



# “HEE”

## *Heat – Electricity – Extractor*

Clean energy source, inexhaustible and inexpensive

Heat – Electricity

*an Open Power project*



In the picture, the HEE concept: Heat-Electricity Extractor

### PREFACE

**Dear Friends,**

When three years ago we set up our Scientific Association "Open Power", we had clear the goal we wanted to achieve together: finding an inexhaustible energy source, clean and inexpensive, which could counteract the material poverty of Peoples and allow our beautiful planet Earth to regenerate.

Today we can assert that thanks mainly to the Titanic work and the desire to create a dialogue among all our partners, as responsible of a unitary result, by our Scientific Director Ugo Abundo, our work has given us a great satisfaction more!

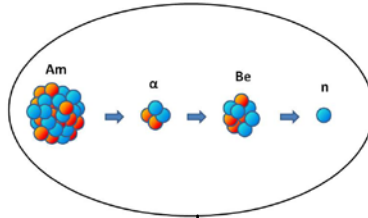
On January 19 th, 2016, Open Power has filed an application for an Italian Patent concerning an apparatus for the direct conversion of nuclear energy into electricity and heat cogeneration from a LENR general kind, in particular by a new kind:

**"Apparatus and method for the direct production of electrical energy from charged radiation and cogeneration of heat through controlled neutron activation of nuclear reactions of light elements".**

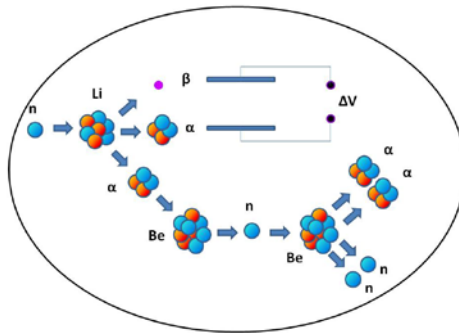
Right now all our efforts are directed to the realization of the first prototype of the apparatus "HEE", Heat - Electricity - Extractor, according to the above mentioned filed patent application (See the Appendix for references).

# Functional block diagram of HEE

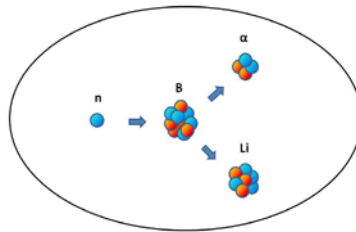
1 – Neutron gun without energy input



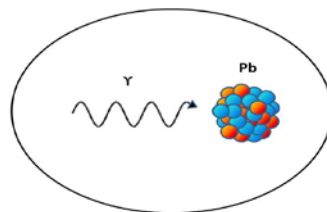
2 – Electricity and primary thermal energy



3 – Secondary thermal energy



4 –  $\gamma$  Capture



## OPERATING PRINCIPLES

The four casings in the above scheme correspond to as many distinct functions:

- **neutron gun**
- **reaction with multiplication (with possible pre-heating), Electrical and Thermal Energy production**
- **neutron excess capture**
- **shielding.**

The basic mechanism of the gun uses americium 241, an artificial transuranic element which is a radioactive waste of fission reactors, with a half-life of about 430 years; its use is widely known in nuclear physics laboratories. At the level of principle other cannon types are usable; they are currently available in the art (eg. Deuterium-tritium accelerated towards a metal target), but these need an electrical energy input.

Therefore the cannon so-called "isotopic" Am-Be is not the only proposed, but in this comment it will be primarily examined.

Americium is naturally radioactive and emits alpha particles of energy sufficient to push out from a beryllium nucleus a weakly bound neutron.

There are projects in the patent literature for the adjustment of the neutron flux emitted, based on means for determining the fraction of alpha rays reaching the beryllium.

We have a first technique based on the interception of alpha particles by helium under pressure, and a second technique focused on the adjustment of the facing between surfaces on which are separately deposited powders of americium and respectively, of beryllium compounds.

In the section of reaction-multiplication, the lithium in the natural isotopic composition (about 10% lithium 6 and 90% lithium 7) if reached by neutrons slowed down sufficiently (eg. by graphite) has cross sections for neutron capture sufficient to the emission of alpha and beta particles, and tritium, exothermically.

If the fuel is in the form of a mixture of fine dusts, sintered or porous, containing also metals highly absorbing hydrogen isotopes (e.g. nickel, titanium), and lithium, graphite, beryllium, then alpha particles that invest beryllium produce neutrons which in turn reinvesting beryllium are multiplied with side-effect of producing more alpha, beta particles, and increasing the ratio  $6\text{ Li} / 7\text{ Li}$ .

The Tritium generated, adsorbed in the metal, invested by neutrons, produces more alpha and beta particles, exothermically.



The neutrons escaping from the reaction zone without having been able to react, are moderated (eg. by polyethylene and water), and caught in a layer of boron 10, optionally in mixture with natural boron 11, exothermically.

A refrigerant extracts the heat produced in the two exothermal zones, the reaction and the capture ones. An external lead shielding prevents the escaping of gamma rays in the environment.

The section for the production of electricity is based on the technology called "Betavoltaic", technically available, which normally uses a spontaneous emission of beta rays from radioactive isotopes, here adapted to the case where such a release is produced by controlled reactions.

Alpha particles hardly are able to escape from the metal plate (lower armature of the capacitor) which houses the mixture of combustible dust, being easily absorbed into thin layers of matter; on the contrary, beta particles travel towards the upper armature; an intermediate grid electrode controls the flow, set to a positive potential, so as to "discourage" the alpha and "promote" beta particles.

The main problem lies in the low number of electrons, even with very high kinetic energy between 100 keV and 1 MeV: well, the proven methods in Betavoltaic technology provide substantially to let accumulate charges up to high potential differences between armatures, however reached by energetic electrons that work, in their travel, against the force of the electric field of the capacitor.

Periodically, such a potential difference is taken, by means of a control circuit, thus creating a pulsed current that may be modified by a transformer (voltage lowered and amperage raised ) to come in the range of usability conditions by a conventional electrical load.

Obviously between the two plates an internal discharge should not trigger , therefore the gas pressure should be controlled at high or very low values, in accordance with the Paschen curves that provide the dependence between the discharge distance and the voltage, as a function of the potential difference and the gas composition.

#### HOW THE *HEE* TECHNOLOGY WILL BE USED

How can then the actual our lives change thanks to HEE technology? A few examples, and we attempt some predictions:

- At first, the poverty will be thwarted, because of even with little money you will heat water during winters, and in the warmer months you will refresh yourself with conditioning systems powered by HEE
- It will be possible to produce food at lower cost, and develop agriculture, and all of this economy sector will be economical and environmentally friendly, by the clean and cheap energy provided by HEE
- We will be able to live in coastal areas without fresh water, because we can desalinate sea water to make it drinkable, using the cheap electricity generated directly by HEE
- If instead we like to live in isolated places, with an HEE available we will be able to do it and will be autonomous from an energy point of view



- If we want, we can also become farmers in the desert! Since the extraction of the fresh water from the wells will have a low cost, it will be possible to irrigate and to make fertile even the driest desert soils
- We could have energy at low cost by our HEE to operate all electrical equipment and machinery that need for our daily work, for the production of manufactured articles, etc.
- The industries could be relocated away from the cities, and could be self-sustaining from an energy point of view
- In a second time also all our means of locomotion could be powered by small *HEE* devices that could provide them with all the necessary electrical energy and great autonomy
- If you like the sea and sailing, even your boats will have a huge autonomy and a complete energy self-sufficiency
- For those who like to go *very far*, in space, the propulsion of future spaceships will certainly be assisted by HEE systems; also human settlements on other planets will be possible: simply carrying a HEE with themselves!
- For those who prefer to live under the ground, this will become practically, economically and technically feasible, since by HEE you can also build energetically self-sustaining subterranean cities
- You will be able also to build self-sufficient submarine settlements, houses and aquariums, thanks to HEE
- You could also build floating cities in the open ocean, self-sufficient from an energy point of view, by the HEE
- You could easily live in isolated places, on remote islands, or on the mountains, having always energy available by using an HEE
- You will more easily work on the hydrogeological and land conservation, because of challenging work to be done with the necessary heavy mechanical means, will cost less when executed by HEE technology
- Finally, the planet Earth will be saved because you no longer need to use fossil fuels, which are among the major causes of global warming.

### **THE NEW SCENARIO**

The interest in the world for "Renewable Energy" is remarkable for several reasons: they range from the continuing rise of energy needs to support the development, to the instability of the prices of fossil fuels, to dependence on them and their next exhaustion, pollution of atmosphere, and the resulting global warming ("greenhouse effect" of CO<sub>2</sub> emissions); the unsustainability of hot nuclear energy is related to its dangers, the related problem of disposing of radioactive wastes, and its astronomical costs.

Currently the equipment named "by cold fusion" are by far the most promising and designed to produce energy in quantity, clean and very cheap! Such as to permit a "sustainable development" and better living conditions all over the planet and for all the peoples of the Earth.



Of course they promise fair revenues for those will invest with foresight in this area. Our philosophy, as specified in our Open Power statute, provides for the licensing to manufacturers selected by us, as long as they commit themselves to sell the plant at a cost not exceeding a maximum with us agreed.

**The licenses will provide for the right to use, at the cost of a royalty payable to us, in the form one-off or charged on any single device produced.**

**The companies that will become our partners will be of two types, or combination of both:**

- a) **only manufacturer : pays the fee and then produces and sells**
- b) **only investor : buys minority patent portions and shares our own benefits in proportion**
- c) **manufacturer / investor: it agrees simultaneously with schemes a) and b).**

## CONCLUSIONS

**After the first positive tests carried out by Open Power, certainly much work is still to do, first and foremost the creation of a valid demonstration prototype. As we are driven by a high intention, determination will certainly escort us.**

**Therefore if you are interested in investing on our research studies and experiments, please contact us. Send us an e-mail to: [contatti@hydrobetatron.org](mailto:contatti@hydrobetatron.org), and book an appointment to meet us personally and deepen into the details of the cooperation.**

## *Open Power Association*

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