

You've Come a Long Way, Baby

(The Story of Alternative Fuel Transportation)

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Revised July 22, 2021

There is much to say about alternate-fuel vehicles. The category includes more than just cars. I have a page on my website dedicated to Green Transportation. It contains articles and stories that keep making the news. It also has an Alternative-Fuel Vehicles section. You might be amazed at what you see there.

As of this writing, twenty-nine of these vehicles (with photographs) appear. And new ones seem to be popping up constantly. You can check them out [here](#).

In addition to cars, the category also includes bikes, boats, buses, flying machines, tractors, trains, trams, and trucks. They are fueled by a variety of power sources, including battery, electricity (hybrid or otherwise), electromagnetism, hydrogen, and solar power.

But let's start with the alt-fuel vehicle with which we are quite familiar – the car.

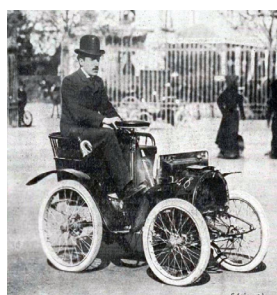
One of the earliest of these was the **Electrobat**. Yes, you heard that correctly. It was the first commercially available electric car, developed by Pedro Salom and Henry Morris, whose patent was approved in 1894. Let's just say it wasn't quite up to the task of promptly delivering driver and passengers to an intended destination, since it could only attain a speed not much faster than an elderly person could walk.

Twelve years later, that problem was solved, at least in accordance with the standards of the day. This was with the help of lighter materials, two 1.1 kw engines, and pneumatic tires. That was when the rear-engine **Electrobat**, with Louis Renault behind the wheel (*above, left*) could achieve a top speed of twenty miles per hour—whew, hold onto your seats. That vehicle and one built by **Riker**, the **Stanhope** (*top, right*), defeated gasoline-powered **Duryea** automobiles in a five-mile sprint race in 1896. Read more about the **Electrobat** [here](#).

By the early 1900s, The New Jersey-based **Electric Vehicle Company** had over 600 cabs running through the streets of New York City, Boston, Baltimore, and other eastern cities.

Motor sports were fully emerging in the early twentieth century. Belgian race-car driver Camille Jenatzy, (pictured right), showing off his *La Jamais Contente* (“the Never Satisfied”). That name was chosen because Jenatzy knew that you should never stop trying to improve your product. This was the first car to break the 60 mph barrier. People could not fail to notice this torpedo-shaped vehicle.

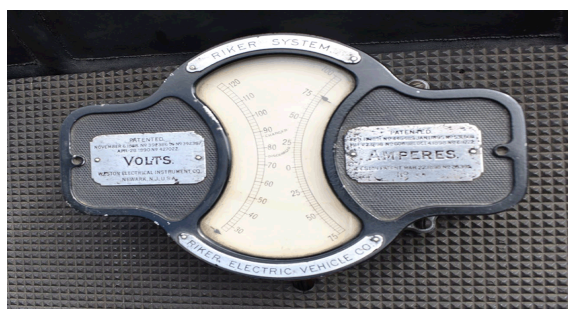
The late nineteenth and early twentieth century world was becoming hungry for new forms of transportation. Do I mean that horses were no longer enough to provide the travel experience the industrial revolutionized world required? I think the answer speaks for itself.



Courtesy of Science Learning Hub



Courtesy of Flickr



Courtesy of Worldwide Auctioneers



Courtesy of MICHELIN / CAR AND DRIVER

Let's bring on Ransom Eli Olds—yes, the very same **Olds** that a formerly very popular car was named for. The brand had a lifespan of 106 years, sadly withdrawn from the market by **General Motors (GM)** in 2004.

Here's a photo of Ransom's first car (above, left), which can still be viewed at the Michigan History Museum in Lansing. Wouldn't you have just loved to pick up your first date in one of these?



Courtesy of the Museum of the City of New York

The image (above, right) is the **Egger-Lohner C.2 Phaeton** (not your grandfather's **Porche**, but maybe your great grandfather's?)

How does that **Porche** compare with the 2020 **Taycan Turbo S**, which you can have for the paltry sum of \$209k? Speed-wise, the **Phaeton** could achieve sound-breaking 22 mph. I think the **Taycan** could do a bit better than that.



Courtesy of Wikipedia



Courtesy of MotorTrend Magazine

Another extinct brand is **Studebaker**, which started off

in the nineteenth century as a wagons and carriage manufacturer, but emerged at the turn of century as one of the first EV manufacturers. The electrified **Studebaker** (above, left) had a lifespan of only ten years. Have a look at a 1963 **Studebaker Avanti** (above, right) for a comparison. The later version was fueled by petroleum, by the way.



Courtesy of mecum.com

The company produced vehicles until its demise in 1954, shortly after it was acquired by Packard and became Studebaker-Packard.

You might notice a slight difference between the earliest Studebakers (above, right) and the **Manta Ray** (left), introduced in 1954. It looks like the kind of transpor-

tation Buck Rogers might have in his garage.

On September 6, 1901, President William McKinley was shot while touring the *Pan-American Exhibition* in Buffalo, New York. The ambulance that



Courtesy of Barry's Imagination

brought him to the hospital was powered by electricity.

If that vehicle could have traveled faster than twenty mph, he might have been treated quickly enough to have avoided the gangrene that led to his death eight days later.

Just think that if instead of the creepy crawler (above, right) used in the vain attempt to save the life of America's 25th President, this author's imagination

for an ambulance, known as the **Vincent** (left) had been used, As it whizzed by, people would be shouting, "look at that **Vincent Van go!**"

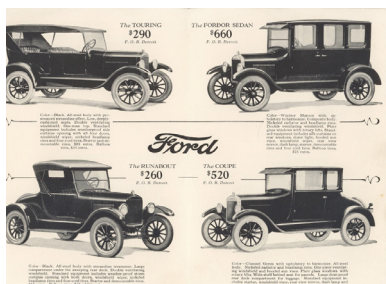
We now move into the *Roaring Twenties* with the introduction of **Detroit Electric** (right). It had a range of 80 miles and could go 25 mph. It was popular in the cities because it was far less noisy than gasoline-powered cars. Women preferred them because engine cranking was eliminated from the starting process. Shopping districts began to have charging stations, giving electrics greater appeal.



Courtesy of CAR AND DRIVEK



Courtesy of CAR AND DRIVEK



Courtesy of Motorcities.org

The **Ford Model T's** prices kept falling. By 1923, the sticker price had slipped to \$300 (about \$4,700 in today's dollars), making it far less expensive than any of its competitors.

Not everybody loved the **Model T**, including Clara Ford, Henry's spouse. She chose the more expensive electrics, form Ford's competitors. But unlike Clara, many Americans drove her husband's creations; Ford having sold over 35,000 vehicles between 1907 and 1939. For a look at all the ancient Model Ts, click [here](#).

Just before WWII, gasoline was winning the power battle. Electric models were either abandoned by their manufactures or those companies went out of business.

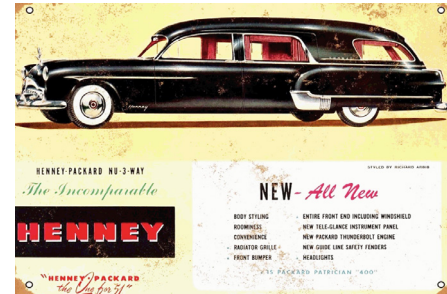
Some electrics, used as taxis or as delivery vans, remained on the scene. Just after that the price of gasoline in Japan became prohibitive, leading to the production of vehicles like the **Tama** (right) in 1947. Powered by lead-acid batteries it achieved a top speed of 20 mph with a range of 40 miles—hardly better than electrics did forty years earlier.



Courtesy of CAR AND DRIVER

Several name changes followed, **Tama** ultimately becoming **Nissan**.

By 1953, electric-powered cars were few and far between, except for the **Henney Kilowatt**. The company combined with **Packard** was known for its electric hearses. You could arrive at your funeral and reduce your carbon footprint at the same time. Who could ask for more?



Courtesy of Etsy

Henney became part of a conglomerate (**National Union Electric Co.**). In addition to **Henney**, their products included **Emerson Radios** and Exide batteries —the perfect combination for electric vehicle production. Eventually, the **Kilowatt** attained a more practical speed of 60 mph and a 60 mile range.

Henney lacked a good distribution system, resulting in only 47 completed vehicles. It did not survive.

General Motors never stopped experimenting with EVs. It got fully into the act in 1966 with their **Electrovair II**. Powered by silver-zinc batteries, its top speed was 80 mph with up to an 80 mile range. What their scientists had failed to figure out was that **Electrovair** batteries could survive only a mere 100 recharge cycles, and cost \$160k, (in 1960s dollars).



Courtesy of GM Heritage Center

This brings us to what *Car and Driver Magazine* jokingly calls the **Nadermobile**. The name was based on the Ralph Nader's senate committee testimony on the viability and planet-friendliness of EVs vs. internal combustion engines. Nader claimed that General Electric (GE) could produce one that go up to 200 miles on a single charge, hitting speeds of up to 80 mph.

In 1967, GE experimented with the **Delta**, (right, top) a car that couldn't get any uglier if it tried. It's range and fuel economy didn't match Nader's predictions. They tried nickel-iron batteries and later switched to the more expensive NICADS (nickel-cadmium) with no better results.



Courtesy of THE MANUFACTURER

Truly a glorified golf cart, the 1974 **Citicar** (right, middle) had two doors, two seats, a 2.5-horsepower DC motor from GE, and 36 volts worth of lead-acid batteries. Top speed: about 25 mph. It got "better" in later model years, with a 48-volt pack that could move a **Citicar** to nearly 40 mph. Range was said to be 40 miles. Sebring-Vanguard built some 2,300 of these cheesy wedges through 1977, after which founder Robert G. Beaumont sold to Commuter Vehicles, Inc., which rebadged it as the **Comuta-Car** and slightly updated it to comply with federal bumper and safety standards. That car (right, bottom) had batteries in its bumpers and a 6-hp motor. The most capable was built to meet a government contract for postal delivery—featuring right-hand drive with a sliding door (right, bottom), it got a 12-hp motor, a 72-volt battery pack, and a 3-speed transmission



Courtesy of motherearthnews.com

All told, the **Sebring-Vanguard** and Commuter Vehicles companies produced 4,444 units, making it the largest electric-car producer in America since the end of World War II, a distinction it would maintain until 2013.



Courtesy of WICKIMEDIA and C-

You've probably never heard of the **Electrovette**? (right) It was **GM's** possible solution to the idea that nobody loved the **Chevette**. But with gasoline prices rising meteorically, electrifying it might just have turned things around. How could one resist?



Courtesy of CAR AND DRIVER

With its “stunning” look and knock-your-socks-off top speed of 30 mph, and 50 mile range, you might think its success was guaranteed. But you'd be wrong. Gas prices never rose to their predicted levels during the OPEC oil crisis, remaining at about \$1.94 per/gal, so the death-knell for the **Electrovette** was sounded.

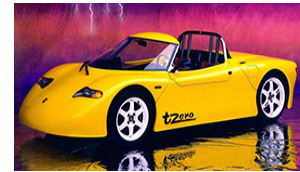
In 1996, the California Legislature, spoilsports they were, mandated that at least a small percentage of vehicles, driven in their state, be emissions-free (thirty years later, Trump did all he could to make future goals like that impossible). In an answer to that mandate, GM started producing the **EV1** (right). It was a revolutionary concept, using an inverter to convert DC (direct current) to AC (alternate current) power.



Courtesy of autonews.com

GM eventually added a nickel-metal-hydride battery (NiMH) option. This would give the **EV1** the ability to achieve a 160 mile range, and a top speed of 80 mph.

We mustn't forget the **tZero** (right), with a 150 KW engine, 201 horsepower, lead-acid batteries, and a design that just won't quit. And it can be all yours for a mere \$220,000.



Courtesy of CAR AND DRIVER

The **Chevy Volt** (not pictured) was considered by experts to be one of the best plug-in hybrids money can buy. Instead of an all-electric driving limit of 20 miles (like the **Toyota Prius**, the Volt could get up to 53 miles, before gasoline power kicked in).

Unfortunately, that is not the whole story. For those who attended the **Volt's** funeral in 2019, there was sadness. **GM** was no longer behind the plug-in concept. Instead, Chevrolet's focus in on the **Bolt** (right, top), which can travel up to about 260 miles on a single charge. Better than the **Hyundai Kona Electric**, but not quite up to what to the **Tesla Model 3** (right)' single-charge range of over 350 miles. **Tesla's** lowest price (just under 40k), where the **Bolt** costs about 5k less.



Courtesy of CAR AND DRIVER



Courtesy of Tesla Motors

Vehicle to Grid

It's all about power! But this time, it's the vehicle providing power to the grid, instead of the other way round (don't be shocked by the photo, at right).

After adverse weather, thousands were without power and water in Texas. Freezing temperatures and snow last week knocked out vital parts of the grid, which are still yet to be restored. To lend a hand, one ingenious **Tesla** owner shared a hack for how they turned their electric car into an external power source. In doing so, they have been able to heat their home, and keep their refrigerator running.



Courtesy of thenextweb.com

Unfortunately, the hack appears to have damaged the car. Rubbing salt into the wound, **Tesla** isn't going to fix it under warranty. Hopefully, the next generation will address this problem.

EVs are quickly taking over the transportation market. Here are a few of the companies that are producing EVs—or will be by 2022, according to **MOTORTREND**: **Aspark, Audi, Bolinger, Byton, Canoo, Genesis, GM** (Buick, Cadillac, Chevrolet, Hummer), **BMW, Faraday, Fisker, Ford** (F-150, Mustang). **Honda, Hyundai, Jaguar, Kia, Lamborghini, Lexus, Lotus, Lucid, Maserati, Mazda, Mercedes-Benz, Mini, Nisan, Pininfarina, Polestar, Porche, Rimac, Rivian, Stellantis, Tesla, Volkswagen, and Volvo**. And many more to come. For a slideshow of all the EV companies mentioned above, click on this [link](#).

It's Not Just Ground Transportation

Back to 1971, and time to look at other forms of transportation. For the *American Apollo program*, NASA contracted with General Motors Delco Division to build four **Lunar Rovers (LRVs)**, which could transport astronauts, their equipment and lunar samples. It ran on non-rechargeable silver-zinc potassium hydroxide batteries with a stated capacity of 121 amp-hours.

Like many government undertakings the LRV wound up costing double what NASA had projected. Due to the surface of the moon, which resembles some neglected roads right here in Sarasota, its speed was somewhat limited. Ultimately it could get its astronauts up to five miles away from their landing vehicle.

This is probably not what Ralph Kramden from the *Honeymooners* meant with his famous shout, "To the moon, Alice."

In 2018, it was news heard around the world, about a plane, running on solar energy flying around the world, powered only by the sun, with no fuel or polluting emissions. (Read all about it from the *Solar Impulse Foundation*. Click on the image to get the full story).

In line with the Piccard Family tradition of scientific exploration and protection of the environment, **Solar Impulse** wanted to demonstrate that clean technologies can achieve seemingly impossible goals.

The record breaking solo flight of 5 days and 5 nights—without fuel—from Nagoya to Hawaii, gives a clear message : Many could use the plane's technologies on the ground to halve our world's energy consumption, save natural resources and improve our quality of life. This message will continue to be spread by the pilots to the general public, students, key decision-makers and entrepreneurs all over the world.

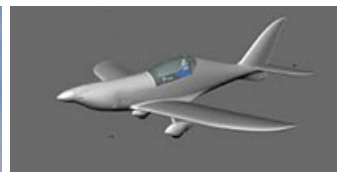
On Earth Day 2021 (April 22), the first electric air race was announced. The event is sponsored by Airbus, Daher and Safran.



Courtesy of airbus.com



Courtesy of airbus.com



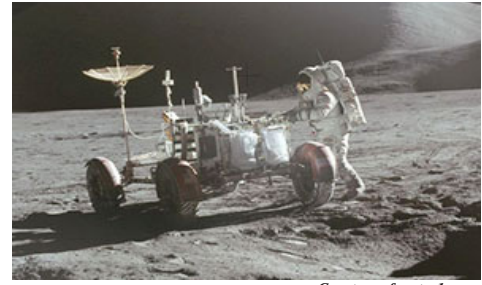
Courtesy of sustainableskies.org

The planes (all electric) that will be competing for the prize are:

1. **EcoPulse** (above, left), uses Distributed Propulsion Technology, and its possible integration on future aircraft. Distributed propulsion is a system that works by breaking down thrust generation among many small engines positioned along the span of the wing.

2. **E-Fan X** (above, center) In less than three years, E-Fan X successfully achieved its three main initial goals, including launching and testing the possibilities – and limitations – of a serial hybrid-electric propulsion system in a demonstrator aircraft, the first of its kind in the world. Airbus will not be going forward with this aircraft.

3. **Air Race E** (above, right) Air Race E will create a mainstream platform in which innovation in electric propulsion can be developed, nurtured and accelerated rapidly. The competition aims to drive the development and adoption of cleaner, faster and more technologically advanced electric engines that can be applied to urban air mobility vehicles and, eventually, commercial aircraft. Click on any image above for more information.



Courtesy of motor1.com

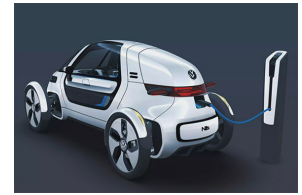


Courtesy of goodfon.com

The Future Is Already Here

This page comes from the [Treehugger Website](#)

The **Volkswagen NILS** (right), an electric commuter car for the urban world of the future, was designed and engineered to offer a dynamic driving experience while generating neither emissions nor noise. The blueprint followed a Formula 1 car: the driver's in the middle, a lightweight 25-kilo-watt-hour electric motor is slung out back driving the rear wheels and four freestanding 17-inch tires and wheels. With a 40-mile range and a top speed of 80 mph, the **Volkswagen NILS** would be an ideal vehicle for most urban commuters.



Chevrolet's second-generation **EN-V 2.0** (right) *Electric Networked-Vehicle* may look like designers crossed a ladybug with a Transformer robot, the two-seat electric vehicle can scoot around cities at 25 mph for 25 miles with energy from a lithium-ion battery. The prototype car was developed to show the possibilities for alleviating concerns surrounding traffic congestion, parking availability, air quality and affordability for tomorrow's cities.



As you might have guessed, **Nissan's PIVO 3** (right) concept follows PIVO 1 and 2. But unlike its forebears, the automaker would like to produce this pint-size urban electric vehicle that seats three. The PIVO 3 may not be able to "crab walk" like its immediate predecessor, but it has some slick tricks of its own.



First, its two doors slide open like a minivan's to allow ingress and egress in tight parking spaces. The futuristic cabin places the driver's seat forward and to the center, flanked by two passenger seats. Power is provided by individual in-wheel electric motors, with energy provided by a Nissan Leaf-inspired lithium-ion battery pack. Rear-wheel steering allows the PIVO to practically spin on its axis, and Nissan says the roughly 10-foot-long EV can make a U-turn on a road only 13 feet wide.

Toyota's **Fun Vii** (left) is unlike any futuristic concept car we've ever seen. The exterior is made of touch-screen panels that can be changed, based on the owner's preferences, with a simple download of a smartphone app or by uploading an image to Facebook. When introduced to the media, Toyota president Akio Toyoda said: "A car must appeal to our emotions. If it's not fun, it's not a car."



Here Comes the Sun!

Wouldn't it be cool if plug-in vehicles could run on renewable energy, like sunlight? Ford's **C-Max Solar Energi** concept brings us closer to that reality. In collaboration with California based *SunPower Corp.*, Ford equipped a C-Max Energi plug-in hybrid with 300 watts of dark, slightly curved solar panels on the roof. Under normal daylight conditions, the solar panels cannot provide enough charging energy to justify the cost.

To solve that issue, Ford and SunPower partnered with Atlanta's Georgia Institute of Technology. The researchers came up with an off-vehicle solar concentrator canopy that uses a special Fresnel lens that boosts the impact of sunlight to equal a four-hour (8 kilowatt-hours) battery charge. Think of the canopy as a carport magnifying glass.



For a look at vehicles of the not-too-distant future, click on this [link](#).

There are many vehicle types we did not cover here, which include bicycles, motorcycles, busses, trucks, and trains. These categories are also emerging rapidly, so stay tuned.

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