

Project Sun Roof

“How extremely stupid not to have thought of that.”

The quote above is, of course, from Thomas Henry Huxley; it was his reaction after learning about Darwin’s simple but powerful idea of natural selection.

Abstract

Project Sun Roof is a visionary project that foresees a time when global electricity needs are met through the power of the sun. This will require a multitude of micro generating stations that will come in the form of individual vehicles, buildings and open spaces (fields, yards, etc.). The ultimate goal of the project is to push down the cost of solar energy through an economy of scale and a boost to the industry that sees the best minds working on innovation and efficiency in the solar energy field. Once solar energy becomes affordable to the average home and business owner, the advantages of being your own power producer become irresistible to anyone wanting to reduce power costs.

Apart from the obvious reasons for the project- reducing emissions to the atmosphere, meeting electricity production needs for the future, global security concerns are also addressed through this project. There is concern about the impact on business, individuals and governments in the event of a collapse of the power grid through either natural disaster or malevolent attack. Having a multitude of small power producers means that a single event cannot significantly affect power production, and in the event of a grid collapse as we witnessed in 2005 in North America, individuals will continue to have electricity due to being an independent producer.

There is a very strong economic argument to be made for investing in the solar industry as well. In a time of recessions and bleak investment returns, the solar industry has continued to grow rapidly. Programs like Ontario’s Feed In Tariff program, introduced in 2010, have very quickly created new jobs in the solar industry. On a worldwide scale, Project Sunroof would create many thousands of jobs and spin-off industries such as retrofitting vehicles, and battery exchange programs.

Project Sunroof also allows any municipality to become an electrical producer of clean energy for their own use- no more costly imports and dependency on foreign or out of state electricity. Each end user becomes both a producer and consumer, each municipality becomes a solution to the global energy crisis. The grid receives inexpensive, green electricity, municipalities reduce dependency upon outside sources

of electricity, automobile manufacturers improve their environmental image, individuals save dollars on utility bills, and the entire planet benefits.

Introduction

It is a multi-step project that begins with select test sites to showcase and promote the project, with the ultimate goal of, in the words of former vice president Al Gore, “a solar panel on every roof”. The ultimate goal will be to connect the auto industry, the electrical grid, municipalities and the consumer in a united effort to meet our electrical production needs while reducing emissions. All this while providing a boost to the auto industry. We can have our cake and eat it too!

Phase one of the project is the solar sun roof on vehicles. A thin film solar collector is installed on every new production vehicle and retrofitted on existing vehicles. The solar panels feed the grid with clean, renewable electricity. The roofs of vehicles become the real estate needed to collect the sun’s rays and turn them into electricity. Thus, the vehicle becomes the solution to the problem it has had large part in creating- CO2 emissions.

Phase two of the project aims at homes and buildings. Phase one will create an economy of scale driving the cost of solar panels lower and lower, making larger solar panels more affordable for individual home owners and businesses. All buildings can then be easily fitted with solar roofs, thus providing a significant enough solar collector on the planet to meet it’s electrical needs. Phase one will also show the viability of solar power on a mass scale in order to convince a skeptical public of this remarkable power resource.

With a planet that is increasing energy consumption rather than reducing, and with the increasing demand for electrical production at a time when there is a strong push to reduce CO2 emitting energy sources, this project hits the mark to meet the needs of the planet moving forward while reducing carbon emissions as well as providing a much needed boost to the auto industry, the solar industry and the power industry.

Phase one- Vehicle Sun Roofs

Despite the auto industry’s attempts at improving emissions and fuel efficiency, they still suffer a black eye from the production of inefficient gas and diesel powered vehicles. A move toward electric vehicles promises a solution at the exhaust pipe but not in the overall emissions for the planet as the electricity to power those vehicles must come from somewhere, typically a coal fired generation plant. Generating electricity from all vehicles, whether electric, gas or diesel, will offset a significant portion of the increased electricity needed to power electric vehicles.

A few vehicles with solar roofs will not make a difference, but millions will. Phase one of Project Sun Roof aims to install solar roofs on every existing vehicle as a retrofit as well as every new production vehicle. Each vehicle will be equipped with a transformer (inverter) to output 120v AC into the electrical grid. A battery bank will store energy created while driving to be downloaded to the grid once parked and plugged in. Electric cars, once mainstream, can plug into the grid and download power to charge the batteries and, once charged will then feed the grid from the solar roof, thus making a “fill up” possible at work and home while the car is idle.

Project Sunroof can be implemented on personal vehicles, buses, trains, transport trailers, or any vehicle that has a roof! In fact, a fleet of transport trailers sitting in a sunny warehouse parking lot is an ideal situation for producing a large amount of green energy.

Phase One Step One- Flagships

As the project is on such a massive scale it is overwhelming to consider bringing the entire project on line at once. For this reason it will be broken down into a series of small steps that lead eventually to the big picture. Step one involves creating test sites or flagships to showcase the concept and prove it's viability on a large scale.

A prototype vehicle will be the beginning of Step One. A thin film solar panel will be retrofitted onto a typical family vehicle. The panel will be wired to a charge controller, batteries and an inverter within the vehicle. The inverter will then have a typical 120v AC plug exiting at the front of the vehicle. The power created does not power the vehicle but flows into the electrical grid when plugged in. The energy stored in the batteries also flows into the grid once connected.

The power created by the vehicles will flow into the electrical grid via a smart meter installed at the parking area of the business or complex. This meter will then spin backward, providing a credit on the vehicle owner's monthly electrical bill.

There is currently much talk about a solar powered electric car. Present technology, however, is limited to providing only a slight charge to the car's battery bank and not even coming close to powering the vehicle outright. Until photovoltaic efficiency is significantly increased we will not see a solar powered vehicle. Phase One of the Project Sun Roof aims to put solar energy into the grid from all vehicles regardless the fuel it uses. This injection of clean, renewable energy into the grid can then be used to offset the charging required of electric vehicles, amongst other uses of this power.

Phase One Step Two- Ubiquity

The second step is to build upon the success of the flagship locations to bring new businesses, individuals and municipalities on board. Based on the blue bin model, once there are enough independent locations using the concept it is not long before all municipalities adopt the idea. Plugging in one's vehicle becomes second nature- "what did we do before?" ("How extremely stupid not to have thought of that").

There is a desire amongst the public to want to do something that helps the environment, to be part of the solution. But the problem thus far is that there have been very few solutions available to the general public and those that are available are extremely expensive and require a considerable commitment of both time and resources, often meaning a complete lifestyle change. We need solutions that cost very little in time and effort as well as expense.

Project Sunroof offers the general public an opportunity to be part of the solution without any lifestyle change (they continue to drive their own vehicle- and a larger one provides more space for solar panels!) or cost (in fact, they will be paid for their effort of plugging into the grid and having their meter spin backwards!).

Who Wins?

By the end of Phase One, we will see that this is a win-win-win concept:

-individual vehicle owners win by becoming part of the solution and getting a financial return on their effort of plugging into the grid.

-the grid wins by receiving free, green energy with no investment in new power plants, very little maintenance and meeting it's need to shift away from carbon emissions.

-auto producers win by adopting a true environmentally friendly option to their entire line up of vehicles- and a Hummer starts to look like an enviro-friendly vehicle with all that real estate for solar!

-the environment wins by the phase out of carbon emission producing electrical plants and a move toward more electric vehicles that can be powered by green energy

Viability: How Much Solar Energy Hits Earth?

If solar power is the purest form of renewable energy known, then how much solar power have we got? The answer to this question, when considered alongside how

efficiently we can convert raw sunshine into usable power, helps determine whether or not it is realistic to consider solar energy as a viable alternative to conventional energy sources.

In full sun, you can safely assume about 100 watts of solar energy per square foot. If you assume 12 hours of sun per day, this equates to 438,000 watt-hours per square foot per year. Based on 27,878,400 square feet per square mile, sunlight bestows a whopping 12.2 trillion watt-hours per square mile per year.

With these assumptions, figuring out how much solar energy hits the entire planet is relatively simple. 12.2 trillion watt-hours converts to 12,211 gigawatt-hours, and based on 8,760 hours per year, and 197 million square miles of earth's surface (including the oceans), the earth receives about 274 million gigawatt-years of solar energy, which translates to an astonishing 8.2 million "quads" of Btu energy per year.

In case you haven't heard, a "quad Btu" refers to one quadrillion British Thermal Units of energy, a common term used by energy economists. The entire human race currently uses about 400 quads of energy (in all forms) per year. Put another way, the solar energy hitting the earth exceeds the total energy consumed by humanity by a factor of over 20,000 times.

Clearly there is enough solar energy available to fulfill all the human race's energy requirements now, and for all practical purposes, forever. The key is developing technologies that efficiently convert solar power into usable energy in a cost-effective manner.

source: <http://www.ecoworld.com/energy-fuels/how-much-solar-energy-hits-earth.html>

So what we can deduce from the above is that in order to meet our current global electricity needs from solar energy we would need to cover one twenty thousandth of the planet with solar panels. It seems reasonable to assume that humans have covered at least that with vehicles and building roofs. Meeting our needs completely through solar energy is then simply a matter of driving the cost of panels down to a point where it is economical to cover that kind of real estate with panels. This is where Project Sunroof plays a major role- driving down the cost of solar energy through the economy of scale.

Phase One of Project Sunroof, as outlined above, is the driver to reducing these costs. By putting pressure on the auto industry to produce vehicles with solar sunroofs, the cost of solar panel R & D and production will be driven down by economy of scale. It will also put this cost onto one of the major emission producing industries- the solution paid for by the creator of the problem. Pure poetry.

Open Source Concept

Project Sunroof is not patented. In fact, there really is not much to guard. It is an idea whose time has come. All the needed components exist already and all we now need to do is put them in place to help the planet and humanity. There may in fact be something

that could be guarded as intellectual property, but I have chosen to put this into the public domain for several reasons:

I am not independently wealthy and do not have the means to bring this needed project into fruition. The idea will die with me unless it is given away.

This is simply the kernel of an idea. I have no notion of where it may go from here once smart people get behind it and develop new components- solar glass? solar paint? Battery packs that can be exchanged at service stations (ie. Tesla)? Putting this into the public domain means that no one can own it and prevent others from building upon it.

There are many stories of conspiracy when it comes to clean energy ideas- ie. the big corporations buy them up and bury them. Putting this idea into the public realm means that no individual or corporation can own it and thus bury it.