

Alternative Power Report

August 18, 2023

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.

VW's US Innovation Hub Reveals Four EV Breakthroughs New Techniques Save Weight, Speed Production



By Guy Youngs, Forecast & Adoption Lead

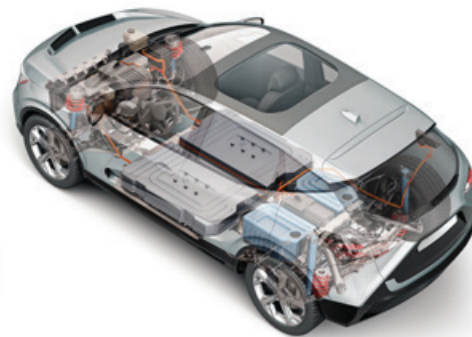
VW's US Innovation Hub just announced four breakthroughs in electric mobility and sustainable transport. First, the team used artificial intelligence on University of Tennessee's high-performance computer

cluster to develop a modular structure in the shape of tiny pyramids; the structure can be 3D-printed from liquid resins and can hold 30K times its own 0.15 lb weight (68g), so this frame would be up to 60% lighter than the steel frame.

Second, they have developed a method of using paper as a recyclable alternative to plastic parts and foils for EV interiors.

Third, researchers re-created the tail gate of a 2020 Volkswagen Atlas using sheet molding compound, a type of fiberglass-reinforced plastic. The new tailgate is 13 pounds lighter than the metal one, resulting in a weight savings of more than 35%. VW says that the tailgate doesn't need changes in assembly processes, so it can be produced in high volumes.

Finally, VW's team has patented a coil and charging pad design with silicon-carbide materials. The research team



has been able to increase the charging power level up to 120 kW with this prototype from an earlier 6.6 kW prototype, and their goal is to reach 300 kW.

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

PSR Analysis: So why is this all important? Apart from the unique savings in weight, the reduction of plastics use and the wireless charging, this is a very good example of how automakers are seeking to further improve their offerings within the electric vehicle world. Constant improvement and innovation (in things like regenerative braking and battery technology) shows a strong commitment to BEV and de-carbonization.

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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EVs Have Fewer Greenhouse Gas Emissions Than Gas Vehicles

Argonne National Laboratory's cradle-to-grave analysis considers everything from raw material extraction to vehicle scrappage to provide a holistic view of the sustainability of different vehicle and fuel technologies.

The analysis showed that EVs (which have no tailpipe emissions) also have fewer greenhouse gas emissions than conventional gasoline or hybrid electric vehicles when the entire life cycle is considered.

Argonne National Laboratory also provided emission estimates for technology anticipated to be available in 2030–2050.

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

PSR Analysis: Surprisingly, in the press at the moment, there are a lot of news articles claiming that EVs are more polluting than ICE powered cars. This kind of ill-informed fake news is damaging to the whole de-carbonization efforts across the world, so it's encouraging to see yet another research article from such a solid organization as Argonne National Laboratory.

Methane Is A Big Greenhouse Gas Problem

The world has a methane gas problem. Methane is over 80 times worse for forcing global heating over 20 years than its greenhouse gas sibling, carbon dioxide.

And yet we love to burn natural gas, which is mostly methane, to make electricity and heat. Our agricultural and food systems leave a lot of biomass lying around where a lot of it turns into methane and enters the atmosphere. Acceptable limits of leakage are suggested at 0.2%, however evidence suggests that actual leakage to be in the range of 1.5% to 3%

Directly related to this, hydrogen is a smaller and lighter molecule and will leak out of gaps that methane cannot pass through. The molecule really messes with steel in pipelines and joints, embrittling the steel and messing with electronics in ways that methane doesn't. And hydrogen, while not as directly bad as methane, is increasingly being put forward to be a heating source.

Putting hydrogen into pipelines isn't nearly the solution many pretend it to be.

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

PSR Analysis: This data suggests that we need to seriously tighten any and all legislation relating to methane leakage, and we need to do this before we rush headlong into hydrogen. If we fail to do this, we will undo all the good that hydrogen can offer.

Liebherr: Four Hurdles To Overcome Before Hydrogen Engines Go Mainstream

Liebherr's managing director of its combustion engine business unit, Stefanie Gerhardt, has outlined four major hurdles to resolve before hydrogen can become mainstream.

Gerhardt asserted that hydrogen combustion engines can be used everywhere where electrically powered machines and hydrogen fuel cells reach their limit. And she suggested that they would be particularly useful in construction applications where economy, robustness, and high performance are required.

1) Combustion technology. While diesel burns in a stable and controlled manner, hydrogen combustion is more sensitive to mixture quality and local hotspots, and this can lead to abnormal combustion such as pre-ignition, knocking or backfires, all of which need to be avoided to ensure an engine's reliability.

2) Lubrication. Another technical challenge involved in developing hydrogen combustion engines comes in ensuring that they are lubricated correctly.

3) Availability of hydrogen fuel. Chief among the challenges is the availability of the fuel itself. "The hydrogen supply network is not yet developed enough so that every customer who wishes to operate a vehicle off highway and also on highway gets easy access to it," Gerhardt said.

4) Sustainability of hydrogen fuel. Meanwhile, hydrogen fuel will only count as a low-emission fuel if it is "clean" hydrogen. That means producing it using electricity generated from renewable sources.

Source: *International Construction* [Read The Article](#)

PSR Analysis: While the article is fairly high level it clearly identifies the main issues, some of which will take considerable time and investment to overcome, but it's useful as this comes from someone who is clearly invested in hydrogen.



EU Requires EV Fast Chargers on Main Corridors by 2025

The Council of the European Union (EU) has adopted a law surrounding EV charging infrastructure, one that's being called a "milestone" in reducing carbon emissions throughout the European transport sector. Beginning in 2025, fast charging stations will need to be present every 60 km along the "trans-European transport (TEN-T) network."

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

PSR Analysis: This is a very ambitious piece of legislation with a very limited timescale, but it's also very commendable. One concern is how possible this is to achieve as the TEN-T network is absolutely massive and covers all of the EU.

The Surprising Rise of Electric Golf Carts as ‘Second Cars’ in the US

In recent years a surprising vehicle trend has quietly gained momentum across the US. Believe it or not, electric golf carts are becoming a popular choice as “second cars” for many American families.

So, what’s behind this surge in popularity?

Electric golf carts have reaped the benefits of the EV technological revolution, becoming far more than just golf course cruisers. Today’s models boast improved battery life from compact lithium-ion batteries, increased power with higher quality brushless electric motors, and a surprising array of creature comfort options. That convenience, combined with the increasing popularity of ordinances that scores of towns have passed to make golf carts legal on smaller public roads, has helped many families replace the need for a second car.

The affordability, reduced maintenance needs, and incredibly low “fuel” costs, make them a sensible choice for budget-conscious consumers. A typical re-charge can cost as little as one dollar and takes place in owners’ garages instead of requiring a stop at a gas station for a fill-up.

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

PSR Analysis: An interesting little trend here which has been supported by clever legal regulations which have evolved to match this trend. Many U.S. states now have laws allowing golf carts to be driven on public roads with speed limits of up to 35 mph, provided they meet certain safety requirements. Manufacturers have also modified many of their models into these LSVs, or Low Speed Vehicles.

BYD Produces Five Millionth Plug-in EV

While some EV automakers are working to deliver EV numbers in the tens of thousands, China’s Build Your Dreams (BYD) is on an entirely different level. The automotive manufacturing conglomerate is celebrating five million new energy vehicles (NEVs) built – a feat in itself, but an even greater accomplishment that shows just how quickly BYD’s production lines are expanding. This year alone (through July), BYD says it has sold over 1.5 million BEVs.

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

PSR Analysis: Tesla has often been touted as the face of the EV revolution; however, many people are unaware of just how big BYD is. The company points out that it took 13 years to reach one million NEVs produced, but it only took BYD Auto another 18 months to reach three million, then another 9 months from there to reach five million vehicles.

Boston Mayor Bans Fossil Fuel Use in Municipal Buildings

As part of the city’s push to become carbon emissions neutral by 2050, Boston mayor Michelle Wu has signed an executive order banning the use of fossil fuels in new and renovated municipal buildings.

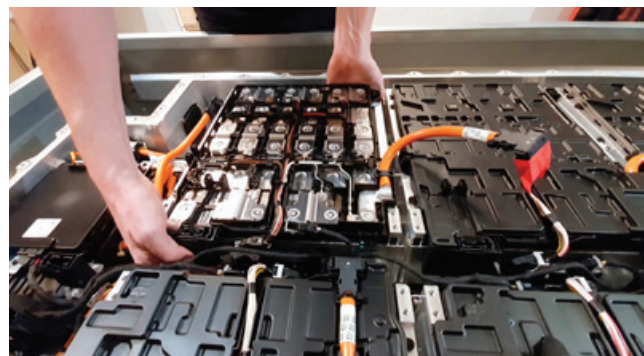
The order calls for a ban of energy sources like heating oil and natural gas, modernizing public buildings in one of the nation’s oldest cities. With over 16 million square feet of property owned by the City of Boston, the order makes strides toward the city’s goals of de-carbonization and electrification, and this will (according to private sector participants) serve as a case study for progress towards 100% electrification.

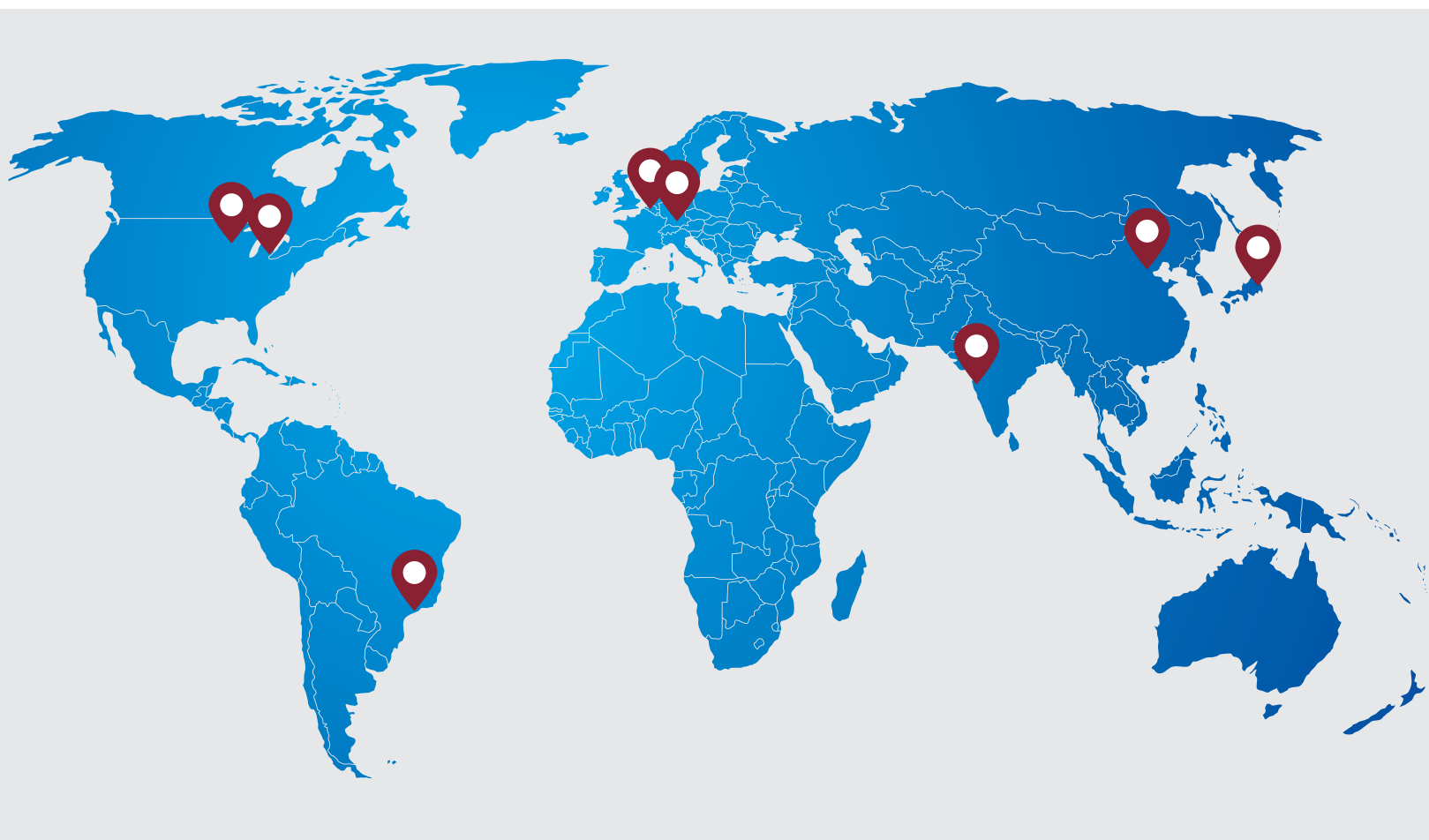
Source: *PV Magazine* [Read The Article](#)

PSR Analysis: While public buildings are a small portion of the overall building footprint in Boston, this is yet another example of how emissions regulations are being driven by local level politicians, and we can expect many more cities to follow this emerging trend.

A Final Note

World’s Largest **lithium mine** is in Australia – [Click Here...](#)
IEA & Oilprice.Com, see peak oil happening this decade – [Click Here...](#)
Better EV Batteries start on factory floor with new “dry manufacturing” method – [Click Here...](#)
After trying hydrogen, German rail operator picks **Batteries+Grid** – [Click Here.](#) **PSR**





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