Leap in Fuel Cell Efficiency

A team of researchers, affiliated with UNIST (Ulsan National Institute of Science and Technology, in South Korea), have made an innovative hydrogen research advancement by improving the efficiency of hydrogen fuel cells with new ionic metal-organic frameworks (MOFs) materials.

Currently, Nafion (Nafion is a brand name for a sulfonated tetrafluoroethylene based fluoropolymer-copolymer discovered in the late 1960s by Dr. Walther Grot of DuPont) is predominantly employed as an electrolyte material by Proton-Exchange Membrane (PEM) Fuel Cells. Nafion delivers thermal, mechanical and chemical stability together with high hydrogen ion conductivity.

However, when using Nafion, PEM fuel cells are challenged with limitations related to their operating temperature range as well as lack clarity on their mechanisms for performance enhancement.

The hydrogen research team focused on MOFs as potential Nafion alternatives. Ionic metal-organic frameworks are materials made up of metal clusters that are interconnected by organic ligands, forming a porous structure. MOFs have exceptional chemical and thermal stability properties.

Source: Hydrogen Fuel News: Read The Article

PSR Analysis: There has been a long debate as to which alternative technology is best for decarbonising in the future – EVs or FCEV. While this article doesn't discuss how much improvement they have made, it's clear from the hype that it's not minimal and any improvement is a plus.

This New EV Charging Station Drives Around Airport Tarmacs

German EV charger maker Webasto partnered up with JBT AeroTech, which provides aviation ground support equipment, to launch AmpCart. It's a towable EV charging station for GSE that maintains, services, and repairs aircraft.

Webasto provided the EV chargers and JBT AeroTech built the mobile EV charging station, which is towed around airport tarmacs.

Source: Electrek: Read The Article

PSR Analysis: What is novel about this is that its mobile and can be used to rescue stranded machinery as well as charge equipment on site. You could imagine similar equipment being used by large companies with huge sites, so it has great potential.

A Final Note

Argonne National Lab Improves Lithium-Sulphur Battery Performance– Click Here

Bramble Energy has the world's lowest cost hydrogen fuel cell technology solution– Click Here. **Dragonfly** is making cells with lithium hydroxide from recycled batteries– Click Here
Why EV Batteries Keep Getting Cheaper & Cleaner– Click Here.

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