50MW SOLAR POWER FARM

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Energy security is an important goal to seek to realize as an absolute requirement for economic growth and stability. Renewable Energy (RE) development is the key element of this goal.

The Philippines has realized significant strides in the development of its renewable energy resources. A third of the country’s power requirement is currently being addressed by Renewable Energy. In 2009, only an estimated 18% of Renewable Energy was utilized. Past studies, however, suggest that the RE potential is twenty five times more than what is currently being used.

The demand for energy will continue to increase as the country pursues the sustainable development path. It is estimated that at least US$40.6 billion is needed to secure the country’s energy requirements between 2011-2030. Renewable energy will not only help address this demand, but also provide the necessary balance between development and environmental sustainability.

Secretary Jose Rene Almendras of the Department of Energy mentioned in one of his speeches, “that the government generated investment commitments of over Php 80 billion (around $19 billion US dollars) for renewable energy projects.”

In response to this concern is Concentrated Solar Power (CSP), developed by Advance Solar Technology (AST) in 2002 in the United States. Concentrated Solar Power (CSP) technology harnesses and controls the sun power resources using parabolic dish or linear solar trough and a solar tracking system that uses memory, CPU time, disk space, input and output device. This serve as the delivery method to drive the waste heat generator, concentrated photo voltaic units, thermoelectric to harness solar energy to effectively manage electricity and corresponding utilities and secure data interchanges, energy operations data and other energy-related information needed in research and development.

Cebu Solar Incorporated (CSI) is an emerging supplier of Renewable Energy Systems and Solar Technology Integration. CSI is under the Advance Solar Technology (AST), established in 2002 by Tommy Lee Tirey Jr., an American inventor of the Solar Fluid Heating System with US Patent using the parabolic dish concentrating solar power technology.

CSI is a manufacturing business and services corporation which provides the engineering and technical services with a competitive pricing designed to address the concern for a more sustainable energy development system. CSI offers alternative renewable energy
solutions to small and medium enterprises to generate savings in their energy consumption and transform them into more efficient and self-sufficient businesses. In addition, this method is environment friendly.

Cebu Solar Incorporated (CSI) is a Cebu-based concentrated solar power manufacturer, providing innovations in the solar power business to make it more affordable to its users in five revenue-generating areas:

1. RE Manufacturing
   • Solar dish or component technology
   • Manufacturing, sales, and distribution of combined heat and power (CHP) products
   • Power electronics for power generation equipment
   • Any application requiring quiet, highly reliable, zero-maintenance, low-emission energy solutions.

2. RE Engineering
   • RE Construction design, installation, estimates
   • Solar farms
   • System Integrator for Green and Smart Building
   • Energy Audit
   • Energy Management

3. RE Research and Development
   • Solar Dish Development
   • Concentrated Photo Voltaic
   • Power Electronics
   • Waste Heat Generator

4. Consultancy
   • Green Buildings
   • New System Consultation/Feasibility Study

**Cebu Solar Incorporated (CSI)** main thrusts are as follows:
• Provides energy security and reliability in the Philippines
• Helps to protect mother earth by slowing/stopping global warming
• Able to help people and business enterprises/companies to save money
• Helps to provide energy independence and sustainability
• Generates thousands of jobs/employment in the country
• Offers cost-effective/affordable solar product portfolio and other related services
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Solar Energy Business Perspective

What is solar energy?

Solar energy, quite simply, is energy that comes from the sun. But there are now many types of solar energy technology focused on making use of that energy and turning it into usable electricity or heat (or both).

The scale of energy generation ranges from the home water heater to serving 100,000+ homes. Below is an outline of the many solar energy forms, starting with hybrid solar power, since it is the least understood and publicized.

**Solar power** is the conversion of sunlight into electricity, either directly using Photovoltaics (PV), or indirectly using concentrated solar power (CSP). Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. Photovoltaics convert light into electric current using the photoelectric effect.

**Hybrid Solar Energy** - by definition, “hybrid energy” includes combinations of clean energy sources such as solar power, wind energy, or geothermal heat pumps, combined with engines or generators. Many in operation are do-it-yourself projects for off-grid use. Sunwize (CA) combines PV solar power and diesel engines, while N. Arizona Wind & Sun incorporates both solar and wind sources. Cogenra Solar capitalizes on the inefficiency of PV solar panels (ranging 15-20%) and captures the wasted heat thrown off to heat water, resulting in 4-5 times the amount of total energy versus PV panel systems alone. Its best “cogeneration” customers are industries or institutions where significant hot water is needed.
Another hybrid solar energy company is SunScience, whose Energy Management System integrates both a concentrated photovoltaic (PV) capability (for electricity) and a thermal component (for hot water), on a compact footprint. Its systems architecture incorporates data from a network of sensors that measures temperature, humidity, and other environmental elements. Proprietary software monitors—and controls—the elements of energy output, storage and environmental elements for total systems management. SunScience’s first application is “controlled-environment agriculture” within greenhouses, to achieve year-round farming in cold climates. Technological “proof of concept” was achieved at a formal “harvest” event late January.

**Photovoltaic (PV) panels.** This is what most people think of to lower their electricity bills or supply clean power to communities. Examples of large solar PV companies are Sunpower (CA) and SunTech (China). Glenn wrote a post in September on how PV solar panels work, and Wikipedia has much more about this decades old technology, but essentially PV panels are made of silicon semiconductors within solar cells that convert sunlight (photons) to electricity (electrons). Scientists at national labs are experimenting with organic materials and “quantum dots” to achieve this process, but most PV panels are still being made with crystalline (or wafer) silicon, with manufacturing now dominated by China. Cost per watt is falling under $1.00, but efficiency is still only 20+% resulting in large land areas needed for significant electricity output. PV roof panels are the predominant technology for home use, whereas huge multi-acre arrays of PV panels are required for utility-scale projects, mostly in remote locations.

**Thin-Film Photovoltaic.** Once touted as the next generation of PV because of a) lighter weight, b) less of the expensive silicon material needed, and c) other forms of photovoltaic material (amorphous silicon) can be used. The result is a lighter, thinner product with a greater variety of applications, such as its own rooftop material, on top of shingles, or even on windows. But the dramatic price reduction of traditional PV panels out of China slowed market acceptance of thin-film PV. Other disadvantages include higher manufacturing costs, lower efficiency, and greater corresponding space needed for energy equivalency. The top thin-film company in the world, in terms of market share, is First Solar.

**Concentrated Photovoltaic (CPV).** In a broad sense, this newer form of electricity production competes directly with utility-scale PV and CSP (described below) solar
arrays. The CPV advantage over these other systems involves a smaller footprint because the solar panels are made of multi-junction solar cells with concentrating lenses, rather than flat silicon cells. The result is increased efficiency anywhere from 2-3 times greater than traditional PV panels, ranging upwards of 43%. Therefore, corresponding less land space is required. Disadvantages include greater complexity of cell manufacture and price per kilowatt hour. Current thinking is that in order to be competitive, CPV systems need to be larger, approaching 100 MW, and located in high-DNI (direct normal irradiance) areas such as the southwest U. S., Mexico, Chile, Mediterranean countries, etc. But now, with PV panels from China becoming dramatically less expensive, economic challenges for CPV only increase. Some successful companies include Amonix and Semprius.

**Solar thermal energy.** Most thermal energy news is about Concentrated Solar Power (CSP) because of the billions of dollars involved and the tens of thousands of homes served with electricity, from one project. America’s first and the world’s largest CSP project is being completed near Tonapah in eastern Nevada. Technically, this highly efficient thermal energy system creates electricity with huge arrays of mirrors (flat, parabolic or troughs) that track and reflect sunlight onto a solar tower that heats fluid to over 1000 degrees F, creating steam that turns a generator, in turn creating electricity.

**Photovoltaics** were initially, and still are, used to power small and medium-sized applications, from the calculator powered by a single solar cell to off-grid homes powered by a photovoltaic array. They are an important and relatively inexpensive source of electrical energy where grid power is inconvenient, unreasonably expensive to connect, or simply unavailable. However, as the cost of solar electricity is falling, solar power is also increasingly being used even in grid-connected situations as a way to feed low-carbon energy into the grid.
Commercial concentrated solar power plants were first developed in the 1980s. The 354 MW SEGS CSP installation is the largest solar power plant in the world, located in the Mojave Desert of California. Other large CSP plants include the Solnova Solar Power Station (150 MW) and the Andasol solar power station (150 MW), both in Spain. The 250+ MW Agua Caliente Solar Project in the United States, and the 221 MW Charanka Solar Park in India, are the world’s largest photovoltaic power stations.

Concentrating Solar Power (CSP) systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. The concentrated heat is then used as a heat source for a conventional power plant. A wide range of concentrating technologies exists: the most developed are the parabolic trough, the concentrating linear fresnel reflector, the Stirling dish and the solar power tower. Various techniques are used to track the sun and focus light. In all of these systems a working fluid is heated by the concentrated sunlight, and is then used for power generation or energy storage. Thermal storage efficiently allows up to 24 hour electricity generation.

A parabolic trough consists of a linear parabolic reflector that concentrates light onto a receiver positioned along the reflector's focal line. The receiver is a tube positioned right above the middle of the parabolic mirror and is filled with a working fluid. The reflector is made to follow the sun during daylight hours by tracking along a single axis. Parabolic trough systems provide the best land-use factor of any solar technology. The Stirling solar dish combines a parabolic concentrating dish with a Stirling engine which normally drives an electric generator. The advantages of Stirling solar over photovoltaic cells are higher efficiency of converting sunlight into electricity and longer lifetime. Parabolic dish systems give the highest efficiency among CSP technologies. The 50 kW Big Dish in Canberra, Australia is an example of this technology.

A solar power tower uses an array of tracking reflectors (heliostats) to concentrate light on a central receiver atop a tower. Power towers are more cost effective, offer higher efficiency and better energy storage capability among CSP technologies. The PS10 Solar Power Plant and PS20 solar power plant are examples of this technology.
BUSINESS BACKGROUND

BUSINESS DEMAND

“Power shortages by 2018 are inevitable without new investment in the Philippines’s power generation.” ~ Energy Development Corporation


Based on the government’s Power Development Plan, the Philippines need an additional capacity of 11,400 megawatts at the end of its 2012-2030 planning cycle. This makes $32.5 billion in investments necessary for power generation and natural gas projects that aim to make the country energy sufficient by 2030. Philippine has been ranked the third out of 30 countries for investments in both renewable energy and conventional energy by PA consulting Group. At the turning point of the Philippines’ transition to a competitive electricity market, IBC Asia’s 2nd Philippines Power & Electricity Conference will be the most dedicated event to discover the immense investment opportunities in power sector in the Philippines.

Do not miss the golden opportunity to network with power sector regulators and stakeholders, to understand the latest investment trends after commercializing of open access retail competition and to investigate the most value-added investment opportunities in the Philippines!

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Critical power situation expected by December 2015


CEBU, Philippines - The critical period of the power supply situation in the Visayas Grid is expected to start by December 2015 with the projected deficit of 60 megawatts (MW) instead of 2019 yet, according to the Department of Energy.

Lisa Go, of DOE Manila, made the presentation Friday at the meeting of the Regional Development Council (RDC) 7 Sub-Committee on Power.

Go reported that on available capacity, critical period starts on November to December 2014 with projected deficit of 30 to 90 MW; April to December 2015 with projected deficit of 80 MW to the maximum of 220 MW.

On the available capacity plus the committed projects, the projected deficit on December 2015 is 60 MW; 70 to 100 MW for April to June 2016; and 120 to 305 MW for December 2017 to December 2018.

This prompted fourth district Rep. Benhur Salimbangon, who attended the meeting, to ask how to address this possible power shortage.

“In Congress during the budget hearing, the (Energy) Secretary has not categorically stated that we are well-protected. That is what we are worried,” Salimbangon said.

Salimbangon said that while they are pushing for more industries to come, the number one question that will always be asked is whether there is sufficient power.

Go reported that there are six committed projects that can generate 429.6 MW for the Visayas.

These are the 2 x 135 MW Concepcion Coal-fired Power Plant in Iloilo, the TPC Coal-Fired Power Plant Expansion Project (1 x 82 MW Coal-Fired Power Plant) in Toledo City, the Nasulo Geothermal Project in Negros Oriental, the Villasiga HEP in Antique, the Asian
Energy System Biomass Project in Cebu; and the 18 MW San Carlos Biomass Project in Negros Occidental.

“We believe that this committed project of about 430 megawatts will cover those shortfall per demand projection and that will be on until 2015,” said DOE 7 regional director Antonio Labios.

Labios said that aside from committed projects, there are also indicative projects which are already completed based on the financial transactions.

“Beyond 2015, which is mentioned as critical, we hope that the indicative power projects which amount to 723 MW will cover the next shortfall beyond 2015,” Labios further said.

Go said that these indicative projects are currently undergoing different stages of development whether completing feasibility studies, contracts, or permits, and others.

She said that the commitment right now is to really look into and help the investors make their processing as fast as they can and for the local government units ready to accept the project rather than be barriers to incoming projects.

National Economic Development Authority 7 officer-in-charge Efren Carreon said that the projection only shows the recent economic performance of the region.

Carreon said that the role of the RDC sub-committee on power is also very critical in monitoring the implementation of the project.

“It would take some time, two or three years on the average, for a power plant to become operational,” Carreon said.

Salimbangon supported the claim of Carreon that the increase in power demand indicates progress.

“Everybody is hoping for this, it shows very clearly that now there is that very bright future,” Salimbangon added.

Among the Visayas sub grids, Cebu reportedly has the highest demand and Bohol the lowest.

The demand in Cebu is even higher than the combined demands in Panay, Leyte-Samar and Negros sub grids. (FREEMAN)
Capitol cites ‘critical’ situation in Cebu; unclear repair period of Leyte power plants affects Veco service


How long will almost daily rotational brownouts continue in Cebu?

They will likely continue until next year due to pending repairs of damaged Leyte power plants, a top official of the Visayan Electric Company (Veco) said yesterday.

Veco chief operating officer Sebastian Lacson said the private distribution utility could only resume full operation in Metro Cebu if the two major power generators are restored.

But no clear deadline has been given for repairs to be completed on damaged Leyte plants which supply the bulk of Cebu’s power.

Unified Leyte Inc. and another geothermal power plant in Leyte supply one-third of Veco’s power needs.

In a meeting yesterday at the Capitol, provincial officials and representatives of power firms including the National Grid Corporation of the Philippines (NGCP) and the Energy Regulatory Commission (ERC) failed to agree on a time frame for the full restoration of power in Cebu.

This was a sharp contrast to last month’s promise of Energy Secretary Jericho Petilla to restore power in the Visayas before Christmas eve.

According to Lacson, power distributors, especially Veco, cannot find other sources of power in Visayas due to its “very little extra capacity.”

“How honestly, we cannot find anything to replace the 500 megawatts supplied by Leyte. Nothing close to that,” he said.

“Our brownout is really dependent on when Leyte power plants recover. Unified Leyte is the biggest power supplier of Veco because they give us 120 megawatts,” Lacson told reporters yesterday.

“Until Unified Leyte is restored, until we get a definite answer from them, we can’t say anything because the bottleneck is really supply, and the loss is really big,” he added.
Power plants in Leyte which sustained heavy damage during the onslaught of supertyphoon Yolanda last Nov. 8, supply more than 500 megawatts of power to the entire Visayas grid.

At present, cities and municipalities covered by Veco specifically Cebu, Mandaue, Talisay Naga, San Fernando, Minglanilla, Liloan and Consolacion continue to experience rotation brownouts.

Veco brownouts last one to two hours and occur at different times in the day. The situation is worse in rural areas in the province where electric cooperatives are also affected by the inadequate power supply.

Lacson yesterday proposed a scheme to inter-connect with the power grid in Luzon but other representatives dismissed it as “costly.”

Cebu Provincial Administrator Mark Tolentino said the proposed solutions raised in yesterday’s meeting “were not satisfactory” for the parties present.

He urged representatives to come up with a timeline “for the benefit of the people.”

“We can all agree that the situation here is very critical and everyone shares the sentiment,” Tolentino said.

At present, ERC is implementing a trading suspension which bans power price rate hikes in calamity-hit areas.

Cebu Gov. Hilario Davide III said he will ask the ERC to continue with the suspension.

Huge boost

Both Davide and Lacson urged big companies to avail of the interruptible load program (ILP) and to run their power generators for Veco and other power utilities to save up on their power load.

According to Lacson, a number of companies in Metro Cebu have already “sacrificed” and started running their own generators at certain periods during the week.

He said this has enabled Veco to save up to 30 megawatts a day, and has eased the power shortage by almost half.

“If we didn’t have ILP, our brownouts would be double. Double in terms of duration and in terms of frequency so we are very thankful to those under the ILP because we need it more than ever. Their contribution has really helped,” said Lacson.
“It will be of huge help if we can lower the demand during peak hours during the day. Even if we avoid using electricity during the night, it’s not a big help,” he added.

Cebu Gov. Hilario Davide III said he will continue to meet with energy sector representatives for updates.

A weekly report on the progress of their operations will also be required, he said. “Nobody can give us a definite timeline because of all the uncertainties that surround us,” he said.

He said a joint statement from the Cebu provincial government and power utilities will be released today for the guidance of the public.

**SUPPLYING THE DEMAND**

Founded by entrepreneur Tommy Lee Tirey Jr, in 1998 as Advanced Solar Technologies in Butte Co. California USA, became Cebu Solar Inc. and is now a Cebu Province, Philippine based company.

Our mission is to create strategic Energy projects to contribute towards the sustainability of rural & urban communities and businesses in the Philippines.

We work with companies and individuals with high integrity and honesty. Together our goals are to build successful business relationships and grow through innovation, quality and commitment. We are a member of the Philippine Solar Network. If you would like to view our investment proposal please visit our website www.cebusolar.com. We are constantly innovating new ideas so please visit our website regularly for the latest in our offerings.

Why MUST you go renewable energy, because people like you and I are changing the quality of life for everyone on this planet making the most basic thing such as energy affordable for everyone. The Philippines is currently one of the more dynamic markets in the global economy.

Any smart investor knows making the right move at the right time is what really matters. You want to be the leader of the pack and catch on to a trend before it becomes a trend, go where others will wish they had gone first. And right now, the Philippines is in that precious, pivotal position. Transferring from petrol-chemical based energy to clean renewable energy, such as the Geo-thermal plants in Leyte

The Philippines is the third largest English speaking country in the world, enabling its manpower to have a unique edge over neighboring countries in terms of labor quality.
Its workforce is easily trainable and generally skilled. Our people are our best national asset. Our natural pool of talents and culturally adaptable human resources position the country as the most valuable place on earth for manufacturing RE products. The Philippines is so strategically located in the Southeast Asia that it can be developed into one of the region’s major centers of trade and commerce.

The cost of doing business in the Philippines is surprisingly low, with wages down to less than one-fifth of that in the U.S. The government is well aware of the need to focus on total energy independence by passing the Renewable Energy Bill it assured a steady influx of technology based companies like Cebu Solar Inc.

With 7,100 islands to cover, the Philippines faces unique electricity market challenges in providing electricity services across the country. Of the three largest islands – Luzon, Visayas and Mindanao – Luzon (which includes Manila) accounts for 75% of all energy demand and 87% of installed capacity. Visayas on the other hand, while accounting for roughly 12% of demand, boasts of only 0.1% of installed capacity. Cebu has watched peak demand increase from 131MW to 190MW over the past five years, while installed capacity reaches only 110MW.

The Philippine National Renewable Energy Program has set ambitious targets, including P1.2 trillion (US$27.6 billion) in renewable energy investments between now and 2030. This will nearly triple the country’s renewable generation capacity to 15,300MW in 2030 from 5,400MW today.

It is the Goal of Cebu Solar Incorporated to fulfill this dream of energy Independence by leading the way in training, production, Installation, and exporting products proudly

**Cebu Solar Incorporated (CSI)** plans to construct at least 50 Mega Watts Solar Power Farm which will supply the Visayas region and moving forward the rest of the Philippines.

The company will also incorporate it’s concept of **Eco-Village** or a community inside the solar power plant which will be self-sufficient. The people living within this village are the family members of those who are working for the company and other important families which are integral part of Cebu Solar Incorporated.
BUSINESS ENVIRONMENT

Business Background

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Advantages of Solar Power System

✓ Solar energy is a completely renewable resource. This means that even when we cannot make use of the sun’s power because of nighttime or cloudy and stormy days, we can always rely on the sun showing up the very next day as a constant and consistent power source.

✓ Oil, which is what most people currently use to power their homes, is not a renewable resource. This means that as soon as the oil is gone, it is gone forever and we will no longer have power or energy.

✓ Solar cells make absolutely no noise at all. They do not make a single peep while extracting useful energy from the sun. On the other hand, the giant machines utilized for pumping oil are extremely noisy and therefore very impractical.

✓ Solar energy creates absolutely no pollution. This is perhaps the most important advantage that makes solar energy so much more practical than oil. Oil burning releases harmful greenhouses gases, carcinogens and carbon dioxide into our precious air.
✓ Very little maintenance is required to keep solar cells running. There are no moving parts in a solar cell, which makes it impossible to really hurt them. Solar cells tend to last a good long time with only an annual cleaning to worry about.

✓ Solar panels and solar lighting may seem quite expensive when you first purchase it, but in the long run you will find yourself saving quite a great deal of money. After all, it does not cost anything to harness the power of the sun. Unfortunately, paying for oil is an expensive prospect and the cost is still rising consistently. Why pay for expensive energy when you can harness it freely?

✓ Solar powered panels and products are typically extremely easy to install. Wires, cords and power sources are not needed at all, making this an easy prospect to employ.

✓ Solar power technology is improving consistently over time, as people begin to understand all of the benefits offered by this incredible technology. As our oil reserves decline, it is important for us to turn to alternative sources for energy.

**BUILDING ECO-VILLAGE within the Solar Farm**

At the core of each Eco-Village will be the Community Vision Center that in many ways will be a facility to support the spirit, heart, soul and mind of the community. This facility is conceived to provide the most advanced support possible for each family and member of the community to work together as a family that deeply trusts, respects and cares for one another. Along with plantation style 8 plex multi-family units, community gardens, aquaculture, solar power and a complete environmental and sustainable approach to living, the Eco-Village is a concept in living that will combine the best that modern technology can offer with an equally balanced approach that respects the traditional Philippine values of right action with respect for the land."
THE ECO-VILLAGE CONCEPT: the Eco-Village is an innovative approach in co-housing that addresses the pressing need in the Philippines to develop economically attainable and environmentally sustainable housing. This concept goes much further than just providing shelter. It is our intention to develop a project that will be an example of environmental responsibility that respects the land through the implementation of community gardens that will bring families back to the land. Each project will support the long term viability of community in the Philippines through a network of Community Vision Centers that are at the heart of each project. As an integrated approach to the Philippines housing needs, Philippine Eco-Villages will build upon the traditional principles of family, unity, and love. The Eco Village lifestyle can be supported by a whole systems approach of integrated technologies and community services including:

1. **8 PLEX APARTMENTS:** The 8plex Unit is a simple plantation style dwelling that will provide housing for eight families. There are 2 & 3 bedroom apartments. The 2 bedroom apartment is 30’x 31’ or 930sf. and the 3 bedroom apartment is 30’x 35’ or 1,050sf. Each unit is provided with a full kitchen and bathroom with a living dining and the second level units have an additional study/storage loft space of 90sf.

2. **SUSTAINABLE WATER AND ENERGY:**
   
   Each community will be a model of energy self-sufficiency. Solar hot-water and rooftop photovoltaic electrical systems will provide hot water and electrical energy to each unit. Fresh air ventilation and low energy-use appliances and lighting will reduce overall energy requirements. Low-flush toilets, special shower heads, grey water use and rain collecting systems will all contribute to overall low-water consumption.

3. **SUSTAINABLE FOOD AND COMMUNITY GARDENS:** Each Eco-Village community will utilize the 8plex Units in a cluster plan that will curtail the need for internal roadways to free up space for community gardens. Creative earthwork will channel rainfall runoff into irrigation and aquaculture tanks. Edible landscaping will provide fruits (banana, papaya, mango, tangelo, grapefruit, avocado) and nuts with areas for traditional taro as well as individual herb and flower gardens. Each Eco Village will incorporate the principles and bio-technology of aeroponics. One aeroponic greenhouse will produce up to 30 times the yield of traditional agriculture per square foot space required. By utilizing aeroponics over the parking lot with an overall community garden plan, it will be possible to provide a program where most of the fruits and vegetables for the residents of the community are supplied on site at greatly reduced cost.
4. AEROPONIC GREENHOUSE & SOLAR / WIND ENERGY PLATFORMS: To maximize efficient use of land / resources, above the parking lot, there will be placed Aeroponic Green House & Solar / Wind Energy Platforms. Utilizing a Sprung Structure on a raised platform the aeroponic green house will act as the first micro business venture for the community as well providing most of the communities’ vegetable needs. On the Roof of the greenhouse will be placed an array of Solar Photovoltaic Collectors along with a series of Helical Wind Turbines, that have the capacity to be the primary source of electricity for the community.

5. SUSTAINABLE FOOD AND AQUACULTURE: In addition to providing the community with a continuous source of fruits and vegetables each Eco-Village will maintain an aquaculture facility. One 10’ diameter - 4’ deep tank, properly maintained, will provide a yield of 300 lbs. of fish 3 times a year. Our initial development will provide 4 tanks or approximately 3,600 lbs. of fish per year depending on the type of fish being raised. Possible species include opelu, catfish and tilapia. The combination of fruit and vegetables along with protein from fish will meet most of the community's basic sustenance needs at an exceptional standard of health and quality.

6. RECYCLING & RESOURCE MANAGEMENT: Advanced recycling systems will eliminate most solid waste, and will include recycling of household materials, purification and recirculation of water, and composting.

7. COMMUNITY VISION CENTER At the core of the Eco-Village will be the Community Vision Center. In many ways this Vision Center will be a facility to support the spirit, heart, soul and mind of the community. This facility is conceived to provide the most advanced support possible for each family and member of the community to work together as an family that deeply trusts, respects and cares for one another. The Community Vision Center will be a multi- functional facility in an octagon form that has two levels. The Ground Level will be devoted primarily to social gathering as follows:
8. GREAT ROOM There will be a Great Room provided for the purpose of social gathering with emphasis on families spending time together with the elders telling stories to the young, singing, music, dancing. Outside there will be a large gathering area to sit under the stars, build a fire and talk story.

- Community Kitchen - There will also be a Community Kitchen, which will provide meals to be shared by community members who choose to eat together.

- Exercise and Weight Room - There will be an Exercise Room with weight lifting equipment.

- Day Care Center - There will be a Day Care Center to take care of the young children from ages 1.5 to 5 with both interior and exterior activity/play areas.

- Storage and Restrooms - Storage space for all the multipurpose furniture will be provided as well as men's and women's restrooms.

- Directors Office - Finally there will be an office space provided for the Community Vision Center Director's office that will be in charge of coordinating overall activities at the center.

The Upper Level will be devoted to the community coordination and the Vision Center as follows:

- **Community Vision Meeting Room** - There will be a large central space for Co-visionary Planning. Co-visionary planning is a method of facilitated group discussion that brings to light the community member’s core values. From a base of shared core values, a vision of the community's future can be created to greatly assist individual members and families achieve their goals. The Community Vision Meeting Room will be the planning center for all the shared activities of the community.

- **Conflict Resolution** - It will also replace Barangay halls for conflict resolution based on the Philippine principle of lupon. There will be two partitioned multi-purpose conference areas for committee planning sessions and for Health and Human Services outreach. There will be a T.V. VCR and Internet terminals along with a satellite dish that will allow the community to link into rapidly emerging global information remote educational programs and networks as the Philippines continues to move into the information age. There will be extensive information available on environmental, social and educational programs throughout the world that members of this community will be able to benefit from.
• **Electronic Town Hall** - The concept of the Electronic Town Hall will be possible with the technologies provided in co-visionary planning center. Through video streaming cameras we can connect various community meeting centers throughout the islands together in a statewide network. With this network in place people in each community will have the latest information on what is working in other communities which will positively affects their lives. This way we can respond to the deeply felt Filipino's understanding of Love and learning utilizing the latest in modem communications technology.

• **Computer Networking Center** - To support the activities of the co-visionary planning center there will be a Computer Networking Center. In the computer center there will be at least four personal computer stations, a fax and copy machine. This facility will provide a number of key resources for the community. Community members will be able to organize their group activities and the running of the aeroponics gardens and the aquaculture center. They will be able to develop business plans, newsletters and organize worthy projects in and around the community. They will have full access to the Internet.

• **Remote Class Rooms** - There will soon be developed remote computer classes with our state community colleges and the University of Hawaii. Eventually they will be able to get information from around the world. The computer center and Co-visionary Director will have the necessary skills to train the community members in the use of the computers. The youngsters and teenagers will have a powerful resource available to them, through multiple educational programs, to truly understand their importance in the new emerging information era that will lead to new levels of human creativity.

8. **THE COMMUNITY VISION CENTER AND SOCIAL SERVICES OUTREACH:** The concept of a Community Vision Center, with the range of services and support to the community, as envisioned in the Eco-Village, is innovative and will require creative support from a number State and Federal Agencies. To support the development of the social programs a nonprofit organization was formed on Oahu called the One-Stop Center. This center could be considered a model and it provided assistance to families and individuals who are either economically disadvantaged or had health and social issues. This program successfully supports many of these community members by providing a wide range of assistance such as providing funds for additional education if necessary, securing employment, and training etc. We envision that the Community Vision Center will be staffed and operated as an extension of the One Stop Center's program.
9. SUSTAINABILITY AND THE GREATER COMMUNITY: The concept of Eco Villages is a complete design-response to one of the most complex and elusive problems that our modern society faces in and in the Nation as a whole. Our current way of living is in many ways out of balance and one result is that the cost of living in the Philippines is continuing to rise beyond the reach of many more families every year. The human, social, health and environmental cost of this continuing situation to society is immense. Until we develop affordable housing projects and a sustainable way of living, that enhances our sense of community for every member of our society, the problems we face today will only grow exponentially.

The Eco-Village concept has the essential structure to support, create and develop community as family. It is founded in the wisdom and tradition brought to these islands by the Filipino's, of respect and love for one's self, one's family, one's community and the Earth. Though the Filipino's, along with other indigenous peoples, seem to be the most persistent stewards of this awareness, this same understanding is found in the best traditions of every culture group that moved to Philippines, whether East or West We are all family. The innovations that will bring forward a sustainable way of life in the Eco-Village will require creative thinking not only by the Development Design Team, but by the new residents, the neighboring community and all the State and governmental agencies that will review and approve this project Working together we are confident that sustainable community living will be enhanced in the Philippines.

The Village has several income streams from a variety of enterprises.

It could function as:
1. A residential community with 56 high-end apartments generating $1,000/month with a “rent to own” mortgage. 2. An eco-resort with 30 apartments generating $100/night each. 3. A private Eco-University campus with rooms functioning as student housing. 4. A Rehabilitation hospice or holistic healing center. 5. A private light-security “prison” for woman generating $2,000 each/month per unit.

These include revenue streams from:

1. The Restaurant and night club in the Community Vision Center. 2. The plant food revenues from the Aquaponic Synponic Growing Center. 3. The fish production revenues also from the Synponic Growing Center. 4. Ultra Water sales. 5. Craft sales and merchandise.

The Market and Its Competition

The Philippines has realized significant strides in the development of its renewable energy resources. A third of the country’s power requirement is currently being addressed by Renewable Energy. In 2009, only an estimated 18% of Renewable Energy was utilized. Past studies, however, suggest that the RE potential is twenty five times more than what is currently being used.

The demand for energy will continue to increase as the country pursues the sustainable development path. It is estimated that at least US$40.6 billion is needed to secure the country’s energy requirements between 2011-2030. Renewable energy will not only help address this demand, but also provide the necessary balance between development and environmental sustainability.

There are only a few small time players across the region which has the capability of supplying/installing solar power system to home owners, commercial and industrial users. Thus, Cebu Solar Incorporated (CSI) has a paramount vision of filling the gap of power supply deficiency and the inability to cater to diverse market in country.

**Cebu Solar Incorporated (CSI)** plans to construct at least **50 Mega Watts Solar Power Farm** which will supply the Visayas region and moving forward the rest of the Philippines.
Product Portfolio and Services

- SOLAR ISLANDS
- STREETLIGHTING SYSTEMS
- CUSTOM/HYBRID SYSTEMS
- RESIDENTIAL SOLAR POWER
- COMMERCIAL SOLAR POWER
- INDUSTRIAL SOLAR POWER
- BUILDING INTEGRATED SYSTEMS
- SOLAR THERMAL

Thermal

Cebu Solar’s Thermal Dish System is a great way to capture Photonic and Infa-red energy at the heart of the system is the new digital-optical tracking controller developed by Cebu Solar Inc. The controller constantly monitors the sun’s position and adjusts the actuators to position the solar dish system directly into the sun. It also senses focal point temperature and system voltage from the PV panel that powers the system. Using patented technology the controller can be programmed to serve multiple functions such as monitoring input and output temperature of the dish system, also the controller senses light level and tells the dish to (wait) when a cloud passes by.

Solar thermal using ORC

Nicola Tesla used a system called Organic Rankin Cycle to power his rotor-less turbine. Now in today’s world after many years of work and sweat and tears, CSI under the Advance Solar Technology (AST), established in 2002 by Tommy Lee Tirey Jr., an American inventor, have developed a Solar Fluid Heating Dish System US pat. # 6,336,452-B1. This
was done under a research grant from the Department of Science and Technology Philippines, as the USA said there was no money for my work.

Several objects that Tommy is using together for the project development, simply he had the idea to not only capture the light but also the heat and in doing so one process helps the other by using a dense array developed by Azur Space. He captured the photon energy by use of a multi-junction solar cell that has an efficiency of about 40% and this dense array must be cooled or it destroys itself at the high concentration ratio of 700-1, now Azur recommends using ethyl-glycol but he has a novel idea to use r245fa genetron ORC gas developed by Honeywell for ORC application.

This gas expands to 100 times its volume at 215f and can be used to drive a micro-turbine expander manufactured by Infinity Turbine which is of course connected to a 3 Kw DC generator, now with the Dense Array out-put of 6Kw and the 3Kw output from the micro-turbine we have a possibility of 9Kw from a 4 meter dish system, that gives a efficiency of approximately 70-75%.

**ADVANCE SOLAR TECHNOLOGIES**

**SOLAR TRACKER/CHARGER/INVERTER COMBO**

In order to setup a viable solar power generator, various modules, gadgets and components are needed. At a minimum, PV (Photo Voltaic) cells or panels, Charge Controllers, a Solar Tracking module to optimize the daily power output, storage battery bank, inverter, mounting and housing accessories, wiring interconnects and accessories, performance monitors and a firm grasp of what goes where with a high level of technical expertise are needed to assemble and get the solar power generator running.

This product integrates a nominal 48 volt DC solar charge controller, a 2 axis/3 sensor input solar tracker and a 3000 watt true sine wave output inverter with integrated performance monitoring functions. This setup eliminates the wiring connections between these modules and greatly simplifies field installation. The inverter output is scalable in a master/slave configuration.

Since this product is sized at a load capacity of 3000 watts, all operating parameters are optimized at this level.
THE SOLAR CHARGE CONTROLLER SECTION

At 3000 watts full load operation, the expected current draw at 48 Volts DC nominal will be 63 amperes. Allowing for a margin of about 30%, the full load current draw will then be about 80 amps DC. If a continuous or a high percentage of continuous full load operating condition is expected, then a second charge controller section (and PV module array) is needed if a battery bank needs to be charged for low light/night operations.

The Solar Charge Controller section offers two (2) 80 amps DC charger/DC source for the system. One is used by the inverter section to directly convert solar power into usable electric power. The other is for charging its battery bank. Maximum Power Point Tracking is used to maximize power transfer from the solar panels to the load.

The Solar Charge Controller section connects directly to the PV/solar panels. This section then adjusts the operating point of the electrical power being delivered to the Inverter section or to the battery banks such that the maximum power available at the solar panel modules are being used fully.

SOLAR TRACKER SECTION

To maximize the sun’s light output, the solar panels should face the sun directly. The Solar Tracker section allows appropriately mounted solar panels to follow the sun automatically.

To track the sun properly, the section uses a 3 point sensor system. 3 light dependent resistors (LDR) group closely together in a triangle form, each mechanically/optically shielded from the others, will exhibit the same characteristic (resistance) only when it is pointed directly to the sun. If not pointed to the sun directly, the resistance of each sensor will vary significantly from each other. The tracker’s controller continuously measures the 3 sensor’s resistance and then turns on or off the Horizontal and Vertical Relays appropriately. The Horizontal and Vertical relays connect to the power mechanism that actually moves the solar panel module array. These relays provide a reversible polarity DC power (12 volts, 10 amperes DC) that then allows the power mechanism to move forward or backward as determined by the tracker’s controller.
The tracker can be programmed to reset itself to a home position to wait for the next solar day.

**INVERTER SECTION**

To maximize load compatibility or the ability to run any electrical load properly, the inverter section outputs a true sine wave. It is a high frequency pulse width modulated synthesized output waveform. It offers a robust start up surge capacity, allowing it to run motor loads properly. The AC output is also electrically isolated from the Solar Panels DC source.

Because it uses microprocessors, operating flexibility is offered. The inverter section can be programmed to output 110, 120, 220 or 230 volts AC at 50 or 60 hertz. Moreover, the inverter can be configured to run as:

A. An Autonomous Solar Power Generation- Load power and battery charging from Solar Panels only, utility AC power is not present; or as

B. An Energy Saving Mode – Solar Panels supply power to Load and battery chargers. Utility power serves as backup; or as

C. A Stand-by Power Supply – UPS mode, utility AC to Load Power and battery chargers, no solar panels needed.

**MAIN CONTROLLER SECTION**

This product uses multiple microprocessors to optimize its various operations and functions. This allows extensive monitoring functions, user configurable operating conditions and user feedback via a 4 line by 20 characters alphanumeric LCD display and key pad, product flexibility and a host of other functions. A USB port allows performance data downloading or setting of operating parameters by pc. A blue tooth connection provides wireless pc connectivity.
Impact on Society, Environment & Economy

The sun provides a tremendous resource for generating clean and sustainable electricity without pollution or global warming emissions.

The potential environmental impacts associated with solar power — land use and habitat loss, water use, and the use of hazardous materials in manufacturing — can vary greatly depending on the technology, which includes two broad categories: photovoltaic (PV) solar cells or concentrating solar thermal plants (CSP).

The scale of the system — ranging from small, distributed rooftop PV arrays to large utility-scale PV and CSP projects — also plays a significant role in the level of environmental impact.

Land Use

Depending on their location, larger utility-scale solar facilities can raise concerns about land degradation and habitat loss. Total land area requirements vary depending on the technology, the topography of the site, and the intensity of the solar resource. Estimates for utility-scale PV systems range from 3.5 to 10 acres per megawatt, while estimates for CSP facilities are between 4 and 16.5 acres per megawatt.

Unlike wind facilities, there is less opportunity for solar projects to share land with agricultural uses. However, land impacts from utility-scale solar systems can be minimized by siting them at lower-quality locations such as brownfields, abandoned mining land, or existing transportation and transmission corridors. Smaller scale solar PV arrays, which can be built on homes or commercial buildings, also have minimal land use impact.
Water Use

Solar PV cells do not use water for generating electricity. However, as in all manufacturing processes, some water is used to manufacture solar PV components.

Concentrating solar thermal plants (CSP), like all thermal electric plants, require water for cooling. Water use depends on the plant design, plant location, and the type of cooling system.

CSP plants that use wet-recirculating technology with cooling towers withdraw between 600 and 650 gallons of water per megawatt-hour of electricity produced. CSP plants with once-through cooling technology have higher levels of water withdrawal, but lower total water consumption (because water is not lost as steam). Dry-cooling technology can reduce water use at CSP plants by approximately 90 percent. However, the tradeoffs to these water savings are higher costs and lower efficiencies. In addition, dry-cooling technology is significantly less effective at temperatures above 100 degrees Fahrenheit.

Many of the regions in the United States that have the highest potential for solar energy also tend to be those with the driest climates, so careful consideration of these water tradeoffs is essential.

Hazardous Materials

The PV cell manufacturing process includes a number of hazardous materials, most of which are used to clean and purify the semiconductor surface. These chemicals, similar to those used in the general semiconductor industry, include hydrochloric acid, sulfuric acid, nitric acid, hydrogen fluoride, 1,1,1-trichloroethane, and acetone. The amount and type of chemicals used depends on the type of cell, the amount of cleaning that is needed, and the size of silicon wafer. Workers also face risks associated with inhaling
silicon dust. Thus, PV manufactures must follow U.S. laws to ensure that workers are not harmed by exposure to these chemicals and that manufacturing waste products are disposed of properly.

**Life-Cycle Global Warming Emissions**

While there are no global warming emissions associated with generating electricity from solar energy, there are emissions associated with other stages of the solar life-cycle, including manufacturing, materials transportation, installation, maintenance, and decommissioning and dismantlement. Most estimates of life-cycle emissions for photovoltaic systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.

Most estimates for concentrating solar power range from 0.08 to 0.2 pounds of carbon dioxide equivalent per kilowatt-hour. In both cases, this is far less than the lifecycle emission rates for natural gas (0.6-2 lbs of CO2E/kWh) and coal (1.4-3.6 lbs of CO2E/kWh).
A. Basic Assumptions

1. Conservative target adoption by at least 5% ASEAN, 20% Nationwide, 25% Visayas

2. 10% target adoption rate per year over the next five years

3. Same numbers of industries per year over the next five years

B. Investment Capital Requirement

CSI is looking for a prosperity financial investor with the amount of **One hundred twenty five million US Dollars (US $125,000,000.00)**.

This funding amount will cover costs associated in developing the main CSI business application and core services, land purchase, solar power farm construction, manufacturing machinery/equipment, inventory, transportation equipment and other operational expenses. ROI will be in **6.5-7 years** after full operation.

**Important Assumptions:**

- ASEAN is the biggest renewable energy market.
- CSI is conservatively projecting a market penetration of 5% within ASEAN.
- A nationwide conservative projection is estimated to cover 20% for Luzon and Mindanao and 50% for the Visayas with a market penetration over the next five-year period.
- Conservative adoption of an annual rate of 10% increase in targeted market over the next five-years
- Keeping the same numbers of target institutions and industries should be factored in the calculation.
Return on Investment Projection

7 Years Projection: $125,000,000.00 Investment Requirement

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<th>Kw per Day Production</th>
<th>Kw per Month Production</th>
<th>Kw per Year Production</th>
<th>Price/kw</th>
<th>Annual Sales (x50MW)</th>
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<td>126,207,900</td>
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Exit Strategy

CSI is keen on the sale of equity (trade sale) or Initial Public Offering (IPO) after the capital investment has been returned back to the prosperity investors.
**Company Profile**

Cebu Solar Incorporated (CSI) is an emerging supplier of Renewable Energy Systems and Solar Technology Integration. CSI is under the Advance Solar Technology (AST), established in 2002 by Tommy Lee Tirey Jr., an American inventor of the Solar Fluid Heating System with US Patent using the parabolic dish concentrating solar power technology.

CSI is a manufacturing business and services corporation which provides the engineering and technical services with a competitive pricing designed to address the concern for a more sustainable energy development system. CSI offers alternative renewable energy solutions to small and medium enterprises to generate savings in their energy consumption and transform them into more efficient and self-sufficient businesses. In addition, this method is environment friendly.

**Cebu Solar Inc. (CSI)**  
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Website: [http://www.cebusolar.com](http://www.cebusolar.com)  
E-mail: sales@cebusolar.com; tommyleetirey@yahoo.com  
Contact Numbers: +63 929 256 1847 Philippines  
530-870-5790 USA

**The Management Team**

**Tommy Lee Tirey**  
Inventor & CEO

A Vietnam veteran, College Graduate, Associates degree in Aircraft Maintenance, Art and Applied Psychology. Certifications of merit in many fields Industrial pipefitting, Automotive repair, welding and Fabrication, Hydraulics, solar design, Forman for Large photovoltaic installer in the Bay Area, Forman for large construction firm in the Bay Area for 5 Years.

**Michael W. Smith**
Jon M. Stallman

1963 Wild Oak Ln., Chico, Ca, 95928 Home: (530) 809-1081 • Cell: (530) 864-5110
E-mail: jonstallman@comcast.net Stallmanjo@butte.edu

EDUCATION

Master of Science, Technical Education Instruction and Program Design, CSU, Chico
Bachelor of Science, Manufacturing Science, CSU, Chico
Certified Manufacturing Technologist, CMfgT
Certified Green Building Professional, CGBP, Build It Green
North American Board of Certified Energy Practitioners, NABCEP Solar PV
Home Energy Rating System, HERS Level 1 Certified
California Designated Subjects Credential; Drafting and Graphic Modeling, Computer
Controlled Manufacturing, Composites.
United States Private Pilot; Single Engine, Tail Wheel, Mountain Flight Endorsements
United States Hang Gliding and Paragliding; Tandem Instructor T-1, Advanced Rating P-4

Appendices

Press Releases/Blogs/Articles & Reference Links

Startup Aims to Cut the Cost of Solar Cells in Half
Posted by Tommy Tirey on Apr 7, 2013 in NEWS | 2 comments

A startup that has been operating in secret until today—has developed a way to make
thin wafers of crystalline silicon that it says could cut the cost of making silicon solar cells
in half. It has demonstrated the technology in a small, 25-megawatt-per-year solar-cell
factory it built in Senatobia, Mississippi.

Siva Sivaram, the CEO of Twin Creeks, says the company’s technology both reduces the
amount of silicon needed and the cost of the manufacturing equipment. He claims the
company can produce solar cells for about 40 cents per watt, which compares to roughly 80 cents for the cheapest solar cells now. Twin Creeks has raised $93 million in venture capital, plus loans from the state of Mississippi and other sources that it used to build its solar factory.

The conventional way to make the crystalline silicon wafers—which account for the bulk of solar cells—involves cutting blocks or cylinders of silicon into 200-micrometer-thick wafers, a process that turns about half of the silicon into waste. The industry uses 200-micrometer wafers because wafers much thinner than that are brittle and tend to break on the manufacturing line. But in theory, they could be as thin as 20 to 30 micrometers and still be just as efficient, or more efficient, at converting sunlight into electricity.

Twin Creeks’ process makes 20-micrometer-thick wafers largely without waste. It involves applying a thin layer of metal that makes them durable enough to survive conventional solar-cell processing equipment. Sivaram says that by greatly reducing the use of wire saws and related equipment and making thinner wafers, Twin Creeks reduces the amount of silicon needed by 90 percent and also greatly reduces capital costs. He says the technology can be added to existing production lines. The company’s primary plan is to sell manufacturing equipment, rather than produce solar cells. “I expect that by this time next year, we’ll have a half a dozen to a dozen of these tools in the field,” he says.

The process begins in a vacuum chamber, where a high-energy beam of hydrogen ions bombards three-millimeter-thick disks of crystalline silicon. The ions accumulate at a precise depth of 20 micrometers, which is controlled by the voltage of the beam. Once enough ions accumulate, a robotic arm quickly removes the wafers, which are then placed inside a furnace, where the ions in the silicon form microscopic bubbles of hydrogen gas that expand, creating tiny fractures within the silicon wafer and causing a 20-micrometer-thick layer of silicon to flake off. The company then applies a metal backing to the thin silicon. (The proprietary process it uses sets it apart from another company, Astrowatt, which makes wafers that are similarly thin. But Astrowatt’s wafers are slightly curved, which could make them difficult to handle in conventional production equipment.)
The Twin Creeks wafers are compatible with conventional solar-cell production equipment, and with processes now being used to make advanced solar-cell designs, such as heterojunction cells. Sivaram says the hydrogen-ion process works with single-crystal materials other than silicon, including gallium arsenide, a semiconductor that has been used to produce world-record efficiency solar cells.

Using an ion beam to create thin wafers of crystalline silicon has been considered before, but it was far too expensive to be a practical manufacturing method. It required a particle accelerator that could produce ion beams that are both very high current and very high energy, and “such a beast did not exist,” Sivaram says. To make the technology viable, Twin Creeks developed an ion accelerator that is “10 times more powerful” than any commercially available accelerator, he says.

While the company emphasizes that the technology is compatible with existing production lines, it does require at least one change. Ordinarily, wafers are treated to create a rough surface texture that helps them absorb light rather than reflect it. The texture is made of pyramids that are about as tall as the Twin Creeks wafers are thick, so it isn’t practical to use with the new wafers. Sivaram says the company has implemented an alternative anti-reflection technology that allows its solar cells to perform as well as ones made with the conventional process.

**Critical power situation expected by December 2015**

*By Gregg M. Rubio, MIT* (The Freeman) | Updated August 25, 2013 - 12:00am

CEBU, Philippines - The critical period of the power supply situation in the Visayas Grid is expected to start by December 2015 with the projected deficit of 60 megawatts (MW) instead of 2019 yet, according to the Department of Energy.


**Capitol cites ‘critical’ situation in Cebu; Unclear repair period of Leyte power plants affects Veco service**
How long will almost daily rotational brownouts continue in Cebu? They will likely continue until next year due to pending repairs of damaged Leyte power plants, a top official of the Visayan Electric Company (Veco) said yesterday. Veco chief operating officer Sebastian Lacson said the private distribution utility could only resume full operation in Metro Cebu if the two major power generators are restored.

But no clear deadline has been given for repairs to be completed on damaged Leyte plants which supply the bulk of Cebu’s power.

Power of the sun now under your command. | Cebu Solar Inc.
October 27, 2011

ATTY. LINDEZA ROGERO-GAVINO
Acting Director
Securities and Exchange Commission (SEC)
Cebu Extension Office
SEC Building, V. Rama Avenue, Engris
Gucalupe, Cebu City 6000

Dear Atty. Gavino:

This refers to your 1st endorsement letter relative to the Articles of Incorporation of CEBU SOLAR, INC. (CEBU SOLAR) requesting for the Commission's comments and recommendations thereon.

In its Articles of Incorporation, CEBU SOLAR stated, among others, that its corporate primary purpose is as follows:

"PRIMARY PURPOSE

To engage in the exploration, development and utilization of renewable energy resources and finding alternative sources of energy, including the development, design, manufacture, trading and/or installation of systems, projects, utility models, industrial designs and/or patents related but not limited to energy generation, providing basic and enhanced technical services between areas and territories within the Philippines and between the Philippines and other countries, including but not limited to technologies and services such as research and experimental development, consultancy and all other services presently available and will be available through technical advances and innovations in the future."
The Commission interposes no objection to the aforesaid primary purpose of CEBU SOLAR. Relative thereto, please note the following requirements and pertinent provisions of Republic Act No. 9136 (the Electric Power Industry Reform Act of 2001 or the EPIRA) and its Implementing Rules and Regulations (IRR):

1. Section 6 of the EPIRA and Rule 5, Section 1 of its IRR:

a) "Sec. 6. Generation Sector. – Generation of electric power, a business affected with public interest, shall be competitive and open.

Upon the effectivity of this Act, any new generation company shall, before it operates, secure from the Energy Regulatory Commission (ERC) a certificate of compliance pursuant to the standards set forth in this Act, as well as health, safety and environmental clearances from the appropriate government agencies under existing laws."

b) "Rule 5. Generation Sector

Section 1. Guiding Principle.

x x x

No person may engage in the Generation of Electricity as a new Generation Company unless such Person has received a COC from the ERC to operate facilities used in the Generation of Electricity. A Person that demonstrates compliance with the standards and requirements of this Rule 5, and such other terms and conditions as determined by the ERC to be appropriate to ensure that Persons comply with all applicable and regulatory requirements, shall be issued a COC."
2. Section 43 (t) of the EPIRA

a) “Section 43. Functions of the ERC.

xxx

(t) Perform such other regulatory functions as are appropriate and necessary in order to ensure the successful restructuring and modernization of the electric power industry, such as, but not limited to, the rules and guidelines under which generation companies, distribution utilities which are not publicly listed shall offer and sell to the public a portion not less than fifteen percent (15%) of their common shares of stocks. Provided, however, that generation companies, distribution utilities or their respective holding companies that are already listed in the PSE are deemed in compliance. For existing companies, such public offering shall be implemented not later than five (5) years from the effectivity of this Act. New companies shall implement their respective public offerings not later than five (5) years from the issuance of their certificate of compliance.”

3. Section 45 of the EPIRA and Rule 11, Section 3 (a) and (b) of the IRR.

a) “Sec. 45. Cross Ownership, Market Power Abuse and Anti-Competitive Behavior. - No participant in the electric industry or any other person may engage in any anti-competitive behavior including, but not limited to, cross-subsidization, price or market manipulation, or other unfair trade practices detrimental to the encouragement and protection of contestable markets.
No generation company, distribution utility, or its respective subsidiary or affiliate or stockholder or official of a generation company or distribution utility, or other utility engaged in generating and supplying electricity specified by ERC within the fourth civil degree of consanguinity or affinity, shall be allowed to hold any interest, directly or indirectly, in TRANSCO or its concessionaire. x x x.”


Section 3. Prohibition of Cross Ownership.

(a) Pursuant to Section 45 of the Act, no Generation Company, IPP Administrators, Distribution Utility or Supplier, their respective subsidiaries, Affiliates, stockholders, directors or officers or other entity engaged in generating and supplying electricity specified by ERC, shall hold any interest, directly or indirectly, in the TRANSCO or its Buyer or Concessionaire, or the Market Operator.

(b) TRANSCO or its Buyer or Concessionaire and any of its stockholders, directors or officers or any of the relatives within the fourth civil degree of consanguinity or affinity, legitimate or common law, shall not hold any interest, whether directly or indirectly, in any Generation Company, IPP Administrators, Distribution Utility or Supplier.”

For your information and guidance.

Very truly yours,

ATTY. FRANCIS SATURNINO C. JUAN
Executive Director III

[Signature]

WEREAL LETTER TO SEC (CEBU SOLAR) 1-2011-0002255
Dear Sir/Madam:

Thank you for your interest in the Department of Energy’s (DOE) Inventions and Innovation (I&I) Program (formerly Energy-Related Inventions Program and Innovative Concepts Program). This grant program is designed to evaluate and support energy-related concepts and inventions with strong commercialization potential within the areas of industry, power (utilities), transportation, and buildings. Selections for financial assistance under the I&I Program are made on a competitive basis, and the grant awards range up to $200,000 (definite award amount still in discussion).

For your review, please find enclosed a copy of the I&I brochure, which outlines specific program information, and an I&I pre-proposal format. As discussed in the literature, the I&I optional pre-proposal process provides the inventor the opportunity to submit a short project description (according to enclosed format) prior to the formal solicitation. DOE then provides a timely response regarding the idea’s program relevance. Pre-proposals must be received at the DOE Golden Field Office by April 2, 1999 for consideration. The 1999 formal solicitation will be issued on May 3, 1999 and will close on July 19, 1999.

If you have additional program questions, please contact Jennifer Squire, I&I Program Analyst, at (303) 275-4764. If you are interested in other Department of Energy Programs, call 1-800-DOE-EREc, which serves as an information clearinghouse for the Department of Energy.

Thank you for your interest in this exciting energy program.

Sincerely,

Douglas W. Hooker
Project Engineer
Inventions and Innovation Program
Tommy Lee Tirey, Jr.
13470 Hegg Ranch Rd.
Yankee Hill, CA 95966

In re: Preliminary Patentability Search Report
Invention: "Solar Water Heater"
Docket: SAM-334-648
Reference: GU.8

Dear Mr. Tirey:

Pursuant to your request, a preliminary patentability search for the above-identified invention has been conducted through the available patents of the United States Patent and Trademark Office. The search was limited to issued United States patents. No foreign patents or publications were reviewed, and although such items may be relevant, no effort was made to determine the existence of similar products in the market place. The search has been conducted to assist you in determining whether utility or design patent protection, or both, for your invention might be available.

DESCRIPTION OF THE INVENTION

The intent of the search was to locate issued United States patents disclosing a solar water heater as described in your provided disclosure. Additionally, to a reasonable extent, the search was expanded to encompass other possible modifications and enhancements to both the functional and ornamental features of the invention, thereby to hopefully provide a broad indication of the current state of the art.

*Licensed only in Minnesota
CONCLUSION

In making the above described analysis, I have compared and evaluated the differences between your invention and the prior art patents included with this report. The courts have held that an invention may be patentable, even if the invention comprises a combination of features already known and shown in the prior art; provided that the combination itself is not obvious. More specifically, the invention must be considered as a "whole" to include each and every individual structural component, implied or described methods of assembly, processes of manufacture, chemical composition, and/or functional usage. In following these court guidelines, as well as the evaluation procedures described earlier in this report, I am of the opinion that your invention still discloses features which are either not shown or made obvious by a combining of the located prior art patents. For example, your invention includes a description of both structural and "method of making" features which differ significantly from what is shown or suggested in the prior art patents included with this report.

RECOMMENDATION

Therefore, I am pleased to report that it is my professional opinion that utility patent protection could potentially be obtainable for your invention.

If I can be of further service, please so advise.

Kind regards,

LAW OFFICES OF KAARDAL & ASSOCIATES, P.C.

by:

Ivar M. Kaardal
For the Firm
Power of the sun now under your command. | Cebu Solar Inc.