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Critical Appraisal of XXIst Century Energy Science and Technology (2): Causes of the Failure of the Electric Vehicle (EV) and Basics of the Autonomous Electric Vehicle (AEV)

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Abstract

Quite aside from the totalitarian measures taken by the smashing majority of governments worlwide to force consumers to replace the IC automobile by the so-called Electrical Vehicle (EV), the ongoing colossal failure of the EV can be attributed to two correlated scientific and technological shortcomings which conventionally-funded academic basic research has proven unable to address: 1) the problem of energy storage, which was falsely solved by the uneconomic and unsafe lithium battery technology; and 2) the inability to create an EV that carries onboard its own power plant, an energy-autonomous EV, or AEV in our terminology. The first shortcoming is also illustrated by the utter failure of the hydrogen fuel cell solutions. Yet, back in the 1990's, we presented GM with a technological proposal to create such an AEV (disclosed for the first time as an accompanying report in the *Journal of Aetherometric Research*) employing massfree energy extraction from the local "medium of space" by electron plasmas. But we were told by GM executives that the electric vehicle was just good PR.

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Introduction

The idea of an electric automobile has been around for some 135 years. But electric vehicles have always been conceptualized, even by N. Tesla, as being dependent upon a power grid that basically recharges their onboard stock of energy, typically chemical "secondary (rechargeable) batteries". On occasion of releasing the heretofore confidential 1993 Labofex Report No. 5 of Series 2, on the design of energy-autonomous electric vehicles (AEVs) [1], which casts a different perspective on the solution to the technological problem posed by land-based electric vehicles, we judged it necessary to provide a fresh and succinct appraisal of the current economic, social and technological failure of the so-called electric car.

Scientifically and historically, we suggest that this failure has two different roots. One concerns the problem of energy storage, and the other, the inability of scientific and technological research to devise a power plant that an EV could carry onboard. In effect, the limitations posed by the specific energy and weight of battery storage systems have always pointed to the necessity of equipping an EV with either its own means of capturing energy from its surroundings, or some onboard method to extract energy in excess of breakeven (with coefficients of performance or efficiency, COP, significantly greater than unity, COP>>1). The problem pertains as much to the design of land-based EVs (cars, trucks or buses), as to that of marine or even airborne EVs.

1. The colossal failure of the so-called EVs

Gone by the wayside are such EV factories as were known once by the names of Nikola, Rialian and so on. On the coattails of the deranged and nonscientific global warming alarmism, the EV craze almost brought GM once more to the brink of bankruptcy, along with Ford Motors, Stellantis, the three German car companies (Volkswagen, Mercedes-Benz and BMW) and so many others. New orders crashed by over 50%. In 2024, Ford reported the loss of $50,000 per EV sold. In December of the same year, the CEO of Nissan prognosticated the company to have a 1-year maximum survival given the runaway expenditures incurred by their dalliance with EV technology. Media critics have called the EVs evil [2], others outrightly denounced them as a scam [3]. The car rental company Hertz put up its fleet of 50,000 Teslas for sale, and others

followed suit. But no amount of rebates, of NGOs financing companies and courier services to buy EVs, could salvage their market collapse. The buyer simply failed to show up - and the gig was off. Politically, the present Trump administration has just stamped the final demise of EVs.

Still left, besides the Chinese Smart 'carts' and endless variants, is the Tesla car - that rehashing of all things not Teslan but Edisonian. Its motors are not AC induction ones - an invention of Tesla - but DC motors, enhanced by the permanent magnet, printed circuit form. Its power source is made up of costly and dangerous lithium batteries that are charged and discharged by direct currents. Lastly, it is not connected to some Wardenclyffe-like electric power hub - but to the "web cloud", constantly feeding corporate divisions and government agencies with information on the behaviour of the driver and the vehicle. The buyer is the guinea-pig, just less cruelly than in Edison's experiments in electrocution of animals and death convicts. By all means, it should have been called the Edison car, not the Tesla car.

The failure of the EV occurred on many fronts over the past two decades. Its dependence on the electric grid, the sheer lack of energy capacity of the latter, plus the rarity of charging stations are three facts that alone put into stark evidence the inability of the technology to provide, even remotely, for all the EVs that would have to replace existing IC cars and trucks. Then, there follows a litany of shortfalls. The EV's reliance on batteries as energy source severely limits the travel range. They become immobilized during blackouts. A full charging of their battery packs takes 7 to 10 hours. With temperate temperatures, the battery packs must ideally be cooled before recharging. But with freezing temperatures, the lithium batteries must be artificially heated, otherwise they develop huge resistances and fail to recharge. Winter graveyards of EVs in charging stations became norm - as happened in Oak Brook, Illinois, in Jauary 2024. EVs may not have carbon, nitrogen or sulphur emissions - but this is a disingenuous shell game, since the electrical energy required to charge their batteries must come from traditional energy sources - either the burning of fuels or nuclear fission, both of which release atmospheric pollution, chemical and radioactive. The problem was just displaced elsewhere, not resolved. The largest EV charging station in Coalinga, California, is powered by diesel generators, irony of ironies! Further, the prohibitive weight of the battery pack makes the EV up to two to three times heavier than a comparably sized IC car, with the unwanted

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consequence of road destruction, increased pollution of the atmosphere by the gaseous derivatives of synthetic rubber tires, and more kinetic energy being released in vehicular collisions, resulting in stronger impacts.

Then, there are the socio-economic factors - astronomical insurance rates, a resale price that has crashed through the floor, the prohibitive cost of the battery packs ($US 30k to 50k) [4] - which cannot be repaired and must be replaced *in toto*, etc. Long lists of the EV failures have been compiled [3, 5].

The very worst consequence of the EV craze, and of the power manipulations of the *Tesla Corp* in particular, was the development and commercialization of the lithium ion battery. Without the subsidy of hundreds of billions poured from the purse of taxpayers in the USA and all over the world, the lithium battery would not have been possible. Its totally uneconomic character is as evident in the greatly exagerated lifespans and the unreliable performance under temperature extremes (loss of up to 35% of its charge in freezing conditions), as it is in the rarity of the mineral, the high cost of its mining - despite use of child slave labour - the ecological devastation and polution it has wrought (leakage of lithium from mining operations poisoned the Lichu river in Tibet, in 2016), and the equally high cost of its retrieval and recycling. There is nothing eco-friendly about lithium batteries. Zilch. It is the core of the EV scam.

Lithium contamination has now become a medical problem affecting the health of peoples all around the planet. Biologically, the lithium ion is the most potent embryonic vegetalizer and inhibitor of neural development known. There are no biological roles for the ion; it is toxic and its use in psychiatry to control the behaviour of schizophrenics and manic-depressives (bipolars) has been but a series of malignant and useless medical experimentations. Manufacture of lithium batteries consumes tremendous quantities of water, releases toxic byproducts, and it is estimated that for the production of a ton of lithium, 15 tons of carbon dioxide are released into the atmosphere. If anything, the fanatics of Global Warming should have been up in arms to oppose its use and production. Instead, our own work in alternative power generation and energy science has, for over 3 decades, endured nothing but defamatory accusations of being at the service of oil companies and derision from the Greens ensconced in Wikipedia, the British Antarctic Survey, Greenpeace, etc. Despite all these strong negatives, lithium batteries achieved an unchallenged rule, and are now found everywhere: in smartphones, homephones,

computers, pacemakers, home appliances, gas detectors, leaf blowers, lawnmowers, portable power supplies, electric bikes, tractors, golf-carts, EVs, airplanes.

With lithium batteries came the explosive fires of smartphones, EVs, garages, residences, containers and container ships, even electric school buses - one such fire burnt together four Lion Electric buses at a charging station, despite the Québec manufacturing company denying it was battery-caused. At least two other fires of buses made by the same company were reported in 2024. A Maine school superintendent stated that "We run them [the Lion Electric buses] for a day or so, and then we get error messages about engine failures or battery failures" [6]. On January 2, 2025, Ford Motor Co. recalled over 20,000 SUVs because of battery manufacturing defects that could lead to a fire [7]. On January 17, 2025, one of the largest Li battery storage facilities in the world - located in Monterey, CA, and owned by Vistra Energy, the top provider of electric power in the USA - went ablaze [8]. Two other Vistra battery-based power-storage plants caught fire in 2021 and 2022, due to sprinkler system malfunctions that caused the batteries to overheat. Lithium battery fires are notoriously difficult to extinguish (since water feeds the runaway reactions) and create toxic fogs that have prompted lockdowns of entire communities, harbours, factories, etc. Some have resulted in mass casualties. Incredible, but factual. This is the catastrophe that corporate eco-socialism a.k.a. green fascism, brought on. In effect, a slow technological suicide. At least in the USA, the EV scam recently came to a swift end when President Trump, on the first day of his second tenure, put an end to all the rules forcing American car manufacturers to develop and produce EVs. Not so in Europe, the U.K., or the Canada "duchy" - where the federal government and the Province of Ontario doubled down on the forced EV mandates by persisting in spending ca. $100 billion in the construction of Li battery manufacturing plants.

2. Energy storage limitations of the EV

2.1. Battery storage: present limitations and future prospects

Energy storage, though possible with flywheels and supercapacitors, still devolves until this day to storage of electric energy in DC-rechargeable batteries. This means that the basic vehicle infrastructure must function with direct current (just as was the case with Tesla's Teleautomaton discussed in [9]). One is therefore locked in the Edisonian vision.

Historically, two rechargeable battery technologies reached wide production and application before the advent of lithium batteries: the Edison iron-nickel battery and the lead-acid battery. In our 1993 Labofex report, we examined these and still other basic technologies, so we will not reiterate the overview. Suffice it to say that the more promising of the then lead-acid embodiments, the gel-polymer cell, has now been widely abandoned, largely because the required venting of the evolved hydrogen gas ends up drying the gel. The more recent development of deep-cycle AGM (Absorbent Glass Mat) gels that impede hydrogen release permitted construction of lead-acid cells with very low self-discharge, and capable of delivering high currents by deep discharge. Still, they remain sensitive to overcharging, either by *slight overvolting* or by peak currents, which prevents them from "fast-charging" and from their direct application in the capture of pulsed or interrupted plasma discharges. Overcharging results in the inevitable vaporization of the hydrogen ion from the electrolyte solution, and in electrode breakdown.

There has been no lack of academic and corporate research into battery systems and rechargeable chemistries, including high-temperature sodium and other molten metal batteries, air batteries, super-iron batteries, selenium sulphur cells, in an endless parade of promised technologies issued from basic science. Many of the investigated reactions may in effect be of utility, but those that qualify cannot be safely mounted and efficiently operated in an electric car.

As we have already pointed out above - the absurd winner which stands as the focus of all current efforts of the global economy to come up with "green technologies" - was the lithium ion battery. In simple terms, it employs the salt lithium hexafluorophosphate as a dry-phase electrolyte. It must be sealed from the environment since the electrolyte is subject to thermal runaway reactions that can be triggered by exposure to oxygen, water or high atmospheric humidity, with saltwater acting directly as their promoter. The state of Florida experienced catastrophic EV runaway fires when lithium batteries were damaged by saltwater in the ocean surges caused by hurricane Ian in 2023. Lithium itself ignites in air near its melting point, and explosively so if water is present. The combustion of lithium batteries that follows self-ignition decomposes the electrolyte into a variety of toxic gases dominated by the extremely poisonous and colorless hydrofluoric (HF) acid gas, but encompassing hydrogen cyanide, sulphur dioxide, fluorinated hydrocarbons, etc. To minimize this tremendous fire and explosive hazard and stabilize the electrolyte, the latter

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has been spiked with other compounds made from expensive elements such as rare earth metals (lanthanides), selenium, cobalt, along with traces of copper, iron, manganese, etc. This has originated a ceaseless and ongoing series of "beta versions" of the lithium battery that have not been properly tested before they reach the consumer market.

Primary research in the construction of different kinds of batteries is an obvious concern of present-day fundamental scientific research. Breakthroughs are frequently reported with much fanfare, but the fact is that even when the science may be right, the technological embodiment often suffers from limitations of the materials used or operational requirements. Replacing metal cathodes with redox organic molecules (such as hydrobenzoquinone) which operate a reversible transfer of electrons and protons across a polymeric membrane appears to be a currently promising path to devise rechargeable cells with high cycle longevity and charge fidelity [10]. Aside from their still low current densities, these organic electrolytes also pose problems of flammability, and of the untested durability of the proton conductor membrane.

In our second volume of *Experimental Biophysics* [11] we succeeded, by using a particular passive circuit, in measuring electroscopically the electric potential of ~750 volts that our theory predicted the each electron of the terrestrial geoplasma, with simply a connection to the ground anywhere on the surface of the earth. In the same section of that book, we also succeeded in measuring electroscopically the full voltage of the human bioplasma (~500 volts), to the exclusion of any electrostatic fields; and, most importantly, in electrically charging various suspended metal plates directly with either a flux of the geoplasma or the human bioplasma. We further demonstrated how these plates could be brought near the electroscope and by influence deflect its gold leaves proportionately to the distance, up until the same full potential was registered, the reverse occurring when they were moved away. In the second appendix to that same book - one that, in our view, corrects the central mistakes of Quantum Mechanics - we analyzed these findings, to conclude that metal lattices can trap, *in wells of the conduction band*, *high-voltage electrons that are paired in dyads to form bilaminar plasmas* held by weak attraction forces [12-13]. This observation may well sire a new form of battery - no longer a low-voltage, voltaic or chemical cell with fluid or dry electrolytes, but a physical battery that traps the high-voltage dyads of bilaminar electron plasmas.

2.2. Hydrogen/oxygen fuel cells

Nearly 6 decades have elapsed since research into hydrogen/oxygen fuel cells commenced, with the hope of developing a viable compact method to electrolytically store and release electric energy that would serve as an alternative to the traditional chemical batteries. The first embodiments provided auxiliary power in the Gemini and Apollo space capsules. Though highly touted by the Obama administration, many breakthrough announcements later and even purchases of entire fleets of fuel-cell-powered buses by woke cities and municipalities that could not put them to use from day one, no incarnations of the hydrogen fuel-cell technology have reached a sustainable practical application. Yet, next to the Li-ion batteries, it has been one of the most varied and costly research projects in physical chemistry and thermoelectricity. And it still lives on - sometimes masquerading for what it is not - like a recent BMW propaganda feature on the pretentious "*Econews*" (January 17, 2025) that was totally misleading by its very title: "This engine burns water instead of gasoline - Germany shows what the future holds." The only problem is that hydrogen cells do not burn water...

The technology employs a stack of fuel cells, in combined series and parallel arrangements, that are fed by compressed hydrogen gas. The latter is filtered through a membrane and recombines with oxygen from air in acid solution to release electricity from the generation of water (the innocuous byproduct). The recombination typically involves splitting the oxygen molecule into monoatomic oxygen and reacting the latter with hydrogen gas - which gives a lower potential than when a hydroxide ion is reacted with a proton to also form water.

The main advantage of the technology as applied to EVs is that it permits a fast refueling time, since carbon-fiber high-pressure tanks obtained from mostly hypothetical 'hydrogen fueling stations' can be readily replaced.

However, the technology has always suffered from a variety of drawbacks. Most capital investment has been absorbed in solving the technological complexities of developing nanometric polymer membranes that can withstand repeated use without holing up and breaking down. Reducing fuel cell weight and attaining the required high energy densities have also been costly targets of R&D programs. Moreover, the technology is rather unsafe. Vehicles equipped with compressed hydrogen are veritable

explosions waiting to happen. Vehicular collisions would spread disaster, mayhem, explosions and fires in city streets and highways.

If we disregard all these factors - the expensive membranes and their low durability, the still low energy densities, the inherent high risks of its operation, etc - the main practical obstacles of the technology remain: the high energy cost and the energy expenditure incurred in generating the hydrogen fuel. Hydrogen must be extracted either from the electrolysis of water, or from knocking it out of compounds like natural gas (mostly methane) - which has carbon dioxide as a byproduct - or other processed fossil fuels. The involved energy expenditure must come from traditional sources - the burning of fuels, or nuclear fission power plants, which ultimately means - from the power of the electric grid. Technically, of course, some negligible percentage could come from solar and wind, but this is irrelevant. If the hydrogen comes from the electrolysis of water, the process of its production is at best 75% efficient, 25% of the energy being immediately lost. Then, it has to be compressed, chilled and transported to a hydrogen station, all of which entail further energy losses estimated at 10% to 20%. Subsequently, the generation of electricity by the recombination of hydrogen and oxygen to form water is at best only 60% efficient. If 100 watts was originally spent to release hydrogen from water, only some 38 watts (38% of the original energy expenditure) will in the end be available to power an EV. There is, therefore, no way to remediate the fact that, as fuel, hydrogen will always be substantially more costly than whatever fuel is used to produce it.

3. The quasi-autonomous Tesla electric automobile

3.1. The mythology of the Tesla electric automobile

In the past 50 years, an urban legend has developed about Tesla's electric automobile. It is based upon an an apocryphal story - that by 1931 Tesla had designed and built, together with a Peter/Petar Savo (supposedly his nephew, but in reality a fabrication), an "Aether Motor"-powered automobile (a modified Pierce-Arrow). Its origin may have been a pre-WWII intelligence caper (see below), but a summary of a purported 1967 interview of Savo by one Derek Ahlers (or Ahres) circulated as an unidentified document in the 1980's [14]. In 1989 and again in 2003, the hoax was re-insufflated with hot air by Don Kelly [15], and further embellished by G. Vassilakos in 1997 [16], while it made the rounds on that horrible forum of disinformation once called Keelynet. Kelly

claimed that 'according to documentation' which he never provided, the 'energy amplifier' was composed of 12 vacuum tubes and 'specially wound inductor coils' that 'enhanced' their discharge. In all cases, the tall-tale was evident by its central claim that, with its long antenna, Tesla's car directly extracted power from atmospheric radiant energy, without the latter being emitted from any source, such as any facsimile of Tesla's Wardenclyffe tower. There is even some fellow on the web that sells Tesla wine along with lore from 1932 that attributes the power source of Tesla's car to the harnessing of (conventional) cosmic rays.

Interestingly, one can even rule out from these tales any ongoing capture of solar power, since they make no mention of photovoltaic cells - or any direct electric capture of solar radiation with resonant Tesla coil circuits [17], since it is demonstrably not efficient in the ground-level atmosphere.

It is not as if Tesla could not be credited with the invention of electric vehicles. His aquatic Teleautomaton [18] is already one such electric vehicle, a sea drone [9]. But the sheer lack of evidence for the electrified Pierce-Arrow, along with its false central claim, should have been enough to quash the myth. Yet, in 1976, A. Puharich had introduced a kink in the story, one that was largely ignored by subsequent versions: that a young self-styled assistant to Tesla, A. Matthews, had once worked in the development of the electric car, part of which was carried out in Ontario, Canada in the 1930's. At the same time, supposedly with the help of Matthews, Tesla was building magnifying transmitter towers in both Ontario and Québec, while inventing a video recorder and player... In a 1986 interview, Matthews claimed that the car was first invented by Tesla in 1897 and "does not use a storage batery. It uses a special primary battery (...). (...) Tesla invented a completely new kind of primary battery, and in this primary battery, if the negative plate wears out, it can be replaced even by a child in a few seconds. And the battery, when installed in this electric car, will run that car 500 miles before the battery needs to be attended to" [19]. Even though this story is most likely just as apocryphal as the tales of Kelly or Vassilakos, it at least escaped the notion that Tesla had succeeded in capturing substantial power from radiant energy present in natural media. The power source of the putative EV was, more plausibly, a primary battery whose cathode could be quickly replaced. The description could apply to dry zinc, aluminum hydroxide (messy) and still other primary batteries, even to Edison's nickel-iron battery. The difference was that Mattews claimed Tesla had discovered *a new primary chemistry* - even though the evidence for the latter is equally

nonexistent (and Tesla was no chemist). Out of the blue yonder, it was also suggested that, while most of the tales about Tesla's EV do not mention capacitors, the primary battery might have been a "giant" capacitor [19]. Totally unlikely.

But even Matthews' yarn lacked credibility - which was further emphasized by his "ufological" claim, made in a prior book he wrote about Tesla ("*The Wall of Light - Nikola Tesla and the X-12 spaceship*", 1973), that the inventor hailed from Venus and was in communication with Mars. Matthews then reported his own encounters with tall, blonde, Aryan-type Venusian ETs... Certainly, Tesla became convinced at some point that he had received intelligent ("rhythmic") radio signals likely from Venus or Mars. Most unlikely, if what is known about Venus or Mars is minimally correct. He even claimed openly he had communicated back. Be that as it may, it wasn't from supposed Venutians or Martians that Tesla got his discoveries and inventions, rather from his hard and determined work.

Over the years, we have been approached by different parties asking us to accept or validate some variation or other of this story, and eventually by a German individual who ran an Association for the Promotion of Free Energy (GFE, Hamburg), Mr. K. Jebens. He claimed to have recently found proof of the truth of the story in the papers of his deceased father - a copy of a confidential December 1930 memorandum which he sent us. The description is very detailed, though lacking any information of substance. Though the text of the 'Confidential' 2-page long memo is quite legible, the heading (for the German League of Inventors, *Das Deutsche Erfinderhaus*) is barely legible. There are also no corrections to the typing (save a 'u' added by hand). These facts suggest that the memo is some kind of a hoax. If perpetrated anytime back in the 1930's to 1943 period, it reminds one of the kinds of hoaxes planted by Admiral Canaris' intelligence service, the Abwehr.

An excerpt from our letter sent in response to Mr. Jebens on December 26, 2002, reads:

Dear Mr. Jebens -

Thank you very much for your letter of 22nd October 2002, with the enclosed photocopy of your father's note regarding his visit with Mr. Tesla.

This is a very puzzling document that you discovered just last year while sorting your father's papers. Particularly puzzling is the fact that the story it tells is essentially another version of the same stories that since 1980 have been circulated by resources which Alexandra and I consider to be disinformation resources -

beginning with RexResearch, then onto Borderland Sciences and finally onto KeelyNet. Most upsetting about the whole story is this reference in your father's memorandum to another nephew of Tesla, Petar Savo. As far as Alexandra and I have been able to ascertain, Tesla does not seem to have had any nephew by that name, and the only place this name appears is in the various tellings of this particular story. Yet, the name appears in all of the three stories we have heard, and as well in your father's document. It is extremely puzzling, all the more so as your document now appears to corroborate these other accounts.

In this respect - of trying to objectively ascertain the veracity of the story - it would be helpful to research this Peter Savo further, or some other critical detail, like the model tubes 70-L-7 which purportedly Tesla might have employed in his converter. Do you have any further information on either that you would like to share with us?

The letter went unanswered.

Jeben's '1930 memo', incidentally, makes no reference to vacuum tubes, let alone 12, which is further indication of the disinformation dissiminated by Don Kelly. Moreover, it has a bitter and cruel irony: Tesla would have been able to crack the Aether Motor to deliver terrific electric power, and combine it with high-voltage plasma discharges - as we ourselves did with the discovery of the autogenous Pulsed Abnormal Glow Discharge (aPAGD) in 1987, and our patented inventions of how to use it to drive spinner motors, charge battery packs, or as an inverter [20-25] - at a time when Tesla had no laboratory, when he was without any sponsors (which was the situation from 1917 until his death, with one or two minor exceptions) and virtually penniless. It feels like a posthumous mockery.

3.2. The reality of the Tesla electric automobile

Tesla did envisage electric vehicles that could be made quasi-autonomous by the joint and synchronous reception of ground currents and atmospheric beams of energy capable of transmitting at a distance substantial electric power. His vision became translated into suggestive drawings showing the antennas of automobiles receiving electric beams emitted from Wardenclyffe-like structures. Seemingly, ground connections also appear. The electric vehicle would function just like his Teleautomaton, with the exception that its power would not be sourced in onboard batteries, but received at a distance from power-transmitting hubs (ultimately, in his vision, these hubs were powered by

hydroelectric systems and machines that could tap local energy sources). At most, besides the coil circuitry, it would have some significant circuit capacitances - as DC filters and regulators, and as resonant and transient charge storage elements. Note that, even today, these capacitances could not be filled by gold supercapacitors *if* the circuitry functioned with high voltages.

Most provocatively, Tesla's real concept of the electric car would have *in principle bypassed the need for either a primary battery or a rechargeable battery system*. *It would even have bypassed the need for an onboard power plant*! The Tesla vehicle would receive the necessary energy directly from a power-transmitting hub. This, of course, raises the problem of transmitting at a distance - in the atmosphere or in "space" - substantial energy, at high density, resonantly and coherently (and we should add: without destroying anything and everything in its path, as laser weapons do). It was Tesla's dream, but the evidence indicates he never attained it. As we saw in the first paper of the present series, Tesla never succeeded in transmitting substantial electric power across gaseous media. *Nor has anybody else to this day*, for that matter - irrespective of the hoaxes cooked up by the "Matthews" and the "Vassilakos" of this world, and so easily embroidered by others.

Moreover, aside from solar photovoltaics and wind-electric generators, no one has succeeded in capturing substantial energy from local atmospheric media, let alone in a direct electric form - with no conversions besides that of harvesting it. In an upcoming publication [26], we prove that the atmospheric medium is sustained by standing ambipolar waves of electrodynamic pressure, having specific and relatively high potentials, and ultimately responsible for barometric pressure. We also demonstrated experimentally how the Schumann frequencies are electrical and not electromagnetic [27]. They are characteristic of a continuous geoplasma, composed of bilaminar series of electron dyads, where each dyad carries the kinetic energy of ~1.5 keV [28]. So, it is conceivable that one may yet capture energy either from the interception of standing ambipolons or the mobilization of geoplasma dyads, or of their electrons.

These two failures - lack of success in transmitting power in gas and vacuum media, and lack of success in extracting electric energy from these media - strongly indicate one should seek alternative paths that do not require energy transmission and tuned reception. We are referring to systems that, whether from "the vacuum medium" or

from the fusion of hydrogen, release more energy than they consume in the form of fuel (e.g. aluminum cathodes or hydrogen gas) plus a controlled energy *input*. Can such systems exist and be made practical? - and do such systems exist? - such are the questions which we will address in the third communication of the present series. The land-based electric vehicle will only be feasible when one can safely and effectively equip it with its own onboard power-generation unit, one that delivers energy in excess of breakeven.

4. The Autonomous EV: Onboard Power Plants

There have been plenty of solar cars invented and built with modern solar film technology. In principle, they could provide for an autonomous EV. But that quickly became another pipedream, and even with advanced solar film technology, solar cars basically remain mere advertizing gimmicks for solar panel companies and financing NGOs. Even the more recent marriage of optical (the wider electromagnetic energy spectrum) and thermal (IR) photocell technology cannot reach the surface energy density required by an EV. It is only feasible when the vehicle is built with disproportionately large areas for solar exposure that are needed to supply the power consumed by an EV.

The best example of a contemporary autonomous energy vehicle is, of course, the modern nuclear submarine. It carries its fuel onboard in the form of radioactive rods, uses their nuclear radiation to heat the hot compressed-gas reservoir of a Stirling engine which, in turn, drives an electric generator that can be tapped for AC or DC outputs. Even though there are concerted efforts to miniaturize nuclear fission plants, none could at present equip even a military submarine. Moreover, fission plants still depend on the production of fissionable fuel that can be employed to trigger the fission reaction but generates radioactive waste.

To solve the power limitations of EVs by equipping them with an autonomous power plant requires a concentrated R&D effort to develop technologies that extract more energy than they input from natural systems that store energy, without any generation of radioactive or pollutant waste. Examples are nuclear fusion - which extracts, *in principle*, energy from the fusion of hydrogen and its radioisotopes to generate helium - or the anomalous acceleration of electron plasmas *in vacuo*. We will address the science and engineering of these two systems in the third paper of this series. EVs equipped with such

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systems must still carry onboard their fuel - hydrogen in the case of fusion, and the cathode material in plasma discharge systems.

Considerable research efforts were carried out by us at *Labofex Co.* to develop a PAGD reactor that could withstand the conditions of a land vehicle with a long lifetime of sustaining extremely high total pulse counts. Documentation of much of this research has remained under nondisclosure to this day. The next issue of the *Journal of Aetherometric Research* illustrates the application of sturdy PAGD/IVAD plasma reactors to the engineering of an AEV. It was written back in 1993 (at a time when the notion of a global urban warming had not yet degenerated into a paranoiac cult of alarmism), to contrast what we called the Autonomous Electric Vehicle (AEV) with GM's 1994 EV, pompously called The Impact. It is little wonder that the Impact was abandoned, since its performace values were so poor (see, in particular, Table 3 and Figure 11 of the *Labofex* report).

As per our patent [21, 23], the PAGD system still requires secondary batteries (drive pack) to store start-up power and the reactor's input energy, as well as store the reactor's output power (in the charge pack). Operationally, the packs would be cyclically reversed. But, as discussed in that *Labofex* report, the engineering design sought to minimize the size and weight of these packs, down to less than half that of the Impact. Five different solutions were presented using both PMDC and AC motors. Some directly applied PAGD/IVAD reactors as inverters that can drive a variety of AC motors [22]. Use of magnetically-coupled flywheels that further limited reliance on batteries was also envisaged as storage for the reactor output, as driver of its input and in auxiliary regenerative braking. More recent research of direct plasma-motor couplings at ABRI identified an ideal motor for inverter applications [29], as it is capable of absorbing efficiently the entirety of the reactor pulsed waveform. It employs a permanent magnet-coupled, flywheel-loaded horsepower spinner (drag-cup type) motor which, when all the circuit components are tuned, displays measurable overunity performance comparable to that observed with the converter system.

Back in 1997, through the efforts of our dear friend, Dr. Rui Silva (then a GM-Europe executive working in Detroit), and of the then President of GM-Europe, our project of a PAGD-driven AEV was briefly presented to CEO Roger Smith and the GM Executive at a meeting in Detroit. Supposedly, we were awarded 5 minutes, but the presentation - reportedly made, according to Silva, by the brilliant engineer Don Johnson -

reduced to showing Table 3 of the accompanying Labofex Report. Elsewhere [30], we have described what happened: the response of a top Detroit executive to the president of GM's European operations best summarizes it: "Haven't you understood? The EV project [referring to the GM Impact EV] is just PR!"

As it turns out, GM was not ahead of its time - it was *already behind* it! And the EVs remained to this day behind their time - as but one more wrecked example of the socialist engineering of society, of trying to have governments force a new technology that has remained impractical and disastrous.

When we first recounted what happened with GM, we also gave two other examples of corporate myopia and competitive dysfunction - one from the Alcoa company, which took six months to have their legal team negotiate from scratch another confidential agreement with us, only to decline our offer to demonstrate, even free of charge, the technology; then, it returned the two packages of our confidential documentation without those it had assigned to make an evaluation having ever opened them! The other from Charter Power Systems, which took a year and half to make an evaluation of the submitted material and data, and then by mistake enclosed *two* internal memoranda addressed to their Director of Battery Engineering and Development in the confidential materials returned to us, the first of which read:

"I have signed the Labofex receipt and just struggled to read each of the six documents. Quite frankly, I find myself unable to objectively judge what the documents are saying, probably because my background is in Chemistry rather than Physics. What I do see is a technology that is full of promises yet to be fulfilled; 10 years of work which does not appear to have been snapped by anybody in spite of the lofty claims."

And then the second, from another appraiser who tersely wrote:

"You can see that so-and-so is not convinced of their claims either."

As if 10 years of work on a shoestring was sufficient to fully develop technologies such as the PAGD/XS NRG™ or nuclear fusion... We have so many stories like this, that Mallove wanted one day to take the two long shelves of *Labofex* material and write his own book about the social and characterological resistance to consider and evaluate new research in basic science and technology. It is a resistance to learn, and also one that can flip into sheer gullability: the CEO of IAI (Israel Aircraft Industries) rejected our PAGD proposal that his head of Innovation, Mr. Uri Soudak, had worked on and submitted - because he doubted our claims and, at the same, thought that, if anything, it would be better to invest

in the then "Sabori brothers" and their fake "reconstruction" of the Papp engine, since it claimed energy outputs that vastly outdid anything we had to offer (for a real evaluation see [31]). Partly because of this, Soudak quit IAI and became our representative, our chief investment negotiator and prospective CEO. But there is also more than just a characterological resistance at work in all this, it is characterological arrogance: as an executive of British Petroleum told Soudak in London: "your [patent] rights will have turned to dust, and we will still be here pumping out oil. You need us; we do not need you." We never doubted that oil and nuclear companies needed us like a hole in the head. But that too had to be put to the test.

There exists today a profusion of claims to all sorts of systems that supposedly release energy in excess of breakeven. Few are worthy of being addressed, so poor are the ideas and embodiments - when not entirely false, and so erroneous are the supposed measurements - if they are ever provided. In the vast field of false inventions that "will save mankind", the prominent position seems occupied by all sorts of magnetic motors that claim to extract "magnetic energy" from the vacuum and to solve in the blinking of an eye every household's energy needs. We have been consulted on plenty of such rackets. And they have been around for over 100 years, though they have now found their forum on *youtube*.

For now, we want to focus on the challenges that lie ahead for any application of a viable machine that releases energy in excess of breakeven. The nonthermodynamic solution to nuclear fusion that we alone have proposed [32] can easily find application to marine and space vehicles where hydrogen storage is feasible and the storage risks can be minimized - or, still better, the storage entirely eliminated (as we propose in an unpublished monograph dedicated to space propulsion; then, indeed, the fuel would be for free). But it seems unlikely that a fusion machine will ever serve as the onboard power plant of an EV. The safety risks are no different from those posed by hydrogen fuel-cells vehicles. Where a fusion reactor really finds its application is in powering communities that will want to become energy-autonomous and independent of the energy grid, since such reactors will be much smaller than existing nuclear power plants, can in principle output tremendous power, and should produce zero radioactive waste.

Accordingly, the importance, in our view, of the accompanying Labofex report on AEVs [1]: the PAGD plasma technology may well have found its most adequate

application in the making of EVs that are energy-autonomous and thus independent of the energy grid. Yet, to fully bring them into being will continue to require the development of energy storage systems that must outdo present-day rechargeable batteries. Specifically, with reference to the outputs of the fusion reactors and plasma reactors that we have invented, they must be batteries or "pumped energy storage systems" that can efficiently absorb peak currents and voltages, while capable of deep discharges. Without an efficient storage system, the energy released from operation of a reactor will be ceaselessly wasted, and the electric power delivered in DC and AC forms to the circuitry cannot be regulated.

5. Final Thoughts

The scientific and technological challenge of the EV remains a battle that must continue to be waged on these two fronts of basic or primary science: research and develop energy systems with a COP>>1, and more efficient and reliable rechargeable batteries, whether wet or dry. A sizeable effort is needed - scientific, technological and corporate - to develop viable pollution-free land-based electric vehicles, and this means vehicles that are autonomous because they can effectuate a controlled release of energy from an on-board power plant. The same thinking must apply, with greater force, to the development of fully electric aircraft or space vehicles.

However, it turns out that this path is not necessarily the answer for aquatic electric vehicles, whether submersible or not. Existing nuclear submarines are already autonomous electric vehicles. But, more interestingly, marine vessels can be made energy-autonomous in other efficient ways that employ no nuclear technology. Back in 2007 to 2011, we designed such a vessel; it was to be driven by three distinct but confluent technologies that we invented but have not patented, two of which we have not disclosed:

1) The vessel's internal superstructure would be built to function like a Hyborac thermal reservoir, as based on experimental work that we conducted [33-35] and have demonstrated on video [36]. Mallove himself confirmed some of the results [37]. The superstructure reservoir is used to drive a reciprocating Stirling engine, which turns an AC or DC electric generator. Very recent developments in our laboratory have led to the design of radically new Stirling regenerators that could be advantageously incorporated into the construction of the heat engine.

2) The hull of the vessel is designed around a complex of water turbines with no moving parts - that we have called called Turbat(s) - which directly generate pulsed DC, whether the vessel is moving or anchored, for as long as there is a flux of water through them. We first tested these turbines literally in vitro, in the lab (see p. 25), with both alkaline water and seawater. Then we ran a field test at Lake Simcoe (August 2013), dragging the turbine behind a boat at different speeds, and the results beat our expectations. The fuel is, once again, the cathode, which can be easily replaced.

3) The third technology is a "wave-capture" power generator that employs the solenoid principle in a toroidal application, and which is wired to generate either AC or DC at various intercept voltages, and can be set with a modal bias for the most common wave voltages. The system can motionally capture wave energy over a range of wave frequency, and it can also function whether the vessel is moving or anchored, for as long as the body of water undulates.

None of these three systems required any increase of the vessel's wind or water resistances. Their point of confluence would be an energy storage system (batteries, flywheel, or both), to which one could easily add the output of other systems, such as photovoltaic, or a wind-driven generator that would be operational only when the vessel was anchored.

After, once again, raking investment interest in many an inquiry to a naval yard or naval construction company, all over the world, we ended up making a proposal to a New Zealand company that specialized in sizeable aluminum boats that were poorly designed to be energy self-sufficient. Our offer was that we would trade the IP of our three energy systems for their investment in producing our energy-autonomous electric vessel, with 50:50 ownership in a new company set up for the purpose. Their serious and professional answer was to ask us for some 7 million dollars in order to produce the vessel... They clearly mistook us for one those billionaires, friends of J. Epstein, who own oil-guzzling megayachts and were so keen on building Ghislaine Maxwell's "Trans-oceanic Communities".

This engineering example of the autonomous marine vessel underlines the fact that vehicular motion through different media requires and permits different technological solutions to the problem of energy self-sufficiency. But it also puts a glaring light on the social inertia that bars any quick technological change from being robust. For all their

unending clown performances, all the Greens and "eco-friends" ever did was impose the laic religion of global warming and dig a deep hole for the future of electric vehicles and sound alternative energy science and technology. They distracted the public from the real challenges, and enrolled thousands of ready-made scientists to engage in their ever-changing conspiracy of lies. Petrochemical conglomerates, oil companies and nuclear consortia were all along the winners - as they went along with it. Never were their profits so great, or oil and gas so expensive - as they proved that every socially-manufactured crisis is indeed just an opportunity to multiply capital. The challenge to fund primary science in search of radically different energy technologies was buried deeper than ever. And all efforts to uncover a new energy science were *ab initio* condemned, by having to stay within the boundaries of electrodynamic and thermodynamic theories that are erroneous, incomplete and have provenly failed.

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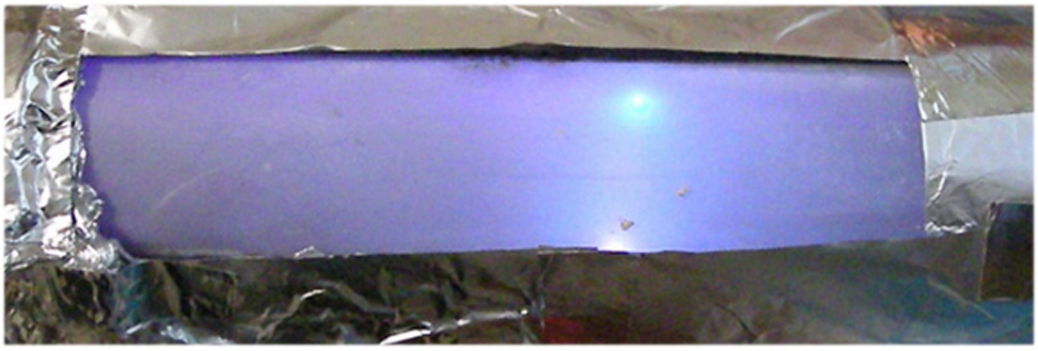
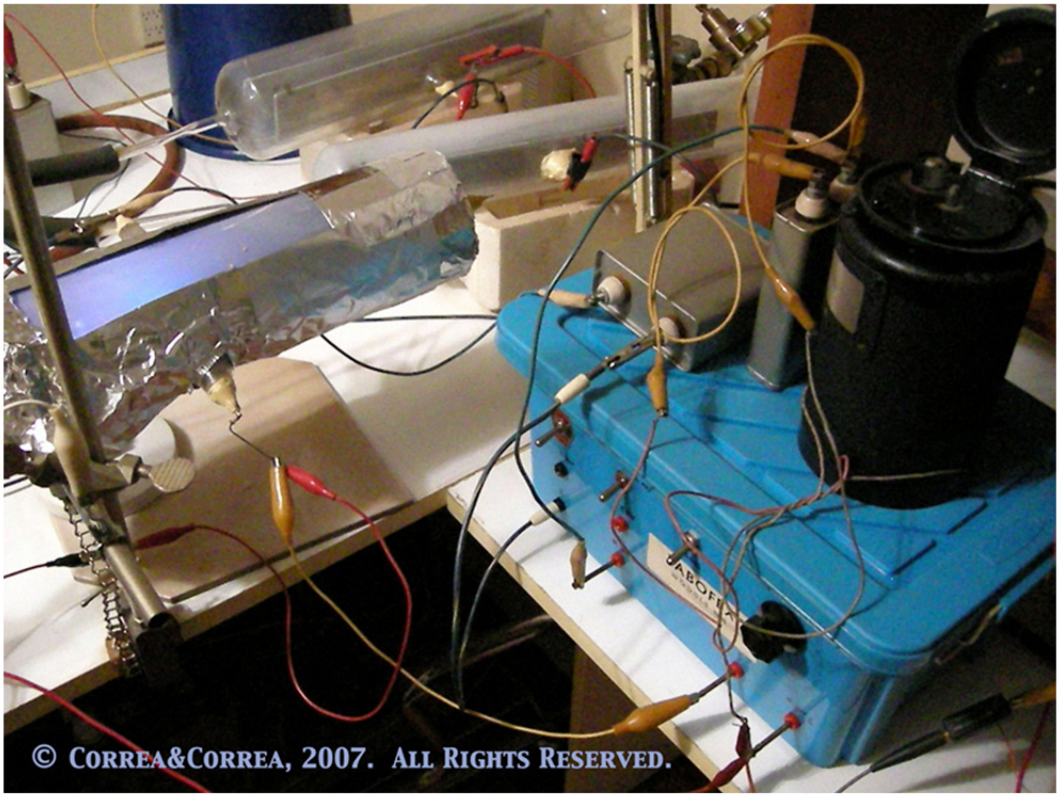
PAGD reactor driving as inverter a magnet flywheel spinner a 17,000





Water turbine (Turbat), second generation, tested in vitro