Project overview:
Several Approaches for Zero point energy - Converters

Prof. Dr. rer. nat. Claus W. Turtur   Wolfenbüttel, 15. February 2021

Ostfalia University of Applied Sciences, Braunschweig-Wolfenbüttel
Salzdahlumer Straße 46 – 48   38302 Wolfenbüttel   Germany
Email: c-w.turtur@ostfalia.de   Phone.: (+49) 5331 / 939 – 42220

Preface

About 21 years ago, namely at the beginning of February 2000, for philosophical and spiritual reasons, I began to ask, with which forces and energies the beings of the non-material and ethereal world operate, who are invisible to us. From my physics textbooks, from which I had learned at the universities, I knew that the space we call empty, the vacuum, is definitely not empty. Among many other items, the space regarded as empty void, contains "zero point" - waves according to H.B.G. Casimir, and virtual particle-antiparticle pairs according to P.A.M. Dirac, and vacuum-polarization is observed according to Richard P. Feynman. That was all I knew about the quantum vacuum at this time. Such topics are simply not taught, nor learned, at universities. They almost don't exist there. And I didn't even have a idea why such topics are kept silent within the official canon of mainstream science - even worse: I hadn't even noticed this concealment !

Hence I first thought I had discovered something new, when I started to find out more about the invisible items of the quantum vacuum, and began to understand a little bit more about them, in the following years. I suspected I might perhaps have opened a new chapter in physics. But somebody who discovers something completely new, which nobody in the world knows (yet), and which is not shared by anybody in the world, is a charlatan, a lonely crackpot. Thus, I was very glad, when after a few years, I was contacted by scientists and inventors, at first only a few, but over the years more and more such colleagues, all of whom working in my scientific field; they welcomed me with pleasure and enthusiasm. First of all, these wonderful colleagues showed me how unbelievably much knowledge had already been accumulated in the field of "invisible", previously unknown energies. I was invited to learn abundantly from the knowledge of the numerous colleagues; learning is one of my favorite pleasures in my present life. Most important, I was free from the danger of being put in the charlatan corner, because from now on, I was an accepted and respected member of an established community of scientists and inventors, even if this community stood outside the mainstream. I feel comfortable as a member of this dissident community. From February 2000 to May 2011, I developed my ideas and concepts; from May 2011 on, I additionally took existing concepts of the "zero point energy" community and further developed them in theory. This resulted in a practical project consisting of several components, which are all suitable to develop zero point energy (**ZPE**) converters, or converters for the utilization of unconventional energy sources, which together cover all energy needs of the world energy market. Of course, a cell phone has to be supplied with a different energy source than a large industrial production hall, and this in turn with a different energy supply than a private household, or a car, or an airplane, or, or, ... Due to the multitude of my existing concepts, I am able to supply energy for all known types of consumption.

The overview of this is, what I want to present in the article here, with several new detail that are not yet published anywhere, up to now.

What I am missing so far is a laboratory, with the full panoply of devices, measuring equipment, staff, in fact a highly qualified team of top technologists and scientists. Originally, I had hoped to quickly bring my initially developed own concepts into a lab, but since I lacked the budget therefore completely, it was not possible. By broadening my inventor's view during the years, I am now in a position to bring so many projects into the lab, that it even opens up a creative scope, allowing me to work out an optimal approach

together with a financial funder. In this respect, I am now ready for the practical laboratory work and look forward to interested potential financiers, who like to reorganize the complete energy supply of our beloved planet "Mother Earth" together with me. We want to have clean and really sustainable energy. The use of "zero point energy" (ZPE) is not only perfectly environmentally friendly and ideal compatible with health, but it also holds immense economic potential, because the entire energy supply of mankind can be completely redesigned through "free energy", especially since this form of energy is permanently available in unlimited quantities everywhere on our planet for 24 hours a day, for everybody.

Introduction

The technical challenges can be regarded as manageable according to my consideration, especially since we know countless inventors, who have already developed numerous functioning systems in the past. Only a few of them have been presented to the public [DVR 21], none of them has reached the state of market maturity. This alone indicates clearly that the obstacles do not mainly technical reasons, but dominantly non-technical reasons. [PES 21]

Business economists know that the phase of market introduction is a particularly critical phase for any new product. Of course, this is in the energy industry similar as in other industrial sectors, except that the dominant energy-corporations act particularly aggressively, which one might recognize from the well-known term "oil war". Would energy corporations be peaceful, there would be no wars for oil or for energy. [Tur 17] However, I personally believe that the phase of market introduction can be managed, as long as we keep distance from energy corporations, and avoid conflicts with the people influenced by the lobbyists of energy corporations.

This makes it clear whom I consider as potential partners for funding zero point energy research and market introduction: All people, companies and businesses partners, except from energy corporations, and those who are dependent on energy corporations. Furthermore inappropriate as potential partners are private hobbyists, who dream to reorganize the entire energy supply of our complete planet earth, just by trial and error in the hobby-cellar or in their garage. Such people have neither the necessary endurance nor the financial staying power. A successful ZPE-project, to re-engineer the worldwide energy supply needs a multi-million-Euros-Budget in order to reach its goal. Everything that can be done without such a budget, I have already done. In this respect I see two possible approaches:

- Sponsors or patrons who want to give a smaller amount, perhaps half a million or a million euros or a few millions, can help to start the laboratory-work by making a donation, whereby the research budget is given for to the research only. All that we achieve is a gain of knowledge, but in this range we do not speak about an economic project with marketing prospects, and certainly not of a financial profit strategy.

- With an investor who is able and willing to participate (to share the project with me) with larger amounts of budget, i.e. double-digit (or perhaps even triple-digit) millions of euros, a profitable economic project can be set up in a targeted manner, which even if it is risk capital (venture capital), can expect enormous financial profits in the case of success, since nothing less is under discussion than the supply of the entire world energy consumption. However, such investors must be aware that in the long run we will not remain alone on the market, because after a few years competitive products can be expected on the market from other ZPE-energy inventors. However, such competition is not a problem, because definitely nobody can seriously dream of becoming the sole ruler of the entire world energy market. Such an aspiration would simply be megalomania. Let's compare the situation with the world automotive industry. Daimler and Benz invented the automobile, and are still doing really well in business today, although other manufacturers are also selling automobiles for well more than hundred years.

What I will definitely not work for: for the lockbox. Whoever wants my results to end up in a safe deposit box, and not reaching mankind, can certainly never be my partner.

Acknowledgements

Abstract / Executive Summary

The purpose of this article is, to present some of my projects for alternative energy sources. Some of them are based on ZPE-energy, others use different energy sources. Especially when I speak about the use of ZPE-energy, I refer to this very part of zero point energy, known in the scientific community as the "zero point energy of electromagnetic waves of the quantum vacuum".

The different approaches presented in the article, can be realized with different efforts, but also have different yields and fields of application. Logically, the development of a magnetic motor in the multi-megawatt range requires a completely different effort, than the development of a motionless converter or an infinite battery to provide the electrical energy for a cell phone or a laptop computer. The advantage of having many different projects comes from portfolio-theory, according to which spreading the risk is desirable in our case. Quite simply: No matter how many systems we put into R&D, once the FIRST system is up and running, we are the winner. The more systems we bring into R&D, the more comprehensive and widespread our concepts are, the faster and more successful we will be in building the first powerful prototypes. Already the first successful (powerful) prototype will bring us into mass production with huge quantities.

The following table lists several of the most prominent possible concepts with which we can enter into research and development work, as soon as a suitable research budget will be made available to me. An energy price as such does not really exist, so that the energy costs are only calculated by converting the purchase price of the ZPE-engine over its lifetime, to the amount of energy produced.

System	Power segment	Examples of Application	Chances of technical success	Energy price
Infinite battery	1 … 50 Watts	Cell phones, Laptops, in the worst case only a revolution of the world battery market	90 % ± 10 %	0,5 . . . . 5 cent / kWh
Motionless-Converter	20 Watts … 5 kW	E-Bikes, transportable devices, small electric cars	75 % ± 25 %	0,2 . . . . 1 cent / kWh
Hydrogen-systems	100 Watts … 300 kW	Transportation sector (cars, ships, airplanes, motorcycles, etc…), motors	80 % ± 20 %	0,05 . . . . 0,5 cent / kWh
Magnetic motor	5 kW … 100 MW	Households, energy supply for industry, only stationary consumers	90 % ± 10 %	0,02 . . . . 0,1 cent / kWh
Magnetic switch	100 W … 5 kW	Transportable devices, Households (low speed motors, electronic systems)	65 % ± 35 %	0,01 . . . . 0,5 cent / kWh
Gravity- and hydraulic systems	10 W … 20 MW	Craftsmen, catering service, etc… (stationary application, medium sized business, Handicraft enterprises)	60 % ± 40 %	0,05 . . . . 1 cent / kWh
Capillary pumps	100 W … 100 kW	Handicraft enterprises, poor countries (stationary application)	60 % ± 40 %	0,1 . . . . 0,5 cent / kWh
Electron beam converters	1 Watts … 1 kW	Arbitrary electrical devices of all kind	50 % ± 50 %	0,1 . . . . 0,5 cent / kWh

If I add up the chances of success in the table, I come to 570%. Therefore, I assume that within a few years 5 ... 6 different systems should be finished. Which one will be finished first, we will see.

Table of Contents

1. Infinite Batteries

1.1 Crystal cell

Infinite batteries are batteries that do not run down for many years. The crystal cell described elsewhere is an example of such "ever lasting" batteries. Therefore, lime slurry is mixed with vinegar and graphite powder to serve as electrolyte; the two electrodes are made of copper and aluminum. A comparison of the energy density demonstrates the enormous advantage of the crystal cells compared to other batteries known so far:

- AAA-Alkaline (hardware strore)   →   80 Wh/ltr.
- Li-Ion high-performance accumulator   →   500 Wh/ltr.
- Elon Musk car ("Tesla")   →   800 Wh/ltr.
- Gasoline, better Diesel   →   10'400 Wh/ltr.
- Crystal cells   →   minimum 400'000 Wh/ltr.

The value of at least 400'000 Wh/liter for the crystal cells is not yet limited upwards, because the test specimens, which an inventor showed me, were not yet empty after the extraction of 400'000 Wh/liter. Since the performance of these specimens diminished somewhat when we tested them, but not very much yet, we have to assume that the lifetime of these crystal cells is not infinite, but still well above 400,000 Wh/liter.

If we divide the energy density of the crystal cells by the energy density of the high-performance Li-Ion accumulator, we get $\frac{400000 \text{ Wh/ltr.}}{500 \text{ Wh/ltr.}} = 800$. This means that a crystal cell WITHOUT recharging at all, can supply an electronic device, such as a cell phone, for the same period of time as a lithium-ion high-performance battery during 800 charging cycles. Thus, we can build batteries for cell phones or laptop computers that do not require a charger.

1.2 Melanin - radiation transducer

Melanin (chemical name: "polyhydroxyindole") is a chemical substance that occurs in nature, which absorbs radiation, perhaps even thermal radiation, and which converts the energy of this radiation into usable energy, if suitably arranged into electrical energy. Thus, melanin battery cells are called "photoelectrochemical" batteries. Nature uses this substance to protect against radiation, for example in skin color, which darkens when being exposed to solar radiation, or in the eye to protect the optic nerve. In this process, electromagnetic radiation is converted into an energy that leads to the splitting of the water molecule. In analogy to the absorption of solar radiation by chlorophyll in photosynthesis in plants, so-called eukaryotic cells in animals (in fish, birds, insects) and in human beings absorb electromagnetic radiation. In contrast to photosynthesis in plants, which uses up the substance within a few minutes, so that the plant has to form it anew, the eukaryotic electrolysis of the water molecule in faunal organisms proceeds over years with constant intensity, without the melanin having to be replaced or formed anew. Thus the reaction can be well reproduced in the retort, and also works very efficiently, especially since melanin absorbs electromagnetic waves by approx. three orders of magnitude better than chlorophyll. As a result, not only visible light, but also infrared radiation / thermal radiation with long wavelength is absorbed, and can be used for the decomposition of the water molecules. The melanin process, which is somehow analogous to photosynthesis, also works in the dark, and even at night. The chemical reaction involved is:

$$2H_2O + Melanin \rightleftarrows +2H_2 + O_2 + 4e^-$$
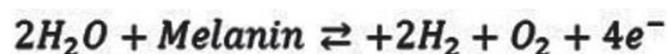
Again, in this context we are not talking about ZPE-energy conversion, but the substance and its chemical reaction can be used to produce excellent long-life batteries, either if the hydrogen and oxygen atoms can be separated and used to generate electricity, or if the produced electrons can be discharged via electrodes and fed to an electrical consumer. The double arrow in the chemical reaction equation shows that the reaction can be basically carried out in both directions. The crucial point, however, is that the melanin is not consumed in the process. Experts estimate that a certain proportion of the energy absorbed by humans is actually obtained from solar radiation via melanin.

For electricity generation, melanin can be optimally used in a four-percent solution in water (4% melanin + 96% water), so that two metallic electrodes immersed into the melanin-water solution, deliver a voltage of several 100 mV (depending on the choice of metal of the electrodes), whereby the current carrying capacity is quite sufficient, to adequately supply small electrical consumers, such as LED lamps or CD players, if the batteries are made of typical manageable size. Due to the fact that melanin is not consumed (not decomposed), melanin cells have the advantage of unlimited lifetime different from crystal cells. Lots of literature and references to top university research can be found on the website [FOT 21] of Dr. Arturo Solis Herrera.

1.3 Electrical internal resistance

Both systems, the crystal cells as well as the melanin cells, have a relatively high internal electrical resistance, so that a certain (not to be underestimated) research effort is still necessary to make the surface of the electrodes as large as possible, i.e. to produce the electrode material as thin as possible for a given battery volume. On the other hand, the electrodes must not be too thin, in the case of crystal cells due to electrochemical material consumption, and in the case of melanin cells due to corrosive attack by water. Methods of physical and chemical surface analysis are necessary, in order to make the sizing of the electrodes reasonable. Moreover, in the case of melanin cells, it is necessary to be aware that the thickness of the melanin substance, absorbing the electromagnetic waves, must be optimized with respect to the power density of the batteries.

1.4 Zambioni-Column

Another interesting long-life battery system is the dry cell battery, first introduced by the Italian priest and physicist Giuseppe Zamboni in 1812. [ZAM 12] Two electrodes made of tin and copper bronze are separated by a paper whose residual moisture is sufficient as electrolyte. The shelf life of such batteries proven so far is also in the triple-digit annual range (more than a century), although we again face the problem that the high internal electrical resistance of the batteries causes a considerable current limitation. So, on the one hand, we have the research and development task of optimizing the geometry (thickness and surface) of the electrodes, and on the other hand, we have the uncertainty of not being able to reliably state their energy density, due to the low performance of the ancient batteries.

1.5 Kammler-Battery

Another example of a battery of unprecedented power density and energy density is the so-called eternal battery, which also became known as the Kammler-battery. Nevertheless, I do not want to pursue the system any further at this point for various reasons, firstly due to the fact that the theory and the mode of operation are not clearly described in the literature, secondly due to the fact that sample specimens can only be obtained only under extremely dubious circumstances or not at all, but above all due to the hearsay myth, that the source of the electrical energy could ultimately be due to radioactivity. A radioactive battery is definitely not something, what we want to use.

1.6 Arbeitsplanung

As methods of surface analysis, for example, procedures like the following come into question
- X-ray photoelectron spectroscopy (XPS)
- Auger electron spectroscopy (AES)
- nuclear reaction analysis (NRS).

Such methods, while precise in resolution, are not cheaply accessible in the private sector. Incidentally, the fabrication of thin electrodes with a thickness of a few micrometers also requires a technological challenge that should not be underestimated. This should certainly not be a problem for series production in large quantities, because suitable technologies are already being applied today in the manufacturing of capacitors and in the production of batteries, but obviously this is not a project in the hobbyist's garage. Thus, we talk about the following steps, when planning the work.

Step A:
Activity: Geometry optimization of electrodes and electrolyte
Performer: Experimental physicist, laboratory assistant, chemist and external laboratory.
Description: minimizing the thickness of the anode, cathode and electrolyte in the interstitial space, while maximizing the power output, but most importantly maximizing the lifetime of the cells. Especifically, the lifetime must be controlled by a chemical analysis of the surfaces of the anode, cathode and electrolyte substance, which requires depth profile analyses (with respect to the rate of wear of the components used).

Schritt B:
Activity: Optimization of the chemical composition of the cells
Performer: Experimental physicist or chemist, laboratory assistant, external chemistry laboratory (for electrochemistry) as well as external analysis laboratory (for surface analysis)
Description: Alternative substances for the anode, the cathode, and, in the case of the crystal cell, for the substance carrying the electrolyte between the two electrodes, are to be investigated and evaluated with respect to the output power, as well as the service life.

Schritt C:
Activity: Development of a power buffer and a housing
Executor: Experimental physicist, laboratory assistant, electrical engineer
Description: Since the crystal cell does not permanently deliver a constant power like a classical battery, but discharges within a few minutes and then requires a self-regeneration phase of a few minutes, power gaps during the self-regeneration phase must be bridged by buffer capacitors or by similar energy storage devices, or perhaps by alternately loading several crystal cells in use next to each other.

Schritt D:
Activity: Connecting an inverter and a transformer
Performer: Electrical engineer, laboratory assistant.
Description: Conversion of the generated DC voltage and current into an AC voltage of 230 volts usable for typical electrical appliances at suitable AC current. The task is actually classically mastered technology that only needs to be adapted to the available power buffers. When supplying DC consumers such as cell phones and portable computers, step D is omitted.

Schritt E:
Activity: Development of a serial production, including the manufacturing machinery.
Performer: Experimental physicist, laboratory assistant, electrical engineer, mechanical engineer, possibly consulting an external manufacturing technologist.

Description: Since a large number of small crystal cells will have to be manufactured and interconnected in a suitable manner, a cost-optimized manufacturing technology must be found with regard to the manufacturing machines in order to be able to accommodate the batteries in large numbers in a "spacious housing".

Opportunities and risks:
Due to the fact that such permanent batteries are already in test-operation for more than a hundred years, and that I also have some (of course younger) test specimens from my own production, the risk for a technical failure of the development is very low. The only technical risk lies in the fact that it may not be possible to increase the power density as far as we would like, dependent on the technical application. Mind you, we are talking about a limit of power density at this point, not about a limit of energy density.

In the worst case, the battery would then be less compact than desired, which would result in either being able to store less energy and thus achieve less lifetime than hoped for, or in units being somewhat more voluminous than we would ideally like. In the very worst case, this would restrict us to a revolution of the world battery market, with batteries that contain perhaps only one or two orders of magnitude more capacity than the best batteries currently available on the market. However, I would consider such a development as unfavorable, even if it would open the possibility of earning enough money to finance all the other research and development components of our ZPE-energy project.

For me, however, a real disadvantage of the crystal cells lies in the fact that we are not talking about ZPE-energy utilization, but have to live with material consumption. Fortunately, this disadvantage is not existing with the melanin cells, so I personally favor the melanin cells to be the more sympathetic system. The melanin cells, however, do not tap ZPE-energy, but only convert electromagnetic radiation or thermal radiation; insofar they are not ZPE-*energy* converters (according to the first law of thermodynamics), but they are ZPE-*entropy* converters (according to the second law of thermodynamics) - with which we could live quite well. The important aspect is, they operate properly. If I would to restrict my development exclusively only the crystal-cells, I would regard this as a genuine restriction; in the case of the melanin-cells I do not have this problem.

The energy price in the range of 0,5 ... 5 cent per kilowatt hour is by far the highest price in the whole field discussed here. However, I regard this quite reasonable, because we are talking about batteries, so we are not in competition with electricity from the wall socket. By the way, it should be emphasized that due to their unlimited lifetime, melanin-cells are at the lower end of the energy price mentioned, whereas crystal-cells are at the higher end of the price range. If we compare the energy price with what we end-users are currently paying the energy companies for the cheapest of all electricity supplies, namely electricity from the wall socket, then we realize how cheap energy can really be produced, even without the need for new types of ZPE-energy technologies. When we move forward to ZPE-energy technologies in the further course of the present article, the energy price will be even much much lower.

2. Motionless-Converter

Motionless converters are ZPE-energy converters without mechanically moving components, and therefore completely wear-free. In terms of service life, we are therefore talking about the absolute top class of ZPE-energy converters. However, due to the fact that electronic components have to be used, which still have to provide high performance at frequencies in the gigahertz range, development is not easy, and the cost of manufacturing the devices tends to be very low, but not at the absolute bottom end of the scale of possibilities of all ZPE-energy systems. I have referred to templates of such devices elsewhere, according to Stefan Marinov, to Hans Coler, as well to Wolfgang Volkrodt. There are various systems of motionless-converters, of which I would like to discuss two types on the following pages. One

type are magnetic systems using hysteresis loop remagnetization of ferromagnetic materials, the other type are over-unity transformers operating according to the theory of "finite propagation velocity of interaction fields".

2.1 Magnetic Motionless-Converters

Magnetic motionless converters work on the fact that it is possible to reverse the magnetization of a suitable ferromagnetic material, applying a certain amount of energy E_X , whereby the alteration of the magnetic flux $\int \vec{B} \cdot d\vec{A}$ of the ferromagnetic material is large enough, to release the amount of energy E_Y in a secondary coil via the law of induction, which fulfils the condition of over-unity $E_Y > E_X$. If necessary, therefore we have to work with "minor loops" in the inside of the hysteresis loop.
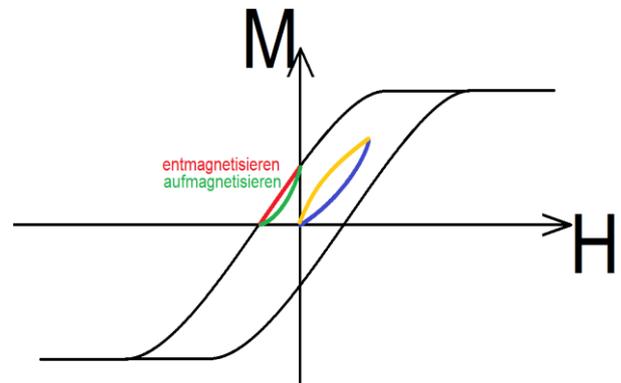
I have already published this extensively elsewhere, thus I do not need to repeat it in detail here.

2.2 „Over-unity Transformatoren"

I have published the explanation of the operation of over-unity transformers elsewhere, and do not want to repeat the theoretical principles here once more. The trick is, that primary coil and secondary track permanently exchange their role against each other, while a magnetic impulse is running back and forth between both coils, and can be brought into energetic over-unity due to the finite signal propagation time of the impulse, provided that the coils and the yoke are suitably adjusted to each other.
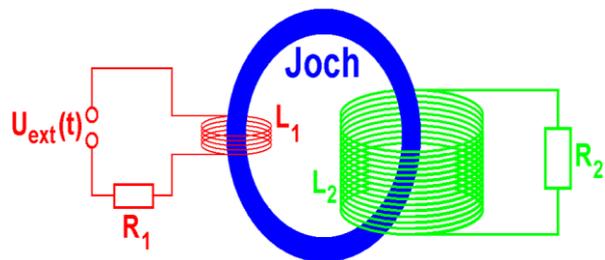
$$U_{L1} = L_{11} \cdot \tfrac{d}{dt} I_1 + L_{12} \cdot \tfrac{d}{dt} I_2 = L_{11} \cdot \dot{I}_1 + L_{12} \cdot \dot{I}_2$$
$$U_{L2} = L_{21} \cdot \tfrac{d}{dt} I_1 + L_{22} \cdot \tfrac{d}{dt} I_2 = L_{21} \cdot \dot{I}_1 + L_{12} \cdot \dot{I}_2$$

Ultimately, the electric charge oscillates between the two coils, amplifying the energy content of the pulse each time, thus building up over time.

2.3 Work planning

For both of these types of devices, the research and development work only makes sense if the theory is mastered. Therefore I have published computer simulations of the underlying theory for both types of converters. On the basis of this theory, setups like those mentioned above according to Marinov, according to Coler, and according to Volkrodt can be made. However, I personally prefer to produce my own structure, which I developed myself in theory, because I naturally understand its fundamental principles best, since it has grown on my own thoughts. For the work planning we speak of the steps listed below.

Step A:
Activity: Development of a high-performance signal generator
Executor: Electrical engineer
Description: Very special signal shapes for the supply of voltage and current (to start the over-unity transformer) are required, namely steep-edged bipolar pulses in the upper MHz range or in the lower GHz range. From the theoretical point of view, the optimal signal shape results from the existing computer simulations, but in the laboratory, the optimal yoke material still has to be found purely empirically, and the signal shape suitable for it must be determined.

Step B:

Activity: Finding the optimal materials for the yoke and magnets.

Performer: Experimental physicist, laboratory assistant

Description: In the case of over-unity transformers, a ferritic ceramic is to be found as the yoke material, in which the pulse shape of the magnetic pulses is transmitted as unchanged as possible, but the propagation delay of the magnetic pulses assumes maximum possible values. In the case of converters based on magnetic hysteresis, a ferromagnetic material with low coercivity and high remanence must be found, in which the steepest possible internal "minor loops" can be found and used, so that the largest possible alteration in magnetization and thus magnetic induction can be achieved, by a small change in the externally applied (external) magnetic field strength. Precise experimental measurements of the propagation delays and the minor loops are required.

Step C:

Activity: For over-unity transformers, my theoretical computer simulations are to be adapted to the empirically achievable values of field propagation delay-time, according to the "Theory of finite propagation velocity of interaction fields" (see: retarded potentials according to Liénard and Wiechert).

Performer: Theoretical physicist

Step D:

Activity: For the over-unity-hysteresis converters, the dimensioning of the coils, capacitors and load resistors can be done, once a ferromagnetic material with a suitable hysteresis loop is found.

Performer: Electrical engineer, experimental physicist, precision mechanic, laboratory assistant.

Description: Various (several) test setups can be manufactured by a precision mechanic. The corresponding measurements must be performed by an experimental physicist together with an electrical engineer (oscilloscope, power analyzer in the MHz/GHz range), i.e. with exactly the same laboratory-equipment which is required for the electrolysis-research, as well as for the EMDR magnetic motor. (Here, synergies with other project components of my ZPE-energy project become usable).

Step E:

Activity: Optimization steps of the motionless converter and preparation for series production.

Executor: Electrical engineer, experimental physicist, precision mechanic, laboratory assistant

Description: In all likelihood, optimization steps are required for low-cost fabrication of high-performance devices. Fortunately, mechanical stabilities are not a problem with the motionless converter since there are no mechanical parts in motion.

Opportunities and risks:

All types of motionless converters can be mounted in housings, just like normal electronic devices. So they can be placed in any electrical devices, for example in lawn mowers, kitchen mixers, drilling engines, vacuum cleaners, radios, electric bicycles, etc..., without the user having to pay special attention to them – with the advantage that the electronic device can be simply operated self-sufficiently without a supply cable and without a power socket. Especially for mobile use, this is an extremely helpful option, which will certainly lead to immense numbers of units in the market demand.

In the field of electric automobility, motionless converters can be used for vehicles that are not too powerful, by installing several such units exactly where batteries were previously located in electric cars. The fact that electric mobility cannot be realized with accumulators, because the raw material reserves (especially lithium) of our earth are not sufficient to allow the production of a useful number of electric cars, is a problem that no longer occurs when motionless converters are used instead of accumulators. In this respect, motionless converters are a possible way to save the concept of electromobility, which so far

cannot work with the technology used today. Since electric cars with motionless converters do not have to go to charging stations, the range of such vehicles is limited only by the rubber tires running off.

Because motionless converters operate absolutely silently and without any radiation, they can be placed in private homes, even in the very poorest countries on our planet, making the construction of an electrical power distribution network (power grid) unnecessary there. In the rich industrialized countries, we gain the advantage that the danger of a power blackout with the associated risks and damage of unimaginable extent will disappear completely.

Wherever rechargeable batteries can be used classically, motionless converters can be used as well, so that energy prices become much cheaper than with permanent/infinite batteries. Nevertheless, the energy price of a few tenths of a cent per kilowatt hour are still not the cheapest of what I describe in this article; this is due to the purchase price of the electronic components for the required high-performance electronics. Due to the indestructible robustness of the devices, motionless-converters are very recommendable especially in the rough industrial everyday life and in the poorest countries, because they work without any maintenance by principle.

My estimation of the chances of success (see above) are a somewhat lower than for the infinite batteries, because there are still open fundamental questions of material science to be solved, which could become a problem for the motionless converters, if the material discovery fails. Fortunately, apart from the little (badly) recorded results of Coler, Marinov and Volkrodt, there are also reports of a friend, a retired engineer, who developed toroidal core data memories as an engineer at IBM some decades of years ago, and could perform measurements, which statet that the above described criterion of the magnetic flux alteration in over-unity in the hysteresis loop was fulfilled. However, at that time IBM had completely different goals (i.e. data storage for computers) and therefore did not further investigate these toroidal memories with respect to the question of energy conversion and energy gain. In any case, I consider the encouraging reports of active inventors as a strong indication of an expected success, as well as my successful computer simulations in theory. Furthermore, there are additional reports from a radio engineer friend of mine, who has successfully achieved pleasant over-unity values in the over-unity transformer, using Feroxcube ceramics (3E5 and TX 20/10/7) as ferrite. In this respect, it should actually only be a question of consistent working methods until the desired prototypes run with high performance.

3. Water-elektrolysis and water-engines

Opposite to the classic electrolysis in under-unity (i.e. with poor efficiency), which is commonly applied in the automotive industry today, there are two other possibilities for the process of decomposing the water molecule into hydrogen and oxygen (oxyhydrogen), which work in over-unity, i.e. with good efficiency. Up to now, the underlying mechanisms are still too poorly understood to be able to distinguish which of the two mechanisms is the one that actually takes place. Perhaps both mechanisms take place, either depending on the situation, or perhaps parallel to each other.

3.1 Fundamental Theory

Possibility No.1 -> Breaking the covalent bond between the hydrogen atoms and the oxygen atom, with the aid of ZPE-energy.
In principle, this process for the "over-unity" decomposition of the water molecule is based on a paradox between quantum theory and electrodynamics. Electrons on their orbit around the atomic nucleus, require a centripetal acceleration for their orbital motion, otherwise they would fly away tangentially. A centripetal acceleration in turn means an accelerated charge, which according to Wilhelm Conrad Röntgen

leads to the emission of electromagnetic waves, which is known as X-ray radiation. Since this radiation carries energy with itself, it has to be assumed that the electron moving around the atomic nucleus permanently loses energy, and in consequence it cannot remain on its orbit, which we know to be stable. Accordingly, it should be impossible, that atoms with the known stable electron orbits, can exist at all. Obviously we face a paradox, because we consist of atoms. Not only we ourselves, but also all matter, with which we have to do all the time, consists of atoms. It is simply fact: Atoms exist. So where is the mistake in our paradox?

The paradox is solved by assuming that the electron (in its accelerated motion) is permanently supplied with energy from the quantum-vacuum, namely from the electromagnetic zero point waves of quantum-vacuum. If we assume that the electron takes up exactly the same amount of ZPE-energy from the quantum-vacuum per time as it gives off, a dynamic equilibrium of energy is established, in which the electron can perfectly keep its orbit. The energy losses due to the electrodynamics (by X-ray emission) are simply compensated exactly from the ZPE-energy. Of course, it is easy to claim something like this, but I did the math. Let's consider, for example, the 1s electron of the hydrogen atom, for which it is easy to calculate the angular frequency of the orbit around the nucleus, according to the rules of quantum mechanics. Likewise, the energy of the electron is well known from the rules of quantum mechanics, namely it is -13.6 electron volts (eV). When I calculated the frequency of the ZPE-wave of 13.6 eV of the quantum-vacuum with the same energy as the electron spins around the atomic nucleus of the hydrogen atom in the ground state, I was astonished when I found out, that the namely ZPE-energy wave has exactly the same frequency, with which the electron goes on its orbit around the nucleus. This is the reason, why it fits precisely, that the electron emits exactly the same electro-magnetic wave with exactly the same frequency by means of X-rays, with which it is excited (and thus supplied) by the ZPE-wave.

In fact, even this perception is already found in the literature, namely as one of many statements of a little known theory, called "Stochastic Electrodynamics" (SED), which plays the decisive role in connection with the "de Broglie - Bohm interpretation" of quantum mechanics (and not within the framework of the the the Copenhagen interpretation), and which does not go back to the Schrödinger-equation, but to the electromagnetic zero-point field of the quantum vacuum. Behind the development of this theory are names like, Trevor Marshall and Brafford as obvious originators. Later the developments were continued by Timothy Boyer, Luis de la Peña and Ana María Cetto, and thereby brought to an amazing blossom. Especially the colleague Timothy Boyer, physics professor at the University of New York, succeeded in reproducing all results of quantum theory by SEG, completely independent from classical quantum theory and its formalisms and computational methods. Basically, stochastic electrodynamics is a full-fledged competing theory to quantum theory, and even Heisenberg's uncertainty principle results from it - so that we would actually have to consider one theory as completely equivalent and equal to the other theory - if we consider it from a purely logical point of view. That this does not happen in the scientific community has probably purely science-political backgrounds.

Although at first I had hoped to have discovered something new, today I am even more pleased about the confirmation of my thoughts by well-known colleagues. What remains for me is to have sorted and put together some well-known puzzle pieces of science into a nice picture, from which fortunately a possible solution approach for the construction of energy-machines results.

So much for the theory in the background. The consequences for tapping some energy of the zero point waves, by the means of decomposing water molecules, can be understood according to my following explanations: If the electrons are kept on their paths only by the supply of ZPE-energy, we only need to suppress the supply of this energy for a tiny moment, and the electrons cannot remain on their paths. Once the electrons are brought briefly out of sync, they can no longer be held on their orbits by the zero-point waves. In the wave model (of the electron), the stable electron orbit corresponds to a coherence between the electron wave and the zero point wave, which can only be maintained as long as both waves are in phase. The motions of the electrons on circular or elliptical orbits around the atomic nucleus can be

regarded as two-dimensional oscillations, which are known under the name of Lissajous-figures. And these two-dimensional oscillations are just, as long as the electron is keep on its orbit, in coherence with the oscillations of the zero point waves. The latter are of course electromagnetic waves (in the quantum-state $|n>=0$). All we need for the decomposition of the water molecule, is a tiny electrical or a magnetic pulse, which brings the electron out of sync, in order to derange the coherent excitation of the electron wave by the zero point wave. If, for example, in a covalent bond, one of the electrons responsible for the bond, can be thrown out of its orbit by these means, the electron pair bond called "covalent" will be detached, so that the bonding partners, (i.e. the two atoms bonded together), can no longer stick together. The over-unity criterion in breaking the bond of the hydrogen atom with the oxygen atom, is the condition that the energy input for the tiny "perturbing (deranging) impulse" is less than the chemical energy output being contained broken water molecule, namely the oxyhydrogen gas. As soon as we manage to detune the electron from its pair bond with much less energy than is contained in the separated gases of the oxyhydrogen, we can decompose the water into oxyhydrogen in a very energy-efficient way.

Possibility No.2 -> Nuclear transmutation processes with transformation of the oxygen atomic nucleus.
When talking about the transformation of atomic nuclei, many people first think (with horror) of the fission of atomic nuclei, or (with a little less horror) of nuclear fusion, even though very powerful bombs have been built with the latter one. In reality, however, the transformation of atomic nuclei takes place absolutely harmlessly and peacefully in the free nature; it is a natural biological process known as "nuclear transmutation." One of the leading researchers in this field was Corentin Louis Kervran. [KER 83] His entry point in to this work was in the discovery that chickens lay eggs with calcium shells, even when they cannot find food containing calcium. Even if this colleague has been posthumously ridiculed for his discoveries [IGN 93], he himself already said, that facts do not disappear by ignoring them [HUX 27], and shows us further other examples of several biological nuclear transmutation processes. Andrea Rossi actually used the nuclear transmutation processes in the laboratory for the production of usable energy, in his case between the nuclei of nickel and copper. These two elements are right next to each other in the periodic table, so they need only a very small change in the atomic nuclei for a transformation to occur. [ROS 15] In the meantime there is talk that a serial production of powerful devices has started, up to the megawatt range, but that these devices are not sold in Europe because of political uncertainties. [ROS 21] Disparagements not only against Andreas Rossi are well-known in Europe and other industrial nations of the so-called "first world", so that it is not necessary to quote further literature references/sources here. I simply feel it more polite and elegant not to refer to unobjective sources, in which facts are twisted, and often half-truths are presented.

Let us turn substantively to the possible role of nuclear transmutations in the splitting of water molecules. Observing natural or near-natural nuclear transmutations, we do not have to think about the extremely high excitation energies (temperature) for nuclear transformations, such as those required in hot nuclear fusion, or present in the burning process of the Sun. There, temperatures of many millions of Kelvin occur, which we definitely do not need to reach. For us, excitation energy amounts that are several orders of magnitude lower are sufficient. For our purpose, it is sufficient to deal with the question of the generation of temperatures in the range of a few 1000 K or a few 10'000 K. We do not know whether nuclear transmutations are triggered by these temperatures. Whether this can trigger nuclear transmutations, or whether the mechanism set in motion for the decomposition of the water molecule is based on the "derangement" of the electrons in the valence bond according to mechanism no. 1, cannot be clarified from the point of view of theory, but can only be determined experimentally, for example by analyzing the hydrogen-oxygen gas mixture produced. If this gas contains isotopes, which were not present in the natural water, this would be a clear proof for the taking place of nuclear transmutations.

The production of temperatures in the range of some 1000 K or some 10'000 K or more, are less difficult than might be expected on the first glance. There is a whole range of possibilities which seem to be surprisingly effectively realizable.

(a.) Electrical flashovers can reach temperatures of up to 30'000 K. This is not generally the case for all electrical flashovers, for example the typical car spark plug only reaches temperatures in the range between 450 ... 800 (max. 1200) Kelvin (although the combustion of the gasoline-air mixture in the cylinder can release temperatures up to about 3000 K). But in thunderstorm lightning in normal weather, for example, the mentioned 30'000 K have been found. [DEH 21]

(b.) In arc welding, typical working temperatures are between 4000 K and 16'000 K.

(c.) Humphry Davy has used short pulse arcs at a gas pressure just above one tenth of a bar, to produce temperatures between 5000 and 50'000 K. The short electrical pulses needed therefore can for instance be generated from a capacitor. (Typical example values: 4000 V at 4 A, but only for tiny fractions of seconds).

(d.) The Edison-Richardson effect is known to allow electrons extracted from an incandescent cathode to be post-accelerated to a few keV with electric voltage. Inserting the Boltzmann constant of $k_B \approx 8.617 \cdot 10^{-5} \, eV/K$ into this consideration, $E_e = \frac{3}{2} k_B T$ allows the calculation of a temperature equivalent to the kinetic energy of small particles, which says that one electron volt corresponds to 7736 Kelvin ($1eV \triangleq 7736K$) Let us regard a numerical example: If for instance electrons are accelerated by a voltage of only 10 kV, a temperature equivalent of $T_{\ddot{A}} = 7.736 \cdot 10^7 K$, is obtained for each individualy accelerated electron. In any case, 77 million kelvin is already a sufficiently high energy to trigger a nuclear transformation (cf. beta radiation). With a betatron tube, the electron energies could be increased to 200 keV, for example, and would thus be higher by a factor of 20, namely at $T_B = 1.547 \cdot 10^8 K$, but I think we won't need to go that far with the temperature.

(e.) In fact, due to the Edison-Richardson effect, I got the idea to shoot the electron beam into water droplets or into water-nanoparticle-mist, or perhaps to work directly with voltage flashovers in water droplets or water-nanoparticle-mist. The process reminds me of so-called "sputtering" (electron beam evaporation). Fortunately, a friend in the ZPE-energy community showed me that this has also been tried long time ago, and it worked. [GRA 97]

As been said above: By theoretical means, it can not be decided, whether electrons are thrown out of their orbits, whether nuclear transmutations are triggered. This question can only be answered by measurements. Therefore we leave it open at this point now. Independently from this open question, I want to discuss now, how we can imagine nuclear transmutation processes in the transformation of the oxygen atomic nucleus from the water molecule. Stable isotopes of oxygen, fluorine and neon are found as follows: -> Oxygen: ^{16}O, ^{17}O, ^{18}O (all three are stable).
                   -> Fluorine: ^{18}F (half-life 109.77 minutes) and ^{19}F (stable)
                   -> Neon: ^{20}Ne, ^{21}Ne, ^{22}Ne (all three are stable)

The nuclear reactions that could then take place as following:

$${}^{16}_{8}O + {}^{1}_{1}H \rightarrow {}^{17}_{9}F$$

$${}^{17}_{9}F \xrightarrow{\beta^+} {}^{17}_{8}O \quad (\text{half life } \tau_{1/2} = 64.49\,\text{sec.})$$

$${}^{17}_{8}O + {}^{1}_{1}H \rightarrow {}^{18}_{9}F$$

$${}^{18}_{9}F \xrightarrow{\beta^+} {}^{18}_{8}O \quad (\text{half life } \tau_{1/2} = 109.77\,\text{Min.})$$

$${}^{18}_{8}O + {}^{1}_{1}H \rightarrow {}^{19}_{9}F \quad \text{or alternatively} \quad {}^{18}_{9}F + {}^{1}_{1}H \rightarrow {}^{19}_{10}Ne$$

$${}^{19}_{9}F + {}^{1}_{1}H \rightarrow {}^{20}_{10}Ne \qquad\qquad {}^{19}_{10}Ne \xrightarrow{\beta^+} {}^{19}_{9}F \;(\tau_{1/2} = 17.34\,\text{ms.})$$

$$\begin{pmatrix} stable \\ ready \end{pmatrix} \qquad\qquad\qquad {}^{19}_{9}F + {}^{1}_{1}H \rightarrow {}^{20}_{10}Ne$$

$$\begin{pmatrix} stabel \\ ready \end{pmatrix}$$
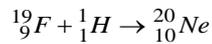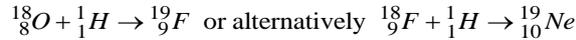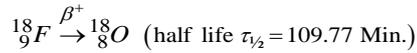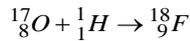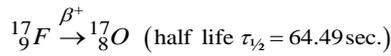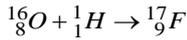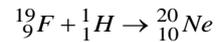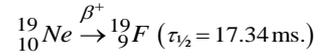
To calculate how much nuclear binding energy is released in the process, we simply consider the mass defects in the nuclear transformations:

$$\underset{\substack{mass\ of\ the\\nucleus}}{M_K} = \underset{\substack{mass\text{-}sum\ of\\all\ protons}}{\sum m_p} + \underset{\substack{mass\text{-}sum\ of\\all\ neutrons}}{\sum m_n} - \underset{\substack{mass\text{-}\\defect}}{\Delta M}$$

We calculate with „atomic mass units". According to CODATA it is

$$1u \cdot c^2 = 931.49410242\,MeV \quad (atomic\ mass\ unit)$$

$$m_p \cdot c^2 = 938.27208816\,MeV \quad (mass\ of\ the\ proton)$$

$$m_n \cdot c^2 = 939.56542052\,MeV \quad (mass\ of\ the\ neutron)$$

Therefrom, we calculate the binding energies of the nucleons in the oxygen atomic nucleus and in the neon atomic nucleus:

$$\left.\begin{array}{l} {}^{16}_{8}O \text{ contains } 8 \cdot m_n + 8 \cdot m_p = 16.127528u \\ \text{whereas } m\left({}^{16}_{8}O\right) = 15.99491462u \end{array}\right] \Longrightarrow \begin{array}{c} mass\ defect \\ \Delta M_O = 0.13261338u \triangleq 123.528581372\,MeV \end{array}$$

(Remark: If I would calculate exactly not with the atomic mass but with the nuclear mass, the value for the binding energy would be a little higher, namely to $127.617\,MeV$, in agreement with the literature).

Just for a rough estimation of the energy amounts, my simple approximation neglecting the energy of the electrons of the atomic shell is sufficient now, and we perform the analogous estimation for the stable neon:

$$\left.\begin{array}{l} {}^{20}_{10}Ne \text{ contains } 10 \cdot m_n + 10 \cdot m_p = 20.15941\,u \\ \text{whereas } m\left({}^{16}_{8}O\right) = 19.99244021\,u \end{array}\right] \Longrightarrow \begin{array}{c} mass\ defect \\ \Delta M_{Ne} = 0.16696979u \triangleq 155.5313746673\,MeV \end{array}$$

The difference of the two mass defects amounts to:

$$\Delta E \approx \Delta M_{Ne} - \Delta M_{Ne} \approx 155\,MeV - 123\,MeV \approx 32\,MeV$$

Since the approximation error due to the neglect of the electron shells, goes into the same direction in both cases, it largely cancels out in the difference, so that we may assume, neglecting lower decimal places, about **32 MeV** of released energy per complete nuclear transmutation process. But even if the nuclear transmutation process does not run through completely for all atomic nuclei up to the stable end at the neon, we see enough energy gain to be able to develop and build a reasonable energy source for the technical usability.

3.2 Technical Realisation

Beyond the question, which mechanism is the decisive one for the effect of the planned energy converter, we want to turn our attention now to the possibilities of the technical use.

In order to insert the energy for triggering the decomposition of the water molecules, various procedures are suitable, as became clear to me by the verbal communication with several different inventor colleagues. We will now go through these possibilities as following.

> (a.) electric pulses (short duration, strong electric fields)
> (b.) magnetic pulses (short-term, strong magnetic fields)
> (c.) laser pulses
> (d.) ultrasonic
> (e.) microwaves
> (f.) thermolysis

In all cases, the aim is to create a self-contained cycle that operates completely without exhaust gases and completely without residues at all, releasing nothing (absolutely nothing !) into the environment - except just the usable energy desired by the consumer. Water remains water, and usable energy is created on the way via the intermediate products:
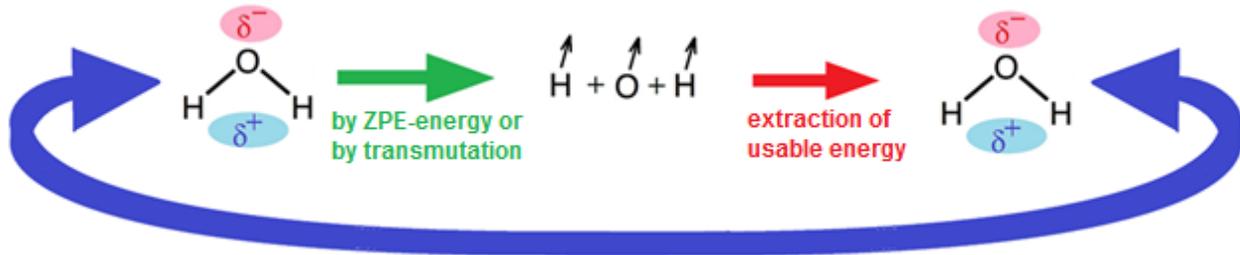
to a & b: Excitation by short electrical pulses and/or magnetic pulses.
Purely electrical pulses can be generated with a pulse generator and applied to two electrodes in a water bath.
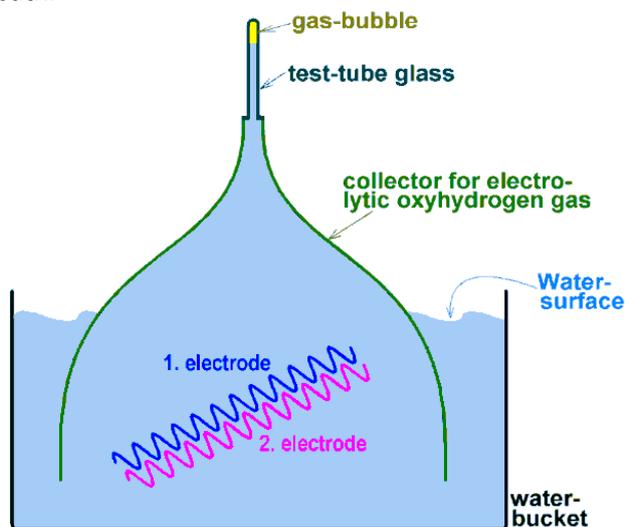
Determination of the efficiency is not complicated. One simply puts the energy gained in the oxyhydrogen gas according to volume measurement, in relation to the electrically supplied energy. With a primitive setup in an old paint bucket, I obtained an efficiency of about 9 % for direct current electrolysis. This is neither much nor little, but it is merely a calibration mark to show me what a bent sheet of metal from an old washing machine drum can do. Of course, a commercially purchased, professionally manufactured electrolysis cell or apparatus would be much more efficient.

I cut the stainless steel sheet of a broken washing machine drum into strips and mounted them as electrodes inside a paint bucket.

Details have been discussed extensively elsewhere. The crucial point is that electrolysis is not performed with DC voltage and DC current, but with steep-edged pulses. The best efficiency so far, I could achieve with asymmetric bipolar square wave signals over a moderate DC voltage offset (a bit different from the diagram below).

With a suitable signal generator the usable pulses can be generated easily. Shown here is an ideal pulse shape, the real obtained pulses appear different, also because the two parallel plates of cathode and anode represent a capacitor, which must be charged and discharged with each pulse. With a storage oscilloscope and a current transducer, U(t) and I(t) have been recorded, so that the integral $\int U(t) \cdot I(t)dt$ could be conveniently evaluated after the measurement. The counting of the oxyhydrogen gas volume proceeds in the same way as for the direct current electrolysis. The coefficient of performance (COIP) depends, of course, on the pulse-pause ratio of the signals, and on their frequency.
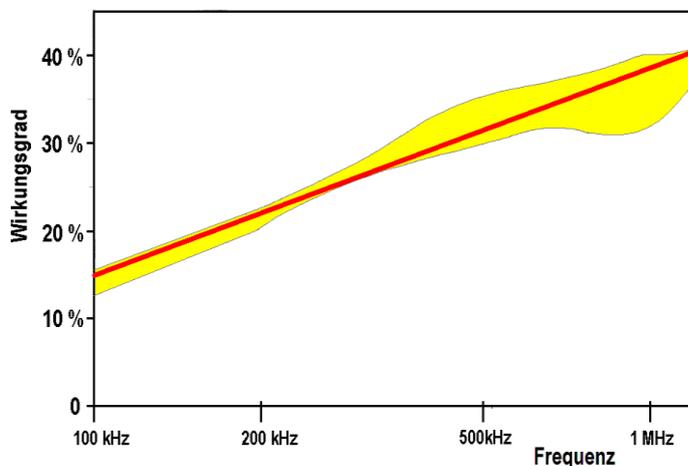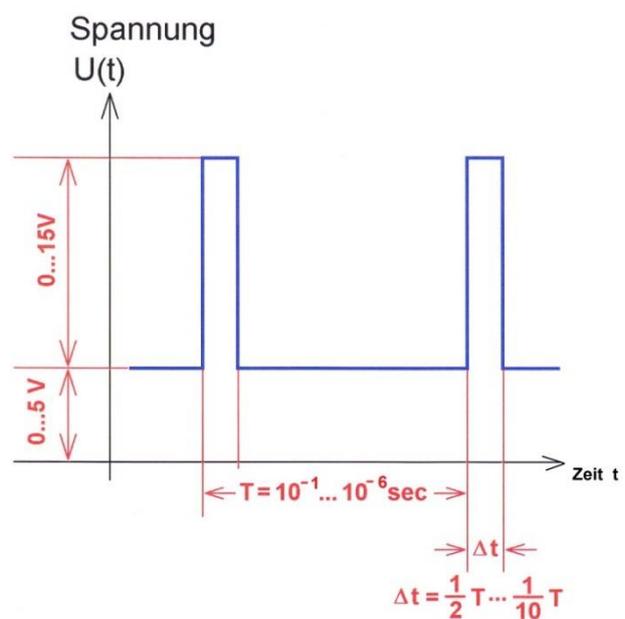
As already indicated, the increase of the COP as a function of frequency was astonishingly good. The yellow highlighted field in the adjacent graph shows the area in which all measured values occur.

Due to the logarithmic representation of the frequency scale, the value (of 9%) for the direct current electrolysis (at a frequency of 0 Hz) cannot be displayed in the diagram, but the linear increase of the COP in the logarithmic scale, which I

have indicated by a red best-fit line, becomes obvious. The red regression line shows a slope of Δη = 21% per frequency decade. By means of an optimization of the pulse-pause ratio and an optimization of the

pulse shape (making it bipolar !), the increase of the efficiency could be increased up to 46% at a frequency of 1.2 MHz.

Unfortunately, with the simple hobby-electronics equipment that a friend allowed me to use for free, I was only able to increase the frequency up to 1.2 MHz. If I had had professional laboratory equipment, the frequency could certainly have been increased up to the gigahertz-range, which is nothing special nowadays, if we remember that most modern computers are also already clocked in the range of a few gigahertz.

Let's now perform a simple rough calculation in our heads: Between 1.2 MHz and 4 MHz is half a decade, and if I increase to 4 GHz, I already have 3.5 decades, corresponding to an increase of $3.5 \cdot 21\% = 73.5\%$. These are to be added to the 46% already achieved, thus we end up with 120% for the expected COP at 4 GHz. If we increase the frequency even more, then of course an even higher COP could be expected. Of course, we do not know if the slope can be linearly extrapolated further in the assumed manner, but the comparison with other work in the literature, where even significantly better COP-values have been achieved, suggests this. [DHA 12] Furthermore, Stanley Meyer is famous for his very large over-unity decomposition of the water molecule by electrical means. [Mey 98]

An additional increase of the COP is expected, if we used a professional electrolytic cell instead of an old cut-up washing machine drum . . . nice to imagine.

In order not to fail the review process of the professional journals, the colleague [DHA 12] of course describes his result in a deliberately tricky way by saying that with AC electrolysis, 96.8 % of the electrical energy to be fed in, are saved compared to DC electrolysis. With a number smaller than ONE, i.e. below 100 %, it becomes tolerable for the reviewers in the so-called "peer review" process.
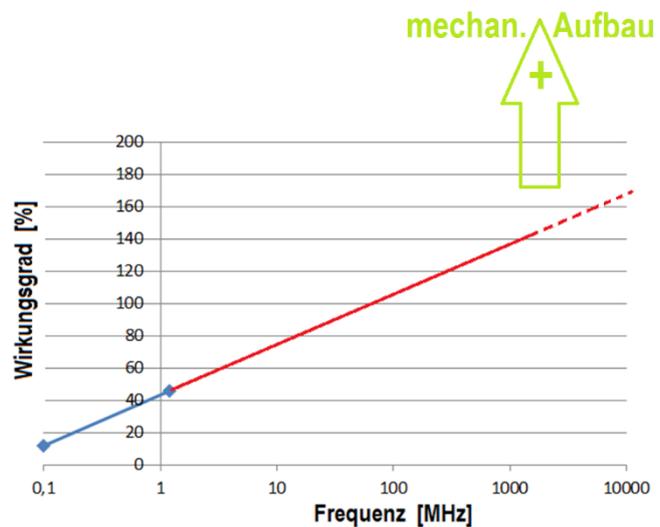
If we look to the numerical result in a meaningful way, the energy saving of 96.8 % means that the colleague only has to feed in 3.2 % of the electrical energy of what he would have to spend with a direct current electrolysis. And now we regard the evaluation and interpretation of this number: 3.2 % = 0.032 is the reciprocal of the COP, which thus comes to 1 / 0.032 = 31.25 = 3125 %. The colleague therefore gets 31.25 times as much energy out in the oxyhydrogen, as he has to put in electrically.

If, for example, I succeeded in improving my mechanical setup by a factor of 6...8 by replacing the rusty washing machine sheet metal with a commercial electrolysis cell, then I would have an efficiency of $7 \times 9\,\% = 63\,\%$ in DC operation, which is quite consistent with the typical values reported by manufacturers. If I now multiply the value by 5, for switching to pulse current operation at 1.2 MHz, we already arrive at a COP of a little bit more than 300%. Increasing the frequency into the gigahertz range would perhaps raise my COP to about 400 ... 500%. With this, I would still not yet reach the value of Dharmaraj and Adish Kumar, but at least I recognize encouragingly that I am on the right way with my findings and experiments.

The further increase of the efficiency by additionally added (high-frequency) magnetic pulses has been reported occasionally by inventors, but is not yet so far known in the literature enough to quote serious reference results of other research groups. I mention this option only, to point out that there are still possibilities for experiments, which should be kept in mind for further improvement. The extent of the expected effect is left to experiments to be performed later.

to c & d: Laser pulses, ultrasonic, microwaves

Following an oral report which sounded serious, the ignition of finest water mist should be possible with laser pulses or alternatively with ultrasonic. Finally it doesn't matter whether we deliver the energy for the triggering of the ZPE-conversion, by nuclear transmutation, by laser pulses, or with electric ignition, or with gasoline. The possibility to kinetically accelerate water droplets in over-unity with electric pulses, has been investigated at [GRA 97], where voltages in the range between 10 kV and 20 kV were quite sufficient to achieve energetical over-unity. The electrical pulses were taken from a capacitor, which allows a very high electrical current for a short time, and thus a sharp bunching of the energy.

If similar short sharply focused energy pulses are introduced into the water droplets with a laser, we are not at all surprised to observe comparable effects. It seems just the same plausible and logical, that ultrasonic pulses can be sharply focused accordingly to produce oxyhydrogen gas from water mist in over-unity. One inventor told me how he was able to run an internal combustion engine on 100% water mist in this way, without having to add gasoline. Water is injected instead of gasoline. The mixing ratio of water mist with air is somewhat different from the mixing ratio of gasoline with air in a gasoline engine, and the ignition time must be set differently because, on the one hand, the generation of the oxyhydrogen gas by ultrasonic takes some time, but, on the other hand, the oxyhydrogen gas explodes much faster than the relatively slow-burning gasoline mist in air. Fortunately, there seems to be the additional effect that the energy released during the combustion of the oxyhydrogen gas causes further water mist to decompose into further oxyhydrogen gas with additional absorption of ZPE-energy, further intensifying the explosion process in the cylinder. The fact that the reaction ends, before all the water mist is consumed completely, is certainly due to the fact that the classic internal combustion engine used for the experiments had (as standard) an exhaust valve installed, which ensured that the cylinder was emptied regularly. In fact, this very classic gasoline engine was operated with pure water mist, after being reorganized with a manageable amount of work.

In principle, it does not really matter, with which method the necessary energy is inserted to excite the water molecules in the (possibly finely atomized) water droplets. Successful experiments with microwaves has also been reported.

to e: thermolysis

Thermolysis seems to be a particularly simple method of decomposing water molecules into oxyhydrogen gas with the aid of ZPE-energy. All we needed is an internal combustion engine in which, in addition to gasoline mist and air, additional water mist present at the ignition. This can be achieved either by simultaneous parallel nebulization, i.e. by having three supply lines to the cylinder, one for air, one for gasoline, and one for water, whereby the two liquids must be nebulized. Or it can be achieved by emulsifying gasoline with water in a special process, and injecting the emulsion into the cylinder through the gasoline line for combustion. In the latter case, different processes have been presented by different inventors, for example, via vortex processes or with ultrasound. [GES 21], [KIR 21], and several others... It is not surprising that such inventions are massively fought against, and therefore end up in juridical court, because even a gasoline saving of only 30 ... 50 % would reduce the profit of the oil industry remarakbly. The explosiveness of these fuel-saving methods is due to the fact that a completely normal standard gasoline engine can be used without too complex reorganization of the engine. Only the ignition timing has to be adjusted suitably, and the tank has to be filled with a fuel, which is a gasoline-water emulsion (with diesel engines naturally a diesel-water emulsion). If this method of gaining additional free energy (no matter whether from zero-point energy or binding-energy from nuclear transmutation) is unsed in such a simple way, the danger is of course particularly large that tvery quickly very many people want to realize the savings for themselves – especially since the exhaust gases are substantially cleaner, than with the today usual internal combustion engines, which are operated with 100% gasoline and/or with 100% diesel. Obviously, the improvement in the combustion process due to the elemental hydrogen and elemental

oxygen in the cylinder, helps the molecules of the combustion fuel to burn better, leaving significantly fewer pollutants.

3.3 Work planning

Thermolysis appears to be a particularly simple process for decomposing water molecules. Of course, the various possible implementations lead to different types of engines and therefore also require very different types of research and development work. The decomposition of the water molecules is only one part of the task. The other task is the energy recovery from the oxyhydrogen gas, which can either take place by combustion (in internal combustion engines), or can lead directly to the generation of electrical energy via fuel cells, for example. In all cases, the end product reverts to water and can be returned into the tank, eliminating the need for any exhaust. Exhaust gases or any substances that have to be discharged into the environment are not produced at all.

Step A: In the case of electrical excitation of the water molecules
Activity: Development of a high-performance signal generator
Executor: Electrical engineer
Description: Very special signal shapes for the supply voltage and the supply current of the electrolytic cells are necessary, namely in the upper MHz range, or in the GHz range. Such frequencies are feasible, that is no problem; just remember that typical computers today work with clock frequencies in the GHz range. The easiest type of signals are rectangular shaped signals, because therefore, only a (fast semiconductor-electronic) switch has to be opened and closed periodically toggling a strong supply. Other signal shapes of course are much more complicated to be generated. The optimal signal shape is still to be determined, under control of power measurements, including a corresponding optimization of the signal shape.

Step B: In the case of electrical excitation of the water molecules
Activity: Finding the optimal materials for cathode, excitation of electrolytic cells.
Performer: Experimental physicist, laboratory assistant
Description: The geometry and especially the material choice of the electrolysis cell arrangement can probably be significantly influenced and accelerated by adopting existing developments that can be bought on the market. Electrolysis cells are available on the market. However, the extent to which the geometry of the purchasable DC electrolysis cells will be transferable to our conditions remains to be investigated.

Step C: In the case of electrical excitation of the water molecules
Activity: Ganing usable energy from the generated oxyhydrogen gas
Performers: experimental physicist, mechanical engineer (specialist in thermodynamics or automotive engineering), precision mechanic, laboratory assistant
Description: If the resulting oxyhydrogen gas can be separated into hydrogen and oxygen, its use in a fuel cell to generate electrical energy is relatively simple, because units available on the market can be purchased and used.

If, on the other hand, we do not succeed in separating the hydrogen gas from the oxygen gas as it is produced, so that we obtain a gas mixture, we will only be able to use it in an internal combustion engine, which would of course involve losses that should not be underestimated due to the COP of the internal combustion engine, which must be compensated by a correspondingly high over-unity in the production of the oxyhydrogen gas. However, since we are not dependent on pumping out the exhaust gases, in contrast to the classic internal combustion engine, we can build a much more efficient internal combustion engine than would be the case with gasoline and diesel. We do not need to discharge the water mist which remains unburned in the cylinder of the combustion engine, via an exhaust valve, but we can reuse it for the next combustion process (for the next explosion). This, of course, saves us the energy losses of the classical combustion engine according to the second law of thermodynamics. From the thermodynamic principle, the COP of a classical combustion engine is between 30% and 35%, whereas due to the fact that

no exhaust gases have to be discharged, we can achieve a COP not far below 100% (minus friction) when burning the oxyhydrogen gas. For this purpose, the internal combustion engine must of course be constructed differently that classical internal combustion engines with gasoline or diesel. This is obvious. The structure of our internal combustion engine, which is not limited by the second law of thermodynamics, but only by the first law of thermodynamics, can then be designed as follows.

> In a large (voluminous) compressed air vessel, we generate the pressure not with a compressor, but by over-unity combustion of the water mist.

> Since the obtained energy is stored in the compressed air tank, the combustion can proceed as slowly as desired, so that the water mist can be completely burned as fuel, not being pumped out unburned through the exhaust as it is the case in the classic gasoline or diesel engines.

> For the combustion process we have so much time that we can even do it without any explosions, in order to work with a comfortable continuous combustion, which has nothing else to do than to maintain the necessary working pressure, to supply the working steps described as following.

> The only important thing is that we have to maintain a usable minimum pressure in the compressed air vessel throughout the entire operating period, with which we drive a downstream air motor.

> Inside the vessel containing the compressed air, we can keep the pressure suitable for the downstream air motor and maintain it throughout the entire operating period. If the pressure drops down below a certain level (due to consumption), we can simply "add a little" pressure again, by means of new combustion of water-mist. Fresh air is supplied only to the extent necessary for complete combustion of the water-mist, which ideally should not require an fresh air at all, because the components of the water react with themselves.

> Compressed air is taken from the compressed air vessel to drive a downstream air motor. We do not have to do anything else, than to replace the extracted compressed air with fresh air. There is no pollution of the air at all. Only those parts of the water mist that are needed for the downstream air engine must be replaced by fresh water mist.

> The option of additionally injecting gasoline mist can be provided, but ideally we operate completely without it.

Air motors can be bought ready-made, and hopefully do not have to be developed by ourselves. [DRU 20] However, the question of the best possible COP of the air motor also plays a role.

Principle sketch of the setup:

The compressed air vessel needs good thermal insulation so that the heat of combustion is thermodynamically converted into pressure.

The compressed air vessel may have 50 … 100 … 200 liters of volume, and 50 … 100 … 200 bar of pressure.
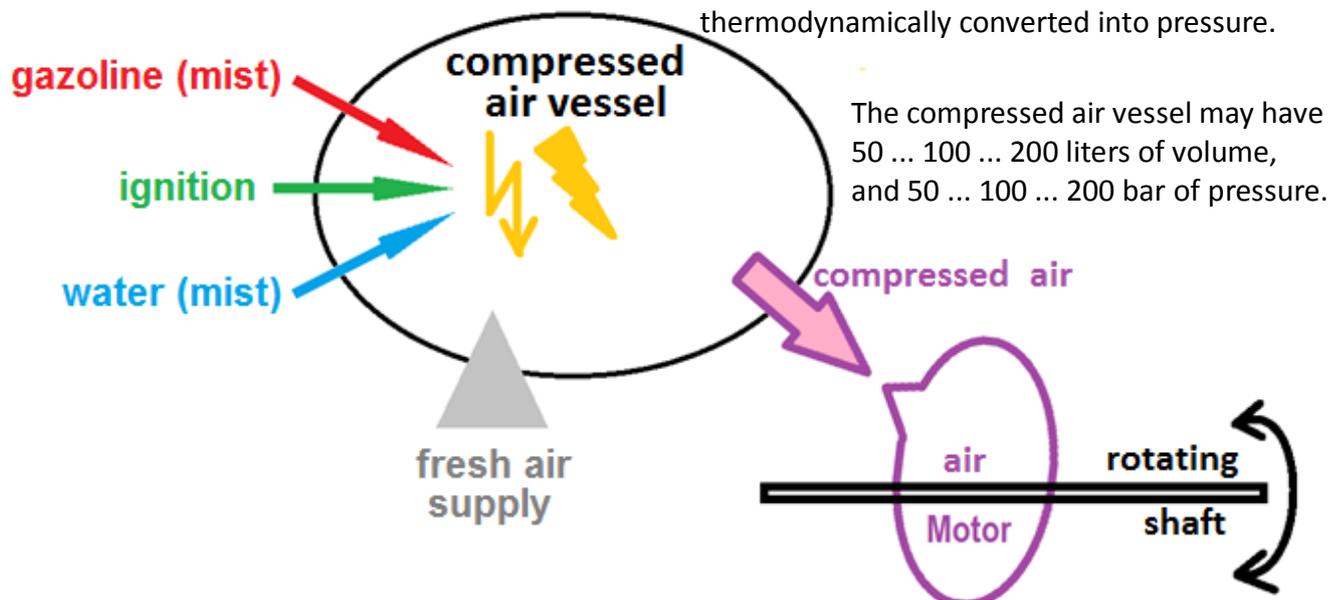
Step D: In the case of non-electrical excitation of the water molecules
Activity: Development of an excitation source -> pulse laser, ultrasound, microwaves.
Performer: engineer and physicist, precision mechanic, laboratory assistant
Description: In case of non-electrical excitation of the water-molecules we do not have a possibility to separate anions and cations (towards the anode and towards the cathode), so it is out of question to supply the oxyhydrogen-gas to a fuel cell. On the other hand, the method of working with the compressed air vessel and compressed air motor as just described, seems to be particularly favorable and advantageous in this case. We can carry out the excitation of the water-molecules by the ignition source directly inside the compressed air vessel. The coupling of the exciting impulses into the compressed air vessel has to be developed.

Step E: In the case of Thermolysis
Activity: Construction of an internal combustion engine, production of gasoline/diesel and water mixture
Performer: Automotive engineer, precision mechanic, laboratory assistant
Description: From the technical point of view, the development of the partially gasoline or diesel powered water engines, appears to be the weakest variant of the water engines, because in contrast to all other variants, classical combustion fuel is still needed. It is obvious that this variant is not perfectly environmentally friendly, because petroleum is still necessary, and exhaust gases are still produced. I would only get involved with such a transitional technology if there would not be enough money to develop a perfectly environmentally friendly version. Due to the energy savings of 30 ... 50 ... 80 % compared to the current engines, the demand for such improvement of classical engines will be immense worldwide (even if they are far away from the top class), I would develop such systems only to earn the money needed for the development of all the other really good ZPE-energy systems.
There would be only two things to develop:
First -> A system, which mixes the classical combustion fuel with the water in such a way that the fuel injections available today, in our usual/buyable combustion engines can cope with it.
Secondly -> Finding the operating parameters for proper operation with the water-combustion fuel emulsion.

Opportunities and risks:
Water motors, regardless of their design, have a rather large power density and can therefore be used without any problems in all applications of today's common combustion engines.
In all other processes types, except the thermolysis, the continuous processing of the water mist means that there is no engine noise at all, which in the case of the classic combustion engine is only caused by the explosions, but which we do not generate by principle, due to the continuous combustion of the water mist. Therefore, in contrast to classical combustion engines, water engines operate completely noiselessly. Since no exhaust gases are produced, such units can also be used to supply classic households, medium-sized craft enterprises, etc...
Thus, all water motors (except the thermolysis systems) were already quite close to the royal class, but because of the complexity of the construction, do not quite reach the robustness and the optimal energy price of the magnetic ZPE-energy engines. A big advantage over the magnetic motors is that the water motors (unlike the magnetic motors) can be operated not only stationary, but also mobile.

4. Magnetic motores (EMDR & MMDR)

4.1 General remarks

After I had developed my theory of the "Finite Propagation-Speed of the Fields of Interaction" (FPGW, abbreviation in German language) and proved it practically in the laboratory by the means of the Magdeburg Electrostatic Rotor, I started to develop magnetic motors, which I have completed in theory

meanwhile. For this reason, the theory of magnetic motors is abundantly published elsewhere, so I do not need to repeat it here. So let's talk right away about the steps for the practical production of powerful prototypes of magnetic motors, which are suitable to be the models of large quantities of serial production.

Within my construction guidelines of magnetic motors, I gave then the name EMDR = "Electro-Magnetic Double Resonance Converter". Since I could not determine several practical parameters within the computer simulations due to the lack of a laboratory, and additionally I eliminated some subordinate calculation errors, in combination with a technical optimizations, I published a corrected advancement of these magnetic motors under the name MMDR = "Magnetic Magnetic Double Resonance Converter".

4.2 Work planning

Step A:
Activity: revolution speed – power – dimensions -> calculate their characteristics and operating curves
Executor: Theoretical physicist
Description: On the basis of existing computer simulation algorithms, a machine design of a magnetic ZPE-energy motor has to be carried out, which, taking into account all aspects of material technology and the required mechanical engineering elements, should deliver an output power in the range of a few 100 watts or a few kilowatts, i.e. should be able, to gain significantly more energy from the quantum-vacuum than the occurring friction needs during operation, so that it can work as a self-running engine, driven completely by the ZPE-energy of the quantum-vacuum. The tasks to develop an appropriate maching-design also includes the dimensioning of the required magnets, the coils, the capacitances of the condenser bank, the rotational speeds of the magnet-rotor, etc... In fact, we have to start with a refinement of the existing computer simulations, in which the operating principles have been taken into account, but not yet the limitations due to the available materials. Moreover, the computer simulations have to be permanently adapted and further developed during the practical laboratory work. Each time when we obtain new knowledge about the operating parameters or of the structure of the engine, we have to include this knowledge into the theoretical computer simulations.

Step B:
Activity: Mechanical engineering support of task "A".
Executor: Mechanical engineer, laboratory assistant
Description: At first, the optimal materials and engine-parts have to be researched, alternative bearing concepts (aerostatic/hydrostatic bearings, air bearings versus magnetic bearings versus high performance ceramic bearings or tip bearings, water bearings) have to be compared. Furthermore, high-tech materials for the construction of the high-speed rotors must be investigated, because the minimum possible rotor diameter for prototype production depends on it, since the angular velocity of the rotating magnets is decisive for the operation of the magnetic motor, which in turn significantly influences the centrifugal forces ($\vec{F}_z$ = central forces) acting on the rotor.
It is $\vec{v} = \vec{\omega} \times \vec{r}$

and $\vec{F}_z = m\vec{\omega}^2 \vec{r}$, thus we receive an absolute value of $F_z = \dfrac{m \cdot v^2}{r}$

As can be seen, for a given linear orbital speed of the magnets, the centrifugal forces decrease with the radius of the rotor " r ", so that the rotor diameter must be at least large enough that the material is just able to withstand the centrifugal forces resulting from the required rotary speed. This results in the minimum possible rotor diameter, for prototype same as for the series production, which in turn means that a certain size cannot be undershot with the magnetic motor of the EMDR-type as well as the MMDR-type. This is the technical reason why a machine power of about 5 kW (using currently available materials) cannot be reasonably undercut.

Step C:

Activity: Development of a classical drive concept for starting the engine (starter motor) and for test runs

Executor: Mechanical engineer, experimental physicist, precision mechanic, laboratory assistant

Description: A high-speed drive unit is needed, with which the magnetic motor can be started and brought almost to full working speed, in any case beyond the critical speed value, from which the power taken from the ZPE-energy is greater than the power absorbed by friction, so that the magnetic motor can run as in a self-propellant mode, i.e. driven completely from ZPE-energy. In addition, a clutch is necessary from the very beginning, to disengage the classical drive, in combination with a brake for the later option of emergency braking, so that the motor cannot overspeed due to the ZPE-energy inserted from the quantum-vacuum in the course of the following development steps.

Step D:

Activity: Preparation of a test setup for the investigation of the bearing, including a measuring method for highly dynamic torque measurement (spatially resolved in single angular degrees)

Executor: Experimental physicist and precision mechanic, laboratory assistant

Description: Bearing concepts must be realized and tested in order to achieve the angular velocity calculated from the computer simulation, without overloading or damaging the rotating material (by centrifugal forces). The rotary speed must be represented in a fatigue-proof manner. At the very beginning, I recommend to use a classical drive for the rotation of the rotor (turntable with magnetic equipment), so that the speed of rotation can be controlled under the supply of classical energy.

For the measurement, a device for highly dynamic torque measurement has to be developed, which can record all changes of the speed and torque during each individual passage of magnets. Furthermore, measurement methods are required to analyze the material stresses and loads, as well as the bearing forces and friction. In the case of air friction proving to be large enough to seriously hinder the running of the magnetic rotor as a self-propeller (see: increasing the critical angular velocity for self-running operation, as mentioned above), the entire magnet motor must be set up in a vacuum chamber, where a "normal" technical high vacuum will suffice (a ultra-high vacuum should not be necessary).

Step E:

Activity: Development of a speed control system with an overspeed protection, including an emergency brake.

Executor: Electrical engineer (with the help of the mechanical engineer), laboratory assistant

Description: An electronic circuit is to be developed and constructed, which permanently monitors the angular velocity (speed) of the rotor with the help of a measuring sensor, and also records the maximum speed during each magnetic passage. In the case of exceeding a presettable threshold, an emergency brake must be activated automatically and immediately, so that an overspeeding of the magnet wheel can be prevented safely, so that a destruction by centrifugal forces can be prevented safely. This device is of really great importance, because otherwise there would be a danger of accident, up to the danger of damage or destruction of the whole test setup, as soon as the power converted from ZPE-energy will increase too much. Moreover, the entire magnetic motor with rotor assembly must be housed in a solid chamber made of non-ferromagnetic material, so that no "projectiles" will endanger the people in the laboratory in case of detaching fragments. This safety device is absolutely essential.

Notice:

In the EMDR magnetic motor, the natural frequency of the LC oscillating circuit is an effective upward speed limit, so that speed control with over-speed protection is not critical in the same way as in the MMDR magnetic motor. Nevertheless, in both cases, safety precautions should be taken very seriously. In addition to the speed control, an unbalance control can also be fitted, whereby it may be said in general that far beyond the mechanical resonance frequence of the rotating unbalance, this problem will tend to become less critical. The maximum danger of an unbalance is in frequence range close the mechanical resonance frequence of the rotating unbalance. Nevertheless, the rotor must pass through the dangerous

mechanical resonance frequency of the rotating machine during starting procedure and overcome it without damage.

Step F: (only in the case of EMDR, not needed in the case of MMDR).
Activity: Manufacturing and measurement of the coils and the capacitor bank.
Executor: Electrical engineer and physicist, plus precision mechanic, laboratory assistant
Description: The coils were characterized in the computer simulation only by a very rough approximation formula. The necessary higher precision of the inductances can only be achieved by producing coil samples and measuring their inductances in the laboratory. Since the design of the LC resonant circuit must be set extremely precisely, and is extremely sensitive to the operation of the magnetic motor, finely tunable capacitors must be provided in the capacitor bank, which must be adjusted during the operation of the magnetic motor. An electronically controlled adjustment may perhaps be required.

Step G: (only in the case of EMDR, not needed in the case of MMDR).
Activity: assembly of coils and capacitor bank, test series, determination of engine parameters
Performer: electrical engineer, experimental physicist, theoretical physicist, laboratory assistant
Description: The computer simulations contain numerous variable parameters, on the setting of which the operation of the machine depends. At the beginning, the computer simulation is based on reasonable-plausible assumptions, but for the real operation of the machine, actual measured values have to be used in order to design (dimension) the machine reasonably. The results of the computer simulations must of course be transferred to a hardware setup in the laboratory, but they must also be constantly adapted during the development of the hardware setup.

Step H:
Activity: Repeated optimization steps of the machine
Executor: Electrical engineer, experimental physicist, theoretical physicist, mechanical engineer, laboratory assistant
Description: In parallel with the step-by-step construction of the machine, the measurement of the simulation parameters associated with each construction step is carried out. In addition, several rounds of optimization will typically be required for both the hardware build, as well as the associated computer simulation. The resulting changes to the machine design are progressed successively. With 3 ... 5 repetition rounds of the optimization steps (duration: estimated 12 ... 18 months), it should be possible to develop the engine from the first proofs of the functional principle, to powerful high-performance prototypes, whereby it is of course assumed that considerable parts of the results of every respective preceding optimization step, can be taken from each step to the successor step, so that the creation of new test setups in each case means less effort, than it was the case with the very first setup.

Termination criterion for the optimization rounds:
➔ Successful termination when the power converted from ZPE-energy is sufficient to operate the machine in a self-running mopde and, in addition, to provide useful (usable) power to a consumer. In this case, a decision to terminate the research and development work is made as soon as the results obtained are sufficient to move on to series production.
➔ Unsuccessful termination, if it is not possible to develop the magnetic motor into a self-running mode, in which it is driven completely by ZPE-energy. The "knock-out" criterion would be the finding that a run-out of the EMDR magnet rotor after starting the machine WITH coil and capacitor bank is slower than WITHOUT coil and capacitor bank (in the case of EMDR). In the case of MMDR, the "knock-out" criterion would be, that the MMDR magnetic rotor cannot exceed the critical speed value necessary to satisfy the self-running operation, within the speed limited by the mechanical stability of the material against the centrifugal forces.

Step I:

Activity: Maximization of the extractable useful power

Performer: Electrical engineer, experimental physicist, theoretical physicist, mechanical engineer, laboratory assistant

Description: By mechanically applying a useful torque to the rotor shaft, useful power can be extracted and supplied to an (external) power generator, for example. Due to the engine-design, a starter motor shall be used, whose operating mode can be converted from a starter into an electrical generator during operation. This change of operation mode shall be carried out above the critical speed value for the self-running condition, so that this starter-generator-combination represents the payload and delivers electrical energy to a consumer from the moment, when a useful operating speed is reached. In addition, however, in the case of the EMDR, electrical energy must also be taken directly via the voltages induced into the coils of the stator, whereby the ratio between the power to be taken mechanically via the shaft versus the electrical power to be taken from the coils, must be adjusted to the optimum operating mode of the machine. Similarly, in the MMDR, coils must be mounted next to the passing magnets to extract energy, and mechanical torque must also be extracted from the rotating shaft via the starter-motor-combination. The fact that both types of magnetic motors always require both types of energy to be extracted, namely a given relation between the electromagnetic energy extracted from the coils next to the rotating magnets on the one hand, an mechanical energy to be extracted from the rotating shaft on the other hand, is a matter of principle which is known from the previous computer simulations of the magnetic motors. Therefore, I also know in which relation the two types of energy must be extracted, namely approximately in the ratio 4:1, with 4 parts of mechanical energy extraction from the rotating shaft, and 1 part of electromagnetic energy extraction from the coils next to the rotating magnets.

Step J:

Activity: Optimization of engine-components with regard to costs for series production, operational reliability, service life, ease of maintenance and other practical aspects in large-scale production.

Performer: Electrical engineer, experimental physicist, theoretical physicist, mechanical engineer, laboratory assistant.

Description: It is well known that once the principle of a machine has been mastered, it can be drastically improved during time, and during the course of subsequent generations of design. This is always the case. (Please imagine: Just compare the cars from the years 1890 and 2020).

As soon as one begins to transfer the machine into the series production, substantial possibilities will arise here. This is already the transition to the next development step, namely the further development to the suitability for series production. Fortunately, the costs incurred in this process can be covered by the ongoing financial profits from the series production already underway at that time.

Opportunities and risks:

Magnetic motors are among the best understood designs of ZPE-energy converters. Numerous systems are reported within the research community of the ZPE-energy research. According to the state of development, these are the ZPE-energy converters which are already the most elaborated in theory, finally thanks also to my fundamental work in physics. Therefore, they are the systems that promise the highest probability of success. However, they are also the most technically demanding systems, and thus the most complex and expensive in terms of research and development work and costs. However, the effort is rewarded by an extremely high performance: range of application -> the minimum power is approximately in the range of 5...10 kW, but upscaling to higher power is possible up to the multi-megawatt range, without any limitation to the top. The construction of magnetic motors becomes technically the easier the larger the devices are. This is an optimal supply from private households up to large industrial companies.

Due to the design, vibrations occur (which can be damped with a suitable housing), and the use of magnetic motors is unfortunately only possible stationary (i.e. on fixed place), not mobile. This is not a problem for

stationary users, so that for stationary consumers in the multi-kilowatt range and in the multi-megawatt range, magnetic motors represent an absolute top class in terms of energy-costs due to the extremely low energy price.

Because of the very high robustness and long-term durability of the systems, I imagine that every single house can be equipped with such a device, as well as every single industrial plant, so that an overland transport of electrical energy becomes completely superfluous; we therefore no longer need high-voltage lines. This is particularly advantageous in regions of the world where no high-voltage lines have yet been laid across the country. Whether each house is then supplied individually, or smaller groups of houses or villages or city quarters together, can be considered and realized locally, depending on the wishes, needs and ideas of the local population. The only maintenance that may be required is due to the fact that permanent magnets lose some of their magnetic force over the years. This decreases the power-performance of the magnetic motor a bit during the years. It should take quite a long time for the effect to become noticeable and even longer for it to become troublesome, but once this effect becomes troublesome, the magnetic motor can be re-newed by removing the permanent magnets from the rotor and remagnetizing them. This is a relatively simple operation, requiring only that the magnets are taken out of the rotor, than being re-magnetized fresh by putting them one by one briefly into a coil (each one for a few seconds). To do this, each magnet must be put in a coil and a large current is mand to flow through the coil for a few seconds, so that the coil generates a strong magnetic field during this short time, and the magnets are remagnetized with this field. After this regeneration procedure, the magnets are returned to the magnetic motor and reinstalled there. As I said, this can be done every few years, whenever the user wants to have it.

4.3 Delimitation

By the way, in chapter 4, I want to discuss only the high-speed magnetic motors, and not slow-running ones, because chapter 4 is limited to such ZPE-energy motors, which work according to my FPGW principle of "Finite Propagation Speed of the Interaction Fields". Slow-running magnetic motors work according to completely different principles, and therefore shall be discussed for example in chapter 5 together with magnetic switches, because they are prominent applications for magnetic switches.

Importantly, I want to point out at this point that there are countless fake videos and fake representations in the Internet about alleged magnetic motors, which in reality are not operational. Such presentations are made to confuse hobbyists in the ZPE-energy scene, motivating them to try some experiments on their own, thereby uselessly absorbing their time, in order to prevent them from engaging in reasonable activites. Such videos also have the spupose to keep raising hopes and disappointing them, so that people eventually turn away from the topic of ZPE-energy in frustration. Unfortunately I must state that also against my work, already fake videos have been created and put on the Internet. For example, I remember the video of an allegedly functioning "EMDR magnetic motor according to Professor Turtur", whereby under the this video, to make matters worse, my office address was given as the address for correspondence - although I know for sure that this motor has nothing to do with me. [FAK 12] I found this video, after people wrote to me, asking questions about it. That this fake video had nothing to do with me, is simply a fact. That the originator of this video was not even willing to communicate with me, is a clear indication that the sense of this video was simply to make me ridiculous. Friends of mine were able to find originator of the video as a paid video producer in Mexico, but he answered my communication attempts with extreme aggression, so that I gave up very quickly. Fortunately, the video has been deleted in the meantime.

A further demarcation I have to make opposite to private hobby-(wannabe-)scientists, who contact me after watching my videos and/or publications with large enthusiasm. But this enthusiasm unfortunately is always evaporated already after several days, and rarely lasts few weeks. There has never been a private

hobbyist who has the stamina to work seriously. Even engineers or physicists can't do serious ZPE-research in the private hobby area, because simply the working capacity and the financial capacity is missing, and with it also the laboratory equipment, the machines, the measuring instruments, etc... As dear, nice and friendly private ZPE-energy-interested people are, I must urgently advise them for reasons of the accident danger, not to perfrom experiments by themselves. If private people interested in ZPE-energy want to participate in this matter in a SENSEFUL way, and if they even want to have an (own) ZPE-engine, the most sensible thing they can do is, to help spreading the information about the usability of the ZPE-energy, and ideally to search in their circle of acquaintances if there is someone who knows someone who has contact to someone who can dispose of sufficient amounts of money, with which it is possible to set up and finance a fully professional research group with specialsts on a full-time basis. There has to be enough money that it doesn't hurt, for example, to hire a professional, for a fee, to design an electronic circuit and build a few sample pieces of it. And there are MANY components to develop and build, lots and lots of them, all wanting to be developed and paid for - so many components that a private person would run out of money before he even got started. I've met a few would-be inventors who have invested their complete life savings and then sold their apartment building, just to carry the development costs on and on and on, and still starved halfway through, without completing a ZPE-converter in their attempts. That is definitely not the recommended approach. I am also giving this warning so clearly and explicitly, in order to protect these people from their own inexperience, so that they don't harm themselves – because, with extremely few exceptions, all of these people are very friendly and pleasant, and actually only have good things in mind, but unfortunately just don't know how to realize a good successful activity.

5. Magnetic switch - „Magnet-Transistor-Analogon" (MTA)

We all know transistors as switches for electric fields. These are electronic components whose purpose is to switch an electric field from an emitter to a collector or not, depending on how the base is controlled. It should be possible to develop an analogue device to switch magnetic fields, and this is precisely the task for the invention of a magnetic switch.

Whether the structure of a magnetic switch (also "magnetic transistor analog" = MTA) should have any similarity to a transistor for electric fields or not, is a question that still has to be answered. A very first very simple construction according to a proposal of Nikola Tesla looks completely different from a transistor. After I will have told on the basis of this example that it is possible to switch magnetic fields, however, I want to go into the transistor-analog magnetic field switches, whose invention turns out to be mainly a material-scientific research task.

5.1 Gadolinium as a switch

A very simple way to switch magnetic fields can be found in a patent of the legendary Nikola Tesla, who found that the Curie temperature of gadolinium is 19.3 °C. This sounds like a special possibility, and that is exactly what it is: the Curie temperature, is the temperature at which a ferromagnetic material loses its ferromagnetism; below the Curie temperature, the material is ferromagnetic, while above the Curie temperature it behaves paramagnetic. This means, in consequence, that below the Curie temperature the material will conduct an externally applied magnetic field, but above the Curie temperature it will not allow the field to pass through. Et voilà, there we have the switch for magnetic fields. However, it is not controlled by a voltage applied to the base or by a magnetic field applied to the base, but it is controlled by a temperature applied to the material. This does not change the principle of the switch at all, but we have to pay critical attention to its energy consumption: Only if less energy is required to operate the switch than can be obtained from the time derivative of the magnetic flux of the switched magnetic field (by means of the law of induction in a coil located behind the switch), we can use the switch to tap an unknown energy source. Alternatively, of course, we can use the magnetic switch to drive a slow-moving magnetic motor by switching the magnetic field through to a magnet-equipped rotor exactly when we

need the field (i.e. the force produced by the field), and switching it off exactly when we don't want the field on the magnet in the rotor. [VID 16] Due to the thermal capacity of gadolinium, the switching of the temperature between values above and below the Curie temperature always consumes a certain amount of energy. Therefore, it is difficult to imagine that a profitable ZPE-energy converter can be developed on this basis, especially since the switching of the temperature always requires a certain amount of time due to the finite thermal conductivity of the material (and the supply lines), which is usually much longer than it would take to operate a magnetic motor or a transformer. The imagination to alternately heat up and cool down a metallic block of gadolinium at a frequency of 50 Hz, i.e. 50 times per second, in such a way that we can exceeds the Curie temperature 50 times per second and go below it 50 times per second, seems downright ridiculous. So we are not talking about the idea of a "gadolinium based" ZPE-converter, but about a basic scientific proof that it is possible to switch magnetic fields. This is the very first simple proof of feasibility. Our task now is to find or invent a fast and efficient switch for magnetic fields. Also alloys, not only pure gadolinium, are also possible for switching magnetic fields (see [CUR 21]), but the thermal Curie motor presented on the aforementioned website remains a rarity.

Nevertheless, I do not want to exclude (without consideration) that with good experimental and technical skills a seriously practical useful application (in the energy industry) can be achieved. This assumption can be justified by a very simple calculation. It is obvious that I am especially concerned with the question of the utilization of ZPE-energy. Thus I want to check, which condition must be fulfilled, so that an over-unity can be achievd. This can be easily estimated by making a small numerical calculation (over the thumb), in which plausible values are inserted. Therefore we perform the following considerations, with which we compare:

- on the one hand, the energy required to alter the temperature of the gadolinium. It is $\Delta W = \mathrm{m} \cdot \mathrm{c} \cdot \Delta \mathrm{T}$
  The thermal capacity of the gadolinium is $c = 230 \dfrac{\mathrm{J}}{kg \cdot K}$. If we assume (as a realistic possibility) a gadolinium block of handy dimensions (e.g. a cross-sectional area of $1cm \cdot 1cm$, and a thickness of $5mm$), and a density of $\rho = 7.901 \dfrac{\mathrm{Gramm}}{cm^3}$, then we get a mass of
  $m = \rho \cdot V_{Gd} = 7.901 \cdot 10^3 \dfrac{\mathrm{kg}}{m^3} \bullet 0.5 \cdot 10^{-6} m^3 = 3.9505 \cdot 10^{-3} \mathrm{kg}$

- and on the other hand the energy content of the switched magnetic field $E = \int u \cdot dV$, with $u = \frac{1}{2} \mu_0 \left| \vec{H} \right|^2$ at a flux density of the gadolinium at the onset of saturation of $\mu_0 \cdot M_S = 2.69 \, Tesla$ with a (realistically assumed) field-filled volume of $V_M = \frac{1}{2} cm^3$.

The condition according to which over-unity can be achieved logically means that there must be more energy in the alteration of the magnetic field, than must be expended in energy to switch the field via the temperature change of the gadolinium. This would be $\Delta W \geq E$. We calculate the limit of this condition, i.e. the decision wether over-unity "yes" or "not", by setting the equation $\Delta W = E$ and then solving it to the temperature change $\Delta \mathrm{T}$, with the statement: If the necessary temperature change $\Delta \mathrm{T}$ is enough (or if less temperature change is sufficient) to switch the magnetic field with the gadolinium, than over-unity can be achieved. If, on the other hand, the technically practically required temperature change would be larger than the calculated $\Delta \mathrm{T}$, in this case more energy would have to be used for heating and cooling than could be gained from the field change of the magnetic field. Let us now calculate this $\Delta \mathrm{T}$ in order to estimate where we will end up. Therefore we combine our (above) equations:

$\Delta W = \mathrm{m} \cdot \mathrm{c} \cdot \Delta \mathrm{T} = E = u \cdot V_M = \frac{1}{2} \mu_0 H_{\max}^2 \cdot V_M = \frac{1}{2} \mu_0 \left(M_S \right)^2 \cdot V_M$ under the favorable assumption that the complete field strength corresponding to the saturation magnetization $H_{\max} = M_S$ can be used in the

entire volume V_M of the magnetic field. We now solve the equation for ΔT, what we are looking for, and get:

$$\Rightarrow \Delta T = \frac{\frac{1}{2}\mu_0 H_{max}^2 \cdot V_M}{m \cdot c} = \frac{\frac{1}{2}\mu_0 \cdot \frac{(\mu_0 M_S)^2}{\mu_0^2} \cdot V_M}{m \cdot c} = \frac{\frac{1}{2} \cdot \frac{1}{\mu_0} \cdot (\mu_0 M_S)^2 \cdot V_M}{m \cdot c}$$

Inserting the numerical values yields

$$\Rightarrow \Delta T = \frac{\frac{1}{2} \cdot \frac{1}{\mu_0} \cdot (\mu_0 M_S)^2 \cdot V_M}{m \cdot c} = \frac{\frac{1}{2} \cdot \frac{1}{4\pi \cdot 10^{-7} \frac{N}{A^2}} \cdot \left(4\pi \cdot 10^{-7} \frac{N}{A^2} \cdot 2.69T\right)^2 \cdot 0.5 \cdot 10^{-6} m^3}{3.9505 \cdot 10^{-3} kg \cdot 230 \frac{J}{kg \cdot K}} = 1.58 \frac{\frac{A^2}{N} \cdot \left(\frac{A\,N}{m\,A^2}\right)^2 \cdot m^3}{kg \cdot \frac{J}{kg \cdot K}} = 1.58 \, \text{Kelvin}$$

This is an exciting value, because it neither immediately confirms the feasibility of over-unity, nor does it contradict this feasibility a priori. Our original approach of the thought was that we find out how large the required temperature change may be at maximum, so that still an over-unity can be attainable from the field alteration of the switched magnetic field. Now, we approximated this value to roundabout one and a half Kelvin. This is not a clear decision memo. Keep in mind: The fact that the usable field volume could be larger than assumed in the rough calculation could have an additional favorable effect. A disadvantageous effect could be the fact that we might not reach the field strength corresponding to the full level of saturation magnetization of the gadolinium. A further disadvantage could be the fact that the required volume of the gadolinium block might have to be larger than assumed, but perhaps, conversely, a slightly smaller gadolinium volume would be sufficient. One of the most critical and important questions might be, how large the temperature change around the Curie point must be, so that the gadolinium can switch the magnetic field properly. Is a temperature change of one and a half Kelvin sufficient therefore?

The result of our rough calculation (estimation) is such that the resulting value does not immediately disprove the possibility of gadolinium as a magnetic field switch for a ZPE-energy motor, but we see that considerable experimental skills will be required if all parameters are to be set in such a way that attempts to build a ZPE-energy motor based on gadolinium might turn out to be successful. At least we have a basic scientific consideration here, that shows us that it makes sense to look for an economically viable version of a magnetic switch. However, since the required temperature change of a gadolinium block will certainly not be possible with a frequency of 50 Hz, as we would like to have it for today's technical alternating current, we are looking for another version of a magnetic field switch, which is not slowed down by the thermal conductivity of a heater and a cooler in connection with the heat capacity of a metal block.

5.2 Transistor-analogue Magnetic-Switch

We are looking for a switch for magnetic fields which can switch a "working field" as large as possible with very little "control field" (also called "switching field"), so that the energy required to trigger the switching-procedure should be orders of magnitude smaller, than the energy which can be used within the working field. Of course, this immediately reminds us of the functional principle of the transistor. A transistor is a switch for electric fields, we are looking for something analogous for magnetic fields. In order to remind once again clearly what we are actually looking for, let us first remember the functioning principle of the transistor. It works in the way that an external control voltage applied to the very thin base widens or narrows the base zone.

- When the base zone is widened, the transistor blocks, so that an applied voltage does not pass through from the emitter to the collector. In this state, no electric charge can flow from the emitter to the collector. In this state the switch does not conduct electricity (nor the field).
- If, in the opposite way, the base is narrowed by means of the external circuit, the transistor conducts electrically, so that an applied voltage now passes from the emitter to the collector. In this state

electric charge flows from the emitter to the collector. The switch is electrically conductive in this state.

The charge transport mechanisms underlying these explanations, which in the electrical case are based on p-doped and n-doped regions, cannot be transferred one-to-one to magnetic field switches, so we will not go into these charge transport mechanism details any further now. I have illustrated those aspects of field switching which are important for our magnetic case in the following sketch. The principle is valid in both cases, no matter if we want to switch electric fields or magnetic fields. Again: A small control-field influences the base, so that a strong working-field is switched through, or not, depending on the base. For electric fields, this already exists everywhere in the world; for magnetic fields, we have yet to develop it.
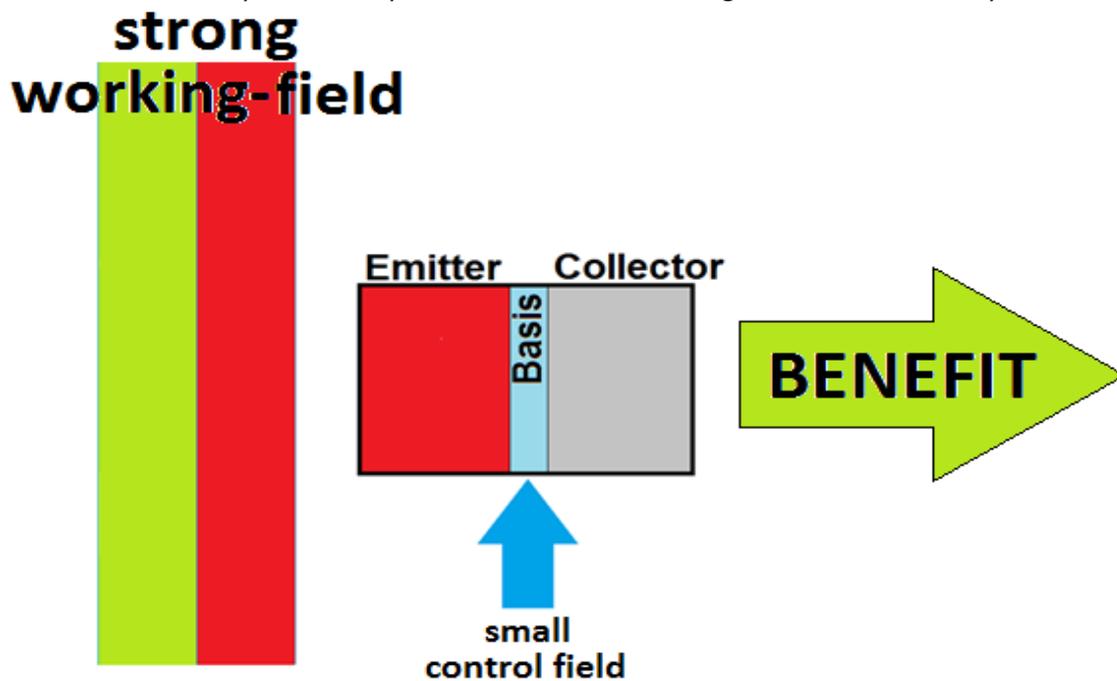

This verson of a magnetic fields switch could function as following: Ceramic ferrites are interesting material candidates, which might be combined to a continuous solid, so that with a small coil (operated with a low-power control field), the spin orientation of the electrons responsible for magnetism in the base can be optionally aligned in field forward direction, or transverse to it. If an externally applied strong working field aligns the spin polarization of the electrons (responsible for magnetism) in the emitter, and the corresponding electron spins in the base are oriented in the same direction, the magnetic field passes through into the collector, so that the strong working field is passed through the whole magnetic field transistor, and then appears as a usable field on the right-hand side. If, on the other hand, I align the electrons responsible for the magnetism in the base transversely to the electron-spins in emitter, i.e. perpendicular to the polarization direction of the electrons in the emitter, by controlling the base with the small control field, the strong working field does not pass through the base into the collector, and thus we do NOT get a useful field on the right side, i.e. the magnetic field is switched off on the right-hand side.

By the way, in the case of the magnetic field switch, it is not for sure necessary to build up the generation of the field and the transistor-analog switch separately, but it might be possible to design them from one piece by applying the switching layer directly on the surface of a permanent magnet. (-> adjacent picture)

The trick, which makes the conversion of the ZPE-energy, is the following: The strong permanent magnet on the left side (in the picture) gives us its field strength without us asking us to supply energy (at a cost), because the permanent magnet gets the energy, which it needs to generate its field, from the ZPE-energy (namely from the quantum-vacuum), as I have explained elsewhere. This means that we have to put very little energy into the control field to be able to switch on or off a strong working field on the right side in the picture.

There are several possibilities to make the (switched) field usable. I briefly describe two of them below.
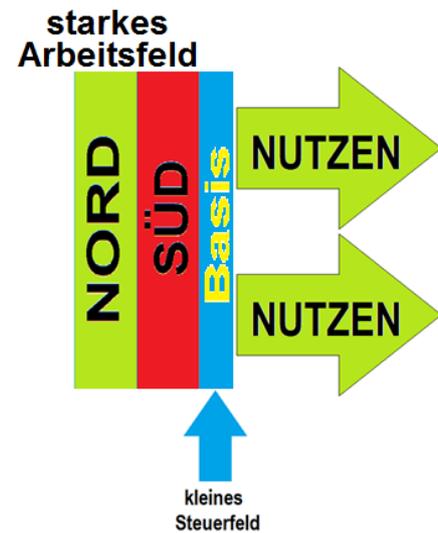
5.3 First Application: Low-speed magnetic motor

I got the idea to look for a switch for magnetic fields from a graduate engineer named Friedrich Lüling. I never met him personally, because he worked long before my time. In the 1950s, he built a slow-running magnetic motor self-propelled by ZPE-energy, which he presented in the cinema in 1966, in the Ufa newsreel. The Ufa newsreel was the main news program for people who did not yet have a television at home at this time. It was shown in the cinema before the main film. This very edition of the Ufa newsreel, in which Friedrich Lüling presented his magnetic motor on February 8, 1966, can still be viewed today in the official German Federal Archives, under the link [LÜL 66]. Lülings namely video clip is the second one in the mentioned newsreel and starts at minute 1:51. Even the reason for which the ZEP-energy could not be established already at that time is mentioned, because the video clip ends with the (german) words for "frozen" and "sabotage". But the fact that already in 1966, a technical solution of the world's energy problem in an environmentally friendly way was presented, is clear from this video.

The crucial point for me in the video is, that Mr. Lüling himself speaks and says among other things that he has found a method "to neutralize magnetic fields". (Quotation from the video.) If this is possible, then it is easy to switch magnetic fields on and off, and than it is not difficul to build a self-running magnetic motor. Therefore I thought about how I would solve this question, if I had to develop such a switch for magnetic fields, and I came up with the variant shown, based on the transistor. Although I suspect that Mr. Lüling used a completely different method at that time, but it was not possible for us, i.e. some friends and me, to track down the heirs or descendants of Mr. Lüling to find out with which method he worked. Anyway - if the magnetic field transistor works, we have a method to be able to produce a slow running magnetic motor. This could then be constructed in the way illustrated in the following sketches.

The decisive aspect is that the fixed blue-yellow switchable magnet is always switched on, exactly when it accelerates the large rotor, and is always switched off, exactly when its magnetic field would brake the large rotor.

We look at the sequence of the image-series (as usual in our culture) from left to right, from state No.1 to state No.6. No.6 is identical with No.1, so that the sequence repeats itself cyclically permanently. In the center of each picture, we see the rotor, which is equipped with red-green colored permanent magnets, turning counterclockwise. On the outside there is (in each case) a switchable magnet drawn in blue-yellow, but one could of course mount eight associated switchable magnets to the eight rotating magnets in the same way, which have been omitted in the graphic representation here only, because they do not bring any new knowledge for the explanation of the principle of operation. Let us now consider the operation of the magnetic motor:

At state No.1 the yellow drawn south pole of the stationary magnet attracts the red drawn north pole of the rotating magnet, so that the rotor is accelerated in the direction of rotation (counterclockwise). This continues in the same way for state No.2, where the rotor has moved a little further. In state No.3, however, the yellow south pole would repel the nearby green south pole, thus slowing down the rotor. We don't want that, so the switchable (blue-yellow) magnet is switched off, so that the rotor continues to run unbraked. The same happens in state No.4. In the states No. 5 & 6, the blue-yellow switchable magnet is switched on again, exactly at the moment when its magnetic field causes the rotating rotor to accelerate in the direction of rotation (counterclockwise) again. Of course, the whole operation must continue cyclically endlessly, so state No.6 is identical to state No.1, so that the rotor can permanently turn in a circle without any time limit.

The type of magnetic motor presented here has the advantage over my EMDR magnetic-motor that one does not need the high speed, with which the EMDR led to a serious technical challenge in the development, as well as in the manufacturing of the machine. Moreover, as a low-speed motor, the magnetic motor with the switchable magnets can be used in non-stationary applications, which is another serious advantage over the EMDR and MMDR magnetic motors.

Further note: The energy needed to generate the small pulses required for the switching of the field can be taken from the slow speed magnet motor's own energy output itself, so that the slow speed motor not only supplies a consumer, but is also supplies itself at the same time. Therefore, the slow speed magnetic motor can also be operated self-sufficiently without external energy supply.

Side note: Together with some friends we have tried several times to think about the statement of Mr. Lüling, that he found a way to neutralize magnetic fields. If he did this in another way than via magnetic switches, we face the question: How did he manage to neutralize magnetic fields? Intuitively we thought about shielding metal sheets, for example of Mu-metal. However, I quickly found out that the motion of the shielding sheet in the magnetic field, consumes exactly the same amount of energy as I could save from the motion of the magnets relativeld to each other. Thus, the use of a shielding sheet results in a zero-sum game in terms of energy balance. What Mr. Lüling might have done, could be a construction similar to switchable magnetic mounting devices, which are used, for example, to fix a tripod with magnetic forces on a metallic subsurface. Of course, I will also resume my experiments and developments in this

respect, and thus continue and expand them as soon as I will have a laboratory with professional resources and full-time staff. The know-how is here, missing is the financing of the laboratory.

5.4 Second Application: Motionless-Transformer

Another possible application for the magnetic switch is the induction of an AC voltage into a coil mounted at the end of the switchable magnet. The advantage is that we have no parts in mechanical motion at all, so we can build a motionless converter, which is wear-free like all motionless converters by principle, and thus has an unlimited lifetime. The construction would correspond approximately to the following arrangement.
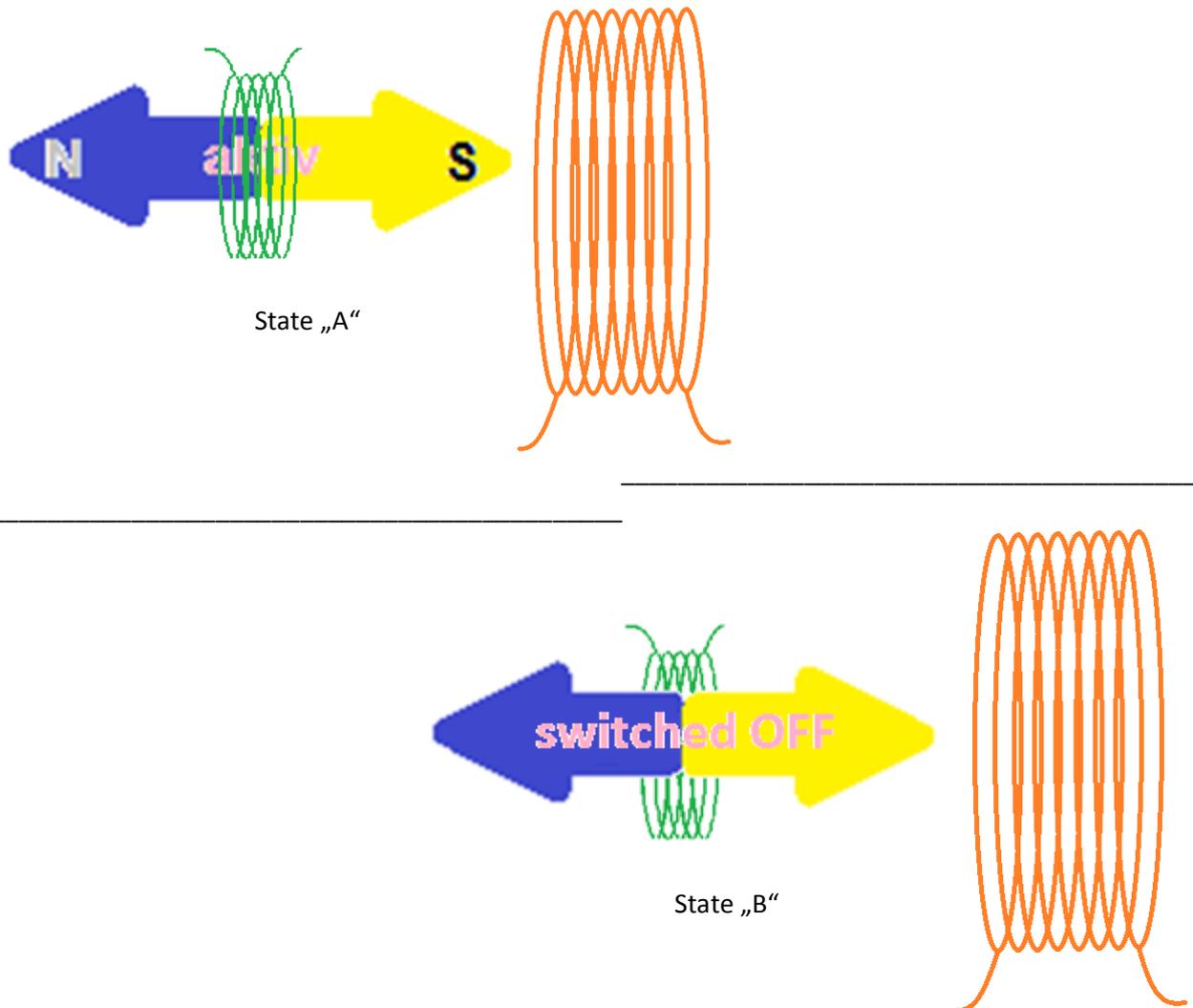
State „A"

State „B"

In state "A" the switchable magnet is switched "ON", so that the magnetic field with its flux passes through the coil. In state "B", on the other hand, the switchable magnet is switched "OFF", so that the magnetic field flux is blocked, not going through the coil. According to the law of induction, the voltage induced in the coil is the negative time derivative of the magnetic flux, integrated over the penetrated area - and this time derivative is different from zero, because the magnetic flux changes when the switchable magnet is switched "on" and "off". The trick for the conversion of ZPE-energy is, that we need only a tiny energy impulse for the small control field of the green coil, in order to induce a large powerful energy impulse in the orange coil. The arrangement comes into over-unity at the moment when the secondary pulses generated from the orange coil, supply more energy than is needed supply the green coil despite the losses from the energy feedback, so that in the end a proportion of the secondary pulses generated by the orange coil, is still available for the consumer as useful energy.

Work planning

Step A:
Activity: Comparative material science studies (starting with ceramic ferrites)
Performer: Electrical engineer, experimental physicist, precision mechanic, laboratory assistant
Description: Hysteresis loops of the (ferromagnetic) magnetization are to be measured for different ferrites with superposition of several magnetic fields in (partially) mutually perpendicular spatial directions (to each other). For this purpose, suitable magnetometers have to be developed, with which various materials have to be compared, especially with respect to the required field strengths for different magnetization directions, in order to finally get into the situation of controlling large working fields with small switching fields (and small switching powers).

Step B:
Activity: Materials science manufacturing methods
Performer: Experimental physicist, precision mechanic, laboratory assistant
Description: Methods are to be developed to fabricate multilayer ceramic films , either as ceramic coatings on permanent magnets, or as ceramic permanent magnets consisting of multiple layers with different magnetic behavior. The aim is to create structures which operate as switches for magnetic fields. Which crystal growth processes or coating technologies are most suitable, will have to be tested in the laboratory, under permanent control of the crystal structure and magnetic behavior of the produced solid state strctures.

Step C:
Activity: Construction of a slow running magnetic motor according to chapter 5.3
Executor: Electrical engineer, mechanical engineer, experimental physicist, precision mechanic
Description: As soon as we are able to control and switch magnetic fields selectively (or to neutralize them according to Friedrich Lüling), we can construct and build slow-running magnetic motors as self-running engines. Magnetic motors for moderate revolution speed are easy to manufacture and can be supported by ball bearings, so that this task does not present any particular challenges, once the rather demanding tasks from steps "A" and "B" has been successfully accomplished.

Step D:
Activity: Construction of a motionless transformer according to chapter 5.4
Executor: Electrical engineer, mechanical engineer, experimental physicist, precision mechanic
Description: Again analogous to step "C" -> As soon as we are able to control and switch magnetic fields in a targeted manner (or else to neutralize them according to Friedrich Lüling), we can build transformers, which again does not present any particular challenges once the demanding work from steps "A" and "B" has been successfully mastered.

Opportunities and risks:
Magnetic switches are one of the two types of the absolute royal-legue of ZPE-energy converters. (The other one of the two royal-league converters are the motionless transformers.) On the one hand, they can be used to build quite normal classic electric motors with the usual speeds, as we know them today from all electrical, household and other appliances, such as kitchen mixers, drills, vacuum cleaners, lawn mowers etc... On the other hand, they can be used to build completely wear-free transformers (without moving parts), which basically work robustly, maintenance-free and unbreakable for many decades, provided they are solidly manufactured. On top of all these tremendous advantages of very diverse application settability, there is also the advantage of extremely low energy price; down to a hundredth of a cent per kilowatt-hour, we have the lowest energy price here in the entire field of all my projects!
By the way, in the the table (in the summary at the beginning of the present article) there is a numerical figure for a power limit upwards at about 5 kW. This is not to be regarded as a real limit, because it is easy

to connect every number of magnetic switches in parallel without any problems. Thus we can use the magnetic switches without an upper limit of power.

All these brilliant advantages are confronted with the enormous research effort that results from the necessity to find suitable crystalline solid state structures, and possibly to manufacture them by ourselves. This is not only a question of research costs, but it also involves a certain degree of uncertainty, because one can never know in advance exactly how much research effort will be necessary until useful results are obtained. The situation can be compared somewhat with the development of semiconductor technology, which has also only evolved over the years and decades into the excellent state that we know today from our everyday lives. Certainly, not the entire development has to be completed by the time before the first market launch; after all, the first transistors have not been in the condition that modern transistors are in today. Nevertheless, we should be aware of the fact that the scope of "magnetic switches" can be classified roughly comparable to the scope of "transistors". The fact that I did not estimate the chances of success at full 100% from the very beginning (see table in the summary at the beginning of my article here) has its reason only in the difficulty that we cannot predict now in advance, how much effort it will take to really come to useful efficient magnetic switches. We simply need to have enough research budget so that we don't run out of money halfway through the research and development work.

The market launch itself will be rather simple, because magnetic switches can be installed in electrical devices just as easily as transistors are installed today. What we end up with, are electrical appliances of all kinds that have no cables and do not need a socket, nor do they need batteries, but they are powered directly from ZPE-energy – a tremendous perspective.

6. Gravity systems and hydraulic systems

Gravity systems and hydraulic systems are existent in many different varieties, so Chapter 6 is a summary of a whole range of ZPE-energy converters.

6.1 Inventions by Viktor Schauberger

Among hydraulic systems we find, for example, the inventions of Mr. Viktor Schauberger. He was a forester and studied the natural flow properties of water. Among other things, he found a possibility to make water flow downhill in such a special way, that it had more kinetic energy at the bottom of the pipe, than it had in potential energy at the top of the pipe.
From where did the additional energy descend?
Schauberger found out that the water was cooled as it flowed down, so that the additional kinetic energy was taken from the thermal energy of the water. Thus, here we do not speak of about a ZPE-energy converter (cf.: first law of thermodynamics), but about a ZPE-entropy converter (cf.: second law of thermodynamics), exchanging entropy with the quantum-vacuum. This requires that the water is not pushed through the pipes with pressure, but it must be pulled through the pipes with suction. This in turn requires a very special geometry of the pipes carrying the water. Schauberger drew comparisons to antelope horns. A tube in the shape of an antelope's horn shows the effect of energy gain as the water flows down, as Schauberger described it. The technical name for such tubes is "swirl tube", and these swirl tubes must be guided in a twisted form, in order to achieve the desired effect of gain of additional energy. Due to adverse life circumstances, Viktor Schauberger was not able to document his work and to publish his results in a form that would enable us today to gain scientific knowledge from them. In later years, Franz Pöpel, head of the Institute for Health Technology at the Technical University of Stuttgart, tried to replicate some of Schauberger's resuls. Although he was initially set by his contracting sponsor to refute (and possibly even ridicule) Schauberger's work, he was so convinced by the results of his own reproduction measurements, that within a short time he became a Schauberger fan. Nevertheless, he did

not pursue his work related to Schauberger, after the very limited money-funds given to him by his contracting sponsor for the investigations, were used up. [SCH 01], [BRÖ 04]

The colleague Pöpel mounted a reservoir for water at a certain height, and then let the water flow down through a twisted swirl pipe, measuring how much water per time flowed down the pipe (the volume-flux). He then calculated the flux-resistance of the water through the pipe and found negative flow resistances at some very special suitable flux-rates. His measurement curves are somewhat reminiscent of resonances (purely visually when viewed) because the flux-resistance clearly oscillates as a function of flux-velocity, with only a few narrow areas where the flux-resistance actually becomes negative. What colleague Pöpel has not systematically investigated is a variation in the geometry of the twisted swirl tubes, and in fact he did not systematically change the tube cross-section, the depth of the corrugations, or the twisted shape of the tubes. If, despite the brevity of his investigations and the very simple procedure, he was already able to achieve regions with negative flux-resistance, we have an indication that strongly suggests that, if the geometry were systematically optimized, it should be possible to achieve a much more significant effect, which should be usable to accelerate the water on the basis of the flow through the special tubes, be alone as a self-running system. If this were the case, it should be possible to find a way to install a self-contained pipe (as a closed cycle), in which the water circulates cyclically and accelerates itself as long as the flux-velocity ensures that the flux-resistance remains negative. With this knowledge, we can construct a self-contained pipe, in which the water, driven by thermal energy in combination with thermal entropy conversion, runs permanently in a circle, producing a source of useful energy for a consumer. The extraction of the consumer's energy should actually be possible by mounting one or more water turbines in the pipe, which are supplied with electricity from outside to start the system, so that they bring the water up to the desired speed. Once the water reached the desired speed, it would then automatically drive the aforementioned water turbines, which in turn could deliver electrical energy to consumers, for an unlimited period of time, because there is no mechanism to stop or stall the flow of water.

Whether a computer simulation of Schauberger's flux-geometry can be performed with a fluid processor of the "Finite Element method" (FEM), may be seriously doubted, because Schauberger uses properties of water, which are not included in the Navier-Stokes equation, on which the normal FEM-algorithms are based. On the one hand, the driving force of water is not pressure but suction, and on the other hand, in connection with the cooling of flowing water, it seems that the density anomaly of the water also plays a important role. I am not aware of any FEM software that takes such effects into account. Thus, we are left only with the experimental approach, which in turn requires considerable effort in shaping the pipes. We therefore make great demands on the model makers in the production of the tube geometries.
Note: For copyright reasons, I omit from copying pictures from the literature or the Internet for illustration purposes.

Working plan:

Step A:
Activity: Manufacturing of the tube geometries
Executor: Model maker, precision mechanic, possibly a technical draftsman with CAD knowledge.
Description: Free-form modeling of the tube geometry, with the proviso that the tube shape must be saved precisely and reproduced as soon as desired. As an additional condition, it should be noted that the pipe walls must be transparent in order to meet the requirements of the subsequent step of "B" (water flux-measurements). It would be optimal if we can find a 3D-plotter that is capable of processing transparent plastic. Should this be possible, then we need a technical draftsman with extensive CAD knowledge, who is able to model highly irregular freeform shapes (surfaces) on the computer. If this ideal is not feasible, then the pipe inner shape would have to be modeled by CAD, and then 3D-plotted with some plastic, and then covered with a transparent plastic on the outside, so that we can finally release the pipe inner shape

(plastic) from the transparent plastic pipe wall, for example with the help of a chemical substance that dissolves the material of the pipe inner shape, but does not attack the pipe wall (outside). In any case, electronic CAD storage of the pipe geometry is preferable to any other method of storage by material hardware, because changing the pipe geometry in CAD should be the easiest and most precise. The precision of working with CAD and a 3D-plotter is most certainly far superior to any other manual manufacturing method.

Step B:
Activity: Measurement of the flux- velocity of the water
Executor: Precision mechanic, physicist
Description: Since we have to expect extremely inhomogeneous flow conditions inside the pipe, most likely even vortex formation at some individual locations, at least during the optimization steps, the flow conditions of the water must not be measured only integrally over the entire pipe, but locally with high spatial resolution wherever inhomogeneities of the flow occur. We can either use Doppler ultrasound sonography (a Doppler ultrasound anemometer), as used typically by medical specialists (for example, angiologists), or we can record real time videos of the flow conditions with a high-speed camera, by following the movement of fine suspended particles, observing their trajectories through the transparent pipe wall. Such particles can be suspended in the water, when we find a substance which has the same density as the water, maybe for instance a suitable plastic. Flux-velocities and flux-volumes are to be measured with high spatial resolution.

Step C:
Activity: Continuous optimization of the tube/pipe - geometry
Executor: Physicist, model maker, technical draftsman, laboratory assistant
Description: The pipe geometry must be changed as long and as often as necessary, until we first find a region of negative flux-resistance, where the water is able to run through the pipe in self-running mode. This is not an incremental optimization of the tube-shape, but rather testing of several (many) completely different tube-shaps. Once a region of negative flux-resistance is found, incremental optimization of the pipe shape follows to further minimize the flux-resistance (make it as much negative as possible), so that the flowing water gains as much power as possible from the ZPE-energy.
In the first part of finding the pipe shape, one of the target parameters is to avoid vortex formation, since vortices basically convert kinetic energy of the water into thermal energy, thus slowing down the flux-rate of the water. This is precisely what must be avoided as perfectly as possible. In the second part, namely during the optimization of the tube-shape, it is important to find out whether certain inhomogeneities in the flux-velocity of the water are favorable, or whether a maximal homogeneous distribution of the flux-velocities (along the cross-section of the uube) is advantageous. The pipe shape is to be optimized under constant control by measurements, until a maximum of the extractable energy at the water turbines is reached.

Opportunities and risks:
The power density of the flux-system according to Viktor Schauberger is not particularly large, so that I expect a probable gain of only a few watts or at most perhaps a few hundred watts from the use of a pipe with an overall diameter of the cycle of one meter.
On the other hand, the system is very close to nature, does not produce any radiation or any (electro-magnetic) fields at all; and once the optimal pipe-shape is found, it can be reproduced very cheaply and robustly at any number of times, even in the very poorest countries by any average village craftsman. Thus, it is an extremely simple and cheap method for energy utilization, which can be spread everywhere, far away from any high-tech production.

Additional remark:

Viktor Schauberger also developed an alternative concept, which has entered the literature under the name "Repulsine". The design works with relatively high pressures and makes rather high technological demands on the manufacturing, as I was told to by a friend who successfully manufactures a Repulsine and made it running; but he could only keep it running for a short period of time because, despite European high-tech manufacturing, he was not able to get the machine permanently operational. In view of such difficulties, I would like to deliberately concentrate in my project concepts on developing machines for which such problems do not occur. Whether this can be achieved with a Repulsine, will be left to later investigations, which I do not intend to include in my project at the very first beginning.

6.2 Gravitational transducers

If it is possible to use the energy of the electric field (see my Magdeburg Electrostatic Rotor) as well as the energy of the magnetic field (see magnetic motor), it is simply logical that it is also possible, to use the energy of the gravitational field for ZPE-energy conversion. The latter field has the advantage of being permanently available to us on the earth's surface with quite a decent field strength, which the planet earth gives us for free. Therefore, the search for a gravitational converter virtually jumps in front of our eyes.

By the way, it should be mentioned that there are numerous inventors who are involved in this topic, especially in the private sector and in smaller handicraft businesses. From such people, I received debatable presentation not really seldom, which do not stand my own examinations. The counterexample shown below is one of them: A massive unbalance (violet color) is mounted on a rod (blue color), which rotates in a circle around the rod as soon as the upper end of the rod is guided in a circle inside a holder (green color). Since the circulating unbalance exerts a fairly large torque onto the rod, the inventor hopes to extract more power from the rod's torque, than he has to apply to move the upper end of the rod in the green guide.
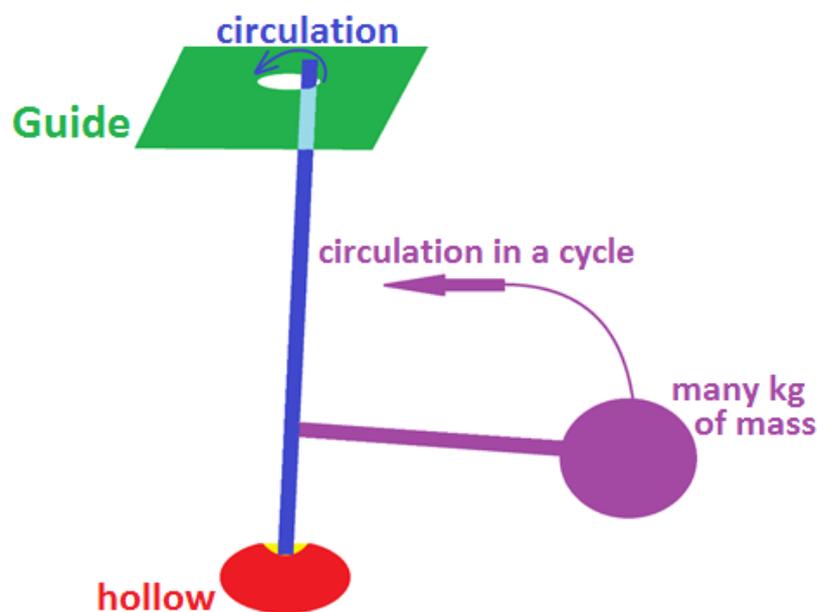

Since the idea seemed interesting to moe at first glance, I reproduced it with the simplest domestic means in my own living room, which took only very few working hours of effort. A measurement of the forces at the upper end of the rod and pf the torque in the rod, means a little bit more effort, but nevertheless confirmed with quite manageable effort, perfectly the classical law of energy-conservation (with a measurement uncertainty of a few percent). As nice as the hope for an easy to build ZPE-energy converter may be at first glance, we have to face reality and realize that it just doesn't work that simple after all. Here again, the difference between a hobbyist and professional research work becomes obvious.

Let's keep joking aside: From now on, let's come back to ZPE-energy converters which work.

One inventor demonstrated a gravitational power plant to me, whose principle of operation is illustrated in the following sketch. In a water column there are metallic hollow bodies, bowls, which are filled with air at the bottom end column, by pumping air through a valve. Air bubbles are inserted through the valve into the water and collect in the bowls, so that the air lifts the bowls upward in the water due to buoyancy. At the top of the water column, the hollow bodies leave the water, and then move to the left side, pulling a drive down with their weight, following gravity.

Both when the air-filled hollow bodies rise in the water, as well as when the solid hollow bodies run down in air, energy is released that can be harnessed via a gearbox that drives an electricity generator, for example. Over-unity is reached as soon as this energy-gain is large than the energy effort to pump the air bubbles into the water.

Classical gravity-converter

black -> glas cylinder
light blue -> water
red -> hollow metal body
yellow -> air
purple -> linear electro-generators
green -> valve for insertion of air
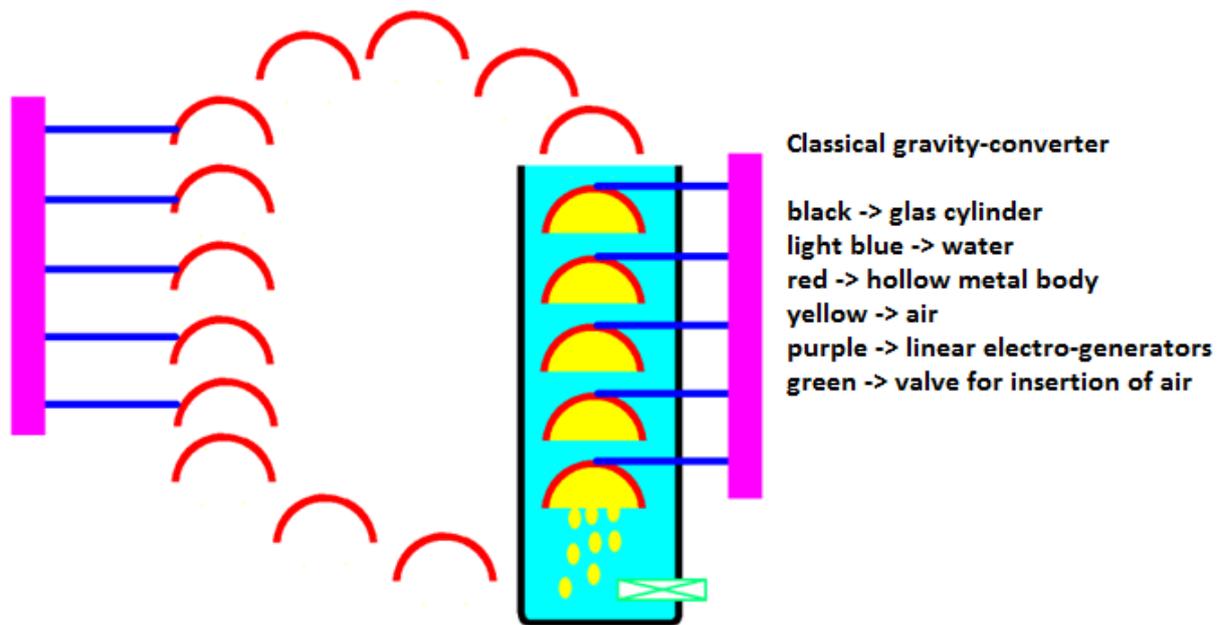
If it is that simple - why aren't such ZPE-motors already available for purchase everywhere ?

The first big problem results from the energy balance: If we would simply inject air bubbles at the lower end of the water column with a classical air pump, then an energy gain would be impossible, because with the introduction of the air bubbles just as much energy must be expended, in order to displace water and thus to lift the water column upward, as is released again with the lifting of the heavy objects. A calculation of the energy balance over the potential energy results in an absolute zero-sum game, except for friction losses. This is definitely not how a buoyancy power plant can works. What is needed is a trick to introduce the water at the bottom of the water column without having to expend the full potential energy to lift the water column.

The first idea I had was, not to pump the air into the water at the bottom end of the water column through a valve, but to split water into hydrogen and oxygen gas inside the water column by electrolysis, so that I would not have to do the work of lifting the water column with the gas pressure at the valve. However, this sounds quite nice only at the zeroth thought, because already the first serious thoughts tell us that we cannot win energy in this way. The required energy input for the electrolysis of the water is so large that we would need a water column with a height of several tens of kilometers to be able to achieve a profitable energy balance. A water column with the height from the bottom of the Mariana Trench to the top of Mount Everest would still not be high enough. So, for reasons of practicality, we have to come up with something else.

Of course I remember my theory of ZPE-energy conversion and my principle of the Finite propagation speed of the interaction fields or interaction forces. I recognized this as a very fundamental principle according to which quite many different kinds of ZPE-energy converters can be realized. So why should I not apply this principle also here? All I need would be the injection of very short pulses, i.e. tiny air bubbles with extremely high pressure, at the bottom of the water column. The injection valve should be opened only very briefly, and would have to be completely closed again, BEFORE the pressure wave generated by the injection, reaches the water surface. Then a lifting of the water column by the injection of the air bubbles would not happen. This sounds interesting, but of course we have to calculate the thermodynamic behavior of the air bubbles. Compressing the air to such high pressure, requires a certain amount of energy to be taken into account. The same considerations have to be applies to the (small) compression of the water column, but it is rather insignificant for the water column, because the pressure in the water does not increase drastically, but is widely distributed. With the pressure conditions in the air bubbles, of course, their temperature conditions also change. This also has to be included in the thermodynamic energy

consideration. What comes out of all the formulas in the end, is a very narrow corridor in which we have to arrange the pressure values and the duration of every air bubble, and thus also its size. The good news is that the pressure requirements are feasible. To find out the narrow corridor in which the feasibility is fulfilled, I performed thermodynamic calculations. These calculations are too long to be printed here explicitly, thus we only have a look to the results. Please see the following curve. The energy balance is plotted on the ordinate, gain is positive, thermodynamic energy losses are negative. The abscissa shows a pressure scale in the SI unit Pascal; our normal ambient pressure is (on annual average) 101'325 Pa, so it is not far away from $1 \cdot 10^5$ Pa. We find the maximum energy gain at a pressure of about $4.1 \cdot 10^4$ Pa, or about 41,000 Pa, which is just a bit more than 40% of our usual atmospheric pressure. We therefore have to work with a slight negative pressure, so we need a pre-vacuum chamber for the setup, which should not be a problem by principle.
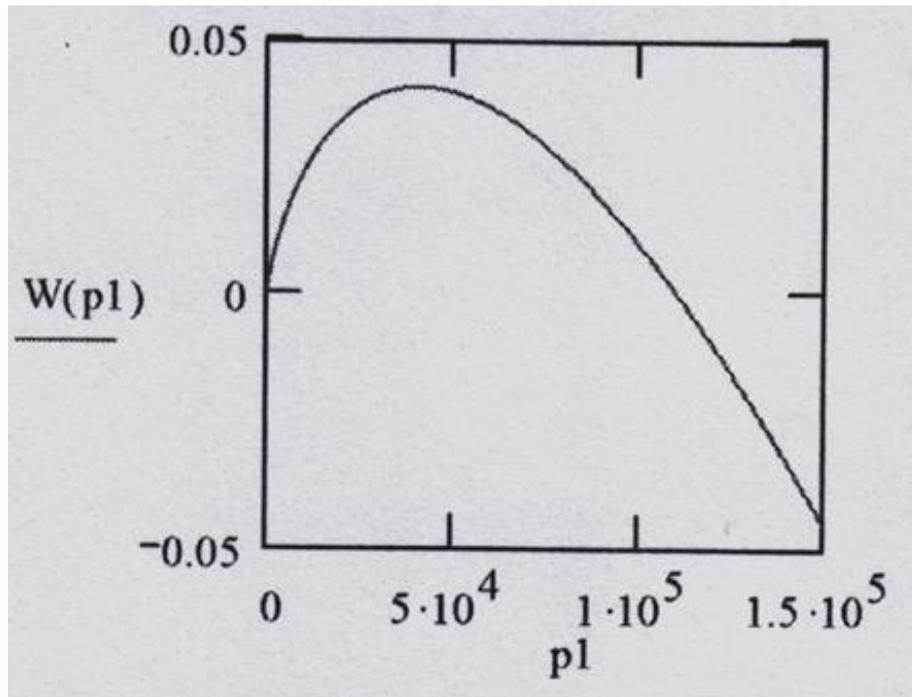
The curve has a clear maximum and a transit through an energy balance of zero.

Elsewhere, by the way, I have spoken about variants of the setup, in which one considerably increases the pressure inside the water column, so that hand in hand with the water pressure it is possible to increase also the pressure of the gas bubbles. Both pressures (in the water and in the air) can be increased up to several thousand bar - an immense overpressure. This significantly increases the power density of the system, but of course also the technical requirements for manufacturing. In principle, this should not be a problem, if we remember the injection pressure as used today, for example, in the automotive sector to drive the so-called "common-rail" engines. From the series production of the pump manufacturers, a typical pressure in the range of up to 2500 bar or even up to 3000 bar can be achieved, which opens up almost unlimited possibilities upwards. Whether it is preferable to use the high power density of high-pressure converters, which enhance the effort and expenses of the production technology, or wether it is better to use the simplest possible production, leeding to the lower power density of normal pressure converters, will have to be found as one of the results of the upcoming development work.

The machine of a Russian inventor with extremely high power density at immense pressures can be found in the literature under the name of Dr. Viatcheslav Valentinovich Marukhin. He has developed a system, and even patented it. The German patent number is DE112004002323T5 dated 24.05.2007 under the name "Wasserhebeeinrichtung". If you want to know more about it, you can easily read about it in the book "Die Heureka-Maschine" by Adolf and Inge Schneider. [MAR 17]

Work planning:

Step A:
Activity: Theoretical calculation, design and construction of a buoyancy power plant
Executor: Thermodynamic engineer, mechanical engineer, precision mechanic, laboratory assistant
Description: The optimal specifications for the buoyancy power plant must be calculated according to the rules of thermodynamics, then construction drawings must be prepared, and finally the setup shall be manufactured and built up in practical hardware, to be put into operation in the laboratory.
The accompanying measurements of temperatures and pressures should only require a manageable amount of time and effort. Actually, not too many failed trials and errors are to be expected, provided that the initial theoretical calculations of the thermodynamic engineer are correct. For the very first experiments, we can start with a very small model. As soon as this works properly, we have the functioning principle under control and can build larger plants from it. The gearbox that directs the motion of the metal bowls can be connected to an electric generator, which supplies the valve and delivers the rest of the generated power to a consumer. Basically, this should be enough to build a ZPE-converter.

Opportunities and risks:
The system is relatively simple and can be replicated by small or medium-sized craftsman's enterprises, who can also carry out repair or maintenance work if necessary. However, maintenance work is not expected, and repair work should only occur if the mechanical gear, or the valve, or the power generator breaks down.
Due to the enormous magnitude of the gravitational field strength at the earth's surface, the power density of such buoyancy power plants is surprisingly high, so that with a base area of perhaps 5 m² and a height of perhaps 5 ... 10 meters, plants with approx.. 10 … 20 … 50 kW should be realistic, which can supply not only private households (for which somewhat lower plants would be sufficient), but even small and medium-sized craft enterprises as well as medium-sized entrepreneurs. Since the plants can be scaled (up and down) arbitrarily, practically effortlessly at wish, it is also no problem to supply larger industrial companies. Here, too, we have a system that can be spread everywhere without too many high-tech requirements. Because of the required water column, buoyancy power plants are only suitable for stationary use.

6.3. Capillary pumps

Capillary pumps also ultimately work with gravity, i.e. with the gravitational field of the earth, because it is ultimately a matter of lifting the water upwards against the force of gravity. That is why I have classified them in the chapter of gravity transducers. The idea for it can be seen by everybody when simply walking in the forest: All plants and trees pull the water absolutely effortlessly (and without musculature) against the gravity upward. The highest trees on earth are more than 100 meters high. But there is not a pump at the root at the bottom, which presses the water with more than 10 bar pressure upwards. We all know that. As Schauberger said: Not pressure, but suction is, what corresponds to nature. The water is sucked upwards by the so-called capillary forces. Basically, water runs upward in all thin pipes with wetting surfaces. This can be read in typical standard textbooks of physics. [WIK 21] The physical formula for the

rising height of the water in the capillary is $h = \dfrac{2 \cdot \sigma \cdot \cos(\Theta)}{\rho \, g \, r}$,

$$\text{with} \quad \begin{aligned} \sigma &= \text{surface tension} \\ \Theta &= \text{contact angle} \\ \rho &= \text{density (of the water)} \\ g &= \text{gravity acceleration} \\ r &= \text{radius of the tube} \end{aligned}$$

As you can see, the thinner the capillary tube, the higher the water is drawn upwards. For a glass tube filled with water, the formula can be summarized as $h \approx \dfrac{1.4 \cdot 10^{-5} m^2}{r}$.

The real difficulty is not in pumping water up against gravity without expending energy, but it is in getting the water out of the top end of the capillary tube, with very small expenditure of energy. What we have to expend at the top end of the capillary tube, is the energy to overcome the surface tension with respect to the occupation of the glass surface with water. The benefit is to let the water flow back down outside the capillary tube by gravity, driving one or more water wheels, giving us usable energy.

Technical note: Since the water molecule is a rather strong electric dipole, the water can be extracted from the top of the capillary by means of electrostatic fields. This is necessary for the capillary force converter to work. Indeed, if we calculate the energy balance of the water rising in the capillary tube as energy gain, and relate this to the surface energy of the water due to the surface tension as a wetting liquid, which we have to expend to extract the water from the upper end of the capillary tube, we get a zero-sum, if we do it WITHOUT the use of as electrostatic field. A droplet of water is pulled upward by capillary forces and thus gains the potential energy $W_{Hub} = \mathrm{mgh} = \rho \mathrm{Vgh} = \rho Al\mathrm{gh}$ in this process. The surface energy to be compared, which must be expended to extract the water at the upper end of the surface of the capillary tube is $W_{Obfl} = \sigma \cdot A$

Meaning of the symbols:

$$\rho = \text{density of water}$$
$$A = \text{cross-section area of the tube}$$
$$l = \text{length of a water droplet}$$
$$\mathrm{g} = \text{gravity acceleration}$$
$$\mathrm{h} = \text{capllary elevation hight (inside the tube)}$$

The crucial point is: Both amounts of energy are equal, independently from the size (length) of the water droplet. From this fact, the height of rise of the water in the capillary tube can be calculated. This is so far the energy balance of the water in the capillary tube WITHOUT the use of electric fields. The trick is that the water molecule is a rather strong dipole ($\varepsilon_r = 81$, slightly variable as a function of temperature), and therefore can be detached from the surface against the surface tension with an electrostatic field at minimum energy expenditure, for which one must apply field strengths of several hundred volts/cm. It it is necessary to insulate the electrodes to avoid electrical current losses.

Plausibility note: Everybody going through life with open eyes, will notice that water also causes static frictional electricity. We know this static frictional electricity from rubbing a plastic, for example a ruler or a balloon, which is electrostatically charged by rubbing and then attracts small pieces of paper. The fact that water also does this effect is not generally known, but is no less real. The most likely way to observe the frictional electricity of water in everyday life is early in the morning, after the water pipe has not been

running for a few hours. If you open the water-tap in this moment, you can feel a very slight electrifying pulse. This can be done by putting your fingers into the very first drops of water of the first thin stream when carefully (but not too weakly) turning on the water-tap.

This works even though water is a conductive substance, namely because the dielectric constant of water is so high, as is the case only with relatively few substances.

Hans Weidenbusch solved the development of a capillary force converter in a mechanical-hydraulic way. [WEI 21] I saw his demonstration with my own eyes at one of his lectures at a conference in Zurich, together with more than hundreds of other visitors. At the side of the conference, he gave me personally opportunity to regard his construction from close distance. Since this demonstration it is clear to me, that capillary force converters can definitely work. Thereby the capillaries of Mr. Weidenbusch were not even 10 cm long and relatively thick in order to achieve a maximization of the flux-rate (of the water flow).

As said before: As soon as the water at the upper end of the capillary has been set free with a minimal effort of energy, it can be made to flow downward outside the capillary from the top to the bottom, in order to drive water wheels (green in the picture), which provide energy in any required form. In order to maintain a continuous flow of water, we only need to mount an appropriately dimensioned tuft of several capillaries next to each other, so that the flow of water as a volume per unit of time, due to the large number of capillaries, is just as large upwards, as the little stream of water flowing downwards requires, when it drives the water wheels.
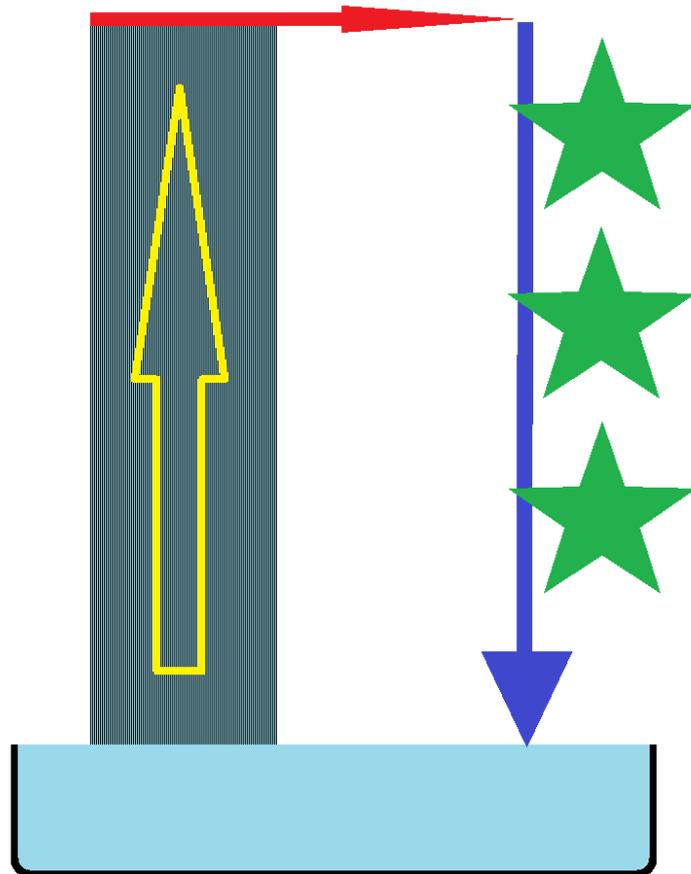
Work planning:

Step A:
Activity: Creation of a test setup
Executor: Physicist, precision mechanic, electrical engineer
Description: The manufacturing of the mechanical setup is relatively clear to see in advance, the arrangement of the isolated electro-capacitor plates for extraction of the water at the upper capillary end as well. What we still need is an electrical power supply and a measurement of the leakage currents to determine the expended electrical power. The positions of the capacitor-plates and the voltage to extract the water droplets must be determined empirically. An extremely low-frequency pulse mode seems advisable, in which a DC voltage pulse is given only whenever a sufficiently large water droplet has accumulated at the upper capillary end, indicating the moment to perform the extraction.
Once the water has been successfully transported upward in over-unity, the construction of water wheels (and electricity generators) to harness the energy of the descending water is not difficult at all. The amount of water being transported (measured as volumetric flow = volume per time) can be controlled as needed by increasing the number of capillary tubes in a capillary tuft accordingly.

Opportunities and risks:
This system is also simple to manufacture and operate, and can therefore be used in small and medium-sized craft businesses. Since nothing can be heard except for the pleasant splashing of the water flowing

down (as a waterfall), the energy supply can be effectively demonstrated to customers, for example, in public stores and in catering establishments, with a slogan such as "We generate our energy self-sufficiently and perfectly environmentally friendly."

Repair or maintenance work is not to be expected in normal operation. The worst that could happen would be, that power generators could break in the waterfall flowing down, which does not mean any great damage.

To be able to achieve power in the kilowatt range, you need a fairly thick tuft of capillary tubes, but this is not a problem if we fill, for example, a whole square meter with capillaries. Because of the water in the flow, capillary power plants are suitable only for fixed stationary use.

7. Electron beam - Converters

When I visited Klaus Jebens in Hamburg some years ago [JEB 13], he told me about his dad, Heinrich Jebens, who had traveled to America in 1930 as the "Reichsleiter of the German Reichserfinderamt" to present a medal of honor to Thomas Alva Edison. A this journey he was allowed to meet the legendary Grand Seigneur of ZPE-energy, Nikola Tesla, and to have a ride in Tesla's ZPE-energy car. Klaus Jebens demonstrated to me with hand movements the size of Tesla's ZPE-converter, just as his dad had shown it to him, and told about the fact that there had been a row of glass tubes inside the converter, visible to the outside, which must have been responsible for the conversion of the ZPE-energy. This triggered my thoughts and did not leave me alone until I finally had an idea how to build such a motionless converter with glass tubes. The idea is, to move just only electrons (and of course as always field flux quanta), but not any mechanically parts. By this way, I got my idea to develop electron beam converters in my mind's eye and in theory. The enormous practical advantage of such systems is, that electrons are extremely light (low mass) and therefore can be accelerated with very little effort to such high velocities, which could never be practically achieved with mechanically manufactured machine components. For example, if I accelerate an electron with a small voltage of only a single volt, I can equate the electrical energy with the kinetic energy, and from this calculate the velocity of the electron:

$$e \cdot U = \tfrac{1}{2} m v^2 \ \Rightarrow \ v = \sqrt{\frac{2eU}{m}} = \sqrt{\frac{2 \cdot 1.6 \cdot 10^{-19} C \cdot 1V}{9.1 \cdot 10^{-31} kg}} = 593000 \frac{\text{m}}{\text{s}} = 2134798 \text{km}\big/\text{h}$$

This is a fabulously high speed, at 0.2% of the speed of light, and it doesn't even require the voltage of a single commercially available flashlight battery. This makes the exploitation of my FPGW-theory of "Finite Propagation Speed of the Interaction Fields and Quanta" extremely efficient. The acceleration is that easy, because the electrons have such an extremely low mass. This leads to the following constructional idea: If we let the electrons meet each other on their trajectories, flying in directions opposite to each other, in the same way as the magnets meet each other in the MMDR magnetic motor, we get the energy gain from the same working principle as in the high-speed magnetic motor, but now with the electrons, which have the advantage to fly extremely fast. The energy conversion according to the FPGW principle is therefore particularly effective for the fast flying electrons.

For the sake of completeness, I want to point out the actual difficulty of the arrangement right from the start: The electrons are, of course, much too small to be touched and handled practically, as it can be done with magnets. While I can trace the movement of the magnets with a high-speed camera, I have of course no comparable possibilities with the flying electrons. All I can do, is to let the electrons fly in a pre-vacuum chamber, which contains a lower residual gas pressure of argon; these are atoms which glow violet when hit by an electron, so that I can, at least in principle, make the electron trajectories visible and follow them - but to visualize more than the integral trajectory of the electrons, will hardly be experimentally feasible. Should this nevertheless be sufficient to be able to construct electron beam converters in a meaningful way, then the attempt is to be classified as particularly worthwhile in any case, because the effectiveness and the efficiency of the electron beam converters are particularly large. We are talking here about

absolute high-tech at the top level, and in case of success we will achieve correspondingly lucrative (in terms of energy gain) top results.

7.1 Electron beam pendulum tube

I have explained the technical operation of the electron beam pendulum tube in detail elsewhere, so that I now like to repeat only few pictures from the other publication as a reminder, and decide to present here such contents which are not in the other publications.

The following graphic illustrates the movement of electrons oscillating in an electrostatic potential between two negatively charged capacitor plates. The subsequent graphic illustrates how the electrons, whose amplitudes of motion are amplified due to the gain of ZPE-energy, deliver their energy to coils, which in turn supply a consumer.
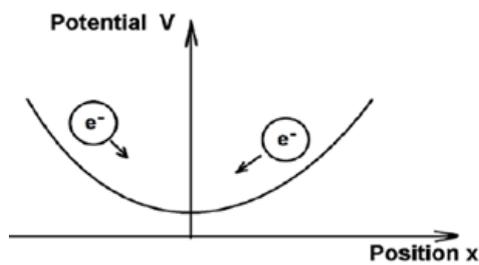

Two electrons oscillating in the Coulomb-potential of our pendulum tube.
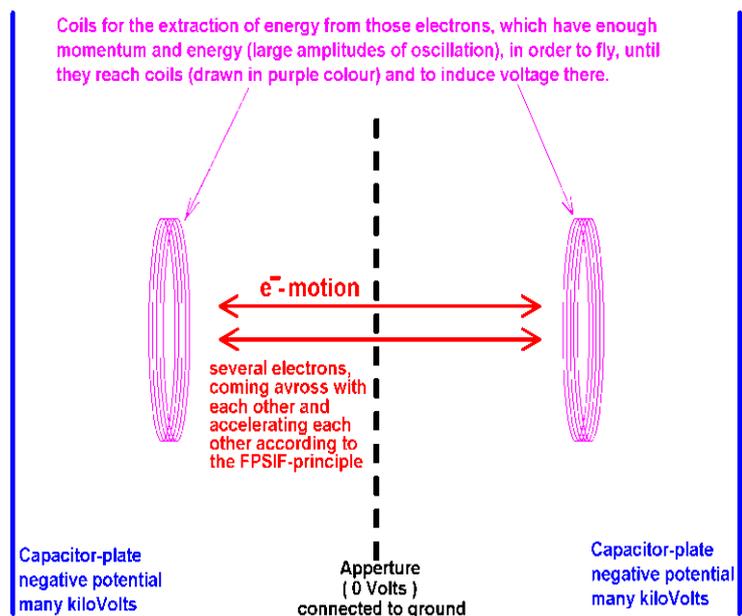
Die Anordnung lässt sich natürlich auch dreidimensional aufbauen, um eine räumliche Divergenz des Elektronenstrahls bequem handhaben zu können.
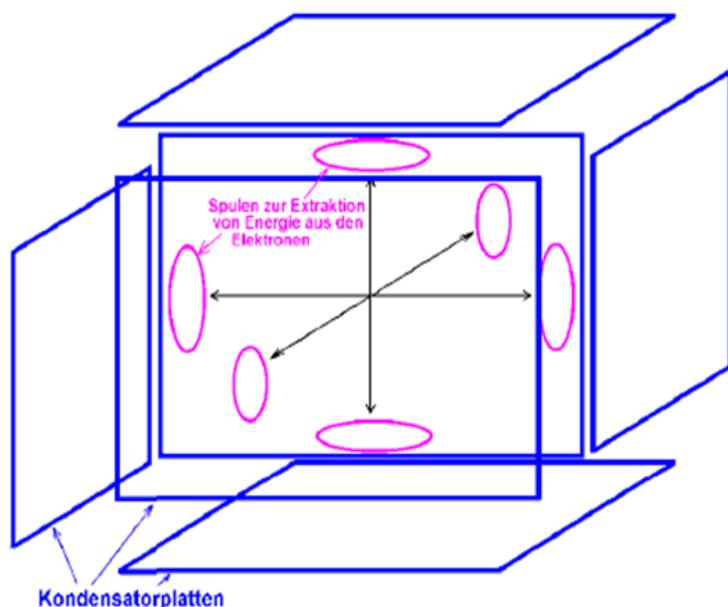
7.2 Electron beam circular path tube
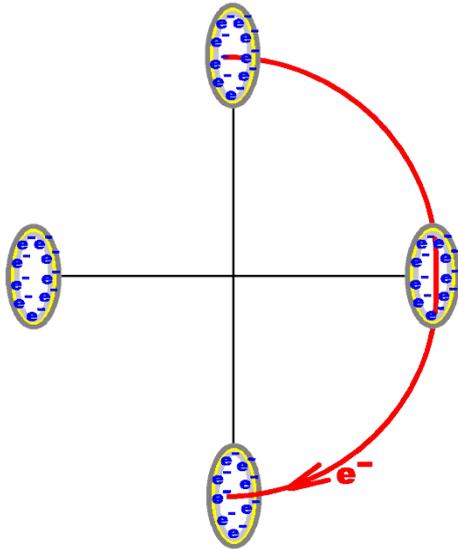
By the way, instead of pendulum motions, electrons can also be directed to circular orbits, which, as is well known, are in principle nothing else than the Lissajous figures of multi-dimensional superimposed pendulum motions.

The adjacent picture shows an electron beam (in red color) flying through the inside of rings (for example torus rings or other shaped rings, drawn in blue/grey color), which serve as electronic optics and guide the electron beam, but at the same time may contain coils for extracting energy from the electrons, which are permanently accelerated from ZPE-energy. Besides the option to let the electron beam fly through electrostatically charged apertures, we also have the possibility to let two electron beams fly opposite to each other, so that the electrons meet each other on their trajectories (similar to the magnets in the magnetic motor).

Both electron beam systems function according to the same functional principle as the magnetic motor high-speed systems, so that further purely technical-physical detailed explanations are considered superfluous here. They published elsewhere. Let us now turn our focus to the work planning for the practical realization of prototypes in the laboratory.

7.3 Work planning

Step A:

Activity: Build the set-up of the appropriate electron beam optics in a vacuum chamber

Performers: physicist (theoretician and experimenter), precision mechanic, laboratory assistant

Description: Electron beams can be directed with electrostatic and magnetic lenses in a fairly similar way as light beams with glass lenses. Electron beam optics can be simulated very well and precisely with computer programs, so that we can get fairly exact specifications for the design of the converters from computer simulations. Since electrons can be extracted very easily from glowing heated tungsten filaments and then accelerated, electron beams can easily be made, and than effortlessly fed into the electron beam optics. What we need, however, is a vacuum chamber so that the free-flying electrons are not lost in collisions with gas atoms.

Step B:

Activity: Practical implementing of the electron beam optics in the vacuum chamber

Executor: Experimental physicist

Description: The implementing of the electron beam optics requires considerable experimental skill, on the one hand in visualizing the electron beams, for example with residual gas atoms or with fluorescent screens, or with other electron beam detectors. Furthermore, the measurement of the beam current is necessary to achieve that the desired number of electrons moving along their desired paths.

Step C:

Activity: Extraction of energy (gained from ZPE) from electron beams

Performer: Experimental physicist

Description: Since in case of correct operation of the system, the flying electrons are permanently accelerated from ZPE-energy, the additional energy can (and must) be extracted from the electrons via the coils as in the above drawings.

Opportunities and risks:

The development and invention of electron-beam-tube converters is an extremely high-tech task at the very highest end of what is currently feasible. Once the research tasks have been mastered and functioning

devices are available, they can be reproduced in a similar way to the tube screens of old television sets, which also work with electron beams. The electron-beam-tube converters from series production will then be comparably robust in their application. The high research and development costs are woth being covered, because of the particularly favorable prices of the devices from the series production, as well as maintenance-free operation.

8. Various other approaches

Concepts are existing for all the ZPE-energy converters mentioned so above. In the course of the years, however, numerous further ideas came up, which might also be included in a ZPE-energy project, although it is still necessary to work out details. Nevertheless, I would like to briefly mention or present their basic ideas here.

8.1. Magnetic Motors with asymmetric magnetic fields (MAM)

Halbach arrays are configurations of several permanent magnets, which are arranged to each other in such a way that whole configuration generates as asymmetric magnetic field (in sum over fields of all participating magnets). [HAL 80] This might make it possible to find cyclic closed lines, along which the ring integral becomes $\oint \vec{F} \cdot d\vec{s} \neq 0$. With single (dipole) magnets something like this is not conceivable, therefore one expects that classical magnetic motors cannot work by principle. [MAG 21] Whether this situation can be changed by using Halbach arrays, should first be analyzed with a computer simulation, and if successful, investigated in the laboratory. It looks like individual inventors have solved this problem intuitively by empirical trial and error. An example therefore is shown by Adolf and Inge Schneider, who personally visited the inventor in America, and have been allowed to see his device in operation. [EAR 20] Since I have heard and seen their personal report combined with a video, I firmly plan that corresponding investigations should be integrated in a ZPE-energy research group.

Step A:
Activity: Practical construction of Halbach arrays with the largest possible asymmetry of the generated magnetic fields, accompanied by computer simulations of the field flux lines and the field strength.
Performer: Experimental physicist and precision mechanic in the laboratory, theoretician at the computer
Description: Together, we should pick out Halbach arrays with strong field asymmetry from the literature, and then set them up practically in the laboratory, and measure their field geometry with Hall probes. In parallel, the field geometry should be simulated on the computer, so that the theoretical computer simulations match the practical measured data.

In principle, the field geometry of a dipole magnet can be simulated in analogy to the field geometry of a current-carrying coil according to Biot-Savart's law. By analogy, the force absorbed by another magnet in the simulated field, can be calculated as the Lorentz force of a current-carrying coil (or several such coils) representing the interaction partner dipole magnet. With simple magnets I have successfully tested this computer simulation procedure by myself, but I did not have the working capacity (I did not have enough time in the absence of helpers and support) to use it to simulate entire Halbach arrays with complicated setups. I could visualize the field lines and the magnetic forces between two dipole magnets correctly on the computer this way, but for only two dipole magnets, of course, for which every closed line integral always results in zero. Thus it is clear that we really need complexly constructed Halbach arrays to be able to build a self-running ZPE - magnetic motor.

Step B:
Activity: Practical construction of a magnetic motor on the basis of the Halbach arrays found.
Executor: Experimental physicist and precision mechanic in the laboratory, theoretician at the computer
Description: Once, suitable Halbach arrays are found that can be used to realize the condition of energetic non-conservative trajectories ($\oint \vec{F} \cdot d\vec{s} \neq 0$), we will have a basis for developing pure low-speed magnetic

motors, which operate entirely on the basis of magnetic forces. These have to be again subjected to computer simulations and laboratory design.

Opportunities and risks:

As soon as suitable Halbach magnet arrangements can be found, this will become a breakthrough for magnetic motor ZPE-technology at all. To be able to handle this development, two and a half employees are needed, a theoretician who works full time on the computer simulations, an experimental physicist who works full time on the preparation of the design drawings and on the practical laboratory measurements on magnets and magnetic rotors, and a precision mechanic who works half time to produce and assemble the required magnet arrangements in reasonable laboratory (machine-like) quality.

With such resources, prototypes can be completed that are suitable as templates for mass production. The magnetic ZPE-motors, which can be set to any speed (slow, medium, fast, as desired), can be used to directly drive devices or machines (such as drills, kitchen mixers, vacuum cleaners, etc.) or to drive power generators to supply any electrical consumers.

Such magnetic motors work as noiselessly, low-radiation and environmentally friendly as classical electric motors, which we use everywhere nowadays. In serial production such magnetic motors are very cheap, much cheaper than EMDR and MMDR magnetic motors. Therefore I would very much appreciate to be allowed to take up corresponding development work in my research group, especially since the devices run absolutely robustly and maintenance-free. By the way, these "magnetic motors with asymmetric fields" correspond exactly to the ideal wish of countless ZPE-energy activists, because the devices really run optimally. Disadvantages of the machines are not known up to now.

8.2. Flux-switch Transformers (FST)

Following Stefan Marinov and Herbert Schnelzer, about whom I wrote a publication together with Johannes Horvath about ten years ago, and further following Wolfgang Volkrodt and last but not least Hans Coler, I got the idea of an over-unity transformer, which I would like to call "flux-switch transformer" to find a catchy name.

The principle of operation is the following: Every flux seeks the path of least resistance; water flows that way, electrons in electrical networks flow that way, magnetic flux in the material of a yoke flows the same way. Even the car traffic on the streets flows this way. In the consequence the following possibility results from it: If you want to achieve a strong change of the flow flow at a certain place, then one should simply set up a traffic sign, on which is written "ROUTE DEVIATION". Therein lies the essence of what I call "flux-switch", the switching or redirecting of the flow to another path. A practical set-up of this could be created according to the following sketch.

red, green = strong work magnet
pink = weak magnetic switch
blue = secondary coils
yellow = yoke
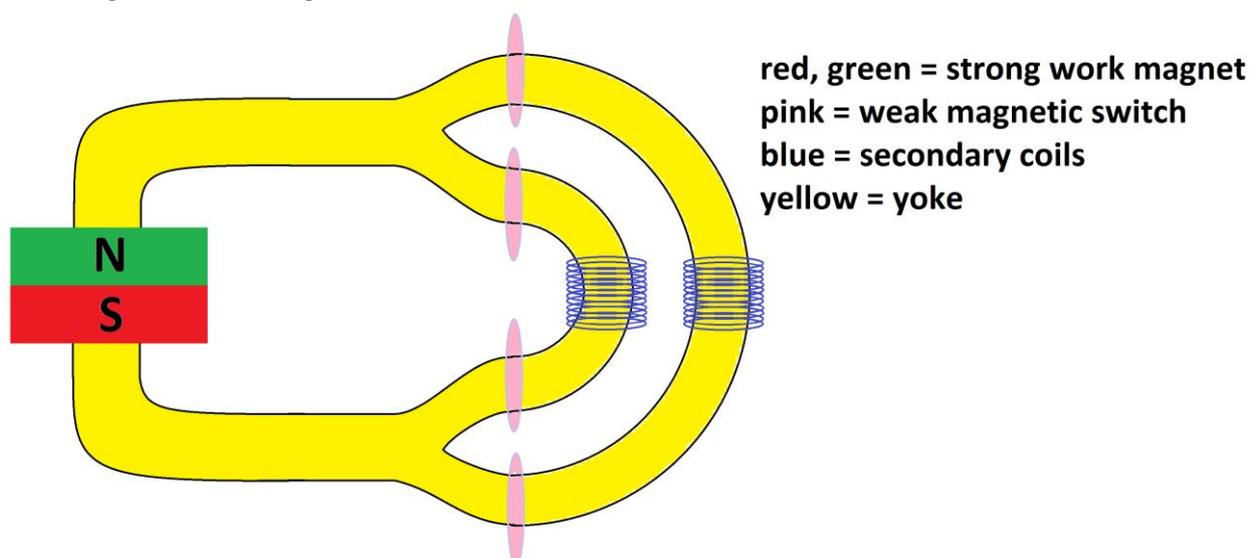
On a yoke, which conducts the magnetic flux well, a strong permanent magnet is mounted, let's call him the working magnet, top left in the picture. Behind the permanent magnet, the yoke is divided into two separate paths, so that we can direct whether the magnetic flux should mainly take path 1 or mainly path 2. To switch the flux path, a tiny permanent magnet is sufficient, let's call him the switching magnet, similar to that one, which Stefan Marinov and Herbert Schnelzer had in their converter types. We can change the magnetization state of the small smitching magnet with a small coil using a weak pulse, in the same way, as Hans Coler wrapped and his permanent magnets with coils, in order to control them. In analogy to Stefan Marinov, we now switch the path for the large magnetic flux of the working magnet back and forth between path 1 and path 2, by controlling the small switching magnet accordingly. The energy necessary for the switching solenoid of the switching magnet is much less, than it would necessary to compensate or resit the (large) flux of the working magnet. If we would have to resist the large working flux, we could never come into over-unity, but in reality this is not the case, for we only have to redirect the large working flux. In fact, the task te redirect the strong working flux only takes a small amount of energy in the switching solenoid, that's all - similar to some Asian martial arts, the energy flow is not countered, it is merely re-directed. This is very energy efficient.

In paths #1 and #2, this results in a sudden strong change in flow (in the working flow), which we can use by means of the law of induction to create a strong electrical pulse in a secondary coil. It is also possible to attach two secondary coils, one in the path no. 1 and the other in path no. 2. While only a very small electrical pulse is needed to supply the switching solenoid (via a coil wrapped aroung the switching magnet), the two secondary coils supply large high-energy electrical pulses, which are sufficient for the self-supply, plus for some energy delivery to consumers.

The construction reminds somehow to the magnetic switch from chapter 5, but differs from it in the fact that with the FST we do not have to make great efforts in material science to find a magnetic switch material. All we needed here, is a small permanent magnet, or two such magnets, integrated into the yoke, which act as an obstacle to the magnetic flux of the working magnet to redirect the flux. It is not necessary to turn off the magnetic flux of the strong working magnet, as in the magnetic switch of Chapter 5, which greatly benefits the effectiveness of the development work.

A very important centrally decisive aspect for the generation of the over-unity also lies in the fact, that we can (and must) use the hysteresis of the switching magnets, to cause significantly large flux changes (in the yoke) with small magnetic field pulses in the switching solenoid, than the external switching solenoid could cause without switching magnet.

Step A:
Activity: Practical construction of a two-way yoke with integrated magnets.
Performer: Experimental physicist or engineer, plus a precision mechanic
Description: The material for the yoke can be classical layered yoke sheet metal, as it is used today as standard in transformer construction. The magnets (one or more working magnets and/or also one or more switching magnets) can either be mounted in air gaps inside the yoke or enclose the yoke as ring magnets. Which variant is more favorable remains to be tried out in the laboratory. The coils can be made of normal standard copper wire, as it is used nowadays in classical transformer construction.
How strongly the individual magnetic components interfere with the magnetic flux inside the yoke, can easily be measured by the electrical pulses of the (secondary) coils on the yoke, if necessary by additionally used current measuring clamps or Rogowski coils. The record of the measurement signals with an oscillograph is completely unproblematic.

Step B:
Activity: Geometry optimization
Executor: Experimental physicist or engineer, plus a precision mechanic.

Description: What has to be tried is the dimensioning of the magnets, the coils, the thickness of the yoke material, if necessary air gaps etc... The goal of the optimization is obvious, it is output pulses with the highest possible energy content in the secondary coil or in the several secondary coils, with the lowest possible energy input in the switching coils. Even if we start in under-unity (η<100%), the optimization can be brought into over-unity (η>100%) without having to change the optimization procedure, when passing the efficiency through equal-unity (η=100%).

Opportunities and risks:
The system ultimately represents a "motionless" type converter, i.e. without moving parts. However, this system requires energy feedback, i.e. the need to cover its own energy consumption from its own output, and additionally to provide the ZPE-energy gain to consumers.

Due to the principle of operation, we have the great reliability and robustness of typical electronic circuits. However, we must also be aware of the fact that power electronics are needed to process the electrical pulses. Therefore, although small and very small units can be manufactured at will, but the power cannot be scaled upwards at will, because the power electronics naturally impose an upper limit on the power. If we want to use it for the supply of medium-strong consumers such as houses or electric cars, then this would certainly not be a problem, because several units can be connected in parallel. But on the other hand, the use for large industrial manufacturing plants in the megawatt range, of course, would not be optimally cost-effective, due to the price of the power electronics. For the megawatt range other ZPE-energy conversion principles can be used more cost-effectively.

Thus, a maintenance-free, perfectly environmentally friendly, health-friendly and trouble-free use in all countries, from the first industrial nations to the poorest countries of the fourth world is possible without any problems. The service life of the devices, assuming reasonable manufacturing, is many decades.

8.3. Non-workable ideas, open questions, professional approach

Basically, the question arises whether a survey publication about possible project components of ZPE-energy research and development project, should also include **non**-functional thoughts, approaches and ideas, or whether these should simply be left out. In principle, **non**-functional aberrations have no place in a professional research project, at least not as we know about their **non**-functionality in advance. Nevertheless, I want to mention such erroneous approaches in passing, in order to demonstrate a differentiation from wrong trains of thought.

Nonsense No. 1: High pressure electrolysis
The idea of this was originally, that the problem of having to introduce the air at the bottom of the water column in a buoyancy power plant, could be circumvented by using electrolysis to create the gas bubbles inside the water column itself, at the very bottom of the water column. One could then use the gas bubbles to make the hollow metal vessels (as explained above) rise in the water column. This idea is not functional because the electrolysis of the water consumes so much energy that one would have to let the hollow vessels rise over many tens of kilometers to reach the over-unity. To produce such high water columns on earth, I think is absolutely impossible. I rejected the idea by a simple calculation of the energy balance, in the direct comparison between the energy with the ascent of the gas bubbles in the water column, in relation to the energy necessary for the electrolysis for the formation of the gas bubbles.

Nonsense No. 2: Evaporation buoyancy power plant
Less energy than electrolysis for the formation of gas bubbles is required if the water is evaporated at the bottom of the water column, and then the vapor bubbles are used to displace the water from the interior of the hollow vessels in the buoyancy power plant. In order to prevent thermodynamic effects during the compression or expansion of the gas bubbles during the ascent, we could even pressure-encapsulate the

hollow vessels and equip them with valves, or alternatively generate the gas bubbles right inside the hollow vessels.

I had to reject this idea, too, because a simple calculation of the energy balance shows that the evaporation of the water to gas bubbles consumes more energy than can be gained during the ascent, if we assume a realistic height of the water column. The energy balance is not quite as extremely unfavorable as for high pressure electrolysis, but water columns of several kilometers height would still be needed to bring the system into over-unity.

Nonsense No. 3: Magnet motor with Mu-metal shielding plates

Mümetall is known for its excellent shielding of magnetic fields. Together with other ZPE-energy activists and hobbyists, we once came to the idea of wanting to build a magnetic motor with handy convenient speed, by letting the magnets act without shielding as long as we want the magnetic force to drive the motor, then quickly insert a Mu-metal between the magnets, as soon as the magnets have reached positions where the magnetic forces would brake the motor, and pull the Mu-metal sheets out again later, as soone as the time has come for the magnets to take up positions where the magnetic forces will again drive the motor in the desired direction.

I had to discard this idea after a (small) experimental test with measurements, where I found out that motion of the Mu-metal consumes exactly the same amount of energy, as we would have to spend, to move the magnets without Mu-metal against the magnetic forces. If the Mu-metal is not moved too fast (unless with fast movement a warming up of the Mu-metal would consume further energy), the energy balance of the movements with and without the Mu-metal is identical, so that we come to the result, that the use of the Mu-metal means only a zero-sum of the energy balance.

Nonsense No. 4: Unbalance example of a gravitaty converter

I have already reported about the *in*operability of such an example in chapter 6.2. Nevertheless it must be stated that in principle it seems possible to build purely mechanically operated gravitaty ZPE-converters. A very interesting example of such devices has been demonstrated by Veljko Milkovic, which surprises me, because I cannot see the mechanism of action underlying the system. [MIL 09] Nevertheless, there are surprising and fascinating demonstrations that cannot be ignored.

Open question No. 1: Shock wave converter

Not yet clarified is the question, whether we can use shock waves / bang waves as fast moving pressure waves in water for ZPE-energy conversion. It is clear that such waves propagate with a finite propagation velocity and therefore should actually get benefit from my FPGW theory. What is still unclear to me is, how we can use this to develop devices or systems that actually allow net energy gain to be generated, i.e., over-unity.

Open question No. 2: Pyrolytic Graphite

Pyrolytic graphite is known for its particularly strong diamagnetism with a susceptibility of $\chi = -4 \cdot 10^{-4}$. This causes it to be repelled by permanent magnets, so much so that it levitates above strong rare earth magnets. The fact that this can be used to shield and/or to repel magnetic fields, could perhaps open up possibilities for building magnetic motors, but up to now, I have not yet found the working time to think about clear motor concepts or even to calculate energy balances. Since creative intuition can not be forced, we have to wait until the muse kisses one of us – therefore I can only mention such thoughts now, and also in a research group, and than wait to see whether somebody might have a bright idea for designing something useful from the ideas.

Open question No. 3: Nitinol

Nitinol is a nickel-titanium alloy known as a "shape memory material". It has the funny property that it can be deformed, but if we warm it up beyond a so-called transformation temperature, it returns back to its

original shape. At first this is an amazing property. As a researcher and inventor I intuitively ask myself immediately, if we can gain a benefit from it for our own work. Many ZPE-activists ask the same question, thus the topic goes through the ZPE-community from time to time. So far, I did not yet find anywhere a sparkling idea how to use this property of nitinol for ZPE-conversion, nor have I been able to recognize such an idea by myself. Nevertheless, the final remark of the open question no. 2 remains valid also here: Since creative intuition can not be forced, we have to wait until the muse kisses one of us – therefore I can only mention such thoughts now, and also in a research group, and than wait to see whether somebody might have a bright idea for designing something useful from the ideas.

Open question No. 4: Ferrofluid
Another exciting topic are ferrofluids, liquids that react to magnetic fields. These are liquids in which tiny (e.g. 5 ... 10 nm small) magnetic nano-particles are colloidally suspended. A sticking together of these nanometer small particles is prevented mostly with a surface coating of polymer (plastic). Ferrofluids remain liquid in magnetic fields and do not become solid. Officially, their magnetic behavior is described as superparamagnetic, and a typical hysteresis loop can be measured. This may open up possibilities to fill cavities with a magnetic material, or to make magnetic material flow. We should keep such options in mind, in the case we ever get the idea how to use such a substance advantageously.

Open question No. 5: „delayed lenz effect"
Lenz's rule is known in electrical engineering as the equivalent of Newton's "actio = reactio". It states that every electric current causing an induction, also always experiences a counter-induction, which exactly counteracts the primary current. This has, for example, the consequence that the conservation of energy applies in transformers.
The question now is, and this is often discussed in the ZPE-community, whether we can use a time delay between the induction ('actio') and the counter-induction ('reactio') to convert ZPE-energy, i.e. to use the time asymmetry that arises between the effect and the counter-effect, that the ZPE-energy gets a non-zero contribution in the energy conservation law. There is an analogue to my FPGW-approach.
Idea: If we could, for example, give a very short sharp pulse from a primary coil into a yoke, so that a pulse is induced in a secondary coil, we would only need to close a switch on the side of the primary coil very quickly during the transit time of the magnetic pulse through the yoke, so that the Lenz'ian counter pulse is prevented from being induced in the primary coil. The switch would only have to close fast enough to anticipate the Lenz counter-induction.
The delayed Lenz effect (also called the anti-Lenz effect) is well known in the relevant literature, and we know that ZPE-energy converters have already been successfully built with its help." [DLE 21] Therefore, the idea of exploring it is anything but absurd. In the literature references within [DLE 21] some setups are shown, which we could reconstruct probably relatively simply, because we know the function principle well and understands it physically. A friend of mine has experimented with it quite successfully in his tinkering cellar, and demonstrated the effects impressively and explained them to me in an understandable way. Unfortunately, he is already well over 80 years old and no longer in a position to advance the development work from a mere effect to a functioning proof of concept, a fortiori not to a working setup. In a ZPE-energy research group I would probably like to take up this topic, because without much additional expenditure, far-reaching synergies to other ZPE-energy converters result, so that we could let suitable investigations run "quasi besides".

Open question No. 6: Levitation according to Hutchinson
The work of John Hutchinson also raises many open questions. The very unconventional researcher living in Vancouver (Canada) had set up his living room as a laboratory, and kept numerous generators for high-frequency electric fields and alternating magnetic fields there, and also put them into operation when needed. Completely unexpectedly and without any theoretical understanding, metal parts suddenly flew unexpectedly through the room. Since the potential energy for lifting the metal parts and making them fly,

cannot be explained by the electric and magnetic fields, there is talk of levitation. The situation became even more confusing, when some metal parts suddenly appeared to bend or to burst. How can it be that a massive piece of metal breaks in the middle? How it can happen, we do not know, but that it happened, is an empirical fact. [HUT 20] To put it bluntly: We do not have any well-founded explanation, but we cannot get ignore the report of empirical facts. Finally, a friend of mine was over there in Canada, visiting John Hutchinson, and attended the demonstrations himself. I was allowed to see a video taken by my friend. The effects are definitely there. Metal blocks weighing many kilograms suddenly levitate just like they would lose their weight at all - and nobody knows why.

In the background, perhaps the ECE theory according to Einstein, Cartan and Evans could be used to explain gravity. It is an open question. The point is: If it would be possible to reproduce the levitation in the same way as demonstrated by Hutchinson, one could win large quantities of potential energy in heavy objects with very little energetic expenditure, which could than be converted into other usable forms of energy, as for example into electrical energy. Hutchinson suddenly received unexpected visits from secret services, from which we can conclude that the application possibilities of his work seem to go far beyond the possibilities of conversion ZPE-energy. It almost seems that the observation of levitation opens a scientific door to the theory of gravitation. [ECK 05], [SOL 06] Do electric and magnetic (alternating) fields cause curvature in relativistic space-time? Whether we include such questions in a ZPE-energy research group, I do not know, but if it would be successful, it would lead to fantastic possibilities of ZPE-energy conversion, and far beyond to the transportation sector, in particular with the energy-efficient air traffic, not only for airplanes, but even for deep space-travel.

Positiver Sinn: Professional way of working

Purely mechanical converters (like the ones mentioned here) should only be included into a research program, if we recognize a clear and logically stringently justifiable mechanism of action from the point of view of theory, on which we can rely when developing and constructing our devices. This claim to work only on the basis of a clearly understood functional mechanism, which I can justify beyond doubt on the basis of physical formulas, I have always taken as a basis for all my converter principles and approaches, because I would consider it senseless to go to work without such fundamental physical understanding. Everything else would be unprofessional.

9. Further new Applications

What does free energy mean for humanity ?
When we speak about free energy, especially ZPE-energy, we open the way to a new better life and time. This type of energy is absolutely environmentally friendly, perfectly healthy and free of charge everywhere in the world, 24 hours a day, freely accessible to all people at all times, always and everywhere.

Energy means freedom, the freedom to move as we wish. In order to move, we have to cover a distance, therefor we need a force, not at least to overcome friction. This is the law of physics, which defindes energy: $E = F \cdot s$. If the energy is free, then the movement is free, then we are free, can move completely freely, as we want. To open the way to such a life for mankind, that is the purpose of my work.

Free energy also means a lot of further possibilities for a truly more beautiful new world, in a time of transformation of our planet, our beloved "Mother Earth". Through free energy we get enough possibilities of mobility and liberty, to clean up our whole earth, to clean the oceans and the atmosphere, to generate drinking water in the poorest areas of this world, so that the people there don't have to starve and thirst anymore. Free energy for ALL people means prosperity for ALL people. Let rich people grow even more wealthy, but first of all let the poor people also become wealthy. (This attitude shall not be misinterpreted as greed.) Free energy thus creates entirely new possibilities that we could never achieve with oil, gas or uranium (nuclear fuel elements), nor with solar cells or windmills.

I want to reflect on some of the new possibilities in the following lines of my article; I want to port my vision of a better world that we can achieve if we use ZPE-energy.

9.1. Generation of fresh water

In addition to my life motto "Free energy for all people!", I also demand "Free fresh water for all people". I think it is part of to the elementary fundamental human rights to have free access to food and fresh water. There is plenty of water everywhere in our world, not only to satisfy all people, but even to completely green all deserts. Then the people and all living beings will have enough to drink and enough to eat. Nature is abundance, an abundance that we all can experience in the new age.

In most countries, there is so much water in the air, in the form of water vapor, that sometimes it just condenses and falls down by itself. We all know this under the name of "rain." In desert areas it is different. There it rains often not even once per year. But there is no shortage of water - not really. One would only have to help the water a little bit, to condense. That is all we need to solve the water problem completely. This condensation assistance works very simply. All we need are cooled surfaces. Keeping a metal sheet in the air is really simple. All we need is a refrigerator to cool the piece of sheet metal. The refrigerator needs energy. 0.28 kWh/liter of water is needed. This is the price of water - everywhere in the world, even in the driest desert. If I buy the energy for around 35 cents per kilowatt hour, as is currently the case from my socket in Germany, I cannot irrigate my fields with condensed water, because each liter would cost me a hefty 0.28 * 35 cents = 9.8 cents. Just around 10 cents per liter - that's possible for drinking, but would I sit in the bathtub at that price? I could not afford that. But above all, no one could afford to use it to irrigate fields.

The possibility of water condensation from air, as a source of fresh water, is to be taken quite seriously. This is demonstrated today by military forces operating in the desert. For logistical reasons, the soldiers do not carry water, but diesel. Diesel contains an energy density of 10.4 kWh/liter. If they burn 1 liter of diesel with an efficiency of 35% as usual in a normal diesel engine, they get 10.4 kWh * 0.35 = 3.64 kWh, and this in turn drives an electricity generator, with which operate their refrigerator in order to condense 13 liters of water. So instead of 13 liters of water, they only need to carry 1 liter of diesel, which is efficient because of the lower mass and volume.

Now, of course, we cannot burn diesel to produce fresh water in the desert to irrigate plants. This technology would lead to terrible environmental pollution due to diesel exhaust fumes. This is not possible at all. BUT: If we take the energy from the free absolutely environmentally friendly ZPE-energy, then the situation suddenly looks really good. Even the driest desert on earth, the Atacama in Chile contains about 10...15 ml of water per cubic meter of air. That's too little to condense on its own and fall down as rain, but if we help it along with a cooled surface, we suddenly get a lot more water than we would need for watering. This can be illustrated with a simple little mental calculation. If the air is flowing due to the wind with a gentle breeze at a wind speed of 20 km/h, then at the humidity just mentioned about drives 200...300 liters of water vapor per hour through each square meter of a surface that is placed vertically into the wind. That is 43,200 ... 64,800 liters of water per day through an area of only 3 meters × 3 meters. If we put up a slightly wider barn door of 3 m x 10 m, it is even 144,000 ... 216,000 liters of water that flows through it per day - but only as pure water vapor. We do not have a shortage of water, we only have to condense the water from the steam. 200,000 liters of water, that would be a swimming pool full with fresh water, with a pool size of 10 m × 20 m and a water depth of 1 m. The barn door could simply be placed at the edge of the pool, mind you, the short pool edge is enough. If we were to place the barn-door at the long edge of the pool, we would even have twice as much water - our pool would then be 2 meters deep. And because energy costs practically nothing, the water can really be used to green the desert. This would not only solve the drinking fresh water problem, but also the world hunger problem. And there is a bit more water in the Sahara than in the Atacama, for which we have just calculated our numerical example. Of course, we remember that even with water condensation, the efficiency is only finitely large, for sure less than 100%. Thus we might need a slightly larger cooled area, or a bit more energy per liter, but that

doesn't change the situation: Fact is, that our problems with water and hunger are solved by the use of ZPE-energy.

Condensing water from the air, by the way, is a standard technology that can be bought ready-made in our days. We don't need to invent anything, and not to develop anything. All we need is an energy supply, and that is definitely my topic. [GEO 21], [BAR 04], [WAT 21].

9.2. World – hunger problem

We are seeing the emergence of desert greening programs, such as "Desert greening" by Madjid Abdellaziz. A wonderful program he has presented; the world needs more such programs. Interestingly, he also refers to ZPE-energy and speaks in this context of "harmony of the spheres", whereby he ultimately refers to the so-called "orgone energy" according to Wilhelm Reich, regarded as another name for ZPE-energy. [ABD 21] Of course, some years ago he asked me directly about ZPE-energy converters which would help him very much. Unfortunately, since I had no research funds (and still have none) I could not offer him anything then, and still cannot. Very sad.

If we can green an area like the entire Sahara, if we can supply the poorest driest countries of Africa and Asia with free fresh water - how many previously homeless people will get the opportunity to earn their own living as farmers and live well in human dignity . . . . a wonderful vision that will also change the world for the better.

9.3. Cleaning the oceans

The pollution of the world's oceans is a major problem that concerns us all. Plastic waste in particular is causing us considerable trouble. Of course, all of this is common knowledge, so there are environmental protection initiatives, but unfortunately they are all doomed to failure because they don't have the ability to get the dirt out of the oceans. [PLA 21]

Therefore, more is discussed than done, which further aggravates the actual problem. The oceans help us a lot by collecting the plastic in a few places in huge whirlpools that are many cubic kilometers in size. [STR 21] The earth helps us to clean it up, but we don't accept the help, we don't sooperate. It is unbelievable, but unfortunately true. People are speaking and speaking and speaking and speaking and doing nothing.

And after all is said and done, there's a lot more said than done.

What would it take for us to accept the Earth's help in cleaning it up? It's simpler than we think: We would need large dredger ships, could drive to the accumulations of plastic waste, and there simply pick the dirt out of the oceans. All we need is clean energy to power the dredgers, but more importantly, clean energy to recycle the plastic. Plastic is a petroleum product. If we had the necessary energy in an environmentally friendly way, we could crack the plastic down into its components again, i.e. into monomers, and then use these to produce new plastic. In this way, a "cradle-to-cradle" cycle would come about. This would give us the opportunity to finally completely stop pumping Mother Earth of her blood, as which we have to understand the petroleum unfortunately. We are drilling into our home planet to pump out (day and night) the petroleum, similar to the mosquito drilling into the harmless sleeper at night to pump out his blood. It hurts.

The extreme pollution of the oceans is causing incredible species extinction in the world's oceans. The oceans are running out of air because small oxygen-producing microorganisms (plankton, algae, etc...) are dying out in large numbers. [OZE 21] Since the tiny gas bubbles of oxygen rise only slowly from the depths of the oceans to their surface, we have so far observed the drop in oxygen levels on Earth only in the oceans, but not yet seriously in the atmosphere. It is only a matter of a few years until we will also notice the drop in oxygen percentage in the atmosphere. When the time will arrive, we will notice it there in a clearly disturbing way. But then it will be already too late, because most of the world's oxygen production

does not come from the virgin forests, but actually from the oceans. If we do not save the oceans SOON, the extreme species extinction under water, will soon be followed by an extreme species extinction of the creatures living in the air.

Can it be that we know such living beings (at air) and have to do with them?

Can it be that we will miss these living beings?

Can it be that we must use the ZPE-energy promptly for the cleaning of the oceans, in order to survive ourselves?

By the way, it is even possible to make a tidy financial profit with cleaning the oceans, because as soon as energy costs nearly nothing, it will be possible to extract vast quantities of plastic from the oceans extremely cheaply, and to reprocess it just as cheaply into fresh plastic and sell it as such at market prices. What will hardly be of interest is the extraction of oil from the old plastic, because nobody will need the oil anymore, because the engines will run on ZPE-energy instead of combustion fuel.

9.4. Cleaning the atmosphere

Apart from the fact that in the last time a discussion becomes louder, which questions whether we have the CO_2 problem in our earth atmosphere or not, it is easily possible with ZPE-energy to filter the CO_2 out of the air and to decompose it into its components (atoms). The pure oxygen can be released into the atmosphere, and to carbon can be compressed into briquettes and be buried it in the soil, because nobody needs the coal any more. Who wants to heat with coal anymore, when we have the clean and free ZPE-energy....

Other impurities like soot, exhaust gases, etc.... can of course be filtered out of the air and disposed of as soon as the energy costs nearly nothing anymore. Most toxins, practically all organic toxins, can be discomposed down by thermolysis (if only heated high enough) into their individual atomic components, which are then no longer toxic. This can also solve the toxicity problem of waste disposal and landfills. Today, unimaginable amounts of incredibly toxic substances are stored in underground hazardous waste dumps, threatening our survival on earth like a ticking time bomb. This should not be forgotten, especially since we also have a wonderful disposal solution for this, in the form of ZPE-energy.

10. Resumée and Perspective

Our perspective is a wonderful future, provided that mankind decides to use the ZPE-energy. Certainly, the energy problem is not our only problem, but it is also certain that it is one of our biggest problems. It is also certain that from a technical point of view we have the solution in our hands, namely in the form of an absolutely free energy source, which is perfectly environmentally friendly and unrestrictedly compatible with health, and above all, freely available in unlimited quantities to all people everywhere and at all times on earth. What prevents us from using this energy source? It is not technological problems, but sociological and/or psychological and/or political problems, bginning with the greed of the classical energy companies, but not ending with this anthropogenic deficiency.

So I summarize my article with the offer to develop ZPE-energy converters as soon as someone provides me with the research budget needed to employ a multi-member research group of top high-tech researchers full-time, and to pay for the materials and laboratory equipment. That takes a tidy multi-million euro budget, which is obviously not affordable to a simple private citizen like me, but in relation to the benefits (and potential profits), it seems not more than petty cash. I myself am not plagued by greed. If a research funder provides the budget as a donation without expecting anything in return for himself, I also work without asking for much money. (Just my everyday expenses have to be covered, because I need a salary to live from). What I would like to have, however, is eye level. If an investor wants to make profits, probably in the billions of euros od dollars, I want to participate - precisely because of the eye level.

11. Literatur-references

[ABD 21] • Madjid Abdellaziz, Wüstenbegründungsprogramm "Desert greening"
 https://desert-greening.com/
 https://desert-greening.com/medien/videos/
 https://www.youtube.com/watch?v=Wd3I2knaXK0

[BAR 04] • https://www.lenntech.com/abstracts/1222/extraction-of-water-from-air-an-alternative-solution-for-water-supply.html
 • https://www.israel21c.org/ewa-squeezes-drinking-water-from-thin-air/
 • https://www.sciencedirect.com/science/article/abs/pii/S0011916404002681

[BET 21] • https://de.wikipedia.org/wiki/Betatron

[BRÖ 04] • Strömungsversuche in Wendelrohren, Axel Brödel
 Rauber Verlag, (2004), ISBN: 3-9805725-3-6

[CUR 21] • http://www.wundersamessammelsurium.info/magnetisches/monsieur_curie/index.html

[DEH 21] • https://www.dehn.de/dehn_custom/blitz/faq/faq_top8.html

[DÖB 10] • Magnetische Mikrostruktur von nanokristallinem Gadolinium: Untersuchungen mit
 Neutronenstreuung, Dissertation von Frank Döbrich (2010)
 https://publikationen.sulb.uni-
  saarland.de/bitstream/20.500.11880/25685/1/Dissertation_Doebrich.pdf
 Mit Hinweis auf S. Legvold, Rare Earth Metals and Alloys, in Ferromagnetic Materials,
 E. P. Wohlfarth, Bd. 1, S. 183–295, North-Holland Publishing Company, Amsterdam (1980)

[DHA 12] • Economical hydrogen production by electrolysis using nano pulsed DC
 C.H. Dharmaraj und S. Adish Kumar, Volume 3, Issue 1, 2012, pp.129-136
 Journal homepage: www.IJEE.IEEFoundation.org

[DLE 21] • http://www.borderlands.de/Links/Anti-Lenz-Effekt.pdf
 • http://jnaudin.free.fr/dlenz/indexen.htm
 • https://www.vasantcorporation.com/downloads/delayed-lenzs-law-04-27-2014.pdf

[DRU 20] • https://www.chemanager-online.com/produkte/anlagenbau-komponenten/hoeherer-wirkungsgrad

[DVR 21] • https://dvr-raumenergie.de/technologien/ueberblick/
 • http://www.borderlands.de/index1n.php3
 • http://www.borderlands.de/inet.jrnl.php3
 • https://www.svrswiss.org/facma/view.php?view=info
 • https://www.oevr.at/

[EAR 20] • https://gehtanders.de/earth-engine/
 • https://gehtanders.de/produkt-schlagwort/earth-engine/

[ECK 05] • Einstein, Cartan und Evans - bricht mit der ECE-Theorie ein neues Zeitalter in der Physik an?
 Dr. Horst Eckardt, NET-Journal, Jahrgang Nr.10, Heft Nr. 11/12, November/Dezember 2005

[FAK 12] • http://www.youtube.com/watch?v=iTIHqAi_FC4

[FOT 21] • https://www.fotosintesishumana.com/

[GEO 21] • https://www.geo.de/natur/oekologie/6685-rtkl-technik-wassergewinnung-aus-luft

[GES 21] • https://www.google.com/search?client=firefox-b-d&q=gesen+papenburg

[GRA 97]   • Extracting Intermolecular Bond Energy From Water, Peter Graneau, Ph.D.
       https://www.infinite-energy.com/images/pdfs/GraneauIE13-14.pdf
    • Arc-liberated chemical energy exceeds electrical input energy
      https://www.cambridge.org/core/journals/journal-of-plasma-physics/arti
      cle/abs/arcliberated-chemical-energy-exceeds-electrical-input-ene
      rgy/C04579576552F5E2FBA3F8333E2F4DF2

[HAL 80]   • https://de.wikipedia.org/wiki/Halbach-Array

[HUT 20]   • Auf dem Weg in das Raumenergie-Zeitalter, Adolf und Inge Schneider, Jupiter-Verlag
       ISBN 978-3-906571-36-9 (erschienen: September 2020)

[HUX 27]   „Fakten verschwinden nicht, wenn man sie ignoriert." - Aldous Huxley (1927)

[JEB 13]   • Die Urkraft aus dem Universum, von Klaus Jebens, (2013), Jupiter Verlag Zürich
       ISBN/EAN: 978-3-906571-27-0

[IGN 93]   • https://de.wikipedia.org/wiki/Ig-Nobelpreis

[KER 83]   • http://www.kervran-info.de/
    • https://de.wikipedia.org/wiki/Corentin_Louis_Kervran

[KIR 21]   • https://www.google.com/search?client=firefox-b-d&q=horst+kirsten

[LÜL 66]   • https://www.filmothek.bundesarchiv.de/video/584688?set_lang=de

[MAG 21]   • https://de.wikipedia.org/wiki/Magnetmotor

[MAR 17]   • Die Heureka-Maschine, Adolf und Inge Schneider, Jupiter-Verlag, Schweiz
       ISBN: 978-3906571317   ,   überschaubare Buchbeschreibung im NET-Journal
       Jahrgang 22, Heft Nr. 9/10, September/Oktober 2017
       siehe auch: http://www.borderlands.de/net_pdf/NET0917druckS14-15.pdf

[Mey 98]   • Stanley Meyer's Wasserauto
      https://www.amazon.de/Water-Fuel-Cell-Stanley-Meyer/dp/1329502418
      http://www.xy44.de/skalar/wasserauto.htm
      https://gehtanders.de/stanley-meyers-und-walter-jenkins-wasserautos/
      http://www.wasserauto.de/html/stanley_meyer.html
      http://www.borderlands.de/net_pdf/NET0918S14-15.pdf   und viele andere mehr

[MIL 09]   • https://www.veljkomilkovic.com/indexEng.htm
    • http://milkovicpendulum.com/anti-gravity_motor_en.html
    • https://www.homemade-circuits.com/how-to-get-free-energy-from-pendulum/

[OZE 21]   • https://www.google.com/search?client=firefox-b-d&q=Den+Ozeanen+geht+die+Luft+aus

[PES 21]   • https://peswiki.com/directory:suppression
    • https://www.raum-und-zeit.com/naturwissenschaft/freie-energie/blockaden-gegen-
    die-freie-energie.html
    • http://www.borderlands.de/Links/EnergySuppressions.pdf
    • Verbotene Erfindungen: Energie aus dem »Nichts« - Geniale Erfinder - verspottet,
      behindert und ermordet, von György Egely
      E-ISBN 978-3-86445-535-3   und   ISBN 978-3-86445-525-4

[PLA 21]   https://www.google.com/search?client=firefox-b-d&q=verschmutzung+der+weltmeere+durch+plastikmüll

[ROS 15]   • http://www.slimlife.eu/kalte_Fusion.html
                • https://www.extremnews.com/berichte/wissenschaft/704c146a760c623
                • Nulceon polarizability and long range strong force from meson exchange potential,
                  Carl-Oscar Gullström, Andreas Rossi, arXiv:1703.05249v3 [nucl-th] 16.Aug.2017
                • https://coldreaction.net/
                • United States Patent US 9,115,913 B1 vom 25. Aug. 2015
                • Nuclear metamorphosis in mercury, International J ournal of Modern Physics B, Vol. 29
                  (2015) 1550239, World Scientific Publishing Company

[ROS 21]   • https://www.e-cat-deutschland.de/home.html
                • https://energyload.eu/energiewende/international/ecat-kalte-fussion-rossi/
                • https://www.everyday-feng-shui.de/der-e-cat-kleinkraftwerk-fuer-dezentrale-
                  energieerzeugung-sicher-sauber-sensationell-guenstig/

[SCH 01]   • Unsere sinnlose Arbeit, Viktor Schauberger (2001)
                  Schauberger Verlag, ISBN-13: 9783902262004
                • Naturenergien verstehen und nutzen: Viktor Schaubergers geniale Entdeckungen
                  Callum Coats, et. al. (2001), Omega Verlag Bongart-Meier, ISBN-13: 978-3-930243143
                • Das Wesen des Wassers: Originaltexte, Jörg Schauberger
                  Viktor Schauberger und Jörg Schauberger (2006), ISBN: 978-3-03800-272-7

[SOL 06]   • Der Hutchinson-Effekt, Mark A. Solis, Nexus-Magazin, August-September 2006, S.60-61
                  www.geocities.com/ResearchTriangle/Thinktank/8863/main.html

[STR 21]   • https://www.google.com/search?client=firefox-b-d&q=plastikstrudel+im+meer+karte

[TUR 17]   • https://www.youtube.com/watch?v=MIM6DSAnteM

[VID 16]   • Thermoelektrischer Motor nach Nikola Tesla, Artikel von Dr. Nikolaus Vida
                  NET-Journal Jg.22, Heft Nr. 5/6, Mai/Juni 2017 Seite 40

[WAT 21]   • https://www.watergen.com/

[WEI 21]   • http://www.slimlife.eu/wordpress/2015/04/kapillarkraft-zur-stromerzeugung/
              • https://www.merkur.de/lokales/ebersberg/philosophische-perpetuum-mobile-731538.html
                • http://web.archive.org/web/20111208014750/http:/www.wissenschaft-frontal.de/

[WIK 21]   • https://de.wikipedia.org/wiki/Kapillarität

[ZAM 12]   • https://de.wikipedia.org/wiki/Zambonisäule