Electronic Electricity Repository (EER)

Electronic electricity repository is an energy concept that aims to accumulate and store electrical energy from any source. The storage would be intended to accommodate such things as electric vehicles, home heating, etc.

The best example is the EV, an electric car that would run on an ever-accumulating power source. That is to say, any and all sources of electrical energy (including diffuse sources), would be collected, combined and stored in the form of capacitance. But, wouldn't the capacitor plates be bigger than the vehicle?

Well, yes they would, unless a way to increase the surface area of the plates within a small perimeter could be fashioned. The plates (and the dielectric) must match exactly, to gain optimum charge. I suggest that Scanning Tunneling Microscope Technology, or possibly even nanotechnology be used to accomplish this, whatever could configure roughly halfway to the molecular level.

Doing this, configuring massive surface area within a small perimeter, is the heart of EER. It could involve steps, or grooves to 'tuck' the surface areas away. BTW, this would necessarily require a much stronger dielectric, which admittedly is taken on faith, but it could be many years away.

The object is to configure the plates and dielectric so they all fit like Jell-O in a mold, and to make these all small in perimeter while yielding enormous surface area. That way, it is hoped, enough charge could be stored to run an EV. Further, it is expected that about 15 sources of renewable energy (solar, wind, wave, etc.) would be able to contribute to the 'EER pool' of stored electrical energy. In time, renewable energy stored in this way could effectively replace fossil fuels and batteries for vehicles. The renewable sources need not necessarily have a device actually ‘on’ the vehicle; it is anticipated that such renewable devices could be located, say, in or on a garage, and the electric charge transferred to the vehicle when required.

I ask you, with the advent of electric cars, might not this concept (if it worked) pretty much end our dependence on oil?

NOTE: This idea absolutely, in no way, breaks the Second Law! No more than a 12v car battery does.

Frank Lincoln
FEERguy9@cs.com
EERguy9@aol.com
EERguy2000@yahoo.com

PS: In case you hadn't noticed, I am VERY weak with computers.

More, if you like.....

This is no more than a guess from a novice as there are some mistakes in the preface above.

In one sentence, I am saying that a very, very advanced capacitor is possible, and would accommodate most of the energy problems we have today, basically it would do the job that the energy function of oil now does.

An energy concept:

Yes, there is a 21st Law of Thermodynamics. That is no knock on Faraday, just a reference to the 21st century, and the new technology it has brought.

Simply stated, it is, "No energy concept involving renewables shall ever be considered unless the word 'diffuse' is used, understood, and taken into consideration."

Faraday could not have seen this coming. In his day, there was not the multitude of diffuse renewable energy sources available, which can be converted to
electricity.

If human beings are ever to use renewable, natural energy sources, they will have to take into consideration the diffuse nature of sunlight, wind, wave, etc. I was actually surprised to find that Faraday, himself, used the word "diffuse" in his writings. But, this was in reference to the spread of charge on capacitor plates, and not the UN-concentrated free energy that is available today for conversion to electricity.

There is NO way around this Law. By that, I mean that there in no way around solving the "diffuse problem," before we are able to put renewable energy sources to work in any effective way.

A goal.....an idea.....a prediction.....energy is easy..... there is no crises.

- We don't need oil.
- We don't need batteries.
- We don't need internal combustion engines.
- We don't need fusion.
- We don't need hybrids.
- We don't need hydrogen-powered cars.
- We don't need ethanol.
- We don't need natural gas.
- We don't need methane.
- We don't even need efficiency.
- We don't even need conservation.

All we need are the renewable energy sources that God, in His infinite wisdom, provided us.

Some could be used, some not. For a while. Eventually renewable energy sources would be all we would need to power our EV's, and heat our homes. We would have the luxury of choice, while at the same time powering our EV's with them. All of them. Any of them. As long as they are able to generate any amount of electricity.

To those who have read this before, and may have rejected it out of hand, let me say that it is my strong belief that two major companies may be engaged in pretty much the basic idea presented here. They have patents, I do not. In no way do I, nor will I, attempt to claim any right whatsoever to this idea, even though all my writing on it came from my own independent thinking for over 12 years. I wish them well.

But, in case I am wrong about that effort
being made, I surely wish some interested party would help me connect this to the people in government who say they want an energy solution. What they are looking for is contained on this letter. I am THAT confident.

Note: I can see EER powering an automobile. That is almost a lock, in my mind. Further applications are, perhaps, a little harder to deal with. Once a car IS powered by EER, then all the entrepreneurs will take the rest to the logical conclusion. For the most part, EER will be discussed in terms of an electric vehicle.

EER in Brief

Electronic Electricity Repository (EER) is merely a concept at this time. There is no business, no patent, and no money involved with this.

This involves solid state capacitors as a usable energy storage device for electric vehicles, and other items. Conventional wisdom limits capacitors to power surges, and the like. The full text of this concept will suggest a way to make them fully competitive with the internal combustion engine, while not violating the laws of energy density.

The easiest way to explain it is to use an electric vehicle as an example. To power an EV with EER, an array of electronic devices, perhaps solid-state capacitors, perhaps another device, would contain the electrical charge accumulated from a variety of sources of electricity. Renewable energy sources are suggested, but any source of electricity would work. With the questionable future of battery-powered EV's, and fusion as an energy source, and the political debate about fossil fuels, there are strong reasons to take a look at EER.

In fairness, many say it cannot be done. But, perhaps another war (or avoiding one), could put the right minds to work on this concept. It would provide a way to be independent of foreign oil, while providing a structure for the transition to renewable forms of energy to power EV's, or any other device powered by electricity.

This is merely a shell of an idea, but perhaps some further thought could help bring it about.

Frank Lincoln....72430,2407.....FEERguy9@cs.com
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A TRIP TO THE STORE IN AN EER POWERED EV

Let's suppose that the EER concept is fully developed, and built into an electric vehicle. Let's also suppose that the newest and best technological devices, some of which are now being used in EV's, are integrated into the vehicle's design. What follows is a description of what might possibly have happened during an everyday trip to the store in such a vehicle. (This assumes the use of an *advanced* solid-state capacitor).

Ms. Jones notices her "fuel gauge" as she starts her vehicle; it tells her that her microchip capacitor battery is 85% full. This means that of the vast number of microchip capacitors in her "battery," 85% are charged with their very small electric capacitance. She proceeds to the store, and returns home, a quarter mile trip. As she pulls in her driveway, she looks again at her gauge. It reads 84%. She thinks that she used only 1% of her battery capacity for her trip.

But, she is wrong. She used 10% of her available charged capacitors for the quarter mile trip. So, why didn't her gauge read 75% when she returned? There were several devices built into her vehicle which were replenishing used capacitors, almost as fast as she was using them. (All figures below are guesses, just to make the point.)

1. The advanced solar panel on the roof of her vehicle was, as always during sunlight, continuously recharging at a slow, but steady rate. Because she had happened to drive and park in the sunlight, the solar panel recharged 5% of her capacitors.

2. The air scoops arranged in her vehicle's design, although accounting for some drag,- were directing the air through small dynamos, which recharged another 2%.

3. The regenerative brakes on all four wheels replenished another 2% of the capacitors.

So, she did, in fact, use 10% of the available capacitor charges, but 9% were replaced by the activity of her trip. This is nothing like perpetual motion; it is merely taking advantage of the natural surrounding energy to replenish the energy spent on the trip.

It is even conceivable that her "fuel gauge" might have read a higher percentage upon her return; a shorter trip on a windier and sunnier day, in a more sunlit route and parking spot, and many more occasions to use the brakes, might have made that possible.

The Second Law of Thermodynamics is not violated, because energy from outside the vehicle was being absorbed along the way. It is noted that a battery-powered EV could have done much the same, but the weight difference would have changed the percentages, so as to defeat the purpose.

Frank Lincoln CS# 72430,2407
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It is understood that high energy density is something that has been sought for many years, the concept is nothing new. What is suggested here is the possibility that modern technology may now be in the position to actually attain it, to a degree that could combine the many energy sources (new and old) into a common pool.

GIVEN:

Trench capacitors, at the present time, have nowhere near the capability to deal with the degree of energy that would be required in Electronic Electricity Repository.

The area of the plates in a trench capacitor will, for the most part, determine the capacitance, not exclusively, but this is the factor that is dealt with here as having the most potential for improvement. It is assumed that progress in the other factors, dielectric strength, dielectric composition, etc., will continue, and will accommodate the supposition of surface area increase made here.

HYPOTHESIS:

- The surface area of a trench capacitor plate can be greatly increased without increasing the perimeter, or the space required to store the capacitor.

- Etching a groove on the plate surface will do this, to a small degree, and it is done, to some extent, today. What is surmised here, is that as the technology allows, many cross-grooves could be etched within the first groove.

Then, with increasing precision, these cross-grooves could, in turn, be cross-grooved. And, then those cross-grooves cross-grooved. Each successive cross-grooving would be progressively smaller, magnitudes smaller. This could be repeated until the molecular level was reached, each time increasing the surface area of the plate, and thus the capacitance. An inexact estimate of the number of times it could be repeated is 26. It is surmised that each groove, cross-groove, etc., would be matched by a ridge, a cross-ridge, etc., on the opposite plate, with corresponding shapes for the dielectric.

The resulting configuration would yield a perfectly matching set of plates (sandwiching an appropriately shaped, and expectedly advanced dielectric). Such a configuration and material composition may not be possible at this time, but the direction of efforts in their respective technologies may lead to their development in the very near future. This concept is put forth in anticipation of those developments.

In theory, each successive etching would substantially increase the area of the plates, and thus the capacitance without increasing their size, their perimeter, or the volume of space needed for them. Again, the only barrier seems to be at reaching the molecular level, after each groove is re-grooved, perpendicularly, and then THAT groove is re-grooved, etc. This would take advantage of all the "inner space" available between the plate surface, and the molecular level. (Understand that in place of "etching," Scanning Tunneling Microscope Technology might be applied, or even nanotechnology, if that ever becomes reality. The point is to configure the grooves, by whatever method.)

BENEFITS:

- An almost endless storage system for electricity.
- A way to store electricity from *any* source, from renewables to a wall
- socket.
- A possible solution to the search for a better power plant for electric
- vehicles.
- A structure within which to make the conversion from fossil fuels to
- renewables.
- A way to accumulate the "trickle" of the many forms of renewable energy,

and combine and store them in a practical way.

- A way that could give strength to the many "weak" and diffuse renewable energy sources.

An attempt to generally suggest HOW to accomplish EER will be made. This will be based on the feedback received so far on this concept. For the most part, feedback has come from various forums in CompuServe. All major objections will be mentioned, and a way around each one will be suggested.

ENERGY DENSITY: This appears to be the leading objection to EER. In the strongest terms, it is postulated here that there is no sacred or permanent universal limit to energy density, there are only hurdles. There are limits to present materials and there are limits to a given geometry, but no universal scientific boundary that would stand forever and always.

There are certainly physical limits to the materials now being used, but this concept of EER does indeed depend upon progress in this area. Improvements in materials are bound to happen.

Unless human progress is at its maximum, there is reason for such an expectation. Especially since many say technology is doubling every day with computer technology, and since many of the best resources in the world are focused on this type of science. (If anything like this concept of EER ever happens, it will be as a natural development of such materials, and NOT a result of this effort. That is quite thoroughly understood.)

It is suggest here that even without improvements in dieletrics, there may be opportunity to vastly improve their capability with the one factor geography of the plates.

Just as computers changed everything about information, some form of EER may change the way energy is dealt with. The suggestion above, regarding etching grooves in trench capacitor plates, and then etching those grooves, etc., is offered as a possible way to provide the structure that would enable a monumentally higher energy density, than has ever been achieved.

If the geometry of the plates is configured as suggested here, and they are identically wrinkled, it is expected that a very high energy density could be achieved by taking advantage of the inner space. The accumulation of a massive repelling force between plates is a problem for which no answer will be attempted here. But, mechanics aside, it appears that developing technology will, indeed, provide the tools necessary to configure the plates.

CAPACITOR LEAKAGE:

Two points here:

1) Leakage in trench capacitors is not nearly as big a problem as it was a few short years ago,- holding a charge for an electric vehicle, for example, would be well within the cycle of usage. In other words, an EV would be expected to be used often enough to use the charges before they have time to leak.

2) The percentage of loss due to leakage could logically be offset by overloading the capacitor bank by a like percentage. This is somewhat of a built-in inefficiency, but in time, wouldn't the leakage problem be expected to continue to improve?

ARCHING: The concern about electrical arching between the extremely small dimensions created by the etching and re-etching can only be explained away by a layman in this way: the extremely small dimensions would occur between parts of the same plate, and *not* between the opposing plates. The surfaces of the two plates would remain equidistant over the entire area. It is expected that the extremely small dimensions would mainly occur between points on the same plate, at the same potential, and thus no arching would be anticipated.

ATOMIC LEVEL: In a pretty thorough analysis in the LEAP forum, it was indicated that "the whole idea of a capacitor thus breaks down as we approach atomic dimensions." (The following assumes abilities predicted by some as to etching, Scanning Tunneling Microscope Technology, atomic force microscope, lithography or other methods.)

If you make one groove (G1) in a capacitor plate, that certainly does not approach atomic dimensions, yet it does increase the surface area of the plate (without increasing its perimeter). Then, if you go back and make another groove (G2) WITHIN G1's SURFACE, you are closer, but still not near the atomic level. Then if the surface of G2 is etched (or STM'd) with G3, you are closer yet. Closer, but still a long way from the atomic level.

How far? Well, the number 26 seems to hold up as the number of times you could re-etch grooves, before you hit bottom. (Each successive etching step would be, say a hundred times smaller than the previous one. G3 is a hundred times smaller than G2. G2 is a hundred times smaller than G1, etc. G26 would be the smallest and would begin to enter atomic dimensions.)

Now, backing up, let's say you made a hundred tiny grooves on the surface of the original plate, so you have 100 G1's. Within each G1, you etch 100 much smaller G2's. Within each G2 you etch 100 G3's, which are yet, again, much smaller. This is a million grooves at the 3rd of 26 steps.

If you could continue on in this way for 26 re-groovings of the grooves, how many grooves would you have at the 26th step? And, by how much would you have increased the surface area of that plate? And how much more dipole moment effect would now take place? And how much more ability to hold charge would you have? If the number 26 makes you cranky, stop at 20, or 12.

The point is this: there is a tremendous amount of "inner space" available before you reach atomic level. Perhaps an optimum number could be safely reached. Even 12 would seem to provide a monumental increase in charge storage ability. Subject to mathematicians' scrutiny, there may be 10^24 grooves, when you are only halfway down to atomic level, and free of the terrible things that happen there. At the halfway point, you have monumentally increased the surface area, without threatening stability.

Assuming that the dielectric follows the shape of the plate exactly, have you not vastly increased the number of molecules subject to polar realignment in the electric field? Could it be said that, even though the individual dipole moments would stay at the same in magnitude, there is an opportunity to create a tremendously larger number of them, by taking advantage of the inner space available?

MASS PRODUCTION: Some of these techniques to reform very small structures are very slow and very expensive. Some question was raised as to their adaptability to a mass production situation. As with any change in technology, first efforts are not usually efficient. But there seems to be enough advantages to EER so that the forces of supply and demand would push the costs down. Once in the competitive market, improvements in technique could be expected.

GROOVES TOO SMALL? A statement made in one of the forums was, "There is a limit to how small the grooves can be before they don't work any more." As this was from a good source, it is taken seriously. If some of the logic above doesn't account for this, there may be difficulty here.

DISCHARGE TIME: Capacitors normally discharge very quickly, so wouldn't they make a rather bad storage device? No detailed answer will be attempted here, but can't this be controlled with a very low discharge current, with a high resistance?

Electricity is, or can be, the common denominator for all energy sources, from solar to hydro. It is for exactly this reason that EER could employ each and every energy source. All the new renewable technology could be "fed" into EER, without exception. Yet at the same time, conventional sources could contribute to it. Every drop of oil and every lump of coal on this planet could be used that much more efficiently. Could this captured energy not then be put to use, as needed, when needed, by controlling the energy bursts to simulate conventional electricity flow?

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The technology that would be needed for EER seems to be within sight, with some faith required perhaps for the materials. Basically, it is the ability to sculpt materials at the molecular level which brought about this revised approach to EER. I have never seen the etching process, nor STM; this whole concept of extremely small sculpting to obtain extremely high surface area is drawn from my imagination and the little I have read about these processes.

I am motivated by the extreme advantages that would come about, and the apparent ability to accomplish this; if not on a production basis, then at least on a prototype basis to start. I'm certain there are still technical errors in this effort, it is hoped that the general idea was communicated with some adequacy. This seems possible, or within reach to me and it seems as though it would bring about profound benefits. It seems to me that it is a logical way to approach energy at this point in time.

But, I defer to the experts.

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I have no patent on this idea. My motivation is not monetary.

I understand that this could not be done today, because of limits on existing dieletrics, and perhaps other items. My position is that EER is not impossible, given advances in some technologies.

Please respond by Email
or call at (248) 288-3459
FEERguy9@cs.com
Frank Lincoln

Please keep in mind that EER would allow energy from any and all sources to be stored and combined in such a way that an electric vehicle could, at some later time be powered by it.

Separating a steel sample using a tensile tester could be useful in EER.

The jagged edges could be cut off, just past their breakpoint. Call these two pieces of jagged metal our capacitor plates. The broken pieces are matched molecular for molecule. If a dielectric is molded between the two jagged ends, the fit could not be better. "d" is maintained. The area of the matching jagged edges is much, much more than the cross section of the steel sample. We then have matching capacitor plates without using STM to configure all the surfaces.

Note: EER may not solve all energy problems, but in my opinion it could certainly power personal vehicles.

Anyone who receives this is free to publish.

FEERguy9@cs.com
EERguy9@aol.com