The Global Power Grid:
Fiber Optics and Space Lasers

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Executive Summary

The current state of global power are unsustainable, dangerous, or lack resiliency. Earth is bleeding energy into space faster than it consumes it. Humans need to move to a concentrated power source which inverts the global power-flow to net positive. The steps into the future are simple to list:

1. develop light-wave specific solar panels,
2. convert fiber-optic data lines into efficient carriers of light waves that used to deliver electricity,
3. create global distribution points which use the specialized panels to convert lasers from space delivery systems,
4. use earth orbiting satellites to distribute lasers from solar lasers to Earth distribution points, and
5. use a solar satellite to collect and concert concentrated energy from the sun at close proximity.

This five step process is easy to list but constitutes nearly a hundred years of sustained effort on the part of humanity. It is far more likely global-politics, infighting for profits, and current special interest groups will prolong the creation of a global power grid for over two hundred more years.

Introduction

Exceptional levels of care are given to nuclear power because it is so dangerous. Fossil fuels are unsustainable and destroying the planet. Renewable energy is grossly inefficient when most productive. It is time for humans to begin thinking about how to bring concentrated power to Earth. A specialized system of solar panels, fiber-optic lines, and space-based laser.

Current Global Power Grid

There is no current power-grid. Entire countries have little to no reliable electricity. Other countries has nearly uninterrupted power continuously. There is a great disparity in the distribution of electrical wealth. This wealth is used to advance societies, power innovation, and sustain economies. Nations poor in power are poor in health, economy, and innovation.

Future State of Global Power Supply

Can you imagine an Earth in which all nations have sustainable electric power? A global power supply that not only harnesses but actually streamlines energy directly from the source, the sun, is achievable. A specialized solar converter can be placed in orbit above the sun. The solar converter directs a specialized laser to an Earth orbiting receiver. The Earth receiver then redirects the energy to Earth surface distribution points. The earth based distribution points use specialized fiber optic lines to carry electricity across the global power grid continuously.

How to Reach the Future

There are several technologies which need to be created to reach this future. The technologies are composed of two major systems: Earth-based systems and space-based systems. Both major system has three minor systems beneath.

Earth-Based Systems

The Earth-based major system requires fiber optic distribution lines, in-home converters, and solar collection dishes. These technologies currently exist in some form but need to be updated to maximize efficiency.

Fiber Optic Distribution

Current fiber-optic lines are designed to carry data signals which are converted into electricity for data interpretation. These fiber-optic lines are not designed to carry the high-capacity light transmissions of electrical energy and could melt under the strain. Fiber-optic lines need to be updated to carry high capacity wave-specific light from distribution points to homes.

Home Wireless Electricity

As fiber-lines carry light into the homes the light needs to be converted into electrical or wireless energy. Fortunately humans have routers. Routers will need to be converted too. They will need to be fitted with special-purpose converters. These converters should be designed to convert limited concentrated wavelengths, potentially ultra-violet. The updated routers will produce wireless energy (wireless charging) and traditional electrical power to the home and surrounding areas.

Solar Collection Dishes

As precisely positioned places around the planet satellite dishes covered in the special purpose converters collect laser energy from space-based satellites. The best placement for the dishes would be near the equator to ensure at least two of the dishes are in continuous ‘sight’ of the orbiting satellite. Other considerations would be isolated areas with low populations. Potential locations could include Columbia, Kenya, Singapore, and Hawaii to ensure maximum visibility from space.

Space-Based Systems

Where is the sun located? The sun happens to live in outer space so outer space is where collection efforts must be concentrated. From a specialized solar lens, a fine-tuned laser in Geo-synchronous orbit around the sun, to a satellite that relays concentrated power from the sun to the Earth's surface. Space is the answer to Earth's unquenchable need for power.

Solar Geo-Synchronous Orbit

At a position in static orbit around the sun should be placed a satellite. It should be located in a position such that it has continuous line-of-sight with earth throughout the year. The parts of this satellite include the lens, the collector, and the transporter.

Lens

The lens should be made of a reflective surface that only permits a specific wave-length to pass through while reflecting all others. It should be a convex ellipse with only rounded edges that are tapered from the concave to convex sides. The lens edges should also extend beyond the edges of the collector by three percent to permit the dissipation of excess heat. To permit the dissipation of excessive build-up of trapped light the ellipse should have a 5 millimeter gap around all edges between the ellipse and collector.

Collector

The collector should be composed of solar cells designed specifically for the wavelength permitted through the lens. They should also be capable of withstanding incredible heat. The collector converts the collected light into electric energy which powers the transporter.

Transporter

The transporter is a giant space laser. No really, it is. It is an obelisk attached to the collector. It is sized and placed in the shadow of the collector to maximize heat dissipation. The laser beams high energy light waves to the Earth-orbiting relay.

Geo-Synchronous Earth Satellite

Do you know the difference between the Earth's daily and annual axis? The daily axis is defined by the daily rotation of the earth. The annual axis is defined by tilt of the earth as it rotates around the sun. the solar relay should be placed in static orbit on the earth's annual axis. This placement should permit the continuous 'line-of-sigh' with the solar satellite.

Collection

The collection should use the same technologies as the solar collector but do not require the same heat dispersing capabilities. There should be a specialized lens that reflects unwanted radiation, light, and

particles. Beneath should be specialized converters that absorb the laser light and convert it into the power required to power the distribution technology.

Distribution Technology

Once fully powered the distribution of energy from earth's orbit to earth's surface is required. This distribution technology should consist of a minimum of two lasers. These lasers should beam laser light to the earth based receivers during hours of visibility. As one earth based receiver is getting close to exiting visibility the laser should dynamically reposition itself to the receiver that is transitioning into view. This continuous leap-frogging will ensure a continuous global supply of power.

Conclusions

The current state of global power is dangerous, unsustainable, and inefficient. A global power grid must be created. This can be achieved by harnessing and concentrating the power of the sun. Current technologies can be redesigned to distribute electricity globally. The sun can be leveraged to power space based lasers that maximize solar panel capabilities. Earth based satellites can 'walk' the earth to ensure continuous power globally. The future is only limited by humans' resistance change. Humans need power.