

Renewable - Free Energy for the World – Forever

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The great bulk of our energy comes from fossil fuels of which there is a finite supply and the use of which is having adverse effects on human and planetary well-being. Wireless power transmission is now in development by several countries and expect

Nonetheless, world demand for energy is growing rapidly. Since greater supplies from our present sources are made available only at increasing cost and, most often, with even greater environmental impact, we must seek new sources that will be sustainable, economical, and which will not exacerbate environmental damage.

Wireless power transmission and space power satellites proposed for the future use a wide array of physics and science fiction in an attempt to achieve power from space and solve this problem. All attempts to date plan on converting solar power into laser and microwave energy transmitted to Earth which need a satellite parked in GEO orbit to work.

All project planning for space power satellites use microwave transmitters made with lasers, klystrons, magnetrons, or traveling wave tubes. The major problem with klystrons, the preferred microwave power device is the cathode fails from electron depletion. Also the recommended transmitted microwave frequencies should be kept at about 2.4 GHz. due to refraction by the Earth's atmosphere.

Laser power transmitters have also been proposed but due to the severity of laser light refraction and power loss due to clouds lasers have been seen as less desirable. The last method which was proposed by Nikola Tesla now in study by MIT and others is wireless power transmission. The method of having two resonating tuned electronic circuits which can transmit power over short distances rules out space operation as the power transfer is less efficient than microwave.

In contrast, the microwave power transmission satellite with its new concept of using free space electrons, LEO orbit as the preferred orbit, and phased shifted microwave signals offers a unique approach to controllable high energy power transmission from a space based satellite to a long distance power receiving station.

In the future it will also be possible to use a klystron with free space electrons feeding the cathode for a much higher electron amperage source while extending the life of the klystron many years.

The satellite using a free space electron feed klystron, and more particular, a satellite that is able to use these electron particles accelerated to 99 percent of light speed as a source for high energy microwave transmission and a propellant for maintaining the low earth orbit of the satellite.

A self contained small, sealed, transportable, autonomous satellite will provide 24 hours a day, seven days a week, 365 days of the year for at least 10 years or greater of 100 Megawatts or 877 Terawatts a year per satellite of microwave energy transmission to remote antennas on Earth. The microwave energy from the satellite will be the source of uninterrupted high power electrical energy to energy conversion sites.

The F2 free space electron density varies around 10^{12} e/m³ at 300 km height from Earth. The F2 Ionosphere electron temperatures vary from 1000 K to 3000 K where the mean thermal speed is 200 Km/sec and the electrons have a Mev to Gev potential. When collected by the satellite collector screen the

free space electrons will supply high quality energetic electrons as a source of renewable thermionic electrons to the klystron cathode and supplemental power to the satellite.

Increasing the amount and energy level of the electrons supplied to the cathode by free space electrons will increase the maximum thermionic current density and increase the total current supplied by the klystron allowing the klystron to produce significantly higher energy microwaves well beyond the original invention design gains specifications.

By using free space electrons the lifetime to failure of the klystron can be extended thousands of times its normal usage, a major problem preventing the successful implementation of space power transmission from satellites to Earth. All klystrons to date have a typical 5,000 hour cathode lifetime before burnout due to electron depletion of the thermionic emitter materials.

This major hurdle to wireless power transmission from space can now be overcome with the use of free space high energy electrons providing the necessary energy for the klystron to reach >100 Megawatt microwave power outputs while extending the lifetime of the thermionic cathode component preventing total loss of the satellite.

Microwave power can now be beamed to the receiving station 24 hours a day 7 days a week for tens of years. There are many major advantages for operating a microwave power transmission satellite in outer space as the solar light can be converted more efficiently to electrical energy for satellite operation.

The electrical energy supplied by the 400 meter 250 kilowatt \$ 60 million 1,000 pound solar panel array will provide the necessary operational energy to the satellite and high power klystron microwave system.

A satellite using electron subatomic beam particles can be accelerated to over 400 thousand electron volts having a thrust of greater than 88,000 horsepower.

This method will allow the satellite to stay in a precise low Earth orbit (LEO) countering the effects of Earth's gravitational pull and other miscellaneous frictional forces acting on the satellites preferred orbit.

All prior world wide aerospace designs of the ISS and satellites looked at free space electrons as bad contamination called space craft charging and a precursor to ISS or satellite destructive damage and much effort was and is given to ridding the ISS or satellites of these electrons.

Today's space power systems proposed by all others talks of cost in the \$ billions even \$ trillions of dollars. The unit cost per LEO satellite of \$ 300 million for a microwave power transmission satellite (MPTS) that will use these free space electrons as an infinite renewable high energy source for the earth and future space exploration is more inline with logical costs. With the addition of many more satellites the energy output to Earth goes up dramatically.

Using the US average cost of \$.05 Kw/h for electricity to homes in America this would calculate to a gross profit from 1 year of operation of \$ 44 Billion/year, essentially paying the cost of 1 satellite hundreds of times over. It would also be conceivable for 1 satellite to create >\$ 1,000,000,000,000 profit (1 Trillion) in its operating lifetime.

Space base power is seen as a viable alternative to man's need for energy and the need for security of our country from terrorist taking control or destroying the present oil / hydrocarbon dependent economies of the world. Japan for example, is investing Billions of dollars and plans on investing Billions more money in this kind of technology than any other know to man.

Another more sinister problem is that of the current practices for supplying energy to the planet with hydrocarbon energy sources that are not renewable and pollute the planet. Earth based wind power and solar power will not be able to meet supply energy demands, is unreliable do to changing weather conditions, and will effect food production and other animal and plant life.

Nuclear energy will not be able to supply future energy needs and has the added problem of radioactive nuclear waste contamination of thousands of years. All other proposed energy sources in research and development have major environmental problems and are still not renewable energy or reliable.

The best of all possibilities is this new cost effective renewable energy source that doesn't destroy the planet, allow terrorist to threaten world peace, and will prevent further hydrocarbon green house gases from being created..... Killing our planet and its people.

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