BUSINESS PLAN
of innovation project of the 7th wave of innovation
"Electric reactor based on a chain reaction with thermal capacity of 50 MW - ERCR-50"

"The innovative and scientific form of activity differs both in terms of resource base and objectives. The basis of scientific practice is intellectual potential. The resources of the innovation process are people-innovators, their knowledge, vision, technical and technological solutions, that is, what, by and large, is the result of scientific activity. The goal of science is to produce qualitatively new knowledge, while the purpose of innovation is the commercial use of gained knowledge and found solutions."

Sultanov Iskander, Founder of Projectimo.ru

In this project, there are the complete interconnection of science - intellectual potential and people-innovators. They're one and the same people.

1. Project summary.

1.1. The essence of the project

The electric reactor based on a chain reaction - ERCR-50 will make it possible to rid the owners of nuclear power plants (NPP), thermal power plants (TPP), combined heat and power plants (CHPP) and city boiler houses of the use of nuclear and hydrocarbon fuels, and also it will free the environment from harmful emissions into the atmosphere and protect the earth from nuclear waste and solid coal slags.

The solution of this problem is at the subatomic level and has never been used in the production of goods, because it is very expensive.

To get rid of nuclear and hydrocarbon fuels, it is necessary to create an artificial substitute on similar principles, for example, on a chain reaction. The solution was found in the form of absorption of microwaves (ultrahigh frequency waves) by cermets with the effect of "thermal runaway" (https://en.wikipedia.org/wiki/Thermal_runaway). **We have defined a narrow range of necessary cermets and the exact microwave frequency on the basis of world experience and our long-term research that will ensure the guaranteed creation of technology and samples of goods.**

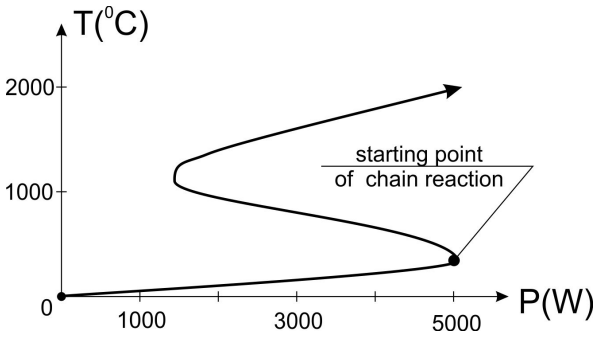

Fig.1.

We have established that «thermal runaway" is a chain reaction, because gamma- and beta-radiation are observed; i.e. the final phase of the process is the same as that of nuclear fuel. Consequently, we managed to find an artificial substitute of nuclear fuel, absolutely harmless (gamma- and beta-radiation are completely absorbed by the body of the electric reactor that leads only to its additional heating). Information about ERCR-50 is known worldwide. Rosatom, Skolkovo Innovation Center and several specialized universities in Russia started to seek their solution on the basis of state capabilities. We started the race for fuel-free heat production, but we do not have the financial means to produce an expensive sample of the reactor for the world market. Without external financing we were able to produce a low-power sample without a body with natural air cooling and to verify the correctness of the theoretical model. Fuel rods from steel began to melt in the in their upper part – it's a temperature of ~ 1500°C. Graph of temperature of "tablets" from the cermets – T as a function of supplied microwave power – P is represented in ***Fig.1***.

We need investments to create technologies for the production of "tablets" for fuel rods, equipment for the electric reactor and microwave equipment, the first samples for bringing them to the declared parameters. Further, all manufacturing of ERCR-50 will be developed at existing plants that will produced the first samples, because they will already have the necessary production technologies, equipment, tooling and test stands for the housings of the reactors. We will act in the capacity of customers. After successful tests, we will shoot a video and together with other technical documentation present it to our future customers - owners of NPPs in Germany (where the law on closing all nuclear power plants before 2022 was passed), France, etc., - only 509 nuclear power

units, not counting steam boilers at TPPs, CHP plants and city boiler houses.

Our proposal to replace nuclear reactors with electric reactors allows us to fully preserve the power supply infrastructure in all countries. ERCR-50 is not afraid of peak loads and reacts to them within a few seconds.

1.2. Brief description and purpose of the innovative (scientific and technical) product, its main technical parameters

The prototype of the electric reactor was an atomic reactor. In our case, there are only the body with TVELs without any moving parts and free access to the "pellets during the operation of the block. Atomic block with thermal power of 3000 MW (electric power of 1000 MW, efficiency factor = 0.3) can be replaced by 60 pieces of ERCR-50 with the same capacity of 3000 MW. Each ERCR-50 can increase the working capacity from 50 MW to a maximum of 60 MW, which allows automatic shutdown of up to 10 ERCS-50 for short-term inspection, filling up of "pellets" and other preventive works without stopping and unloading the 1000 MW block. The block without stops can work for years, which is impossible with nuclear reactors. The service life of ERCR-50 is determined only by the "aging" of the body of reactor - this is at least 50 years old.

Technical characteristics of ERCR-50

Reactor design sees at Fig.2.

Техническая характеристика установки
Technical characteristics of the installation

Мощность	50 МВт	Power	50 MW
Расход воды	100 м³/ч	Water consumption	100 m³/h
Рабочее давление	60 атм	Operating pressure	60 ATM
Температура пара	275 °C	Steam temperature	275 °C
Поверхность нагрева	300 м²	Heating surface	300 m²
К-во нагревательных трубок (ТВЭЛ)	1938 шт.	Number of heating tubes (fuel rods)	1938

Габаритные размеры.
Overall dimensions.

Установки
Installations
- длина 4,00 м
- length 4,00 m
- ширина 1,80 м
- width 1.80 m
- высота 7,20 м
- height 7,20 m

Площадки обслуживания:
Service platform:
- длина 7,00 м
- length 7.00 m
- ширина 6,50 м
- width 6,50 m
- высота 7,10 м
- height 7.10 m

Масса:
Weight:
установки 10 600 кг
installations 10 600 kg
площадки обслуживания 6 900 кг
service platform 6 900 kg

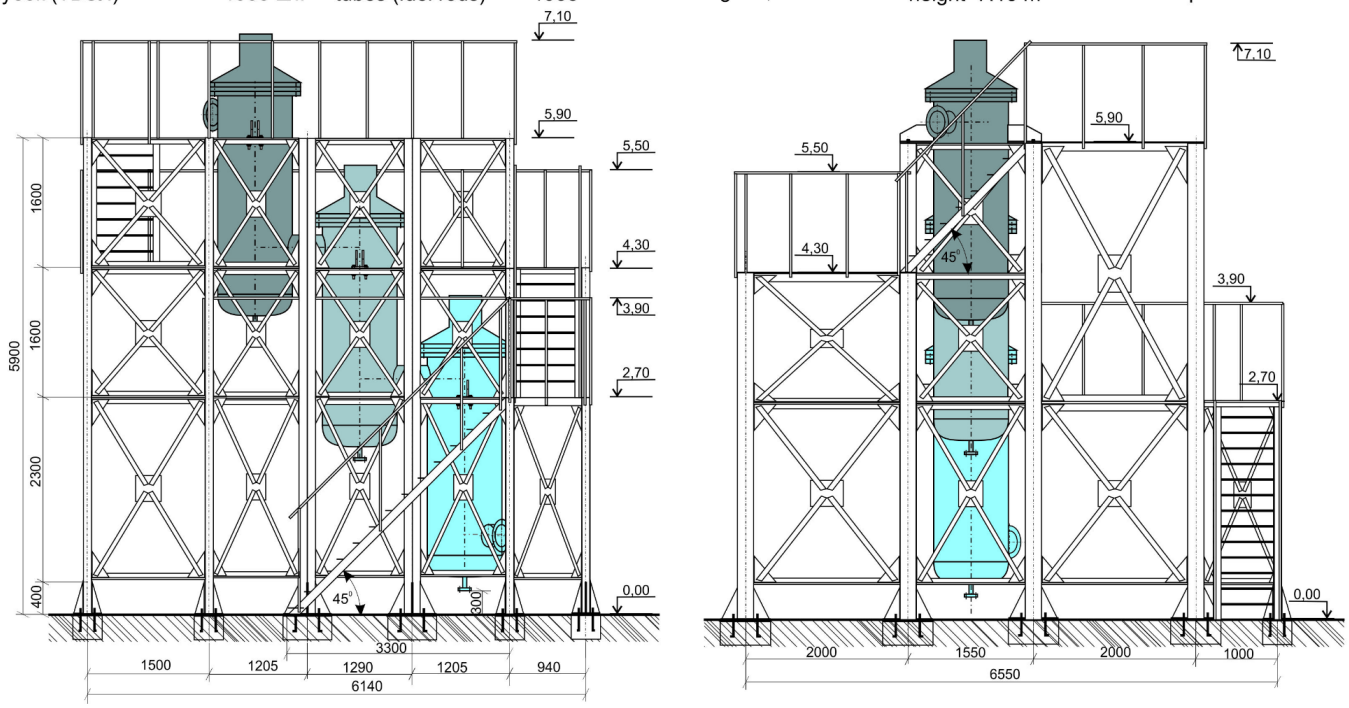

Fig.2

1.3. Short list of costs when creating an innovative product.

The principles of projects to create such final products are the same as in the whole world – it is science towns of NASA type, academic towns and others with the structure:

- Separate inhabited locality;
- Intelligence agencies and paramilitary security;
- All equipment is concentrated in one place;
- All developers and specialists are concentrated in one place and can work 24 hours a day.

We are a private structure that needs to create its «NASA» on electron-microscope-friendly lands (without vibrations within acceptable limits) and to ensure the secrecy of the developments.

We nothing cannot take on lease, in principle, because for a relatively large amount of money the lessor will sell everything without blinking an eye. To protect secrecy with arms in hand, it is necessary to have private property. The level of scientific findings is so high that security and secrecy of objects come to the fore, because the investor should be confident in the return of his funds, and we should be confident in that our long-term work is not in vain.

1.	Construction of a heat shop for ERCR-50 and laboratories for its finishing to the project capacity with fixation of all parameters and shooting a video.	$8,000,000
2.	Purchase of land for a heat shop and laboratory	$4,000,000
3.	Project engineering and supply of power with a capacity of 600kVA, special water supply and sewerage. Execution of works under the project with the purchase of equipment.	$1,200,000
4.	Manufacturing of the housing of ERCR-50 and its platforms, delivery, installation.	$5,000,000
5.	Purchase of equipment: pumps, automatic locking devices, safety valves, instrumentation, microwave equipment, delivery, installation and more.	$4,500,000
6.	Development of reactor control software products	$2,000,000
7.	Financially maintenance of about 300 employees within three years	$21,600,000
8.	Automobile transport	$1,000,000
9.	Acquisition of housing for specialists	$6,000,000
10.	Purchase, delivery and installation of electronic microscope "Talos F200i" with training and maintenance https://sernia.ru/catalog/mikroskopy/talos_f200i_thermo_fisher_scientific_prosvechivayushchiy_elektronnyy_mikroskop/	$4,000,000
11.	Purchase or rent an office for BSA Ltd with its own translation office for work in different countries.	$2,700,000
	TOTAL AMOUNT:	$60,000,000

1.4. The payback period and other performance parameters of the project

The payback period is exactly the period for which technologies and sample goods will be developed, i.e. about three years, plus the time of receipt of the first order, which will fully return the investment. In total, about three years.

Profitability index PI = 5000%.

1.5. Brief information about the company.

Company Name	BSA Ltd
Description	Scientific-industrial production of technologies and equipment for fuel-free electricity industry
Industry	Energy and Environment
Date company was founded	May 2006
Website	http://neutronscience.com.ua
Country	Ukraine

Postal address	106/2, prosp. Holosiivs'kyi, Kyiv, 03127
Contact person / persons	1. CEO of BSA Ltd Sergey Skorodumov BSA.prez@meta.ua, mob.: +38(050)3281909 2. CFO of BSA Ltd Dmitriy Belan bda19622@gmail.com, mob.: +38(050)8555178 3. Scientific director of BSA Ltd Valeriy Andrus valeriy.andrus@gmail.com, mob.: +38(050)1791131 4. Interpreter Denis Sokolov mob.: +38(050)1791131

1.6. Team of project.

1. CEO of BSA Ltd Sergey Skorodumov
2. CFO of BSA Ltd Dmitriy Belan
3. Scientific director of BSA Ltd Valeriy Andrus
4. Interpreter Denis Sokolov
5. 25 specialists in various scientific and technical fields (initial staff).

1.7. The implementation strategy of the project.

There are 509 atomic blocks in the world; about 30 of them are in Europe, which they plan to close. The price of one block of electric reactors with a thermal capacity of 3000 MW is $ 600,000,000 - this is at least twice cheaper than an atomic reactor. Profitability of sales is 50%. The profit from the sale of one block will be $ 300,000,000.

The share of ownership of BSA Ltd of 23% for the project ERCR-50 will bring to the investor a profit of $ 69,000,000 plus from the MGA project - $ 345,000,000. In sum, from two projects, in one of which the investor of ERRC-50 does not participate, he one-time additionally will receive $ 345,000,000.

In total, after three years the investor will receive $414,000,000, and then on average for 10 blocks per year (BSA Ltd will needs to work for 50 years) the profit will be $690,000,000.

1.8. The amount of funding requested and its form.

1. Loan of $ 60,000,000 with a three-year grace period of 10 years with an annual interest rate of not more than 10%, with the right of early repayment at full interest payment

2. We are also will satisfied with small loans from $ 1,000,000 with a three-year grace period of 10 years with an annual interest rate of not more than 10%, with the right to early repayment at full interest payment

3. The share of ownership of BSA Ltd for the ERRC-50 project is 23%. The profit from the first sale of one ERCR-50 block will be $ 300,000,000 • 23% / 100% = $ 69,000,000. Further, the annual profit for 10 blocks of ERRC-50 will be $ 3,000,000,000 • 23% / 100% = $ 690,000,000.

4. The value of 49% of ownership of the BSA Ltd is $130,000,000. You can also purchase shares of ownership of BSA Ltd starting from $1,000,000 – it is 0.377%:

$130,000,000 - 49%

$1,000,000 - x

X = $1,000,000·49%/$130,000,000 = 0.377%.

From the first sales of technologies and products (3 samples of MGA and 1 block of reactor ERCR-50) after three years the investor - owner of 49% of ownership will receive the first profit in the amount of:

$$\frac{(\$300{,}000{,}000 + \$1{,}500{,}000{,}000)\cdot 49\%}{100\%} = \$882{,}000{,}000$$

and the owner of the minimum share of 0.377% - respectively

$$\frac{\$882{,}000{,}000 \cdot 0{,}377\%}{100\%} = \$3{,}325{,}140$$

And then annually the profit from 10 blocks of ERCR-50 for the owner of 49% will be

$$\frac{\$3{,}000{,}000{,}000\cdot 49\%}{100\%} = \$1{,}470{,}000{,}000$$

Respectively, the owner of 0.377% -

$$\frac{\$1{,}470{,}000{,}000 \cdot 0.377\%}{100\%} = \$5{,}541{,}900$$

5. The contracts will specify all the terms of the transaction (send your suggestions).

1.9. Plan of repayment of borrowed funds and payment of remuneration.

Immediately after receiving the prepayment for the first block with a thermal capacity of 3000 MW, presumably from Germany.

1.10. Guarantees.

1. The team has experience in the construction and operation of thermal power plants, CHP plants and city boiler houses. The Scientific Director worked as the chief engineer of Regional Department of heat power engineering.

2. Investments will be mainly put in capital facilities, equipment and wages, which is easily controlled.

3. The implementation of the project itself is based on the science and intellect of its developers, and here the guarantee is 100% since two new directions for fuel-free technologies have already been opened in the production of heat and electricity, which were not even previously suspected.

Information on the 7th waves of innovation

The 7th wave of innovation is technologies and products based on the new fundamental Neutron Sciences – Neutron physics, Neutron chemistry, and Neutron astrophysics.