

Free Energy Principles

Without bullshit

Revision 5 (draft)

FE R&D group <http://groups.yahoo.com/neo/groups/ferd/info>

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Foreword

Many people spend lot of efforts, time, money and other valuable resources trying replicate or build some presumably FE/OU device. How we can avoid wasting time, resources and getting frustrated about negative results?

I often give an example – can you build a radio or TV set yourself? Well, it could be a challenging task even for experienced person...but most of OU researchers are amateurs.

So what to do when your next project does not work? With radio it's easy, it was done before, and we know that it is possible...so if it does not work you know for sure that something gone wrong in our implementation... Nobody going to say that radio or TV transmission is impossible...and all radio / TV sets we see are fakes ☺ (*)

When building FE device we are in much more difficult situation. There are not so many working examples around us and prevailing social perception of FE is that it is a fake.

There are many “alternative” theories like “new physics” with hundreds of pages of bla-bla-bla, exotic words and “tons” of formulas...but they are useless for our real world engineering task.

Obviously we need a simple and practically applicable theory or method to check ideas. So that we could know ahead could the device work in principle or not. It would be very unfortunate throw away almost ready device but with some minor issue, and same in opposite – spend years trying build device which could not possibly work.

I spent a lot of time analyzing, comparing and trying replicate different devices. At the end I think I have general and simple concepts of the FE. Everything started from Tesla's article about increasing human energy (see app. 1). It took several years for me to understand it and come up with generalized principle based on it. I call it a First or Classic or Tesla's principle. We can see examples of it in nature. I continued thinking about different principles and I came up with two more. May be there will be more, who knows? ☺

By some reason it appeared that it is very difficult to explain these principles. It's kind of “alien knowledge” to what we were told in school and university. I keep trying come up with short and clear explanation. Please give me feedback and hopefully together we can improve this book, so more people can benefit from understanding of the principles.

To illustrate principles I decided present possible systems or setups. Each of this sketches give some idea what system is and where energy supposed come from. These are not complete plans to build practical devices. I would like to provide such plans but I don't have them ☺ (yet)

Each of concept devices can be used as a starting point for research. I still believe that principles I am describing here give huge advantage and transforming “abstract search” into more or less defined engineering problem.

Please don't be frustrated if something does not work right away. Most of our everyday technology, which we are even not noticing anymore in our everyday life, came out of many years of hard work of scientists and engineers.

* I know one guy who did not manage make crystal radio work and at the end he claimed that it is a fake...as most of FE devices ☺ (actually, I not sure if it is funny)

A special words for “smart” skeptics

“Heavier-than-air flying machines are impossible.”

Lord Kelvin,
President of Royal Society, 1895 (*)

- FE not possible due to laws of thermodynamic.

Before you say this please check your books one more time...and think carefully when these laws can be applied.

- Nobody ever seen device with COP > 100% before

I sure you have seen one or perhaps two...right in your house. Both are using heat pumps... and I hope you can recognize them now ;-)

- Nothing free in this world

Money is a human invention and has nothing to do with laws of Physics. Sun shines free for everyone. Building a FE device allows one tap energy himself and avoid paying constantly rising prices.

(*) Ironically he discovered one of most interesting FE processes in nature (see Kelvin Dropper)

Tesla's (classical) principle

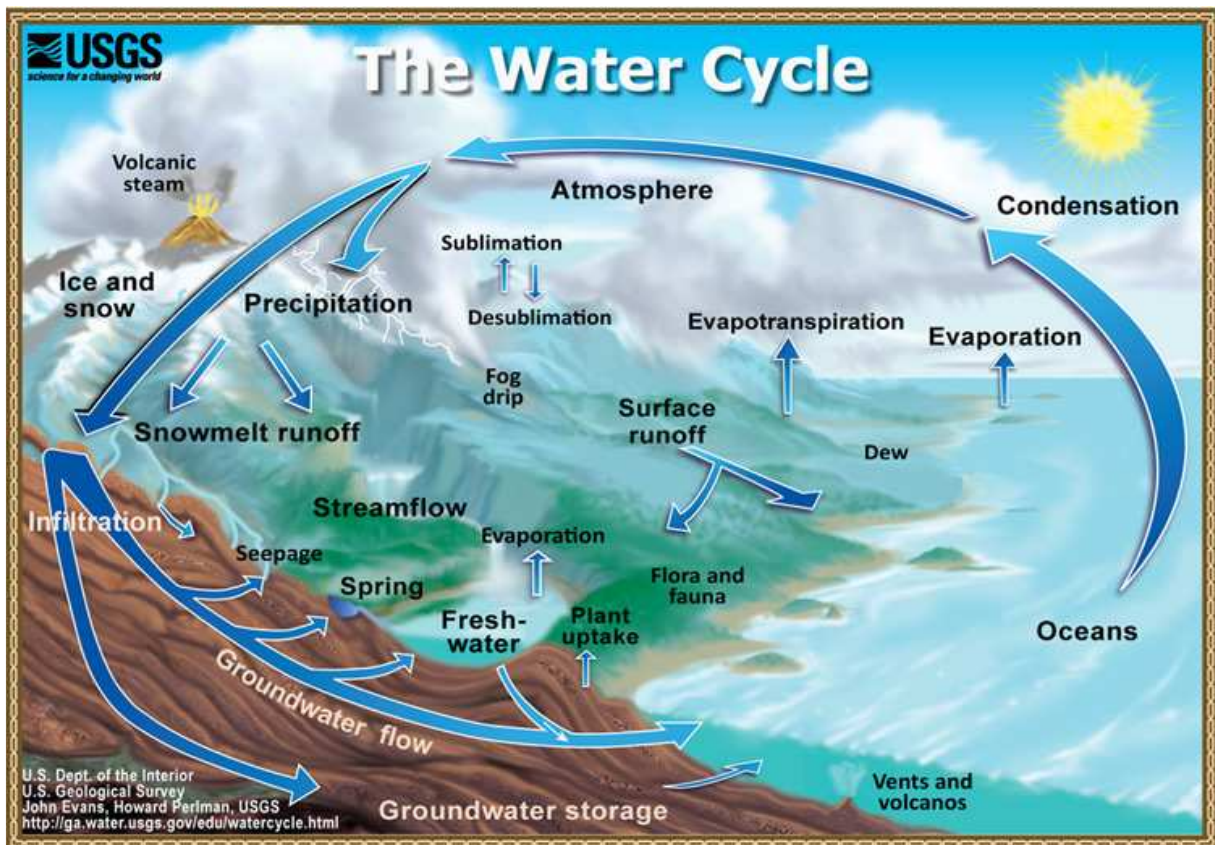
“All natural FE systems built on the principle of a phase transition in the field of conservative force. The water cycle on Earth, storms on Jupiter, even the heat of the Sun...”
dedivan (skif.biz)

I think it is obvious that environment or space around us contains energy, we can try extracting it and use for our needs. So we don't need any fuel. I think first time such idea was described by Nikola Tesla in his article “The problem of increasing human energy” with special references to the harnessing of the Sun's energy by Nikola Tesla, Century Illustrated Magazine, June 1900 And most important part is “A Departure from known methods – possibility of a “self-acting” engine or machine, inanimate, yet capable, like a living being, of deriving energy from the medium – The ideal way of obtaining motive power.”

Complete article available e.g. here <http://www.tfcbooks.com/tesla/1900-06-00.htm> and most important part of it in Appendix A in the end of this book.

I believe that everyone FE researcher read this article, but amazingly small attention was paid to this principle and it seems to be ignored until now. One possible reason is a difficulty to understand it. It took probably 5 years for me to get the Tesla's idea since I first time read this article.

Let's consider this principle in more details and use example from nature - natural water cycle (or hydrologic cycle).



pic.1 Natural Water Cycle (source: http://en.wikipedia.org/wiki/Water_cycle)

Water vaporized from ocean (lake, ground etc.) goes up into atmosphere, condense there, form clouds and drops as a rain or snow, then flow thru rivers and returns to ocean.

This is a natural water flow which exists in environment. Humans use it to harness energy by inserting special devices (like hydropower stations) into the flow to capture energy.

As you probably know Tesla built first hydro power station in Niagara Falls in 1895 (*). Perhaps working on that project brought him the idea of extracting energy from environment.

I think is important to consider where energy comes from? Most people will say “from Sun” and will be right, but not exactly. When water evaporates, it takes up energy from its surroundings and cools the environment. When it condenses, it releases energy and warms the environment. So if we assume that same amount of water first vaporized and condensed afterwards, from “global” point of view no energy was consumed, heat was just transferred from one place to another. Also water transferred from ground to some point above the ground and gravitation is actual force which drives water down back to ground level and drive turbines in hydropower station. So in theory, heat from Sun is not required here to continue the hydro cycle.

I am aware that this is very “controversial” claim and probably will not be accepted by many people. As an argument to support my claim I can give an example – we know that outer planets (e.g. Saturn, Jupiter) located far away from Sun and therefore receive much less Sun’s energy (radiation) but we also know that there are very powerful tornados in their atmospheres, much stronger than in Earth’s atmosphere (so this “extra” energy should come from somewhere and gravitational field is very good candidate for such energy source).

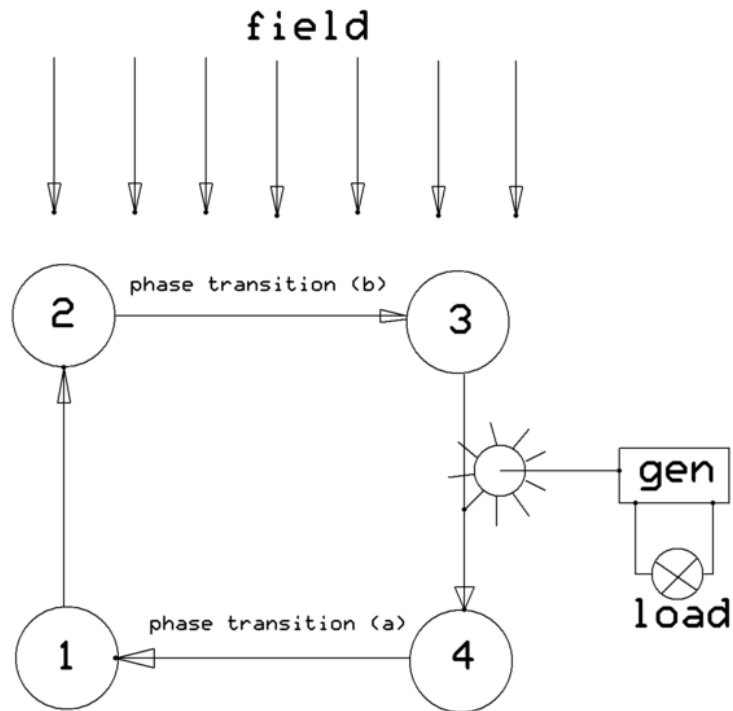
Coming back to Earth and closer to Tesla’s principle let’s try do some generalization.

* see e.g. this <http://www.teslasociety.com/adams.htm>

Generalization of the principle

"If you only knew the magnificence of the 3, 6 and 9,
then you would have a key to the universe."

Nicola Tesla (*)



pic.2 Idealized FE system

I presented working cycle of system based on Tesla's principle on pic.2

Let's say we have a field (gravitational for example) and we have a "working body" – some substance which can change its aggregate state from liquid to gas and back (e.g. water).

The working cycle is shown on the picture.

Explanations:

4 -> 1 "working body" make a phase transition to the state where it does not interact with a field (e.g. water vaporizing)

1 -> 2 "working body" moves to gain some potential energy (e.g. vapor comes up, we don't do work here against the field)

2 -> 3 "working body" make phase transition to initial state (e.g. vapor condensing)

(*) some people think that N.T. refers to frequencies and harmonics; other suggests that it is a Fibonacci sequence which defines a spiral, but...

3 -> 4 now “working body” start interacting with a field (water dropping down), on this phase we can capture some energy. The cycle repeats.

This is a quite simplified picture but it represents the principle.

Different fields can be used (gravitational, magnetic and eclectic), different working bodies and phase transitions, so there are a lot of different systems possible.

We know 3 fields in nature (gravitational, magnetic and electric).

From practice we see also static and pulsed systems. In static system field present all the time and working body make phase transitions, in pulse systems field appeared only for short time and “trigger” phase transition in working body which continues itself by “inertia” after triggering field removed. Here are some examples of possible FE setups/systems (Tab. 1)

Table 1. Field and corresponding phase transitions

field / mode	static system
gravitation	”water cycle”
magnetic	MEG, MHD
electric	”vacuum tube”, Kelvin dropper spark gap

As we see from practice some time it is enough to have only sharp parameter variation (not phase transition). Some of possible phase transitions and property variations presented in Tab.2. Of course there could be much more implementations, on different levels etc.

Table 2. Possible FE systems based on 1st principle

field / mode	phase transition
gravitation	liquid – gas
magnetic	Curie point, ionization
electric	ionization, electrostatic induction

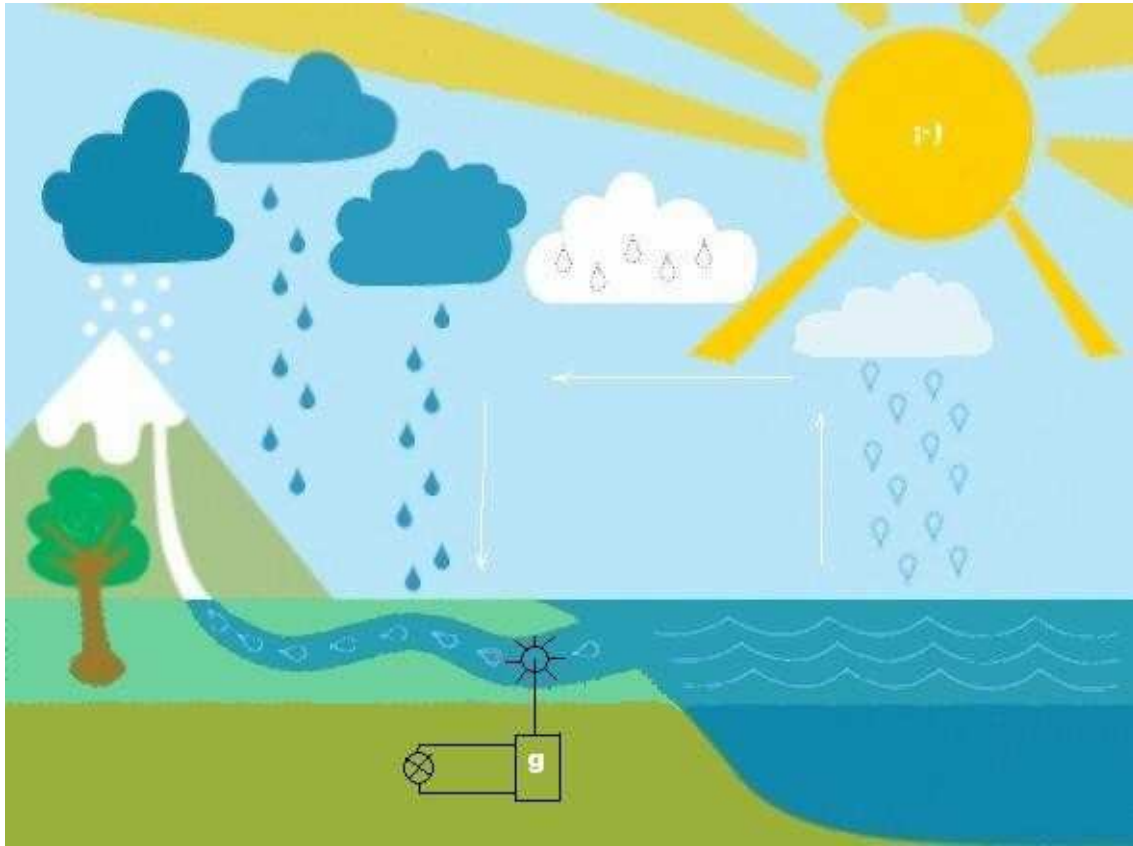
So now, when you see some claim about FE you can ask yourself

- What field used to perform work?
- What phase transition or related property change?
- Are there proper conditions to allow “field” to perform work?
- Is system parametric (load is not affecting control) ?

And based on the answers you can make good guess could it work or not 😊

Let’s now consider some application of the principle and possible systems.

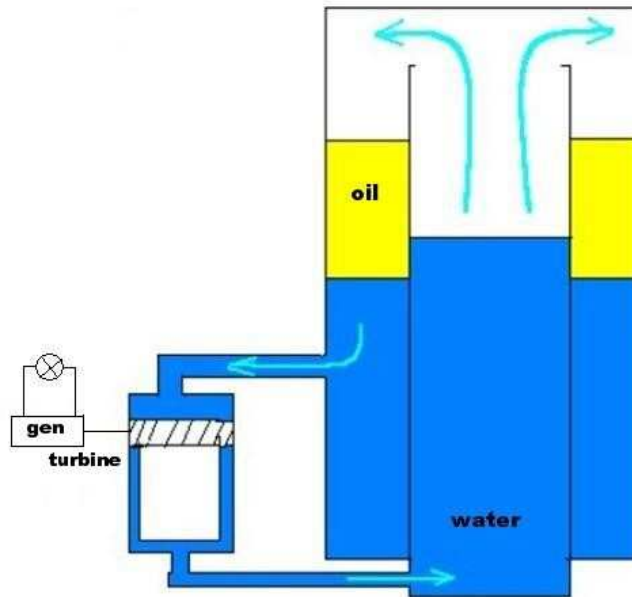
Gravitational field



Pic.3 Conventional hydropower

As we know water cycle most common FE process we can see in nature. Conventionally it's done this way - we "insert" our device to harness energy into flow naturally existing in the environment. So we need proper conditions and we change environment (usually not into better direction).

However, nothing stops us from creating our "own" flow, isolated from environment and capture energy in it. We can do something like this:



pic4. Concept of “Isolated” hydro power station

* Oil here used to prevent water from vaporizing in “a wrong place”

Key to working system is phase transition (liquid-gas) which allow gravitational field perform some useful work 😊



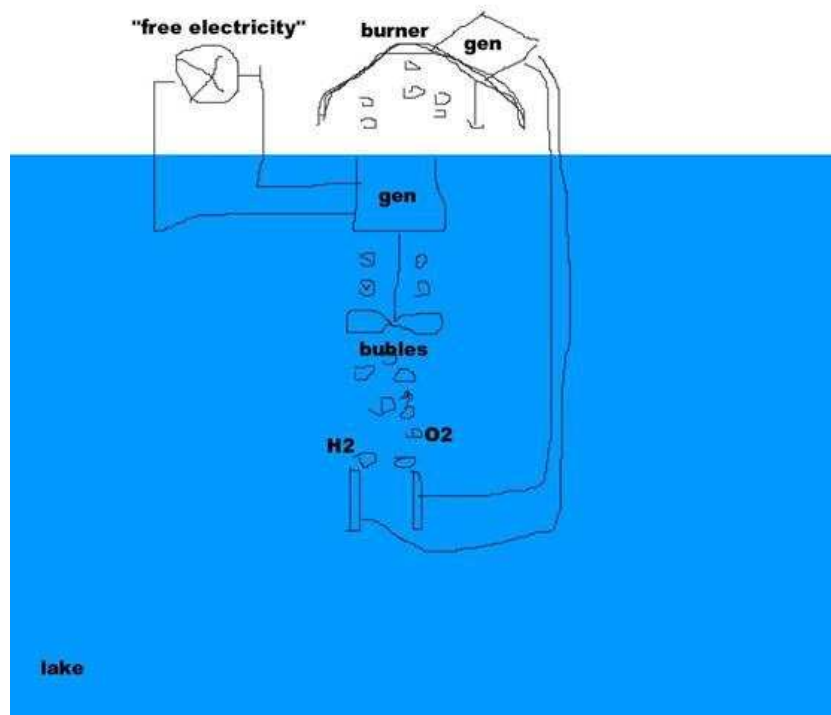
pic.5 A toy illustrating this principle:
http://en.wikipedia.org/wiki/Drinking_bird

Since our system “isolated” we can use other working bodies e.g. liquid with low vaporization temperature, or we can lower pressure, so again vaporization will happen easier...

One issue I see here is system will be quite big but still we could build it e.g. as a standard part of every building, so why not? (*)

* You are welcome to make some calculation and estimate required dimensions for such system to deliver practically usable power

Let's take a look on another possible setup



pic6. Concept of device which use gravitation as a power source

Explanation:

- put electrolyze device into "lake" (any water reservoir)
- bubbles come up, put on the bubble's way a turbine, here our FE
- on the top, we collect bubbles, burn and drop water back to lake, use released energy to supply power for electrolyze device
- COP of electrolyze device and burner not 100%, but we can use some part of FE to compensate loses
- power of device depends on how deep we put electrolyze device 😊

* It is known that performance of electrolyze is not affected by pressure. It is also possible do electrolyze in a closed can. High pressure of H₂ and O₂ will build up. We can use this pressure also to perform some useful work.

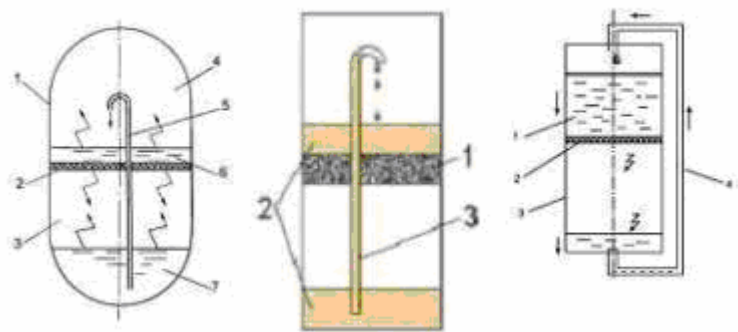


pic7a. My version of Lazarev's Kolcar ("cyclor")

Another interesting toy which everyone can build at home is Kulibin's fountain or Lazarev's Kolcar or "mono-therm".

Construction: A bottle separated in two parts with a membrane, some amount of water placed in both upper and lower compartment. A tube allows water to come from the bottom of the bottle to the upper compartment.

Water under action of gravity will be pushed thru membrane from top to bottom compartment of bottle. At the same time pressure in the bottom part will rise and some water will be pushed thru the tube back into upper compartment.



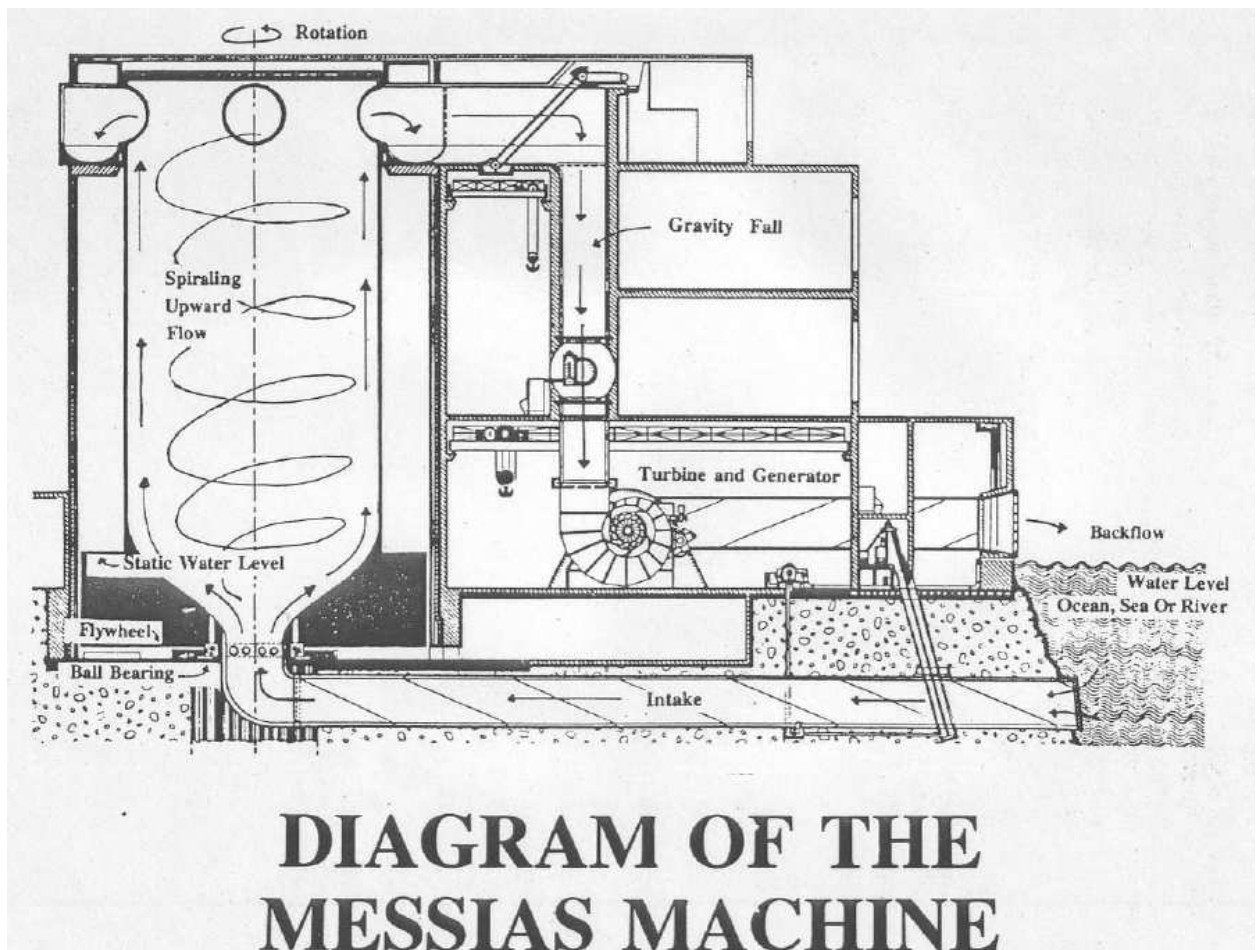
pic7b. Construction of Lazarev's Kolcar
1-porous membrane, 2-water, 3-tube

Some historical information about Ivan Kulibin: http://en.wikipedia.org/wiki/Ivan_Kulibin

Here some reading about Kulibin's fountain and other gravity powered device

http://ua-hho.do.am/publ/idei_po_energii/v_vlasov_fountain_kulibina_as_a_generator_of_energy/2-1-0-151

(unfortunately can't find any better text about Lazarev's Kolcar)



The Messiah Machine was invented by Al-Masih Daruish Al-Khooss. Mr Al-Khooss was born in Syria in 1926 and throughout his life, worked as a farmer, a tile layer and a shoemaker. Very little is known about the early development of the device.

In 1979, Ahmad Khammas wrote an article for a German magazine, describing the simple device as a water bucket with a hole in the bottom. When the bucket was spun on a flywheel, like a potters wheel, water would enter through the hole in the bottom and be lifted up the sides.

In 1980, Walter Baumgartner wrote an article for his ENERGY UNLIMITED magazine where he translated much of the article by Ahmad Khammas into English.

Mr. Al-Khooss believed that the development of the Messiah Machine was a “peace project for God”. A power plant based on this idea would use a rotating vertical cone to raise water against gravity, using centrifugal force, and then let the water fall again through a turbine to produce electricity and more energy than it takes to keep the cone spinning.

<http://free-energy.ws/messias-machine/>

Magnetic field

Nickel Curie Point Engine http://www.youtube.com/watch?v=YzwGzJm41_o

In the video work performed by magnetic and gravitational field, heat used only to change property of nickel washer and could be recycled.



point 2 (low permeability)



point 1 (high permeability)

Pic8. Nickel Curie Point Engine working points
(source: captured frames from above video)

Nickel washer attracted by magnet and pull pendulum into left. Due to heat nickel washer occasionally loses its magnetic properties (when temperature reach Curie point) and became non-magnetic, so pendulum returns to vertical position. Then washer cools down and process repeats.

We can use not only heat but something else e.g. saturation.

See http://en.wikipedia.org/wiki/Permeability_%28electromagnetism%29

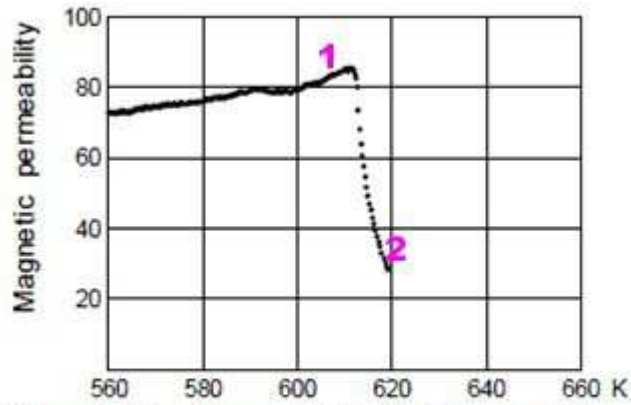
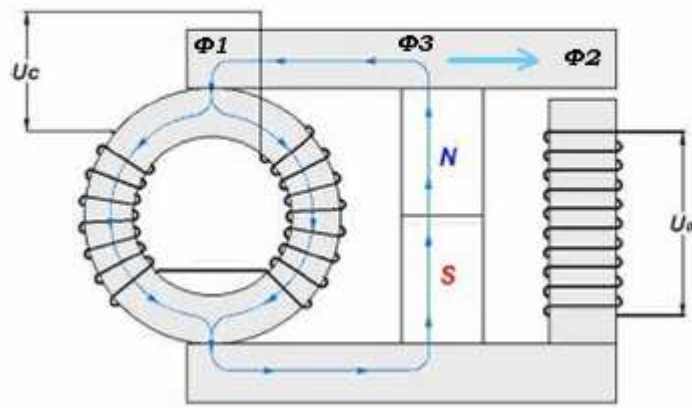


Figure 6. Magnetic permeability of nickel evaluated from the measured Z/R ratio.

Pic9. Magnetic permeability of Nickel vs Temperature

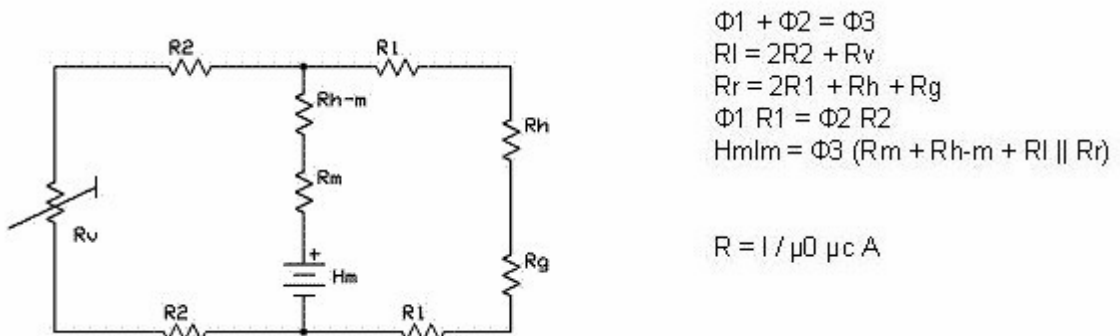
Variation of permeability in transformer core can be used to “modulate” field of permanent magnet. So we can build a non-mechanical system, a special version of transformer. Using proper coils arrangement we can change core permeability and avoid load reaction on modulation coils, so work will be performed by permanent magnet.

MEG

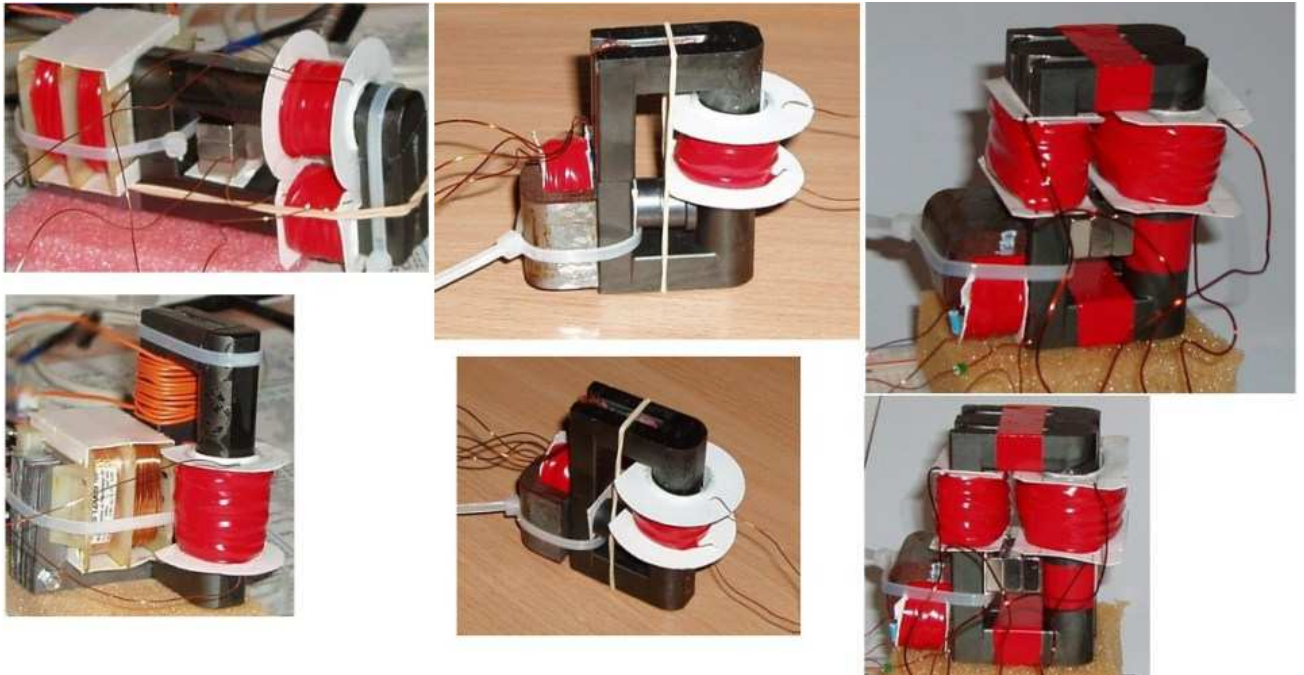


pic10. MEG concept (INKOMP by Valery Ivanov, source mazeto.net)

There is well established theory for magnetic circuit calculations and simulation. Such system can be designed using same methods which used to design conventional motors and generators.

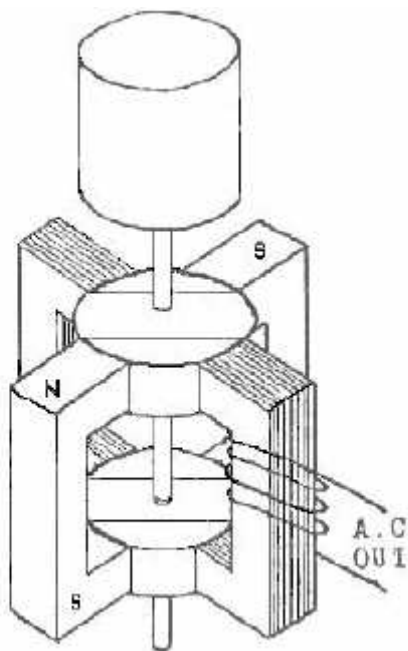


pic.11 Magnetic circuit



pic12. Some pictures from my MEG experiments

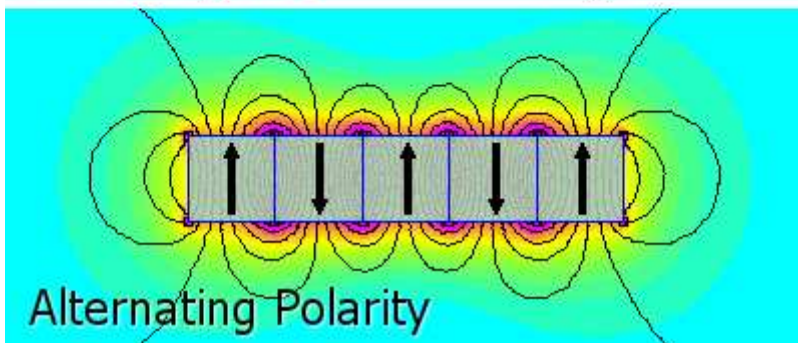
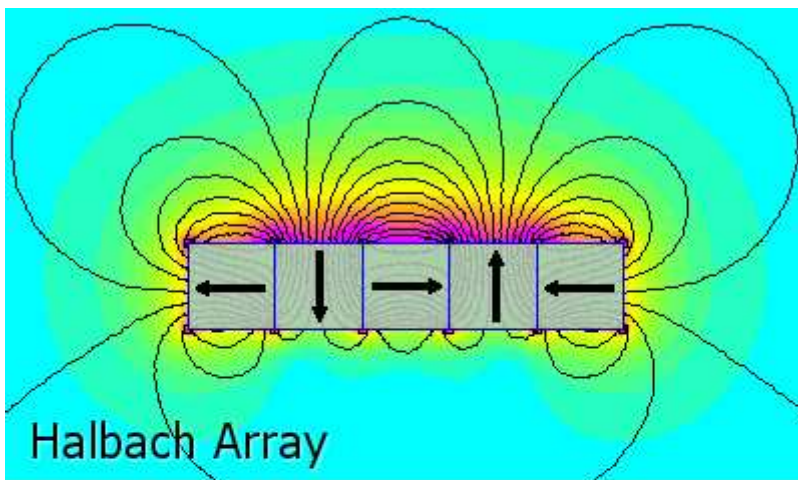
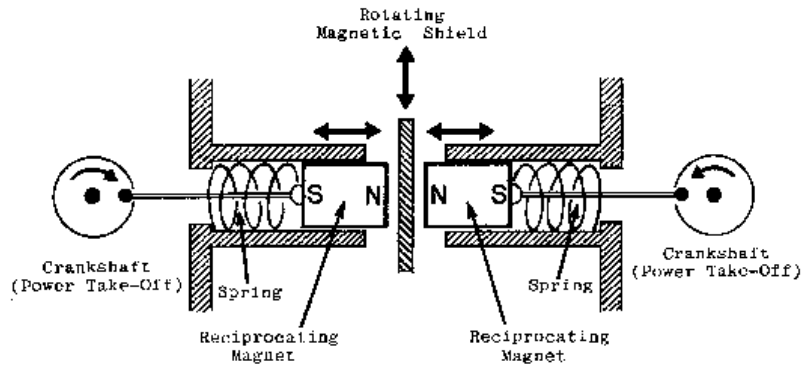
Unfortunately I did not achieve OU with these setups. Even more, some considerations suggests that it could be not possible at all. Anyway I still think that idea of modulating field of PM is perfectly valid. However modulation method is a open question and good topic for research. Here some mechanical setups which are good candidates for success

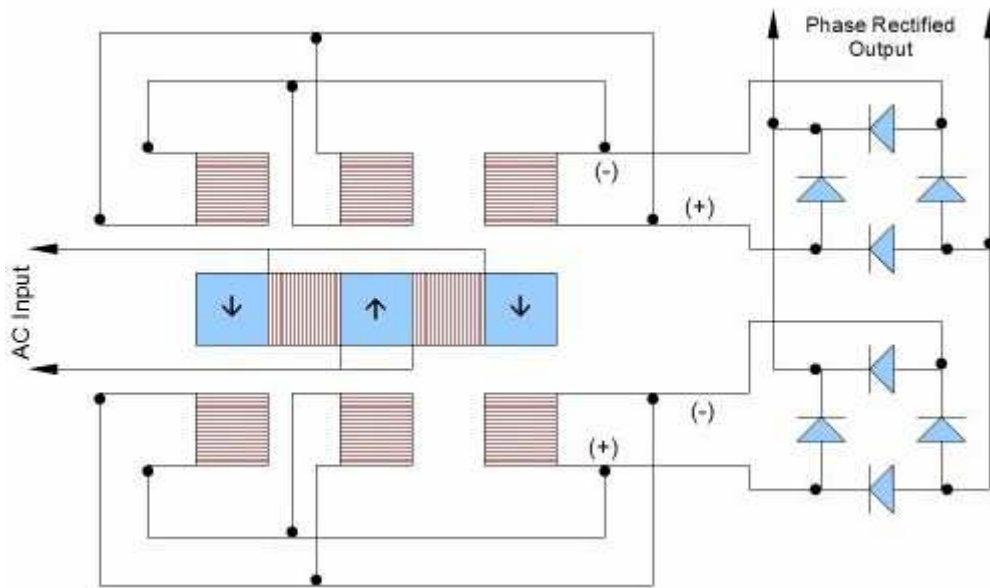


pic14. Eclin-Brown generator
- mechanical implementation of PM flux modulating device

patent 3,879,622

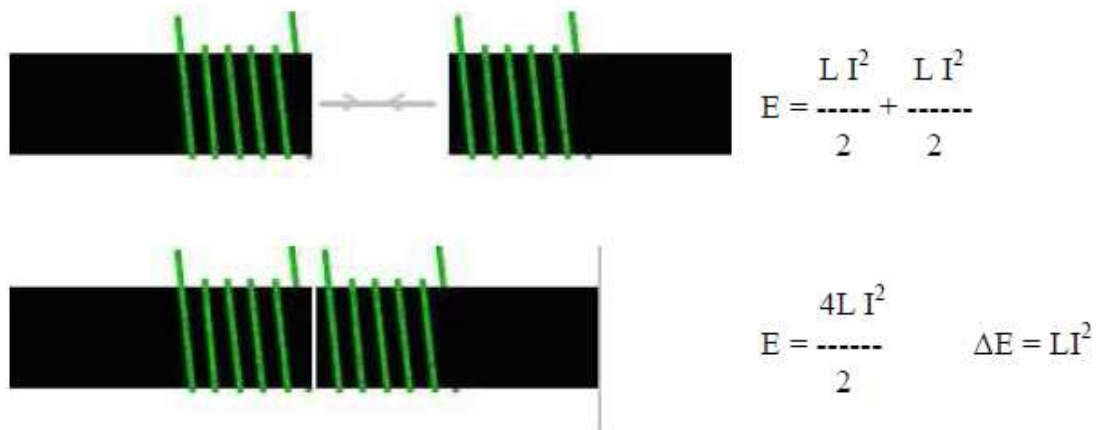
similar approach can be implemented with a rotor between pairs of opposed magnets



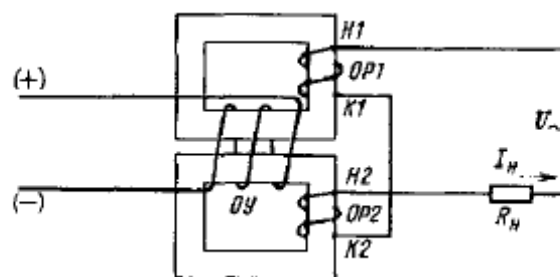


Halbach array is a good candidate to make solid state modulator.

Another interesting concept device can be based on variable inductor.



pic15. Non-linear inductance concept (mechanical)



pic16. Variable inductor – good candidate to implement non-mechanical device

Compressing magnetic field (mechanically or by changing core properties) we can gain energy.

See http://en.wikipedia.org/wiki/Explosively_pumped_flux_compression_generator

(as usual, military applications go first ☺)

More interesting links:

<http://sparkbangbuzz.com/mag-audio-amp/mag-audio-amp.htm>

<http://www.rfcafe.com/references/popular-electronics/magnetic-amplifiers-jul-1960-popular-electronics.htm>

<http://www.themeasuringssystemofthegods.com/magnetic%20amplifiers.pdf>

Here another interesting possible FE system (presumably developed by Tesla)

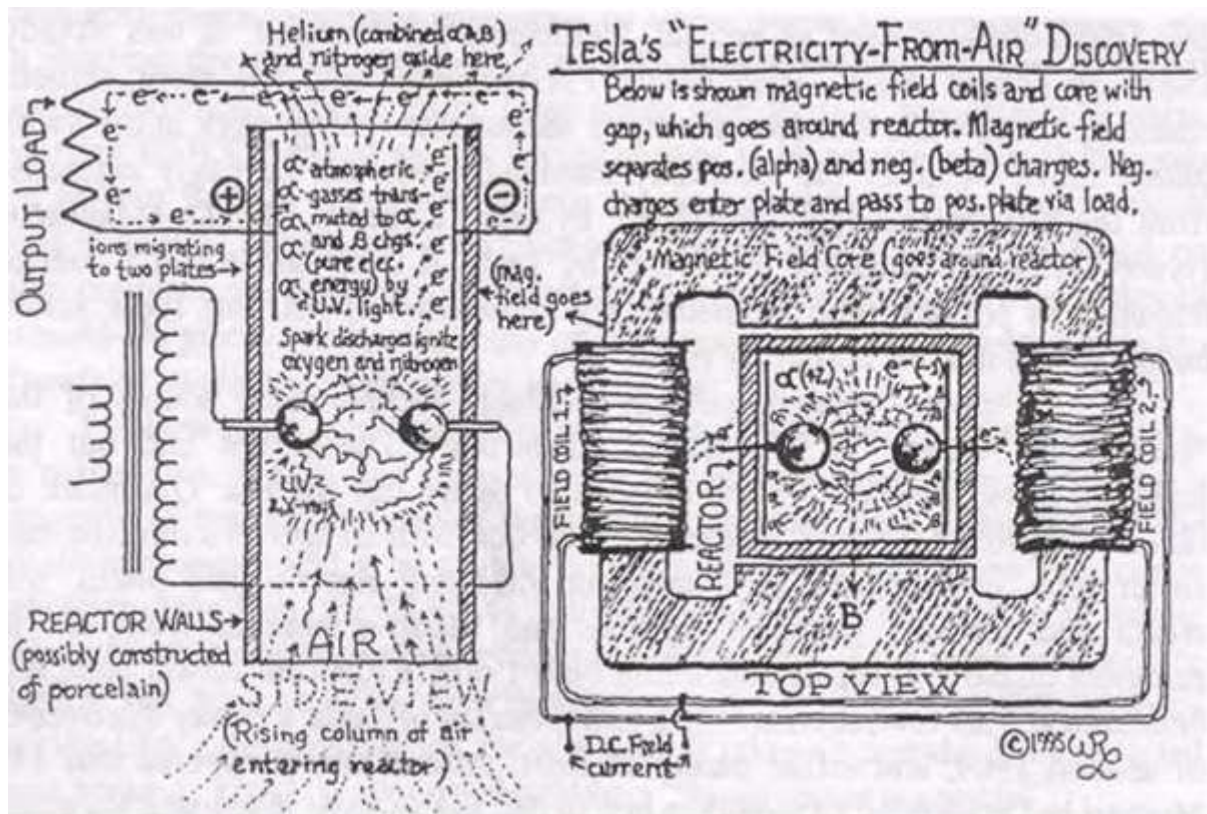


Fig. Tesla's electricity from air device
Source: book "Pentagon Aliens" by W. Lyne
pic17. Electricity from air device sketch

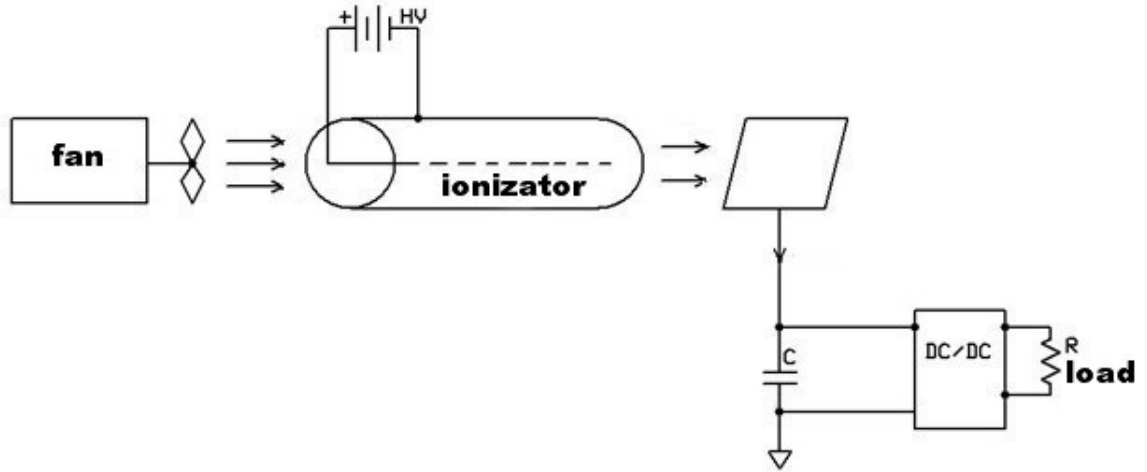
Air (or some gas) ionized, ions moving in magnetic field separated and charge absorbed by two collector plates. This is more "sustainable" version of modern MHD generators where ions produced by burning some fuel. (See http://en.wikipedia.org/wiki/MHD_generator)

Some interesting links:

Gadolinium motor <http://www.youtube.com/watch?v=E2qO-AbH08A>

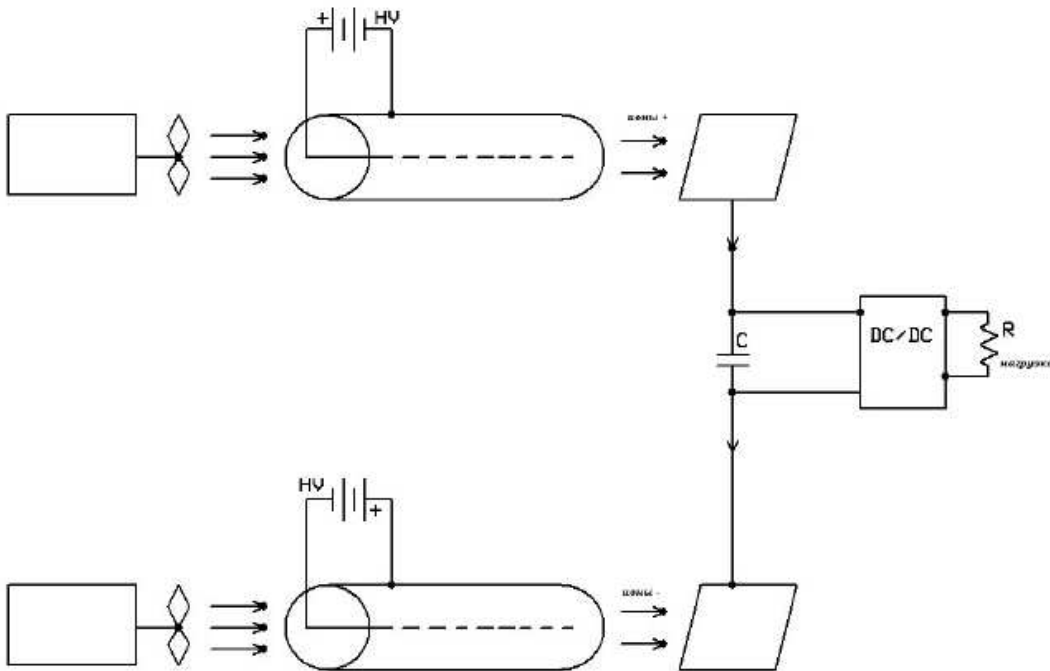
Electric field

Now let's consider systems which use electric field.



Pic20. Concept of device using electric field and ionization.

High voltage ionize air and one type of ions (e.g. negative) moved by fan towards a collector plate which is connected thru capacitor to ground. Positive charges "pumped" from the ground wire. Load connected thru DC-DC step-down converter to the capacitor.



pic.21 Also symmetrical version (which does not require ground) possible.

For charge transfer we could use special tube (see below) or some other special setup e.g. electrostatic sparring or ultrasonic evaporation.

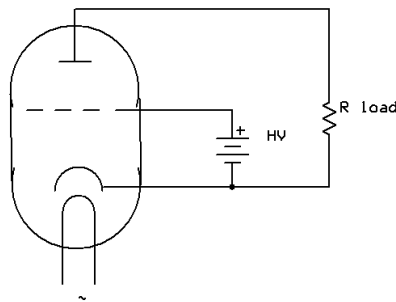
This device employs also second principle of FE (non-linear growth of energy in capacitor).

In these setups we have current (moving charges) supplied by one source and static electric field accelerating these charges provided by other source. In other words this allows us combine current and voltage from different power sources and so gain power. (UxI concept)

Interesting historical link

<http://longstreet.typepad.com/thesciencebookstore/2013/07/history-of-lines-atmospheric-electricity.html>

We could build a special vacuum tube and implement same principle as above on a low level using electrons instead of ions (as perhaps did Tesla, Moray and Gray).



pic.22 "Static" electric field accelerates charges

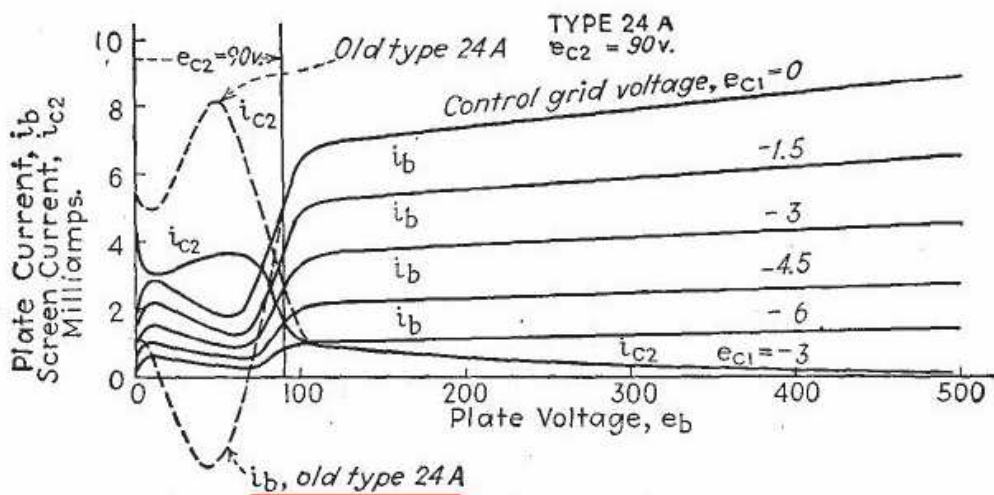
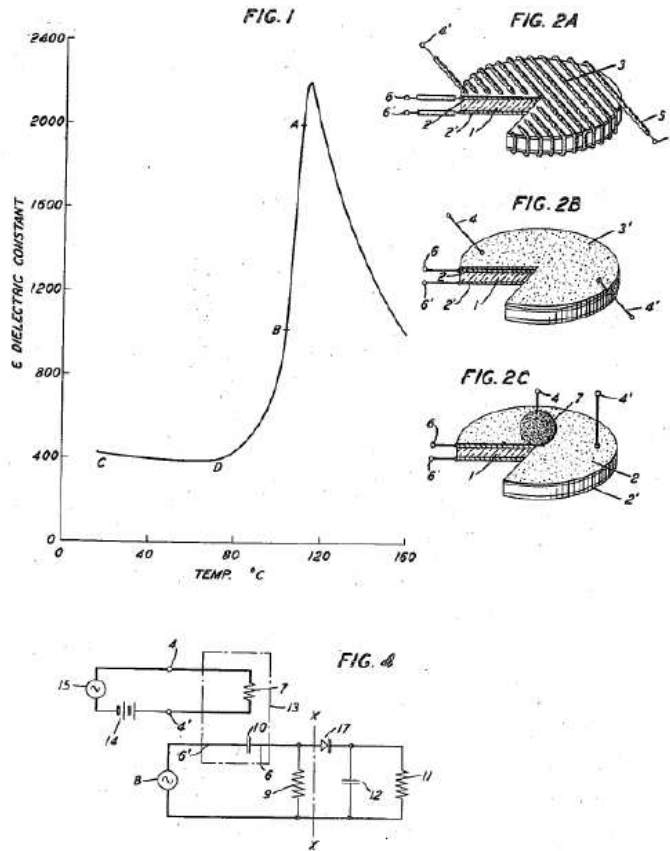


FIG. 3-9.—Typical screen-grid tetrode plate characteristics at 90-volt screen voltage, e_{c2} .

pic.23 source "Theory and applications of electron tubes", Herbert J Reich, page 58

Secondary emission which is responsible for negative resistance behavior and could be a source of usable energy appeared in first tubes and was considered as a parasite effect, so there were special changes in tube construction made to reduce or completely avoid this effect in newer tubes. But some traces of the effect are still there even in "modern" tubes.



pic.24 Temperature variation modulate capacitance

This is a “twin-brother” device of non-linear inductance device. But here we modulate capacitance changing dielectric’s properties inside capacitor. Changing charge density (mechanically or changing dielectric properties) we can also gain energy.

Also dual system to MEG possible – we can use electret and modulate its field changing dielectric parameters.

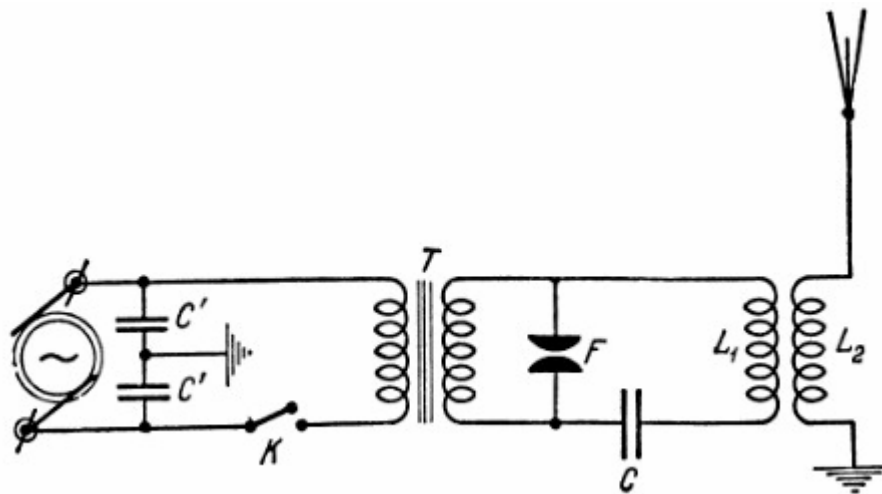
Some interesting links:

<http://ether.sciences.free.fr/electrets.htm>

http://www.sae.edu/reference_material/audio/pages/Microphones.htm

<http://www.capturedlightning.org/hot-streamer/pool/dielectric.htm>

Tesla coil based system could provide extra energy.



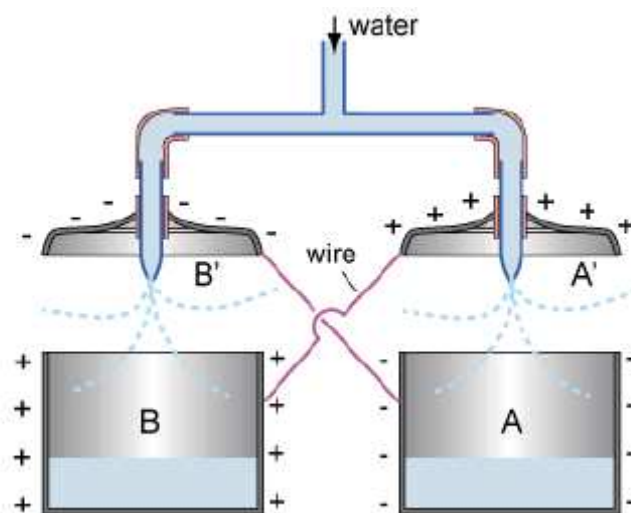
pic.25 Spark gap transmitter – one of first FE devices ;-)

It is sad to hear how Tesla's "followers" claim that Tesla never claimed or achieved Free Energy. There are at least two possible sources of FE in spark gap transmitters:

- Earth's natural electric field in combination with ionization provides negative resistance in antenna
- Spark gap itself can be source of energy (see below)

Such system most probably will not be acceptable in modern word because it produces very high radio interference...but it may be it would be possible use 2 or 3 phase systems to reduce radio emission.

Another FE process observed in nature was discovered by Lord Kelvin when he observed static electricity in water falls. Traditionally mainstream science denied FE here usually claiming that work performed by gravity ;-).



pic26. Kelvin dropper

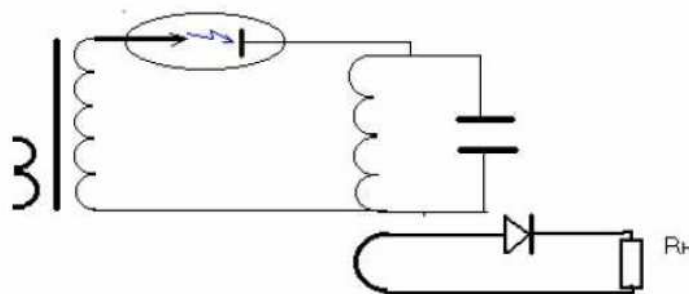
There are some difficulties preventing practical applications

- Effectively stepping down HV
- maintaining high charge flow

However with advancing of power electronics there more and more chances that we see such devices in use.

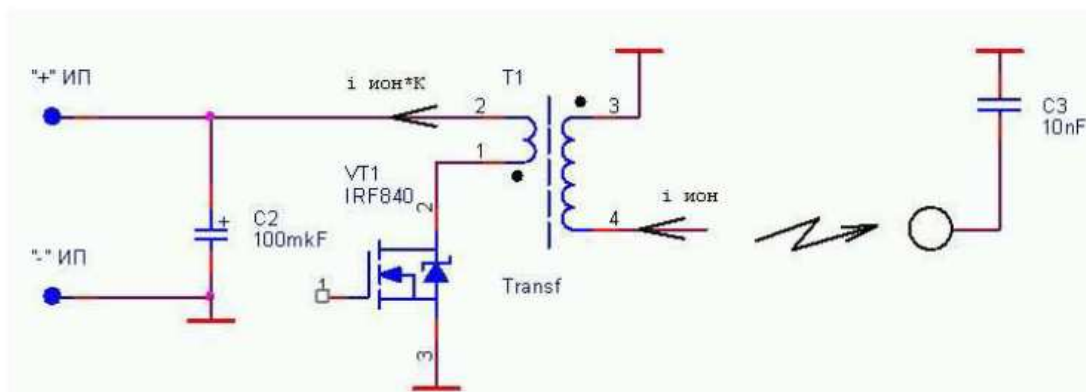
(see http://en.wikipedia.org/wiki/Kelvin_water_dropper)

Spark gap represents most possible energetic phase transition (gas - plasma)



pic. 27 Concept of device utilizing electron avalanche in spark gap
(picture source: www.skif.biz)

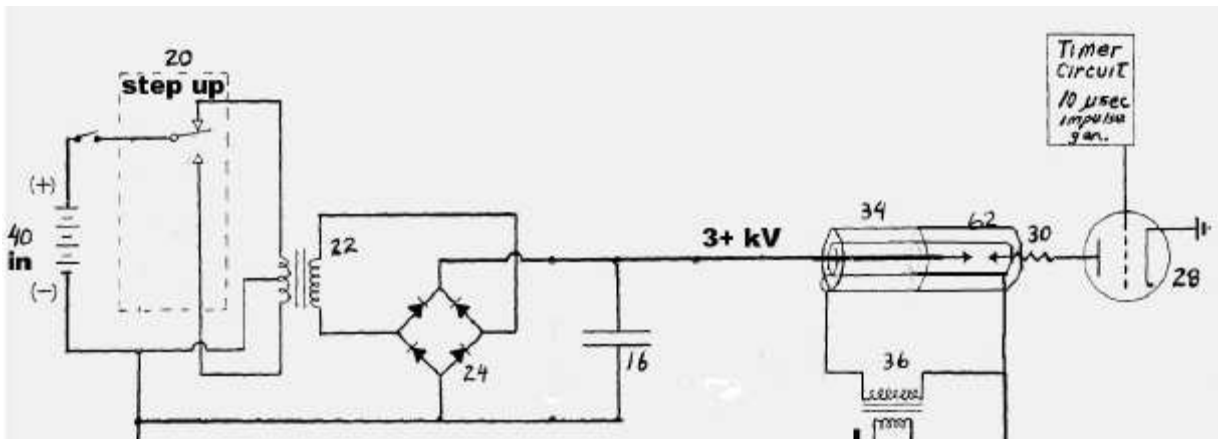
Electron avalanche initiated with very short high voltage pulse. It produces 50 or even 100 times more energy than required to start the avalanche (you should not try it at home :-)
This extra energy can be captured and used. Most known example is Edvin Gray's devices.



pic.28 Variation of spark gap device (picture source: www.skif.biz)

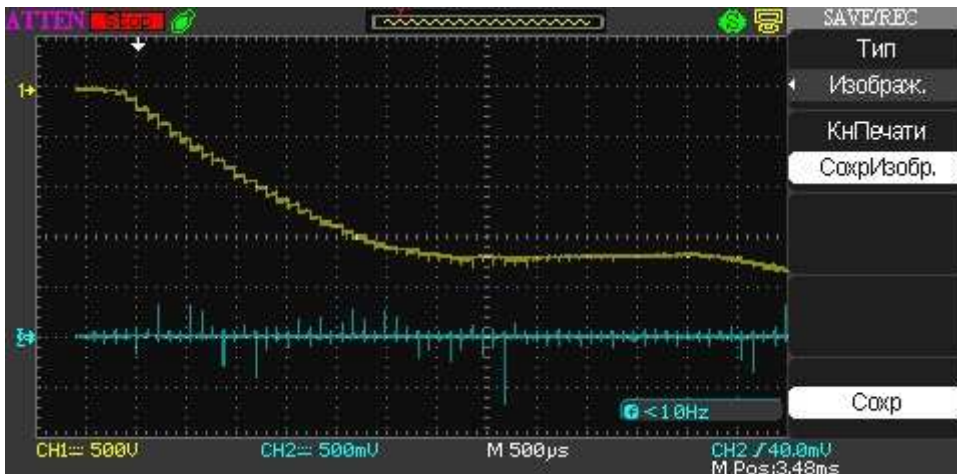
* Here DC-DC step down converter should be used to convert charge collected by capacitor into practically usable voltage

Edvin Gray used similar setup but he didn't have high voltage power MOSFETs in 1960s

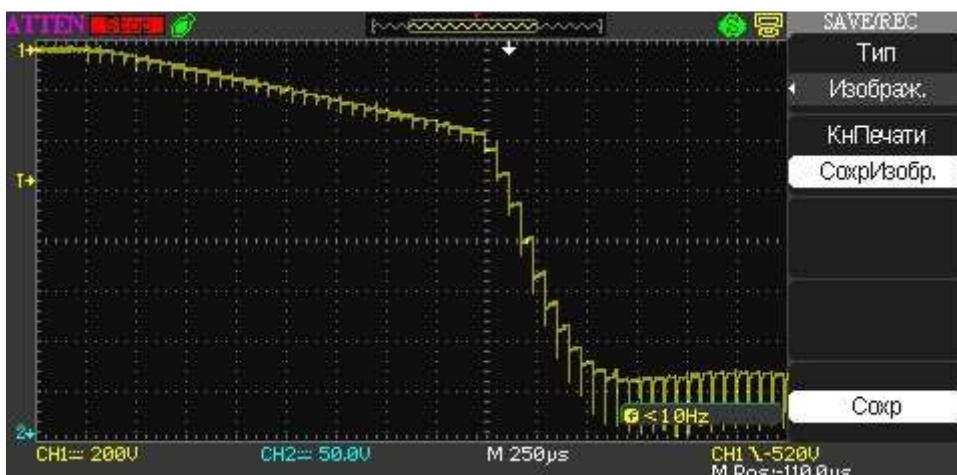


pic29. EVGray setup

* here HV DC power supply switched with electronic tube and current limited by resistor connected in series. We don't know for sure but it could be also that Gray use bifilar coil (two cylinders on the sketch) to collect displacement currents instead of capacitor used in system presented on pic. 27 and 28



Linear discharge

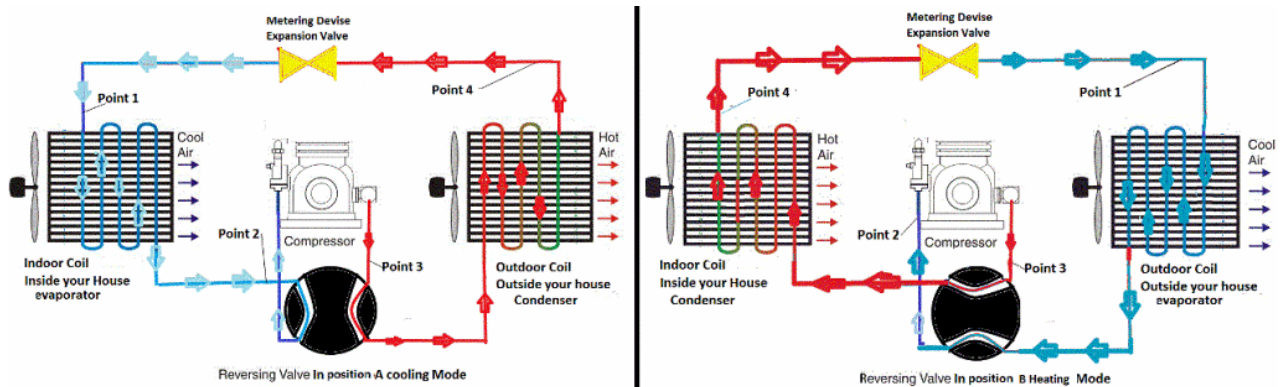


became non-linear after reaching some threshold (avalanche)

* Peter and John probably still having nice time laughing on innocent FE researchers searching for “Electro-Radiant Event” and “Cold Electricity” :-/

Heat pump

I feel that it is absolutely necessary mention this device even if it doesn't fit very nice in my classification. Heat pumps commonly used now days in heating/cooling systems and according to Wiki have COP range 2 to 7.2. In other worlds many of us have FE device installed at home (I let you decide for yourself why these devices still consume a lot of electricity ☺)



pic.8 Heat pump (source: <http://www.heatpump-reviews.com/heat-pump.html>)

See also http://en.wikipedia.org/wiki/Heat_pump

Energy inversion

Here a (translated) fragment from A.Frolov book "New Energy Sources" with a summary about energy inversion

People from Oshchepkov's institute, created a theory, and performed calculations for the design of electronic systems to produce electrical current by converting the energy of the environment. Created and work several experimental electronic equipment which convert ambient energy directly into electric current. In the specially created circuits of resistors and specially processed semiconductor diodes (they created "a rough analog" of potential barrier) was able to create a device which generates a voltage of more than ten volts.

In the magazine Youth Technology, №11, 1983, the classification of the main methods of inversion of the thermal energy of the medium were considered. We'll take it as a basis, but supplemented by new methods.

Photo inversion. Known properties of certain substances (luminophores) re-emit the light falling on them, but on the other, an increase in wavelength (so-called "Stokes luminescence"). Later cases have been found to reduce the wavelength re-emitted light, ie increasing the photon energy (the so-called "anti-Stokes luminescence"). The increase in the photon energy is going through the transformation of its own heat energy to the phosphor in fluorescent light. Due to the selection of heat phosphor is cooled, and lowering the temperature compensated heat gain from the environment. Consequently, the energy increase in fluorescent emission occurs ultimately by heat concentration of the environment, and this increase can be very significant. Theoretically, it may reach 160%, that is, the phosphor may provide power 60% higher than it receives it in the form of radiation. Currently, intensive work performed on the practical application of this effect (cooling facilities masers fluorescent, luminescent photo multiplication and so on.).

Chemical inversion. Energetically open catalytic systems have the ability to store energy, and exist in a non-equilibrium thermodynamic state. This process is possible by combining the exothermic reaction occurring on the catalyst to the endothermic reaction (cooled) catalyst. These are capable of self-maintenance (and heal) reaction realized on the absorption of scattered heat protection, open prospects for the creation of new technological processes. There galvanic elements running on the endothermic reactions. The energy for these reactions shown by the lattice structure, whereby the housing member is cooled (covered with frost), and it continuously flows (concentrates) the thermal energy of the environment. Consequently, electric energy in a chemical source of energy, partly due to absorption of energy from the environment.

Mechanical inversion. There are various ways to use the kinetic energy of the air molecules. These devices may be passive or active, i.e. cavitations and streaming technology.

Gravity inversion. Since the gravitational field of the environment makes patchy, then it should make "distortion" in the process of leveling the thermodynamic condition characterized by an indicator of increasing entropy. This fact is still commemorated by Maxwell and Tsiolkowski, who expressed the idea that the atmosphere under the influence of the gravitational field, should arise the vertical temperature gradient. Tsiolkovsky predicted that this gradient should depend on the molecular composition of the gas.

Thermo inversion. Consider a piston engine operating on the injection into the chamber with a cylinder of liquefied non-combustible gas (nitrogen, helium, air). The pressure of produced gas will move the piston, the cylinder will be cooled as the gas expands, and it will direct the flow to the thermal energy from the environment. Employment of such an engine, in the amount will be half of the work of expanding gases, but also there will be some increase due to the use of thermal energy of the environment.

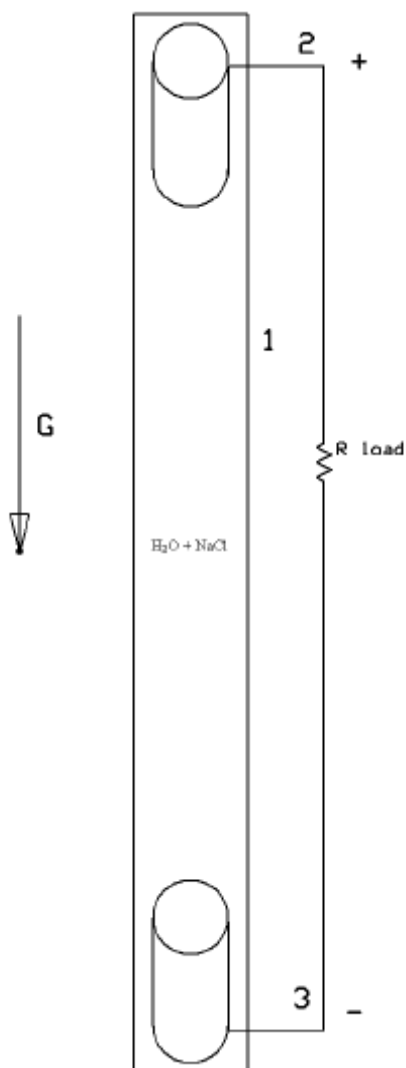
Electric inversion. In this research, great expectations were associated with P.K.Oscephkov's semiconductor converters heat into electricity (*).

* there were reports that Oshepkov demonstrated in the mid 80's a device based on special Cu Al alloy which was able to light a small light bulb using environmental heat. Metals were arranged in the piece of wire in such way that concentration of one metal slow increase and concentration of other decrease. This arrangement creates a potential barrier and "rectifies" heat noise.

Gravity battery

Theory of operation

Under gravity influence concentration of salt in water depends on height same as air pressure depends on height. If we insert two electrodes in the tube, one near top and one near bottom, due to difference in ions concentration some EMF appear between electrodes and if we close circuit there will be some electric current flow. In such battery plus will be on top terminal and minus on bottom terminal. If you turn it upside-down polarity will change. I think if we periodically turn such battery upside-down, polarity will change periodically and we can control (reverse) processes on electrodes and avoid chemical destruction. So, theoretically, such battery can have quite long life time.



Construction:

1 plastic tube filled with salt water
2,3 plates e.g. copper

I use plastic tube 1m and electrodes made from copper foil.

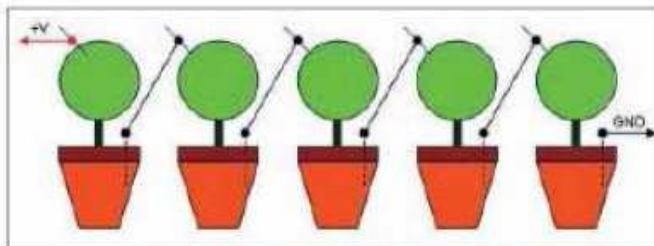
Fill battery with tap water and table salt (one big spoon per 0,25l)

Seal carefully with silicon sealant.

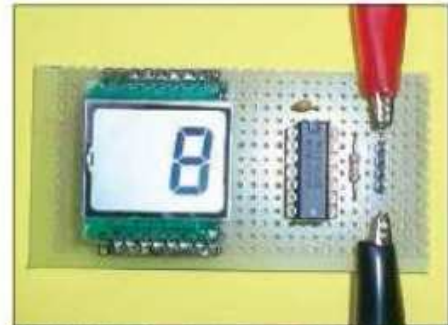
Place vertically and wait at least several hours

Flower Power – unusual battery design

Some years ago I saw an article in Nuts & Volts magazine (1) where somebody used flowers as power source. It said that if you connect one wire to the ground and one to the flower's top leaves some voltage appear and very small current can be obtained. This article puzzled me a lot. It is not typical chemical battery like "lemon" battery which works similar to regular batteries. I made some information search and to my surprise found that it is well known fact. Some



■ FIGURE 1. Block diagram showing the serial connection procedure among several plants. Like any standard battery, every plant has a positive and negative terminal.



■ PHOTO 6. Close-up view of the LCD timer hardware. Simplicity is the key to be able to run an electronic circuit with such a tiny amount of energy.



MSP430F2013 based device powered from flowers

use trees instead of flowers and one guy even got patent for device which can charge mobile phone from a tree. But despite many people tried use this effect nobody really knows (or shares) why it really works. Only recently after building "gravity" battery I got idea how it works. Water while rising from the roots move also some ions and creates a concentration gradient. I don't like idea of damaging flowers and trees (3) but similar process can be created artificially. So I built a "vaporization" battery.

Membranes



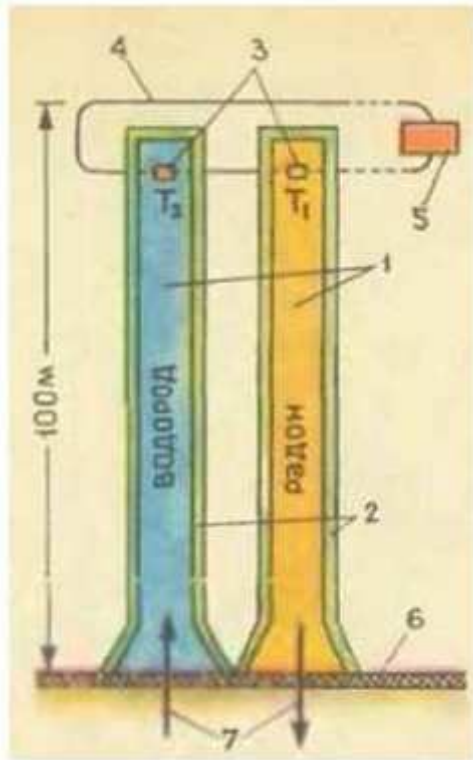
Let's consider two vertical tubes with height h , which connected on the bottom end and located in gravitation field. One tube filled with liquid solvent with density ρ_1 and second one with solution with average density ρ_2 , let's assume the $\rho_2 > \rho_1$. In the places where tubes connected on the top and on the bottom installed membrane filters, penetrable only for solvent molecules...

Spontaneous processes", Minin V.N. (Ukraine)
Magazine of Russian Physical Thought, 2011, Issue 1-12

<http://www.rusphysics.ru/files/>

Minin.Samoproizvolniye%20processi%20%20.pdf

Thermo generator

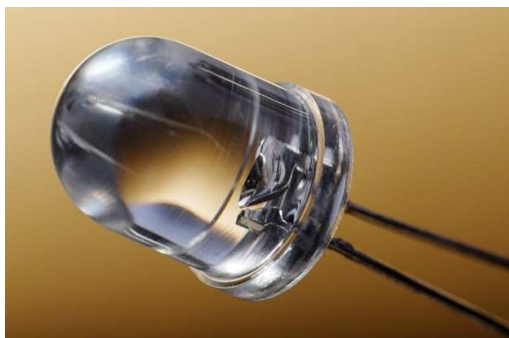


Inversed thermo generator

Two tubes filled with different gases (1, hydrogen and radon) covered with thermo isolation material (2) on sides and on top. Gravity creates temperature gradients (temperature drops when height increase) but in tube with heavier gas temperature on top will be significantly lower than in second one. This temperature difference can be used to generate electricity if we insert two thermoelectric elements (3) and make electric circuit (4) with a useful load e.g. motor (5). This circuit will produce some usable power because both tubes have thermo connection with ground (6) and there occur heat flows (7).

Ultra-efficient LED

puts out more power than is pumped in.
Science 09 March 12 by Duncan Geere



MIT physicists have been testing a light-emitting diode that has an electrical efficiency of more than 100 percent. You may ask, "Wouldn't that mean it breaks the first law of thermodynamics?" The answer, happily, is no.

The LED produces 69 picowatts of light using 30 picowatts of power, giving it an efficiency of 230 percent. That means it operates above "unity efficiency" -- putting it into a category normally occupied by perpetual motion machines.

However, while MIT's diode puts out more than twice as much energy in photons as it's fed in electrons, it doesn't violate the conservation of energy because it appears to draw in heat energy from its surroundings instead. When it gets more than 100 percent electrically-efficient, it begins to cool down, stealing energy from its environment to convert into more photons.

In slightly more detail, the researchers chose an LED with a small band gap, and applied smaller and smaller voltages. Every time the voltage was halved, the electrical power was reduced by a factor of four, but the light power emitted only dropped by a factor of two. The extra energy came instead from lattice vibrations.

Don't miss: Let there be LED: The future of the light bulb

The scientists involved have detailed their discovery in a paper published in *Physical Review Letters*, saying: "Experiments directly confirm for the first time that this behaviour continues beyond the conventional limit of unity electrical-to-optical power conversion efficiency."

69 picowatts of light, of course, is a very small amount -- so you're not likely to be able to read in bed with one of these LEDs. However, it could have applications in low-power electronics, acting as a thermodynamic heat engine but with fast electrical control.

Updated 13 August, 2012: A previous version of this article suggested that MIT built the LED. It was actually built by the Ioffe Physico-Technical Institute in St. Petersburg.

<http://www.wired.co.uk/news/archive/2012-03/09/230-percent-efficient-leds>

Magnet-gradient generator

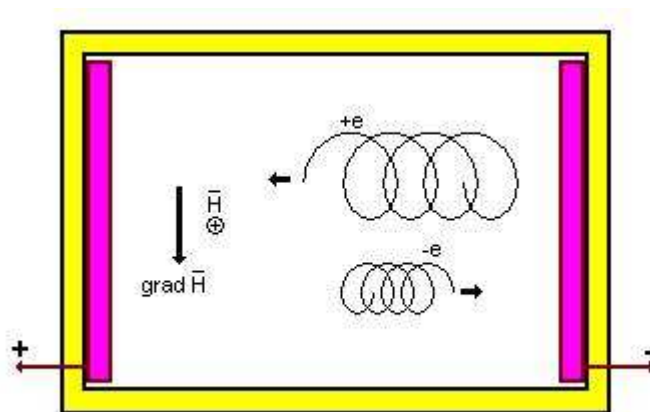
Vyacheslav Zaboronsky and its experiment

"... In 1871, James Clerk Maxwell proposed a thought experiment, which entered into a science called "Maxwell's demon". In this experiment, the "demon" - an entity or device - selects, arranges the gas molecules is initially in thermodynamic equilibrium, which leads to an imbalance, occurrence of difference of temperature, pressure or concentration, which means breaking the second law of thermodynamics.

Is it possible to create this "demon" in practice? Yes. The "demon" in relation to gas of electrically charged particles - ions and free electrons can carry out gradient magnetic field. (Similarly, by the way, are the crossed electric and magnetic fields).

Imagine a volume filled with charged particles that are in random thermal motion. With the help of an external source - permanent magnet - in the volume created magnetic field. It is known that charged particles in a uniform magnetic field under the influence of the Lorentz force moves in a circle or spiral whose radius depends on the field strength. The axis around which the particle is drawn parallel to the magnetic field vector and does not move with time. If the magnetic field is not uniform, gradient, ie, its intensity varies smoothly in the direction perpendicular to the field, the particle passes periodically varying the intensity of the field area, the radius of curvature of the trajectory it also changes periodically. As a result, the axis around which turns a particle moves. There is a so-called gradient drift. Drift velocity vector makes with the tension vectors and gradient strength of three mutually perpendicular vectors.

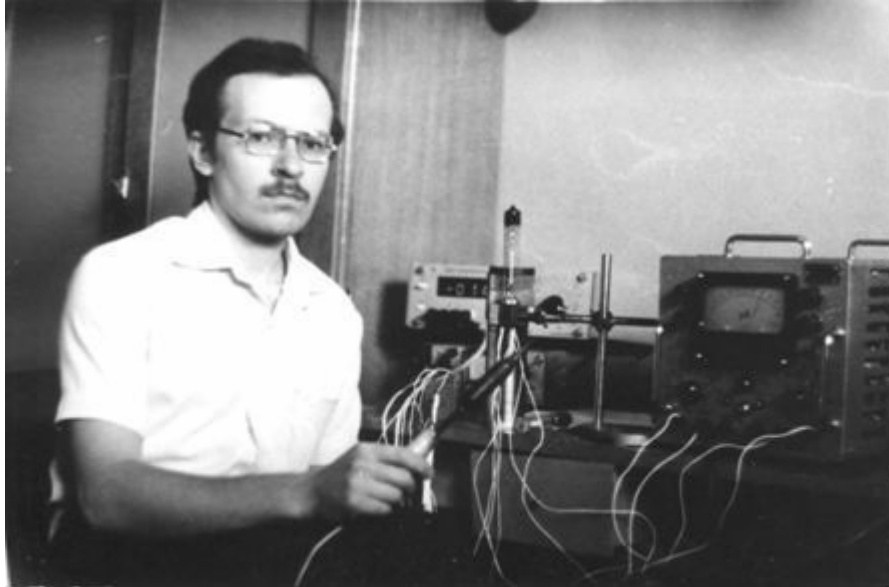
This is true for all the charged particles involved in the random thermal motion. In other words, if a certain volume filled with an electron gas located in the state of thermodynamic equilibrium, make a gradient in the magnetic field, then all the electrons will drift in one direction that will lead to the macroscopic effects - current, there will be a potential difference, temperature and so on. If the volume is filled with a gas of electrons and positive ions, there is also a current, with the electrons and the ions will drift in the opposite directions.



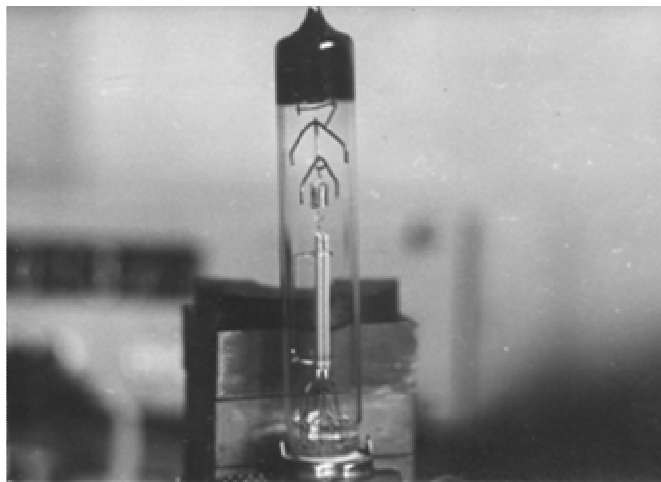
This creates magnetic gradient generator that converts heat into electricity without the temperature difference. This conclusion is confirmed by the author of this experiment in July 1984.

In experiments observed gradient in vacuum electron current between two parallel hot cathodes located at the same temperature. Changing the direction of the magnetic field or the magnetic field gradient is reversed resulted in changing the direction of current. There was also a gradient

current of electrons from the cathode to the less than hot hotter. Physicists understand that this current means heat transfer from less hot cathode to a hotter - because each electron moves from the cathode to the cathode of an additional energy equal to the electron from the cathode. Thus, the experiment shows the heat transfer from a cold body to a hot without doing external work. This is a direct experiment refutes the second law of thermodynamics.



Vyacheslav Zaboronsky



and his tube with two cathodes.

Kessors – entropy manipulators

Dielectric absorption

Dielectric absorption is quite “unfortunate” effect when you perform measurements but it can be used as a power source. Dielectric absorption manifests in both situation – when capacitor discharged and when capacitor charged.

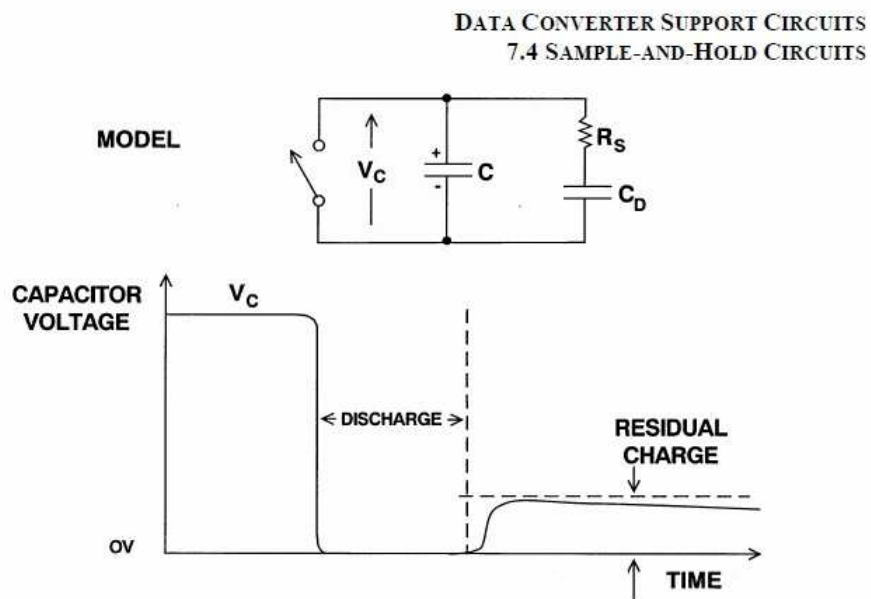


Figure 7.111: Dielectric Absorption

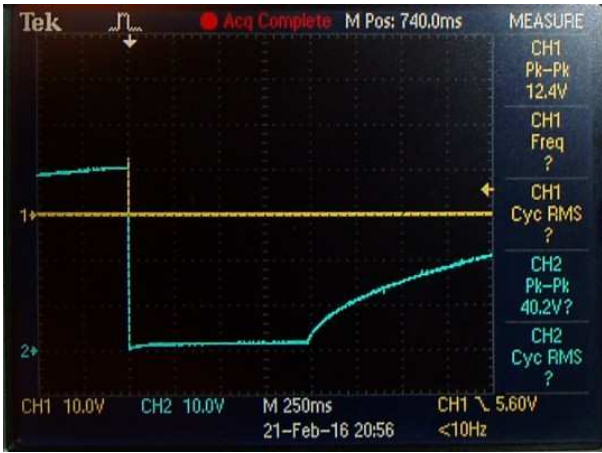
Different capacitor materials have differing amounts of dielectric absorption—electrolytic capacitors are dreadful (their leakage is also high), and some high-K ceramic types are bad, while mica, polystyrene and polypropylene are generally good. Unfortunately, dielectric absorption varies from batch to batch, and even occasional batches of polystyrene and polypropylene capacitors may be affected. It is therefore wise to pay 30-50% extra when buying capacitors for SHA applications and buy devices which are guaranteed by their manufacturers to have low dielectric absorption, rather than types which might generally be expected to have it.

pic33. Dielectric absorption when capacitor discharged

(picture source: Analog Devices ANALOG-DIGITAL CONVERSION,
Chapter 7. Data Converter Support Circuits, page 101

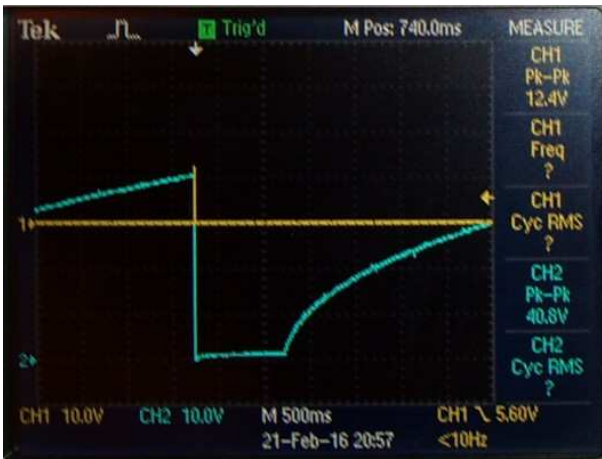
<http://www.analog.com/library/analogdialogue/archives/39-06/chapter%207%20support%20circuits%20f.pdf>

These effects relatively small e.g. about 10% of overall capacitor energy for standard capacitors (the worst possible capacitor should be selected).

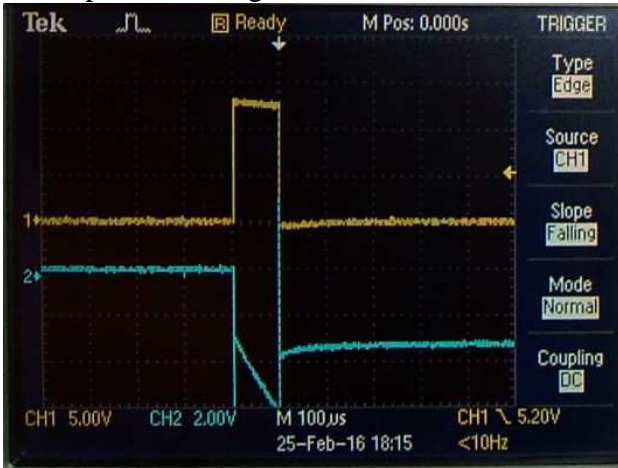


dielectric absorption can be clearly seen

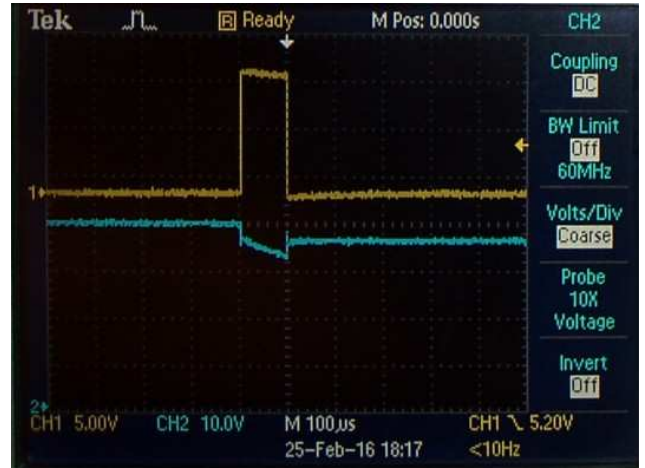
approximately 10% of the voltage
(Which corresponds to only 1% of energy)



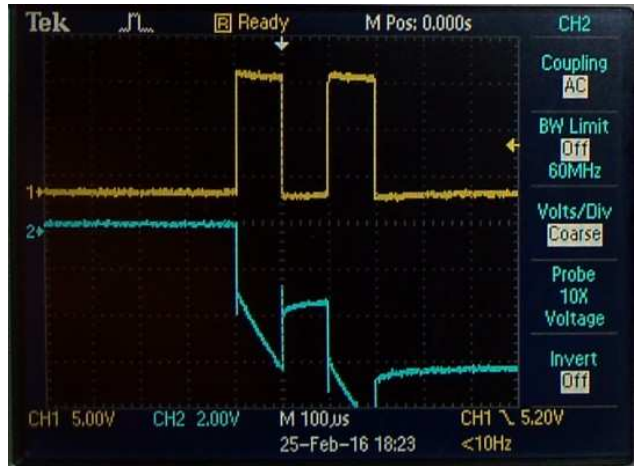
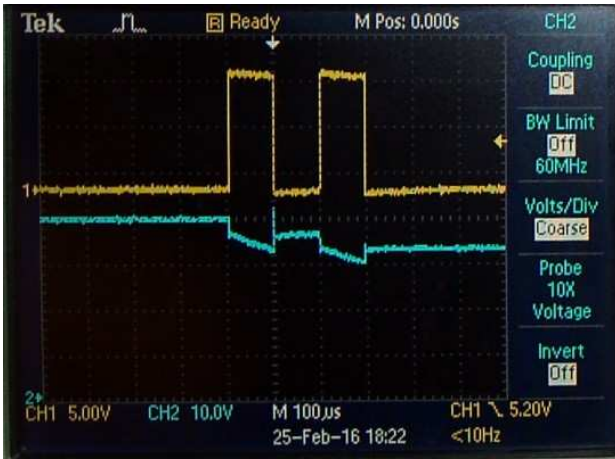
Incomplete discharge



1 pulse 45 -> 40v

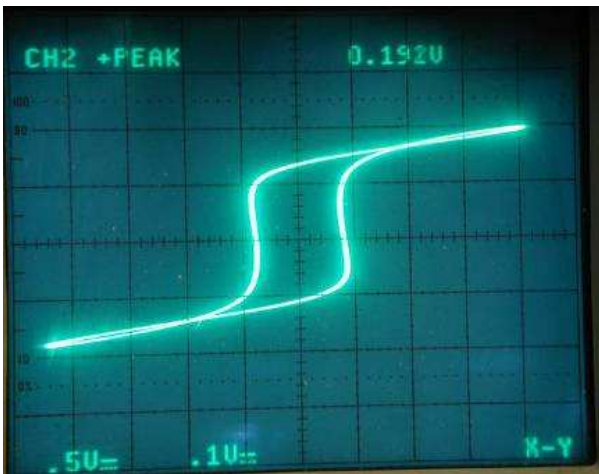
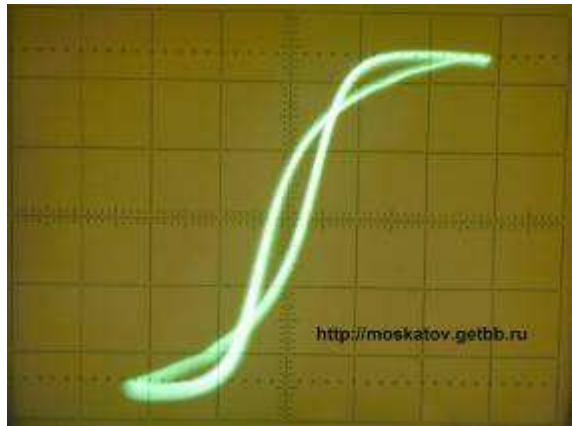
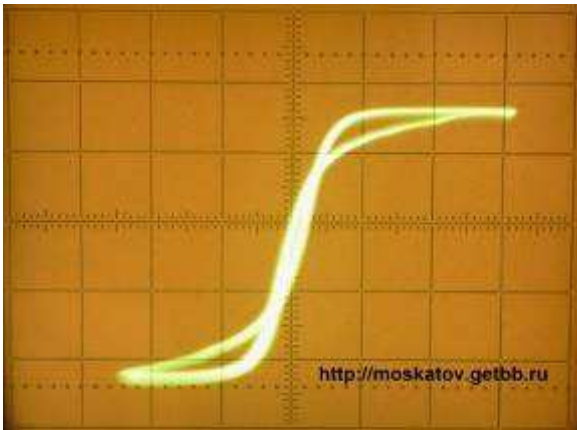


using AC input



2 pulses

Unusual BH curves



pic. Fair-Rite Type 43 Material source (9)

Despite technical difficulties I believe that it is possible to build non-mechanical systems which will use avalanche magnetization to convert environment heat to electricity (Zaev's concept).
 Magnetic refrigeration http://en.wikipedia.org/wiki/Magnetic_refrigeration

Rotation

It seems that rotation is a common method to manipulate entropy and create devices which extract energy from environment, here some well known examples

Serl / Roshin-Godin

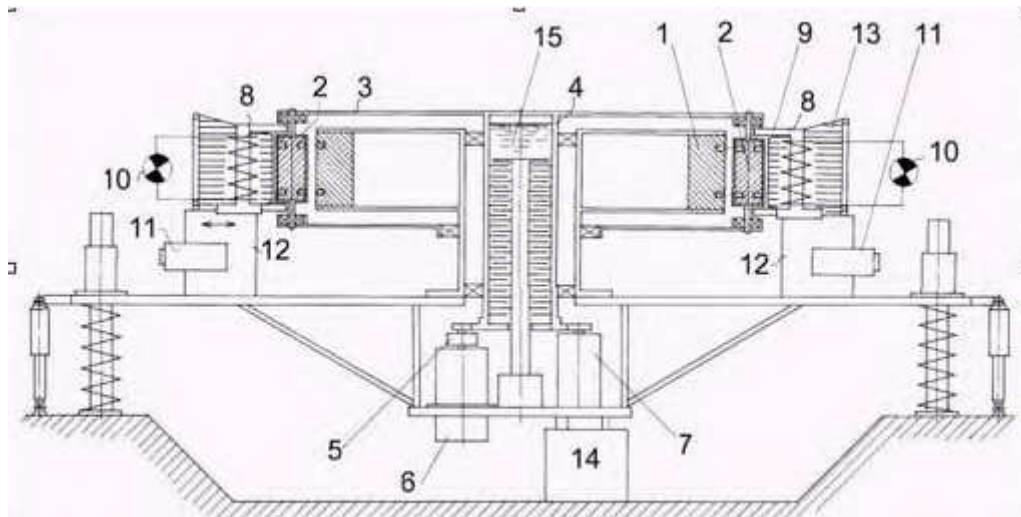
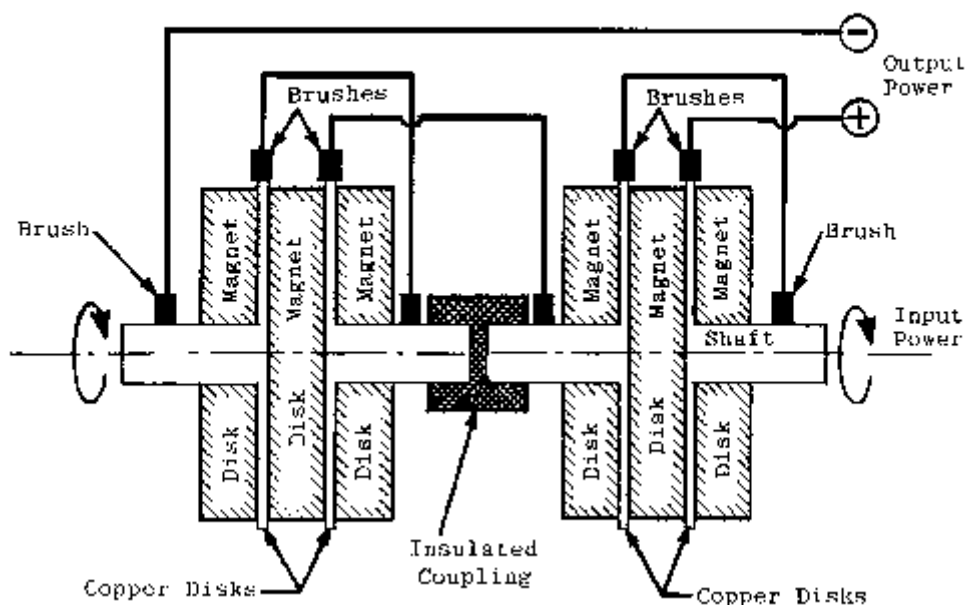


Fig.3. The general view of the platform with one-ring converter.

(see <http://rexresearch.com/roschin/roschin.htm> and <http://rexresearch.com/searl/searl2.htm>)

Unipolar generators



There are some reasons to think that EMF in unipolar generators created with no electromagnetic induction and this is why they are OU.

(see <http://brucedepalma.com/>)

Ranque-Hilsch vortex tube

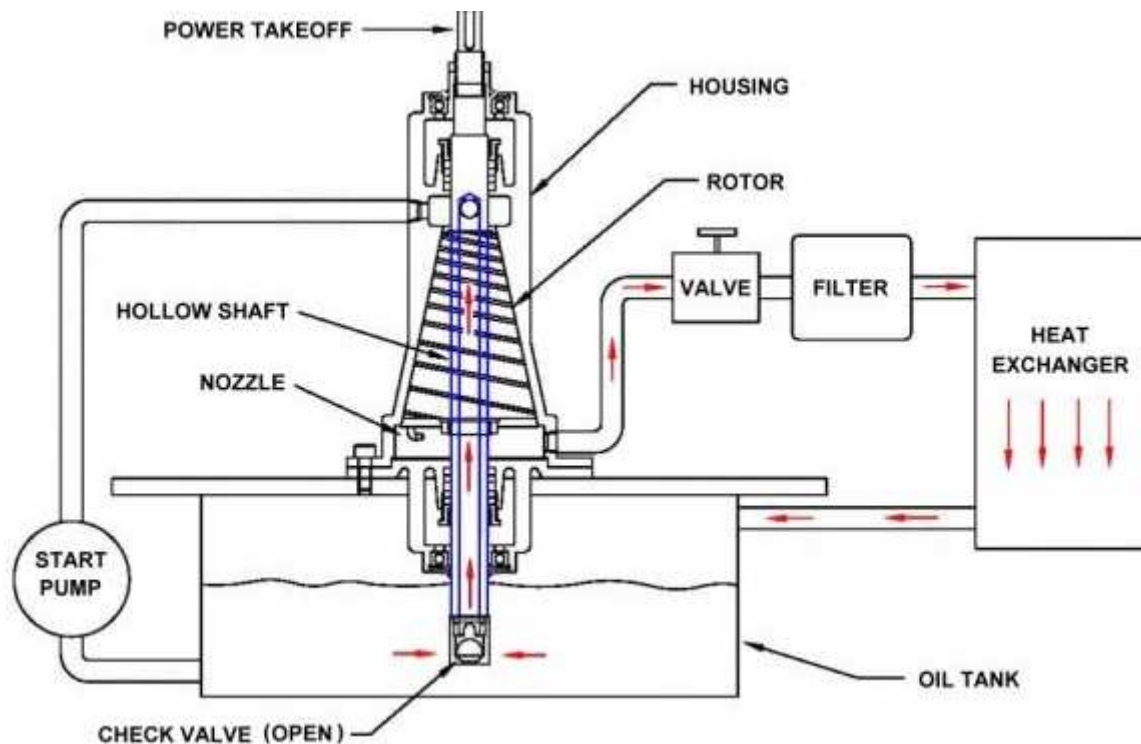


The vortex tube, also known as the Ranque-Hilsch vortex tube, is a mechanical device that separates a compressed gas into hot and cold streams. The air emerging from the "hot" end can reach temperatures of 200 °C, and the air emerging from the "cold end" can reach -50 °C. It has no moving parts.

(see https://en.wikipedia.org/wiki/Vortex_tube)

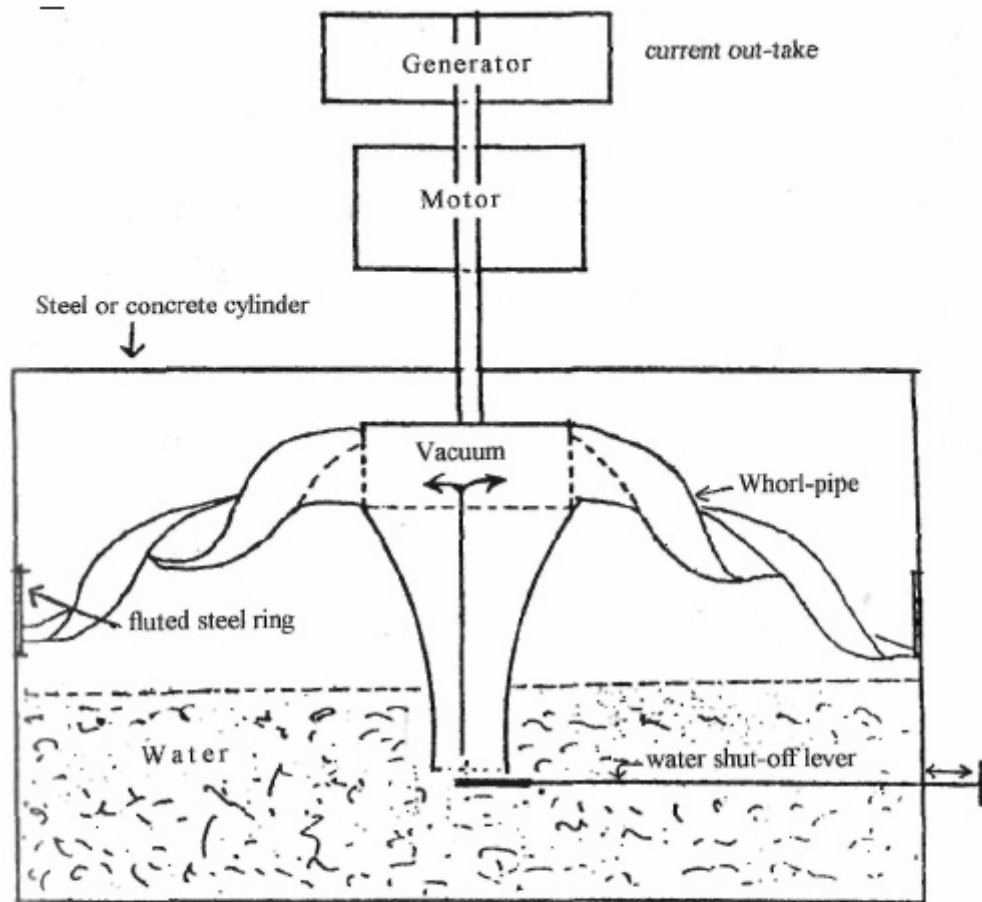
By analogy vortex heaters can be constructed for liquids also (e.g. water)

Richard Clem



(see <http://rexresearch.com/clemengn/clemeng.htm>)

Viktor Schauberger



The Water-driven Implosion Machine (design principle)

This machine produces additional torque, which relieves the load on the electric drive-motor and drives the generator. Since the generator produces more power than the drive-motor requires, the drive-motor can be powered by the generator. According to Schauberger's concepts, the generator ought to produce ten times more power than the drive-motor needs, i.e. there should be a nine-fold surplus of electric current; the whole arrangement representing a form of perpetual motion. (A. Khammas - Implosion No. 83, p.21)

Fig. 20

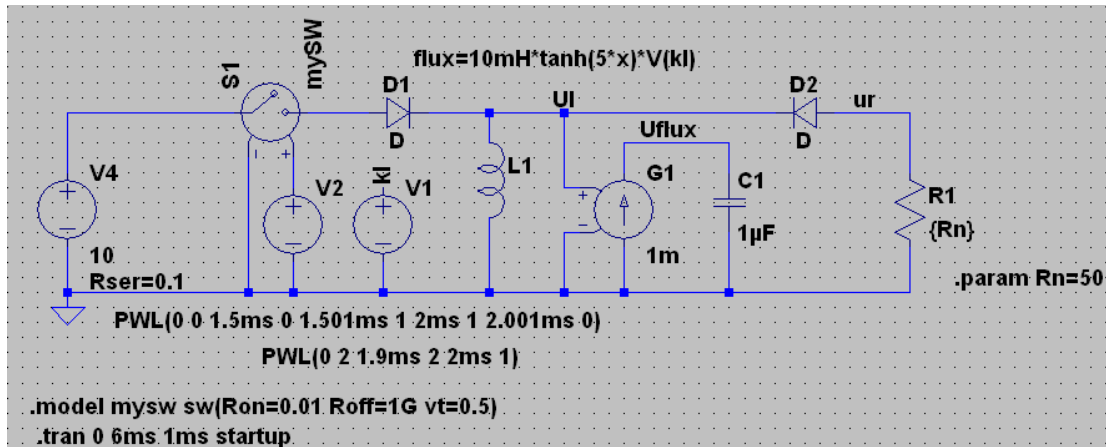
(see <http://rexresearch.com/schaubklimator/klimator.htm>)

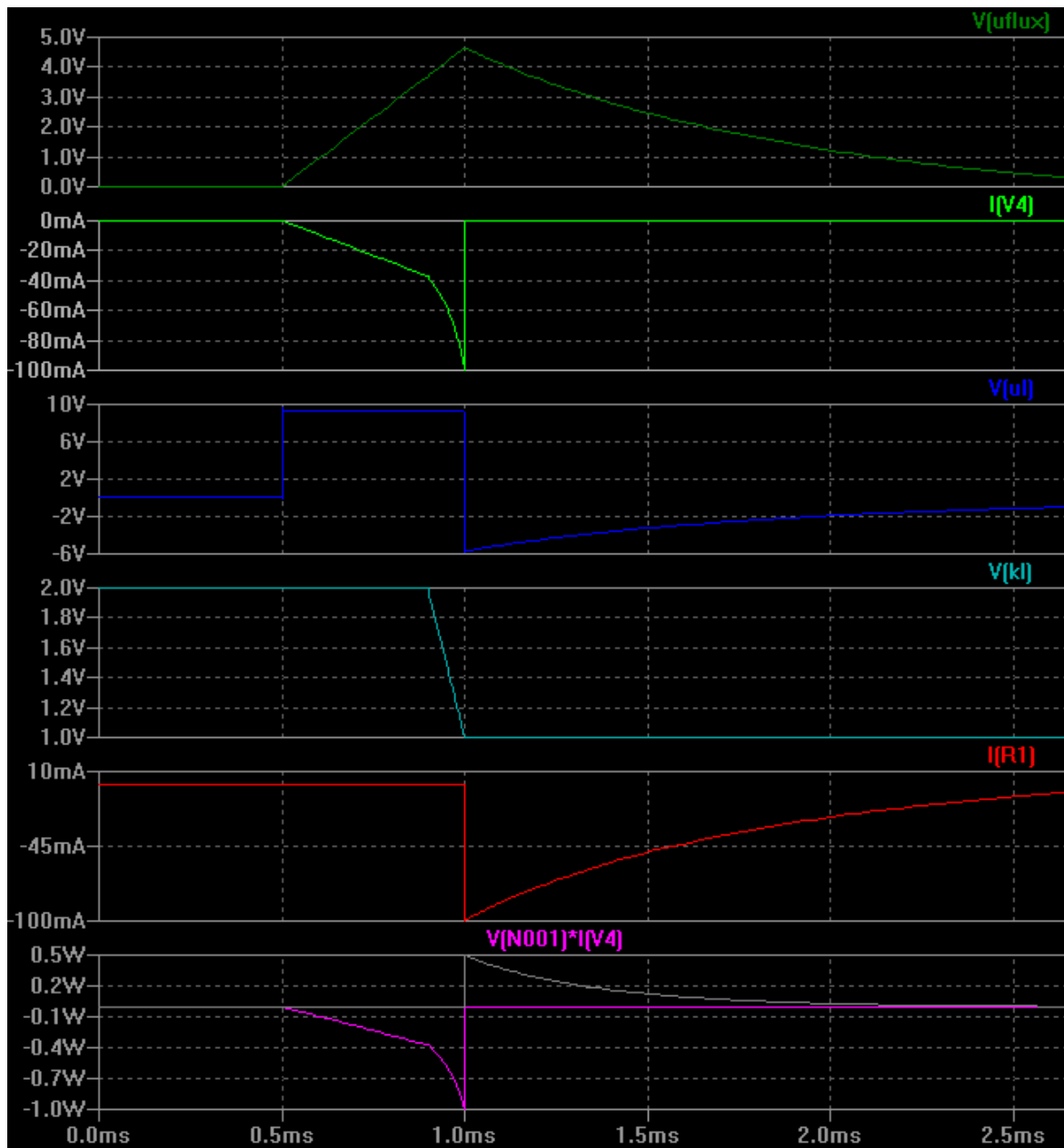
Energy generation concepts

Parameter variation

Variable inductor

In this section I would like to present several LTSpice models to illustrate how power can be generated in "unusual" way (not using mechanical power generators)





Waveform: $V(N001)*I(V4)$ ✕

Interval Start:

Interval End:

Average:

Integral:

Waveform: $V(ur)*I(R1)$ ✕

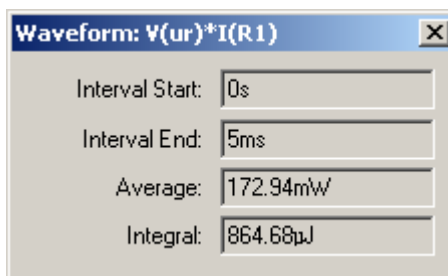
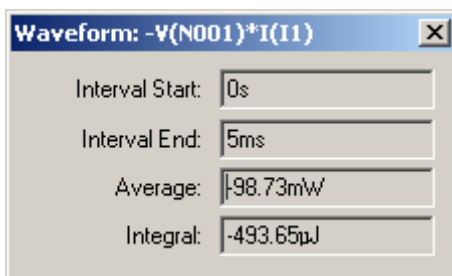
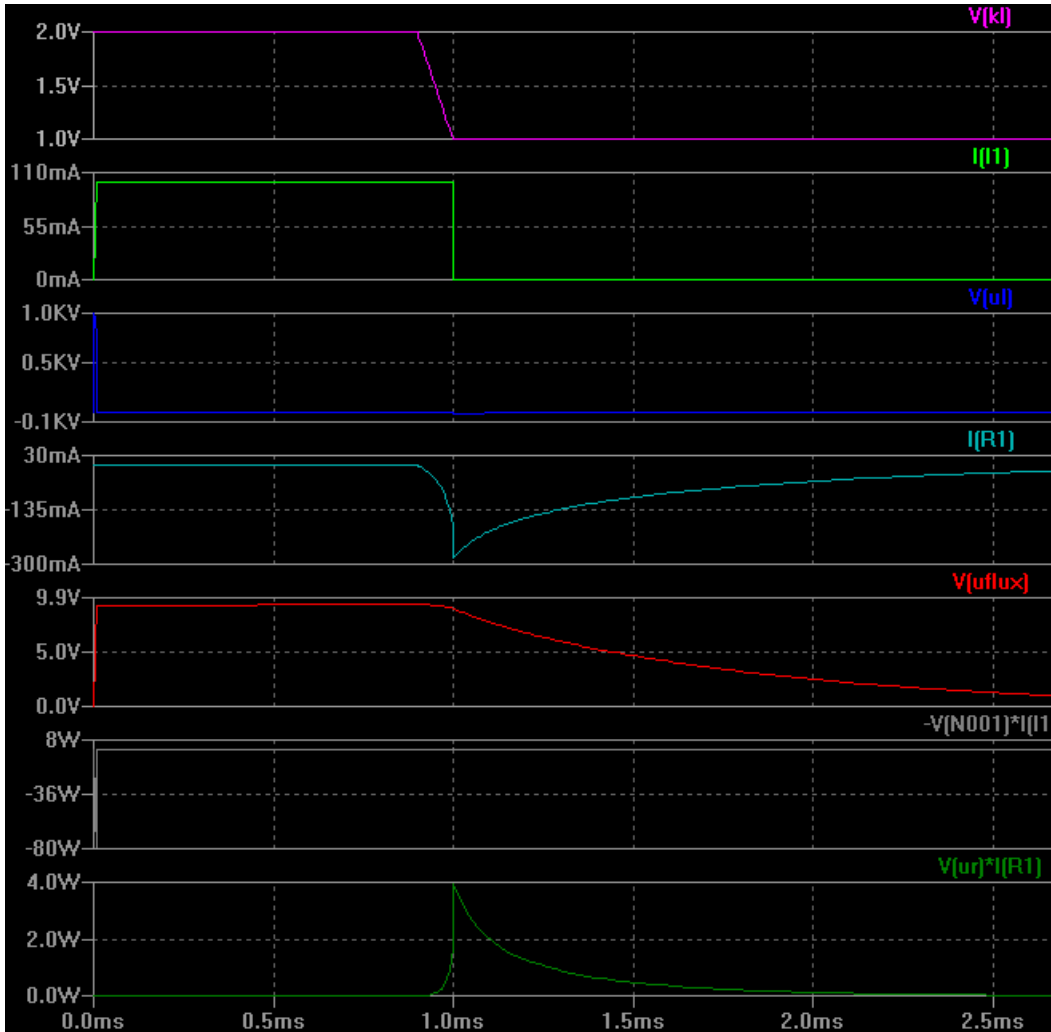
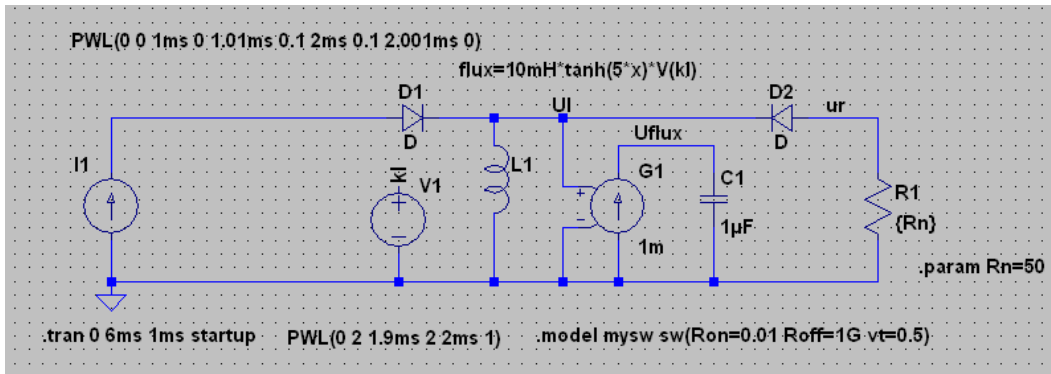
Interval Start:

Interval End:

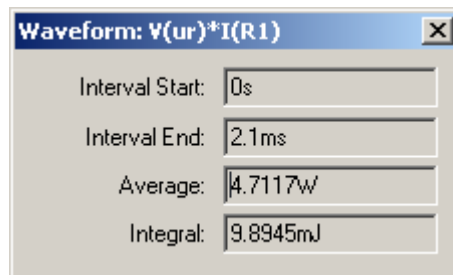
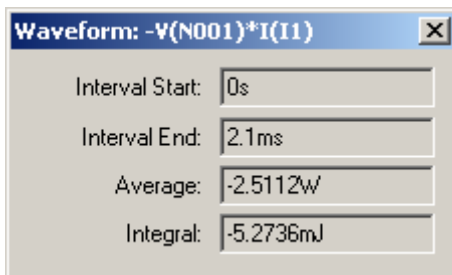
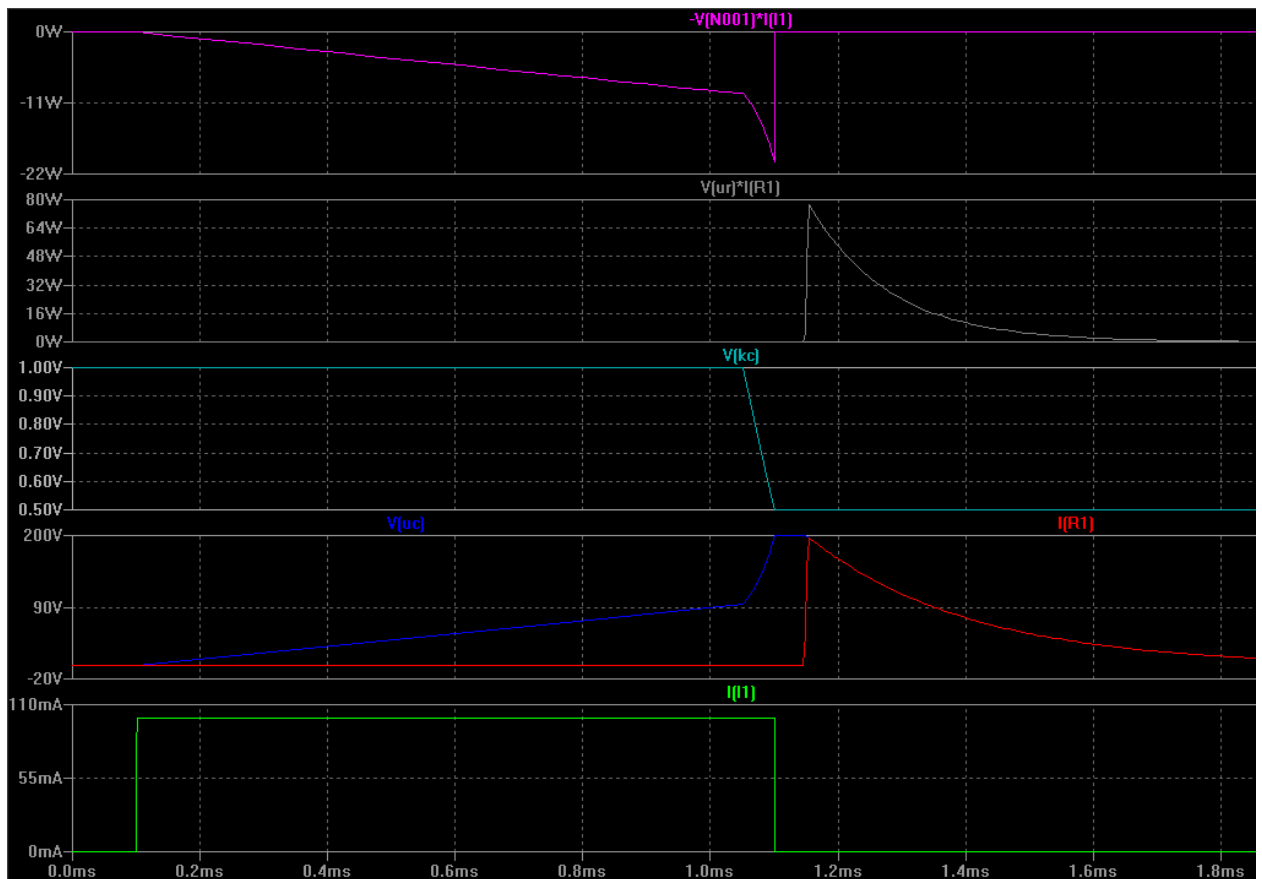
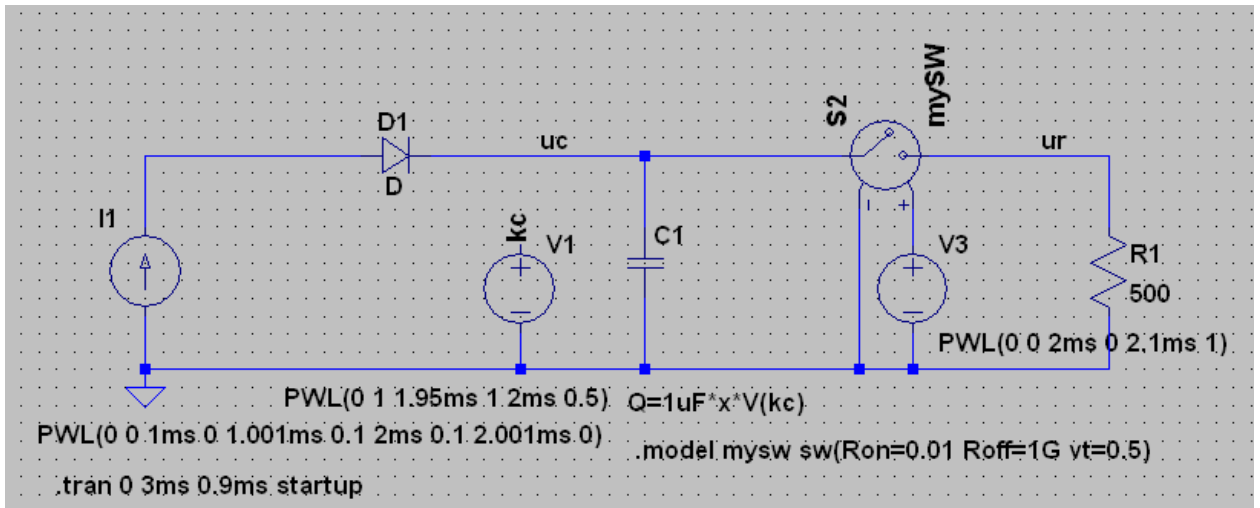
Average:

Integral:

Variable inductor an current source

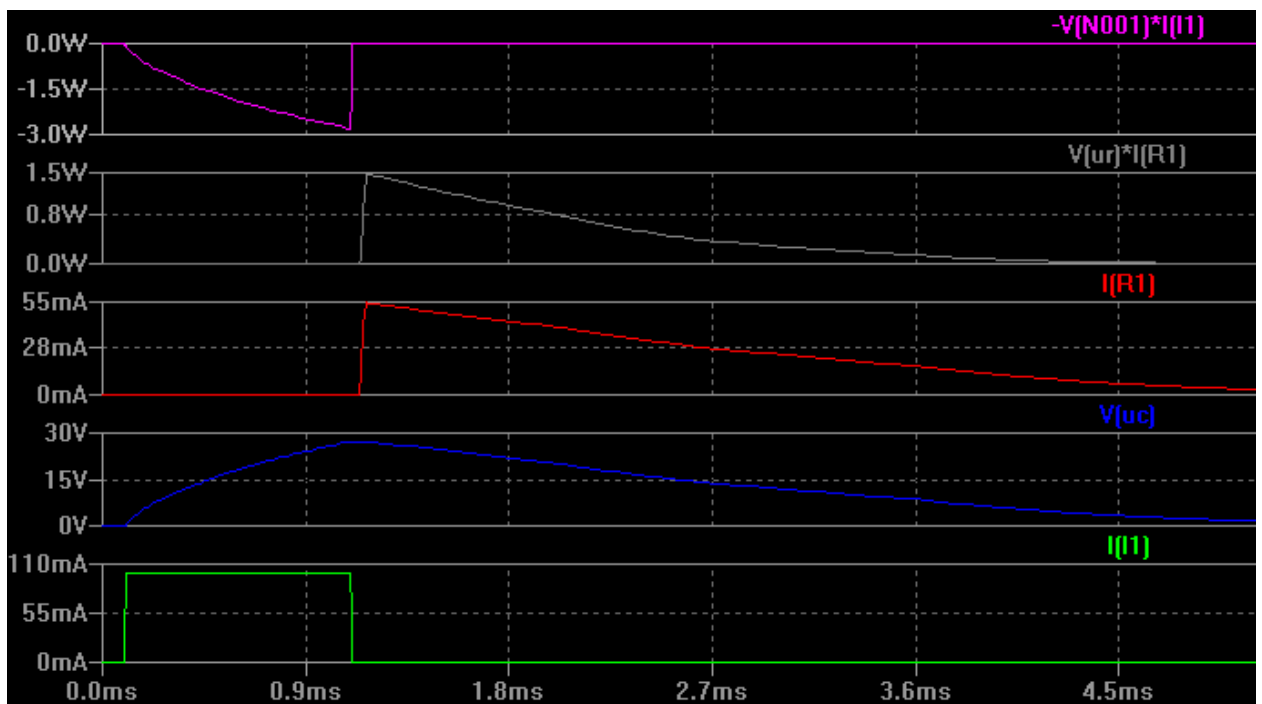
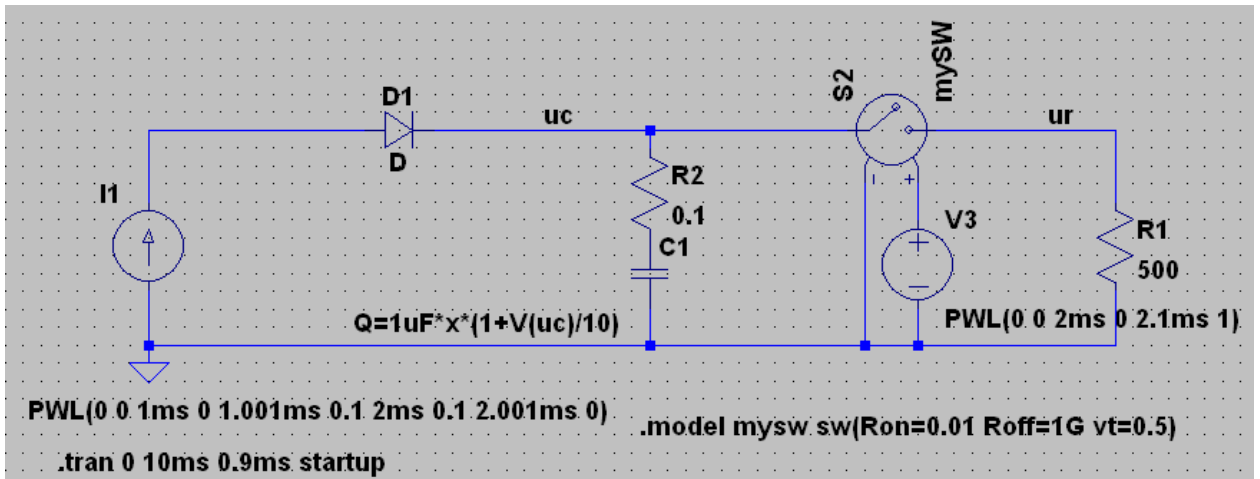


With non-linear capacitor



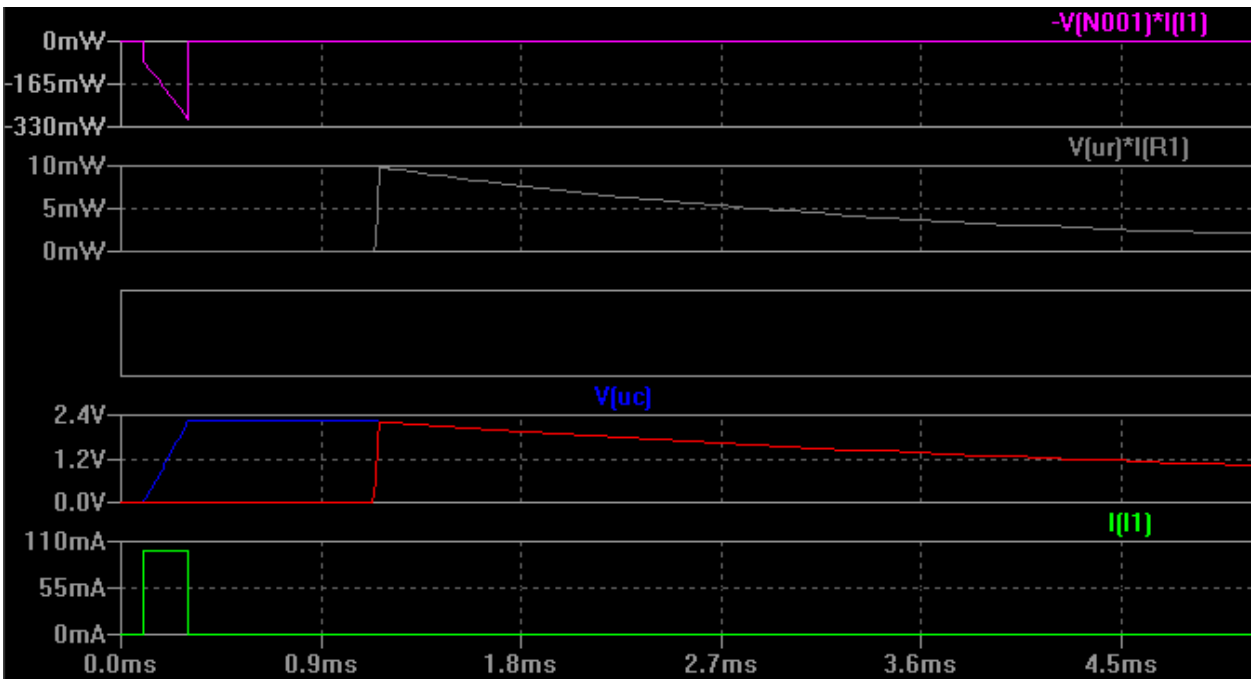
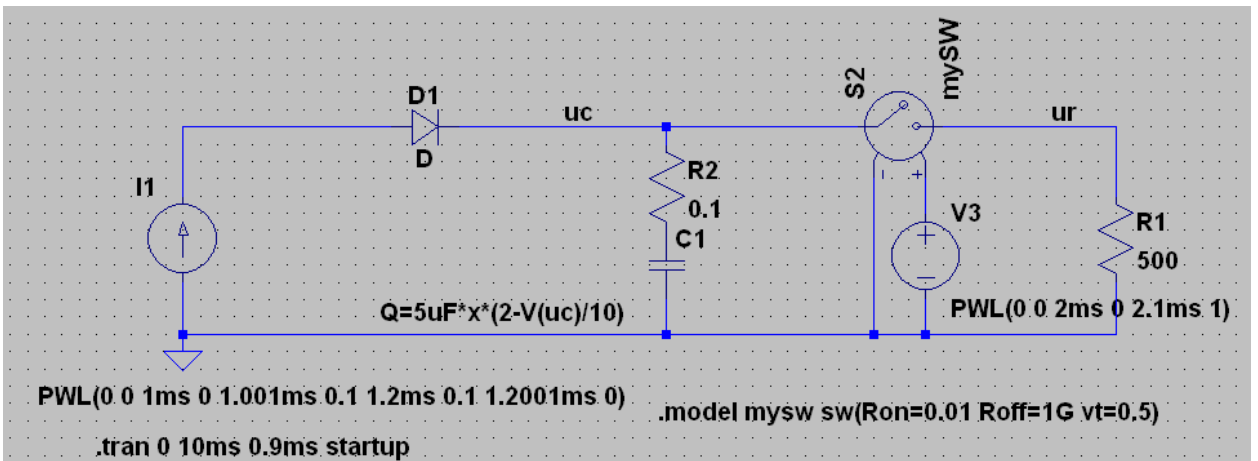
It is important that it is not enough to have non-linearity, the nonlinearity must be different for the charge and discharge (magnetization and demagnetization)!

Here examples with “symmetric” non-linearity



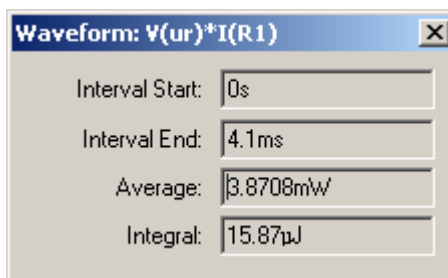
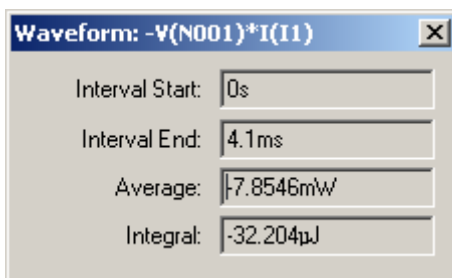
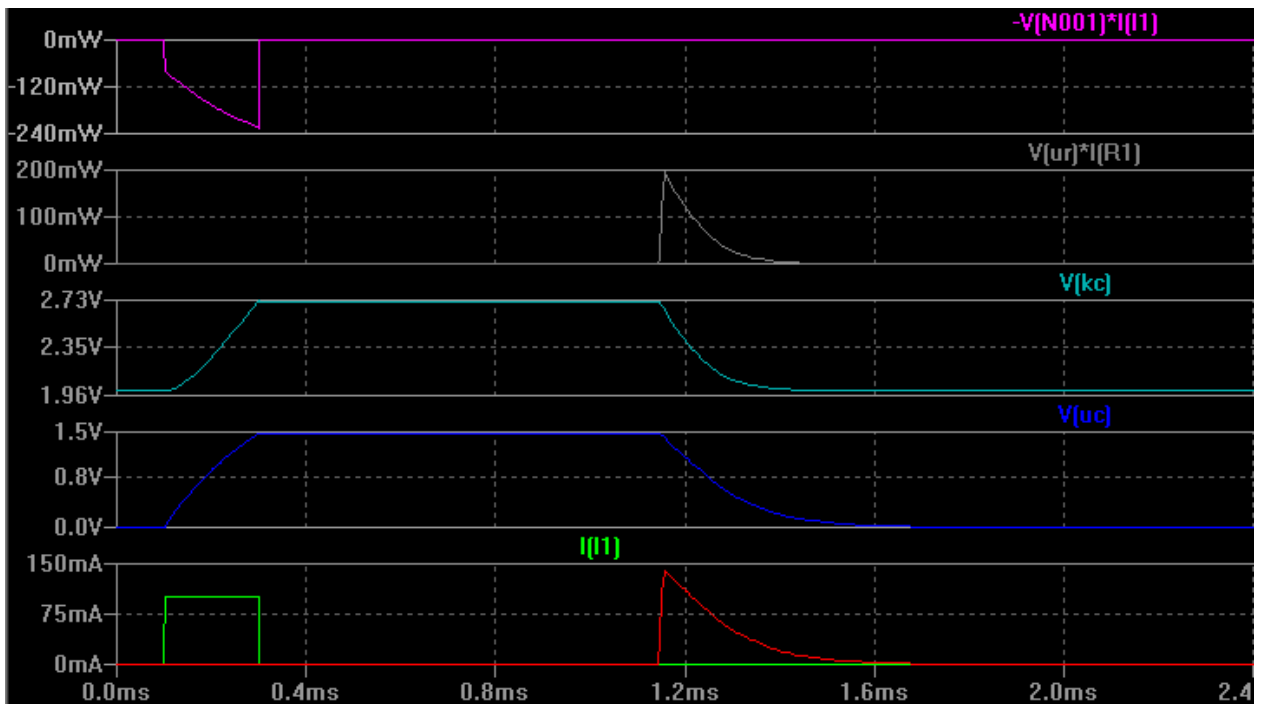
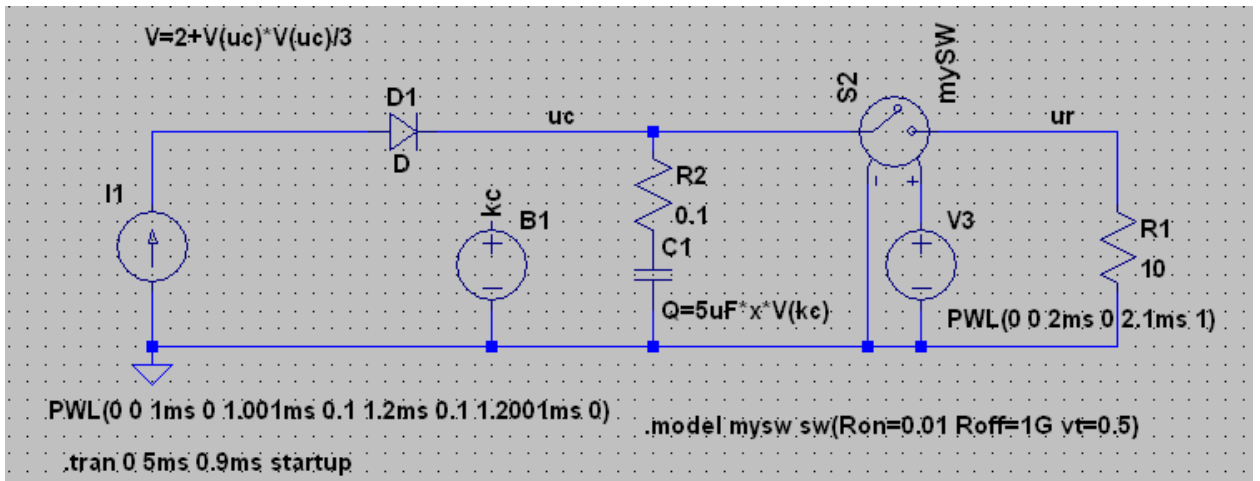
Waveform: -V(N001)*I(I1)	
Interval Start:	0s
Interval End:	9.1ms
Average:	-194.87mW
Integral:	-1.7734mJ

Waveform: V(ur)*I(R1)	
Interval Start:	0s
Interval End:	9.1ms
Average:	182.02mW
Integral:	1.6564mJ



Waveform: -V(N001)*I(I1)	
Interval Start:	0s
Interval End:	9.1ms
Average:	-4.0709mW
Integral:	-37.045μJ

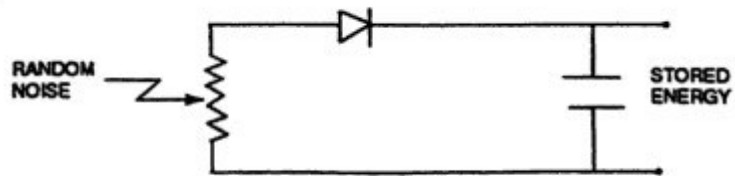
Waveform: V(ur)*I(R1)	
Interval Start:	0s
Interval End:	9.1ms
Average:	2.6028mW
Integral:	23.686μJ



Synergy principle

“Since a nonlinear system does not exhibit linear superposition, a combination of inputs often produces surprising, synergistic effects – the whole becomes greater than the sum of its parts.”
Quote from “Tapping Zero-Point Energy” by Moray B. King

Figure 1

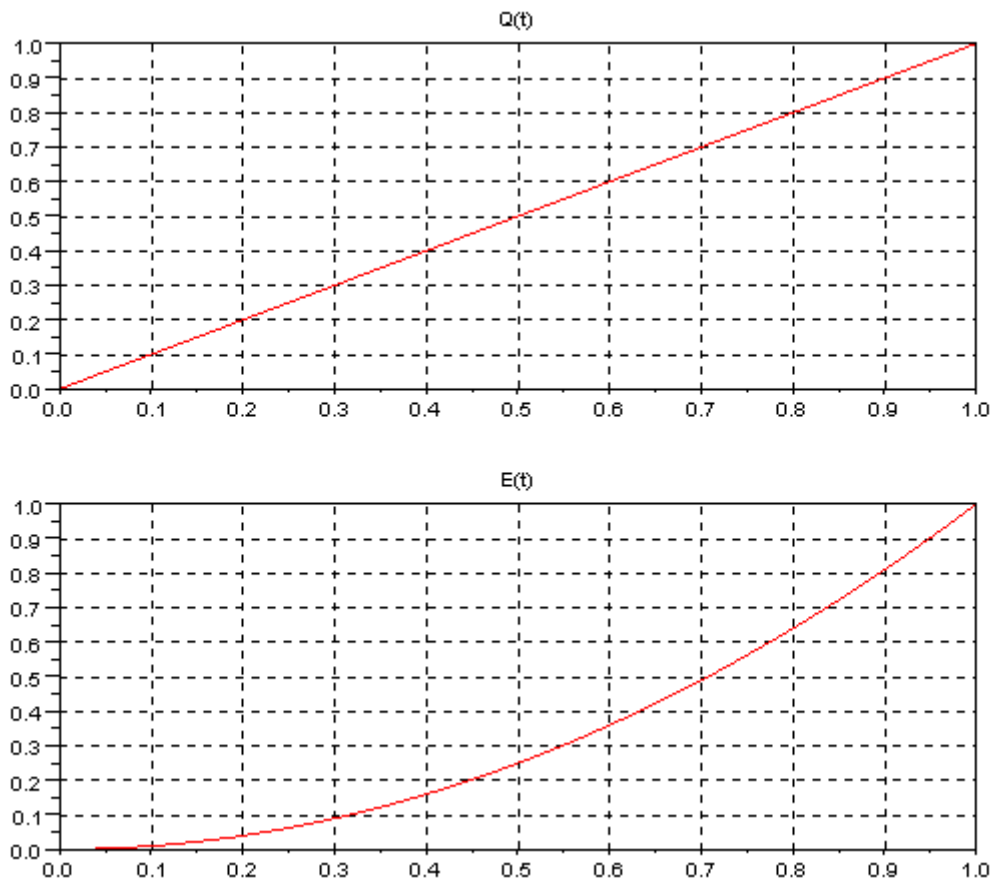


A SIMPLE NONLINEAR SYSTEM

pic. 30 Nonlinear system example

(source: “Tapping Zero-Point Energy” by Moray B. King)

We often see this principle used together with first principle.

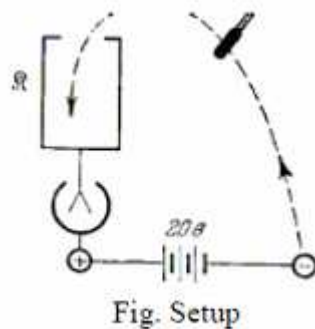


pic31. Charge and energy stored in capacitor

For example energy stored in capacitor will grow quadratically depending on the charge.

<http://hyperphysics.phy-astr.gsu.edu/hbase/electric/capeng2.html>

(and we see similar quadratic growth in many other physical processes)



pic32. An experiment with charge transfer

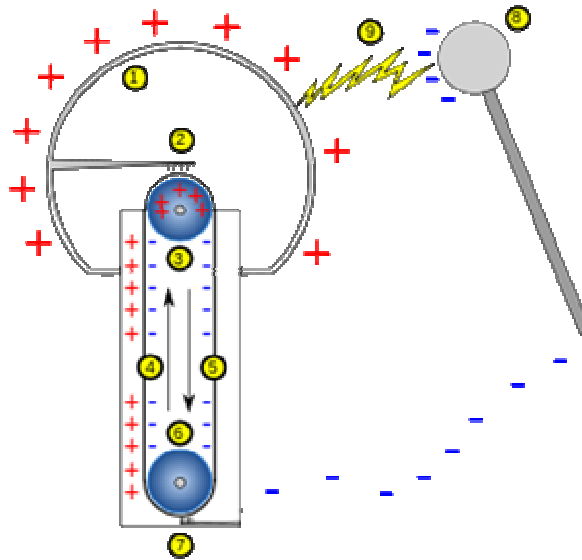
Here simple experiment with a power source which provide 20v. Moving “metallic” object back and forth we can charge a metallic can to any voltage, e.g. to 400v

This is what actually demonstrated here:

<http://www.youtube.com/watch?v=XaaP1bWFjDA#t=2680>

* It is absolutely bizarre situation that FE device shown on one of the first Physics classes and at same time they claimed that it is not possible ☺

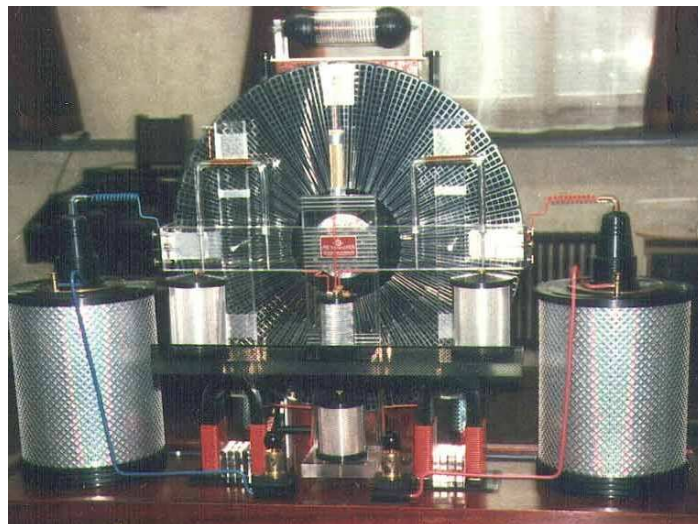
Van der Graaf generator



pic.34 Van der Graaf generator

(picture source: http://en.wikipedia.org/wiki/Van_de_Graaff_generator)

Van der Graaf generator is just “automated” version of experiment shown on pic. 32. If we would use it to charge capacitor then we could get a modification of system shown on pic. 20,21



Pic.35 Small Testatica machine

You probably agree that following this logic we can guess that Testatica machine could use same principle.

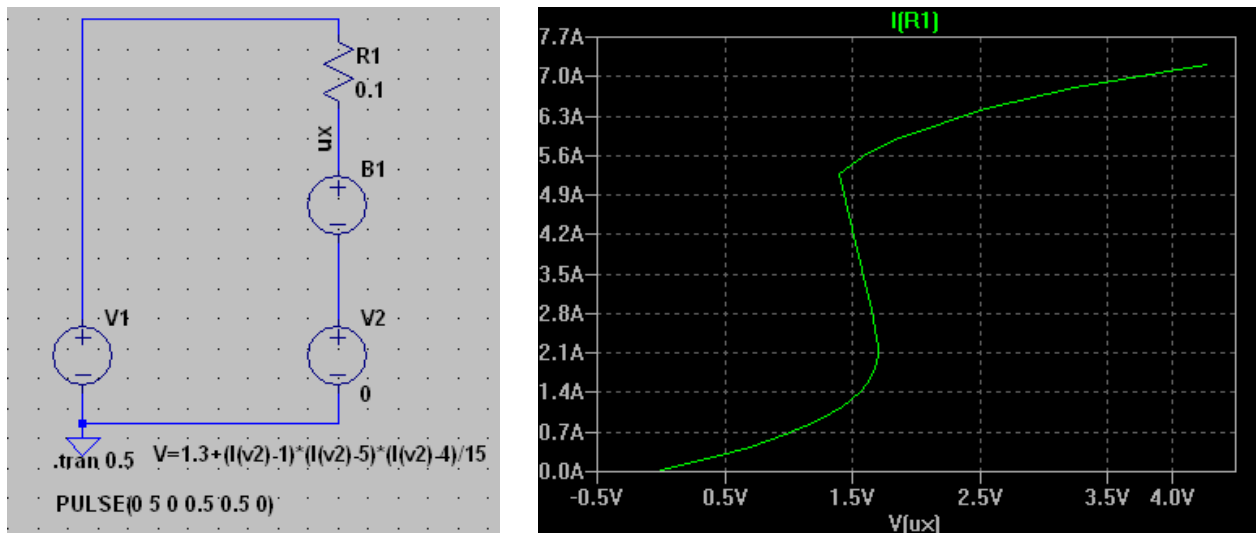
See http://en.wikipedia.org/wiki/Electrostatic_generator and <http://www.coe.ufrj.br/~acmq/whyhow.html>

Negative resistance and pulse systems

We can use S-shaped Negative Differential Resistance to supply additional power to a load if we subject NDR to short pulses. In some way we saw already this principle in pulse systems when discussed first principle (e.g. discharge in gas can be represented as NDR).

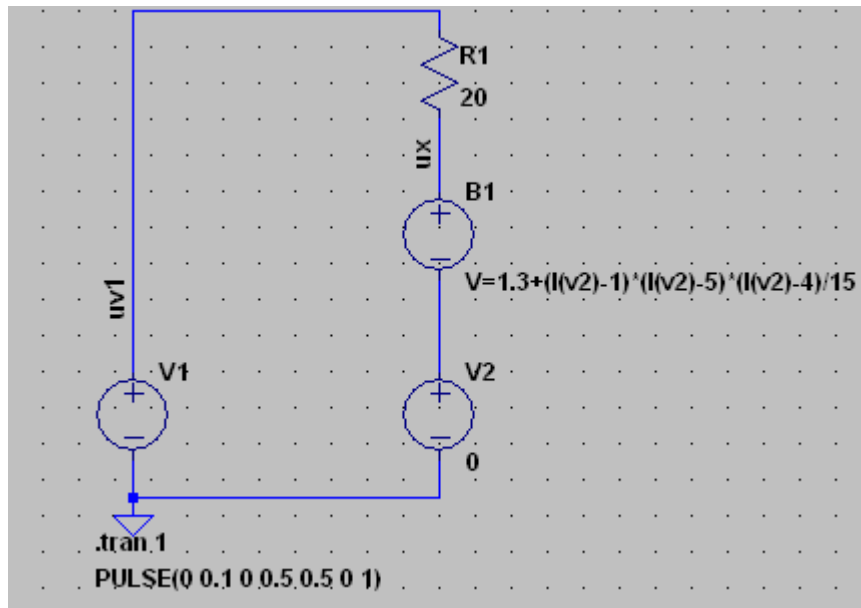
I still think it is appropriate list it as a separate principle because it refers to one of fundamental property of mater – inertia. We use small portion of energy to start some process and then we can capture more energy back. Such behavior can be observer in many completely different systems. Keeping in mind this principle could help us recognize potentially FE system/process.

As an illustration of my words I am adding here simulation results of very simple NDR resistance circuit.

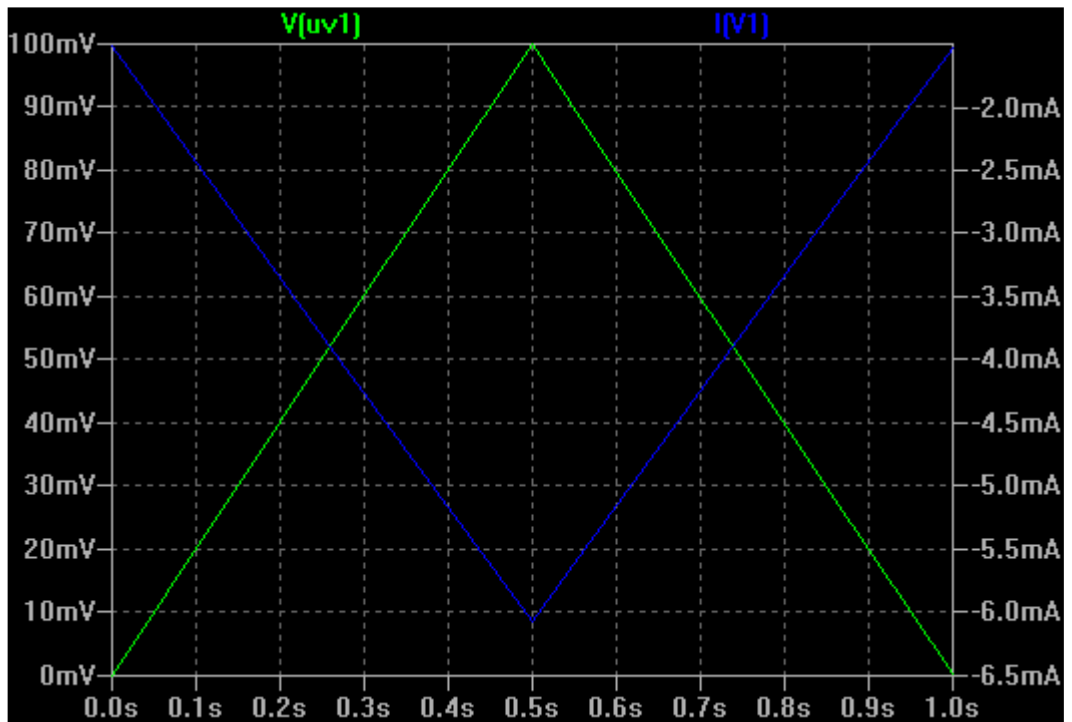


pic36. Test S-shaped NDR based on function $f(x) = 1.3+(x-1)*(x-5)*(x-4)/15$;

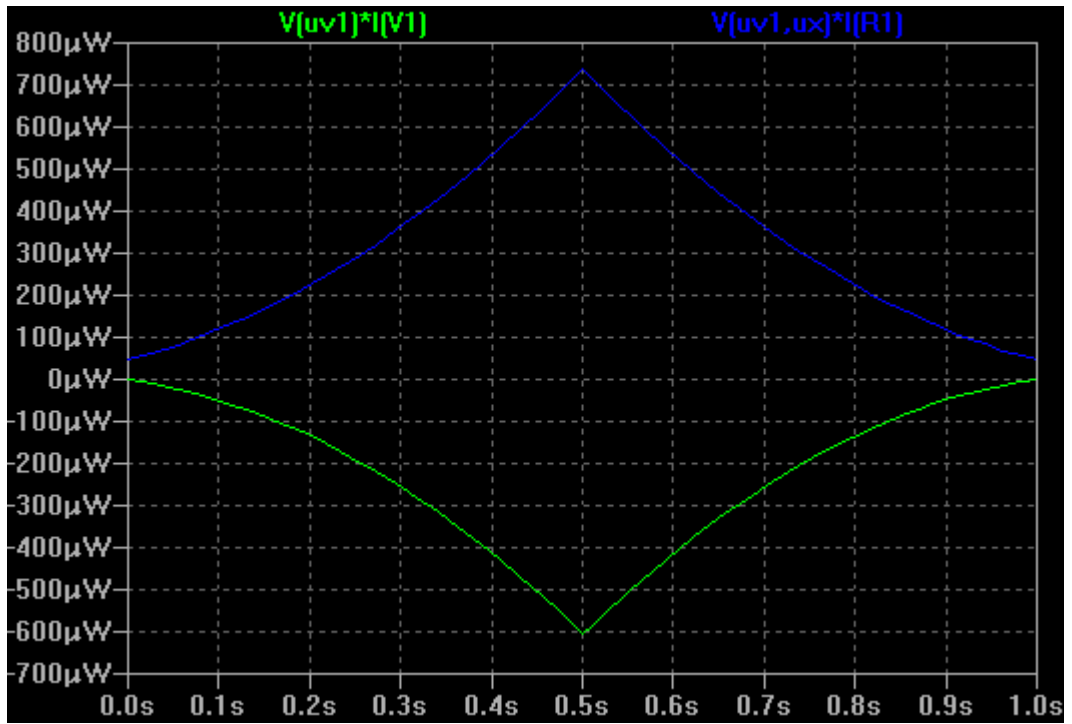
* Despite simple illustration that it is possible often mainstream science denies possibility use NDR to gain energy



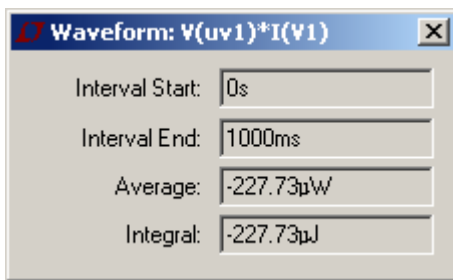
pic37. Simulation



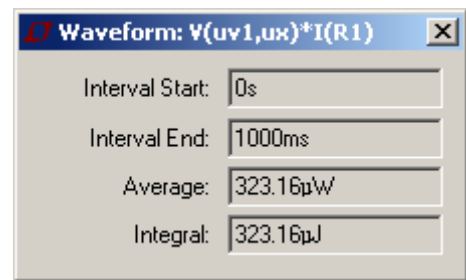
pic38. Simulation results – power supply voltage and current



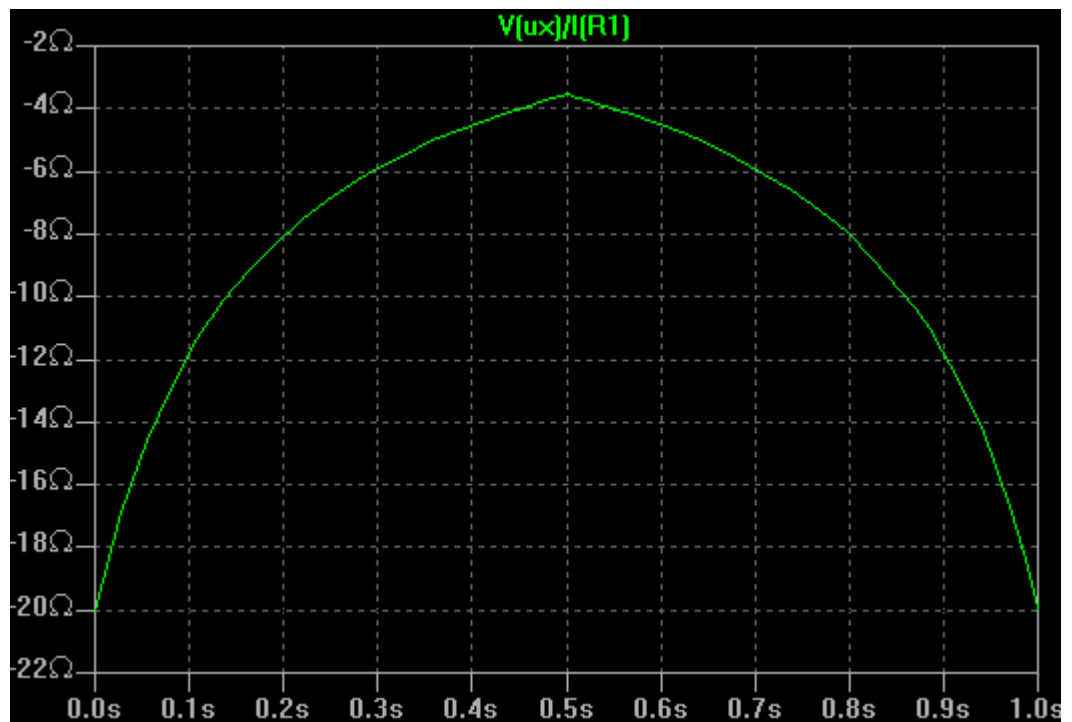
pic39. Simulation results – power from power supply and in load



pic40a. Energy delivered by power supply



pic40b. Energy dissipated on load resistor



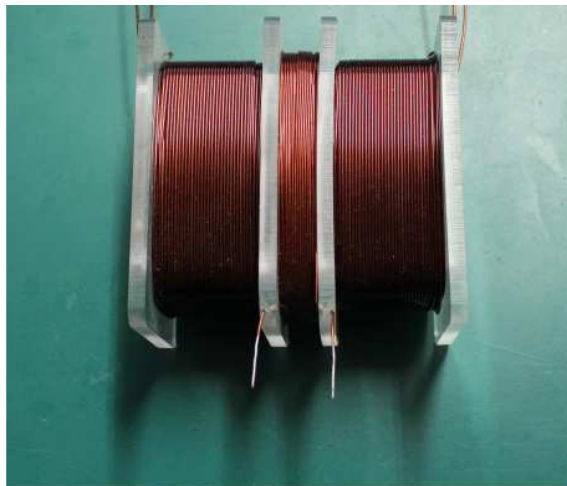
pic41. Negative resistance

Links about NDR:

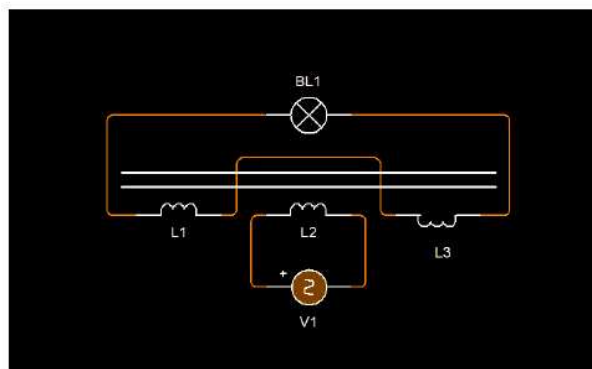
1. Demystifying the Negative Differential Resistance Phenomenon
http://en.wikibooks.org/wiki/Circuit_Idea/Negative_Differential_Resistance
2. Zinc Negative Resistance Oscillator <http://www.sparkbangbuzz.com/els/zincosc-el.htm>
3. Negative resistance in electrical discharge <http://mysite.du.edu/~jcalvert/phys/dischg.htm>
4. FE Basics, chapter 6 https://www.dropbox.com/s/plsrxlltgkl9wtb/fe_basics.pdf

Concepts considered as philosophically wrong

Fields cancellation

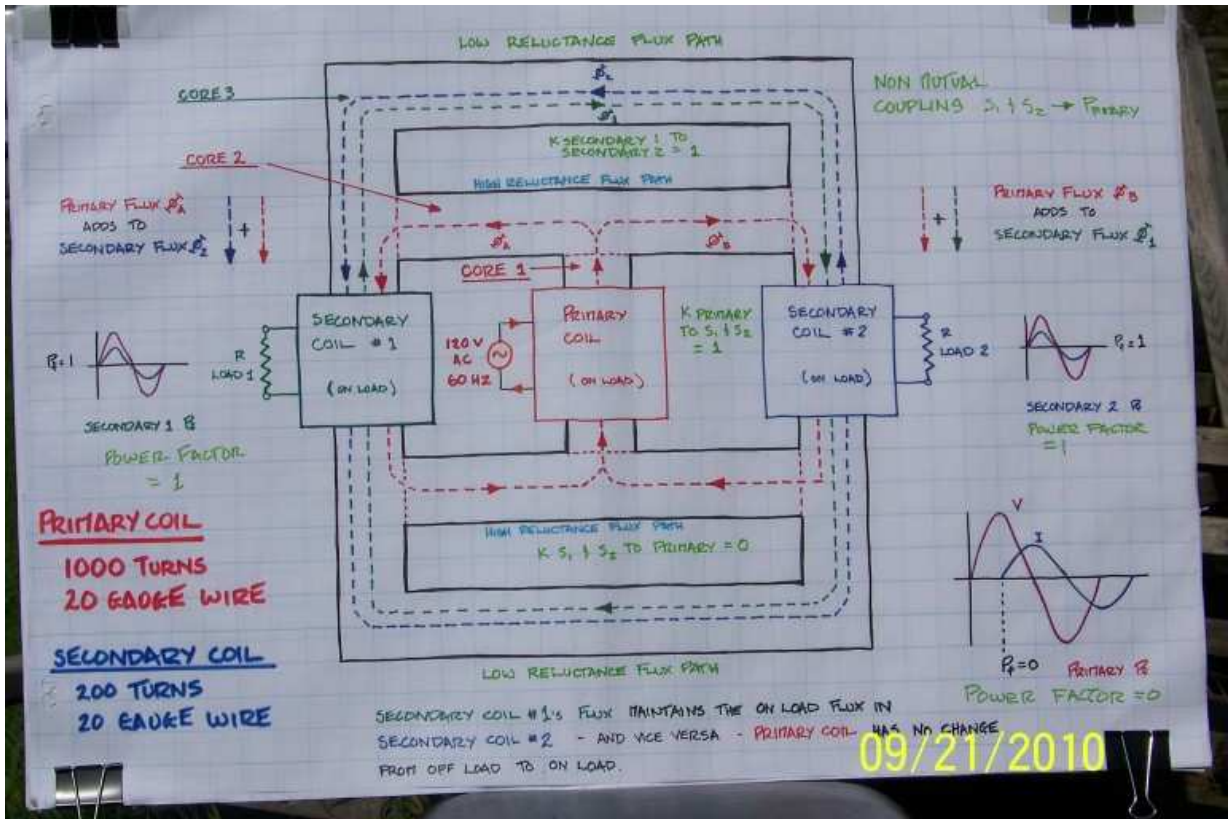


Circuit Equivalent:



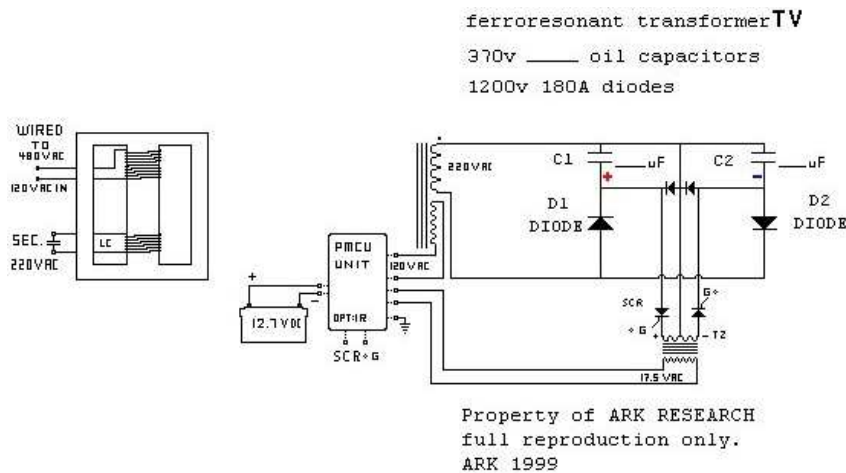
Magnetic fields are not canceling each other in nature. Do not confuse real things with terms in math equations.

Action without reaction (BEMF cancellation)



Reaction can't be "canceled"

Extracting reactive power without reflection



Hector's "Non Reflective Diode plug" nonsense

Afterword

I would like ask reader excuse me for imperfections in this book, low resolution and hand drawn pictures, bad formatting, wrong spelling and difficult to follow explanations. This is a fourth version of the book and I still not happy about it content. I invite everyone to send me feedback and contribute to improvement of the book. Only together we can bring “bright future” into our everyday reality.

Best wishes to you and good luck in FE research ☺



16 years in 21st century but future still is not here ☹

Appendix A.

THE PROBLEM OF INCREASING HUMAN ENERGY

WITH SPECIAL REFERENCES TO THE HARNESSING OF THE SUN'S ENERGY.

by Nikola Tesla

Century Illustrated Magazine, June 1900

<http://www.tfcbooks.com/tesla/1900-06-00.htm>

A DEPARTURE FROM KNOWN METHODS—POSSIBILITY OF A "SELF-ACTING" ENGINE OR MACHINE, INANIMATE, YET CAPABLE, LIKE A LIVING BEING, OF DERIVING ENERGY FROM THE MEDIUM—THE IDEAL WAY OF OBTAINING MOTIVE POWER.

When I began the investigation of the subject under consideration, and when the preceding or similar ideas presented themselves to me for the first time, though I was then unacquainted with a number of the facts mentioned, a survey of the various ways of utilizing the energy of the medium convinced me, nevertheless, that to arrive at a thoroughly satisfactory practical solution a radical departure from the methods then known had to be made. The windmill, the solar engine, the engine driven by terrestrial heat, had their limitations in the amount of power obtainable. Some new way had to be discovered which would enable us to get more energy. There was enough heat-energy in the medium, but only a small part of it was available for the operation of an engine in the ways then known. Besides, the energy was obtainable only at a very slow rate. Clearly, then, the problem was to discover some new method which would make it possible both to utilize more of the heat-energy of the medium and also to draw it away from the same at a more rapid rate.

I was vainly endeavouring to form an idea of how this might be accomplished, when I read some statements from Carnot and Lord Kelvin (then Sir William Thomson) which meant virtually that it is impossible for an inanimate mechanism or self-acting machine to cool a portion of the medium below the temperature of the surrounding, and operate by the heat abstracted. These statements interested me intensely. Evidently a living being could do this very thing, and since the experiences of my early life which I have related had convinced me that a living being is only an automaton, or, otherwise stated, a "self-acting-engine," I came to the conclusion that it was possible to construct a machine which would do the same. As the first step toward this realization I conceived the following mechanism. Imagine a thermopile consisting of a number of bars of metal extending from the earth to the outer space beyond the atmosphere. The heat from below, conducted upward along these metal bars, would cool the earth or the sea or the air, according to the location of the lower parts of the bars, and the result, as is well known, would be an electric current circulating in these bars. The two terminals of the thermopile could now be joined through an electric motor, and, theoretically, this motor would run on and on, until the media below would be cooled down to the temperature of the outer space. This would be an inanimate engine which, to all evidence, would be cooling a portion of the medium below the temperature of the surrounding, and operating by the heat abstracted.

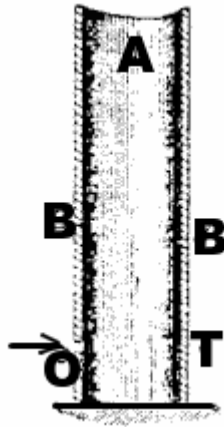


DIAGRAM b. OBTAINING ENERGY FROM THE AMBIENT MEDIUM

A, medium with little energy; B, B, ambient medium with much energy; O, path of the energy.

But was it not possible to realize a similar condition without necessarily going to a height?

Conceive, for the sake of illustration, [a cylindrical] enclosure T, as illustrated in diagram b, such that energy could not be transferred across it except through a channel or path O, and that, by some means or other, in this enclosure a medium were maintained which would have little energy, and that on the outer side of the same there would be the ordinary ambient medium with much energy. Under these assumptions the energy would flow through the path O, as indicated by the arrow, and might then be converted on its passage into some other form of energy. The question was, Could such a condition be attained? Could we produce artificially such a "sink" for the energy of the ambient medium to flow in? Suppose that an extremely low temperature could be maintained by some process in a given space; the surrounding medium would then be compelled to give off heat, which could be converted into mechanical or other form of energy, and utilized. By realizing such a plan, we should be enabled to get at any point of the globe a continuous supply of energy, day and night. More than this, reasoning in the abstract, it would seem possible to cause a quick circulation of the medium, and thus draw the energy at a very rapid rate.

Here, then, was an idea which, if realizable, afforded a happy solution of the problem of getting energy from the medium. But was it realizable? I convinced myself that it was so in a number of ways, of which one is the following. As regards heat, we are at a high level, which may be represented by the surface of a mountain lake considerably above the sea, the level of which may mark the absolute zero of temperature existing in the interstellar space. Heat, like water, flows from high to low level, and, consequently, just as we can let the water of the lake run down to the sea, so we are able to let heat from the earth's surface travel up into the cold region above. Heat, like water, can perform work in flowing down, and if we had any doubt as to whether we could derive energy from the medium by means of a thermopile, as before described, it would be dispelled by this analogue. But can we produce cold in a given portion of the space and cause the heat to flow in continually? To create such a "sink," or "cold hole," as we might say, in the medium, would be equivalent to producing in the lake a space either empty or filled with something much lighter than water. This we could do by placing in the lake a tank, and pumping all the water out of the latter. We know, then, that the water, if allowed to flow back into the tank, would, theoretically, be able to perform exactly the same amount of work which was used in pumping it out, but not a bit more. Consequently nothing could be gained in this double operation of first raising the water and then letting it fall down. This would mean that it is impossible to create such a sink in the medium. **But let us reflect a moment. Heat, though following certain general laws of mechanics, like a fluid, is not such; it is energy which may be converted into other forms of energy as it passes from a high to a low level.** To make our mechanical analogy complete and true, we must, therefore, assume that the water, in its passage

into the tank, is converted into something else, which may be taken out of it without using any, or by using very little, power. For example, if heat be represented in this analogue by the water of the lake, the oxygen and hydrogen composing the water may illustrate other forms of energy into which the heat is transformed in passing from hot to cold. If the process of heat transformation were absolutely perfect, no heat at all would arrive at the low level, since all of it would be converted into other forms of energy. Corresponding to this ideal case, all the water flowing into the tank would be decomposed into oxygen and hydrogen before reaching the bottom, and the result would be that water would continually flow in, and yet the tank would remain entirely empty, the gases formed escaping. We would thus produce, by expending initially a certain amount of work to create a sink for the heat or, respectively, the water to flow in, a condition enabling us to get any amount of energy without further effort. This would be an ideal way of obtaining motive power. We do not know of any such absolutely perfect process of heat-conversion, and consequently some heat will generally reach the low level, which means to say, in our mechanical analogue, that some water will arrive at the bottom of the tank, and a gradual and slow filling of the latter will take place, necessitating continuous pumping out. But evidently there will be less to pump out than flows in, or, in other words, less energy will be needed to maintain the initial condition than is developed by the fall, and this is to say that some energy will be gained from the medium. What is not converted in flowing down can just be raised up with its own energy, and what is converted is clear gain. Thus the virtue of the principle I have discovered resides wholly in the conversion of the energy on the downward flow.