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MR. NILESH PATEL, CEO, MOVYA CONSULTANCY

Gujarat finally deciding on Solar PV project based REC Scheme

With Recent market reports on financial debt and strength of state power distribution companies across India, clearly four States: Gujarat, Maharashtra, Andhra Pradesh and West Bengal, shows some strength to payback to solar power generators.

Based on this scenario and lack of state based solar power policy, many investors and solar developers are inclined to go to only these States; even if it is for REC based solar PV projects under APPC rates.

Having one of the best transmission network and infrastructure, Gujarat naturally becomes most favoured destination for most of the solar developers. But there were rumours that Gujarat Government is not accrediting any REC project due to reasons:

- Gujarat has already been able to comply with its RPO obligation
- Gujarat is working on new avatar of third phase state based solar policy

Last week GEDA organized a meeting calling up individually, to-be Solar Developers/Investors who have already initiated process to set up REC based solar project in Gujarat.

The meeting was attended by Principal Secretary Energy and Petrochemical department, Managing Director GETCO, Deputy Director GEDA and Managing Director GUVNL along with all office bearers who are associated with business of Solar power generation from government of Gujarat.

As GEDA reported, more than 700 MW of REC based solar project request came from 68 individual applicants so far and are receiving many more. But only 5

developers had actually provided complete documentation, specifically about exact Land details. GEDA needs this details to proceed further for them to convey GETCO to carry out Feasibility study and report them back, so GEDA can assess the application and ask all remaining documentations from the developer which are necessary for REC accreditation process.

Some of the conclusions reached during this meet were:

- Government will be ready to sign PPA on APPC rate up to 100 MW
- Government will not have any objection on capacity of Captive or third party sale based REC projects. The cost charges for power transmission and wheeling will be decided soon. That means Captive customer can now go forward with

however big capacity one can afford on REC based solar project. There is no restriction

- All associated department i.e. GETCO, GEDA, GUVNL and EPD along with PGVCL, DGVCL, MGVCL, SGVCL will convey a meeting shortly and will draft REC policy documents for all REC developers to follow for accreditation of the solar PV project in Gujarat.
- REC draft policy will be circulated among the REC solar project applicants to get feedback and there after accommodating needed feedback, EPD will get approval in the legislative assembly.

So Gujarat now on track to start accreditation and that's good news for Investors, Captive consumers and Developers of REC based solar power project.



MR. HARI MANOHARAN; RESOLVE ENERGY CONSULTANTS

Budget 2013: Some good news for the renewable energy sector

The budget proposals being announced are matter of some joy to those involved in the renewable energy sector. The announced proposals breathes some much needed life into the wind energy sector which had lost steam due to the lack of clarity on the available incentives. There was also some good news for the solar manufacturing sector as well as renewable energy developers.

Some of the highlights pertaining to renewable energy sector include:

- The biggest announcement was the allocation of Rs. 800 crores to MNRE for providing Generation Based Incentives (GBI) for wind energy projects.
- The government has proposed to introduce an investment allowance of 15% for high value investments (above Rs. 100 crores) in plant and machinery during the period 1.4.2013 to 31.3.2015. Thus any company investing Rs. 100 crores or more in plant and machinery for manufacturing would be allowed to deduct 15% of the investment in addition to the current rates of depreciation. This is specifically beneficial to the solar manufacturing sector as it would help improve the returns on new manufacturing units.
- In addition to the above, specific incentives have been announced for semiconductor wafer fab manufacturing facilities which includes zero customs duty for plant and machinery. This is again is good news for companies looking to invest in setting up solar manufacturing units (fully integrated) and could help drive down the cost of domestic modules and help them hold their own against foreign competition.
- From a developer's perspective, there is more good news. It has been proposed that low interest rate loans would be provided to developers from the national Clean Energy Fund



(NCEF). The scheme is proposed to have a lifespan of 5 years. As I have mentioned earlier, low interest rate loans are the primary driver in facilitating investment in solar projects. Low interest rate loans would mean that developers would not be pigeonholed into looking for foreign funds (and thus forced to buy foreign components). This means that this announcement could benefit not only the developers, but also the domestic manufacturers. Again all this depends on what the interest rates are going to be. For reference, power projects financed using foreign funds typically have interest rates between 7% and 9%. One specific project that I recall had a varying interest rate @ LIBOR + 4.9%.

- The "80IA" benefit would be extended for another year. 80IA stands for a tax holiday of 10 years given to power projects.
- The Minimum Alternate Tax (MAT) + ancillaries which would have to be paid even during the tax holiday would be retained at around 20%.

- The education cess levied on imported goods would remain at 3%
- India Infrastructure Finance Corporation (IIFC), in partnership with ADB will help infrastructure companies to access bond market to tap long term funds.
- Finally there is also an "evolving" proposal to encourage cities and municipalities to take up waste to energy projects in a Public Private Partnership (PPP) model while remaining technology neutral. The Government will support municipalities that will implement waste-to-energy projects through different instruments such as viability gap funding, repayable grant and low cost capital.

All in all, this is some good news for the entire renewable energy sector and the solar/wind energy sector in particular. Further, the note on waste to energy technologies is heartening as this is remains an untapped source for energy inspite of significant efforts taking in the area and should have the added benefit of helping manage the burgeoning waste pockets in the country.

SUSANNA HUANG, FOUNDER, GREEN ENERGY VILLAGE LLC

My Observation of Globalization and Solar PV Industry

The best speech I had heard on globalization was given by a Honda executive from Japan delivered in not-so-fluent English. He shared his experience of visiting a supermarket where he picked up goods made in different kinds of countries. He concluded that the global competition occurs everywhere in our daily lives.

I reflect on my personal experience of globalization.

My first job out of graduate school in China was working for a global consulting firm. At that time, the "foreign" investments in China were still rare. Management was expatriates. Students chose to work for foreign companies. I had training opportunities in the U.S. every year, "envied" by many students. Domestic companies not only lost their competitive advantage but also lost many talents to "foreign" companies. People with obsolete skills lost their jobs. People had mixed feelings of concerns and hopes.

Over years, more and more companies have entered the China market. Interestingly, domestic companies did not disappear; instead, some of them grew much stronger. Take one example, when I conducted Global PC strategic sourcing project at Switzerland, I negotiated with Lenovo. I

used to pass by Lenovo's building in Beijing when it was still a Chinese brand name. In 2005, Lenovo acquired IBM PC division and now became the third largest PC vendor in the world.

I visited many manufacturing plants in the U.S. and in China. In the U.S., I sometimes was surprised by the age of the production equipments, 20+ years, 30+years etc. I also observed low morale (my sample size is small). In contrast, the plants I visited in China had modern plants with advanced equipments and highly motivated workforce.

What happened? How did it happen?

China learned the lesson taken almost one hundred years ago. At that time, China closed the "door" to avoid foreign influence. The country became weaker over-time until it was invaded by other countries. About 30 years ago, China adopted a "open door" policy. "Foreign" companies are welcomed to compete directly on China market. The advanced technologies and management practices brought by "foreign" companies spilled over to domestic companies, which grew stronger under tough competitive environment.

Some domestic Solar PV companies filed bankrupt recently, causing concerns. Maybe other domestic companies can learn

from China experience. Global competition will stay. Industry change is inevitable. Protectionism might help an immature industry; it is by no means a long-term solution. A company under too much protection might lose its competitive edge. Complaining the outside environment does not help improve the situation.

US Solar market is at a critical stage. In my view, this might be defining moment for U.S. PV industry. It can be a great opportunity for a change under crisis. An U.S. company might want to face the reality, focusing on its strength (i.e. advanced technologies, service market etc.) instead of improving its weak areas (i.e. cost structure etc.). I like the word "co-petition". It means competitors cooperate while compete with each other. There might be ways for U.S. companies to collaborate with Chinese companies and jointly develop the market in the U.S and in China.

I don't have a silver bullet to the problem which Solar PV industry is facing in the U.S. I only believe that the crisis breeds opportunities. Globalization is everywhere in our lives. A company might want to listen very carefully at this teaching moment and take actions to change its strategy match

DR. SANJAY VASHISTHA, FIRST GREEN CONSULTING

Understanding Power Purchase Agreement (PPA) for Solar Projects

Traditionally PPA was vehicle for purchase of electricity from power producers and distribution utilities. However, now days independent power producers as well as owner of solar power projects assigning PPA's with non-utility buyers/ open access consumers who have also obligation to meet their solar portfolio. Typically a third party PPA model works in such a way that a project developer builds own and operates a solar plant and signs an agreement (PPA) for selling electricity to any consumers via a long term PPA. In this process, while the open access consumer's gets a benefit of solar electric-



ity available at a cheaper rate, it also meets its solar power obligation as mandated by the RPO's. If a project developer do not want to sell its green electricity he can sign a PPA only for the sale of electricity (grey electricity) and can sell environmental attributes/ green power (REC's) in the open market through exchange. This means that solar electricity can be bought by a consumer who want to meet its solar obligation as well as to a consumer who only want to buy electricity.

While selling electricity from a solar power generator to any open access consumer located in the TO PAGE 5 >>

BHARAT VASANDANI, ENERGETICA INDIA

Global warming can increase power prices in India



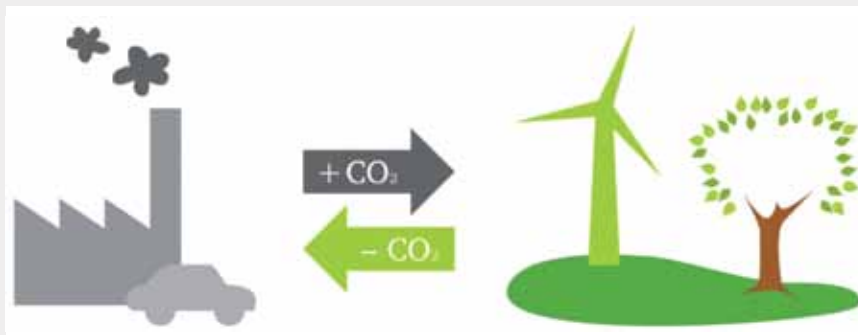
Last week I had an opportunity to visit Mr. Vyas, Director-Solar at International Marketing Corporation. We had a good discussion on the current state of climate change being experienced in India.

We did touch upon the fact that this year India has experienced a longer winter; compared to previous years. Though nobody is complaining; this does show the impact of global warming.

Following the long winter; is the expected long and much hotter summer. This will surely further increase the peak power demand everywhere in India.

Taking into account; the coal supply issues, the deficit in electricity to meet daily demands and the increasing diesel prices; we can surely expect the prices to further increase to meet the current peak demand.

This, along with increasing diesel prices, can be good news for solar in India.



Maybe the metros will be spared of power cuts; but smaller towns will not escape the heat.

Straying off-the-course

With solar modules from outside India taking up most of the pie with on-grid projects, the reasons above can be a game changer for solar manufacturers in India. Ofcourse there are other factors which will come into play such as location, current awareness of solar off-grid in the particular area, etc.

One thing that was quite an eye-opener; during the discussion with Mr. Vyas, was the fact that Indian manufacturers were supplying solar modules

to the European market before the announcement of JNNSM. This resulted in a small but existing market for solar equipment companies in India.

What JNNSM was supposed to do; was increase the role of Indian solar manufacturers. This would also have resulted in a much bigger market for solar equipment companies. But infact the opposite has happened.

After JNNSM, the Indian solar manufacturers have lost market share. Global solar equipment companies who started coming to India in 2009 have now stopped focusing in India. They are waiting for the right impetus to restart their sales & marketing efforts in India.

Open Access at 33 kV	Gujarat	Maharashtra	Tamil Nadu	Andhra Pradesh	Rajasthan	Karnataka
Transmission losses (%)	7.00%	4.85%	5%	4.02%	4.40%	4.03%
Wheeling Losses (%)	7.00%	6%	7%	7.89%	3.80%	5.00%
Banking Charges (%)	12%	0	0	2%	2%	2%
Wheeling Charges (Rs/kWh)	0.13	0.04	0.14	0	0.11	0
Cross Subsidy Charges (Rs/kWh)	0	0.61	2.07	0	0.38	0.11
Electricity Duty (Rs/kWh)	0	15%	0%	0	0	0
Base Rate(assumed) (Rs/kWh)	5	5	5	5	5	5
Effective Rate (Rs/kWh)	6.43	6.3425	7.81	5.6955	6	5.6615
Open Access Charges	0.79 Rs/Kwh	0.84 Rs/Kwh	6483Rs/Kwh/Month	1592Rs/Mwh/Month	146.61Rs/Kwh/Month	1.56 Rs/Kwh

>> FROM PAGE 4 same state following charges apply (see table).

The above table shows that typically if

an electricity generator signs PPA from Rs. 5 with an open access consumer, the net rate to the consumer ranges between Rs. 5.6-

7.8 depending on the location of the state.

Cross subsidy surcharges are the major factor in the state which TO PAGE 6 >>

>> FROM PAGE 5 impact the electricity sale to a third party while few states such as Gujarat do not have any cross subsidy surcharge for Solar on the other hand states such as Tamil Nadu charge over Rs.2 as cross subsidy surcharge.

In order to avoid the cross subsidy surcharge many solar investors sign a PPA under group captive scheme. The group captive scheme requires at least 26% of

equity share in the solar project by the consumer and has to consume a minimum of 51% electricity from the solar project.

Many large consumers are now tying up PPA's with solar generators to take benefit of group captive generation scheme. It is important that the buyers and sellers of electricity must be aware of the different state regulations and find out an appropriate way for the third party sale. In recent time, third

party sale model has also been adopted by roof top owners where in the solar power developer installs a solar plant at the roof top of any building owner and signs a PPA for electricity sale through roof top solar.

In case the electricity is consumed directly by the building as off-grid consumption, no REC benefits are available. 30% capital subsidy and accelerated depreciation can be availed.

MR. SANDEEP GOSWAMI, COO, FOUNTAINHEAD II CLEANTECH INDIA PVT LTD

Geothermal to beat Recession away – Future Renewable Energy Thoughts



While we wait for Solar to take its place under the Sun, which no doubt it would and even avoid eating up large swats of land by just floating on water, while

keeping in mind to allow sunlight down below; and compliment Wind turbine which line the Oceans along the sea faring route, in large floats which allow ships to charge up their dynamos from one point to the next, thus limiting the use and carriage of bunker fuel; especially when they enter territorial waters from the Blue Seas. In fact these floating Wind turbines could act as buoys / light-houses too and being closer to shore more easy to maintain, while avoiding the socio-political problems it faces on land, we must at the UNFCCC level hail Geo-thermal as the Messiah for now.

Low temperature geothermal applications include space heating and in agricultural uses (greenhouse heating, the drying of fruits and vegetables, aquaculture and seawater desalination, and in spas), providing an ideal synergy with other widespread commercial ventures. As technological advances allow for the exploitation of lower temperature geothermal resources, found at just a few meters below the ground surface, the heating and cooling of water for domestic use, for instance, becomes

highly viable and attractive. Such applications lessen reliance of non-RE resources, are highly reliable and cost effective, and emit far less carbon dioxide.

Advantages of investing in Geothermal are many as there are wealth of geothermal resources around the World. This can provide emerging markets with substantial entry-stage opportunities due to wide variety of synergistic applications.

And Messiah it could very well be for Greece. All the Greeks need to do is look towards Santorini. It is the most famous volcano in Greece. The most recent volcanic eruption in Greece was Santorini in 1950. Greece has 752 hot springs which are popular tourist destinations. Greece lies in a geographic position that is favorable to geothermal resources, both high temperature and low temperature.

High temperature resources, suitable for power generation coupled with heating and cooling, are found at depths of 1-2 kilometres on the Aegean islands of Milos, Santorini, and Nisyros. Other locations that are promising at depths of 2-3 kilometres are on the islands of Lesbos, Chios, and Samothraki as well as the basins of Central-Eastern Macedonia and Thrace. Low temperature geothermal resources are found at the plains of Macedonia-Thrace and in the vicinity of each of the 56 hot springs found in Greece. These areas include Loutra-Samothrakis, Lesbos, Chios, Alexandroupolis, Serres, Thermopyles,

Chalkidiki, and many others.

Geothermal power – the energy derived from stores of superheated water and steam in seismically-active areas – could, according to geologists, offer a realistic alternative to fossil fuels in the production of electricity and position the country as a regional leader in what is a growing global market. According to an energy profile of Greece in a US Commercial Service report, there are up to 2,000MW of electrical output available from 'high temperature fields' across the country.

By the end of 2007 the installed thermal capacity of the direct geothermal uses in Greece amounted to roughly 75 MWt. Despite the large high-enthalpy resources in the active Aegean volcanic arc, no electric power is produced from geothermal resources in Greece. With the existence of 30 geothermal fields in Greece – two of them sizable enough to produce at least 250MW of uninterrupted electrical power, Greece can not only pay its way out of the Economic crisis but also show the way to the EU Nations on how they could meet its Kyoto Protocol and EU targets on greenhouse gas emissions.

The above story is also true for India, which does not even exploit its easily available recourses. In fact Mumbai is practically sitting on it.

Should the State Government of Maharashtra seriously consider the use and application of geothermal lying underuti-

lized it could use the applications of geothermal energy, which vary according to their temperature and include:

- Power generation ($\theta > 90^\circ\text{C}$)
- Space heating (with radiators, $\theta > 60^\circ\text{C}$, fan-coils, $\theta > 40^\circ\text{C}$, floor heating systems, $\theta > 25^\circ\text{C}$)
- Refrigeration and air conditioning (using absorption heat pumps, $\theta > 60^\circ\text{C}$, or with water-cooled heat pumps, $\theta < 30^\circ\text{C}$)
- Heating greenhouses and soil because plants grow more quickly and become bigger with heat ($\theta > 25^\circ\text{C}$), and for protection from frost
- Aquaculture ($\theta > 15^\circ\text{C}$) because fish need a specific temperature to grow
- Industrial applications such as desalination of seawater ($\theta > 60^\circ\text{C}$), drying agricultural products, etc.
- Thermal spas ($\theta = 25\text{--}40^\circ\text{C}$)

Besides geothermal fields, with today's technology, heat from rock at a shallow depth, as well as low temperature un-

derground or surface water can be used for heating and air conditioning. Hot dry rock, which is found everywhere at depths between 3 and 5 kilometers, by artificial water circulation through it at a temperature of up to 150°C . If the cost of energy is calculated over the life cycle of the system, geothermal heat pumps cost less than a system which consumes oil or natural gas.

Geothermal energy should be exploited in India where using Nuclear Energy is meeting with stiff social resistance, especially after the Fukushima daiichi incident in Japan. Moreover, it has been proved beyond doubt by the experts of Geo-thermal in India that setting up a plant would cost far less than that of Nuclear and produce more and safer energy.

The other advantage it could have over coal based thermal or large hydel generated power is its "portability". The size of a Geo-thermal plant compared to the above two would be very small – gen-

eration capacity wise. Moreover it would neither flood vast areas causing socio-economic upheaval nor produce fly-ash a dangerous polluter. The only thing it emits is water vapor. However, in some certain trace gases are found which can be easily treated.

This portability has a very great business advantage, which perhaps power companies have overlooked. It is a fact that energy generation and distribution in India is far costly than the tariff applied. Typically, domestic (24% of total power supply uptake) and agricultural (22%) enjoy cross subsidies from industrial (38%) and commercial (16%) users. Industrial and commercial users still pay 30-60% above average power price. Therefore if Geo-thermal plants are placed close to the industrial & commercial areas by the Private power companies, they would be able to evacuate and distribute power at a far cheaper cost, which would be beneficial to both.