

### JMD S NOTE



Diwali being biggest festival

for us-the Indians, we look forward for Diwali every year, the fun & the quality time that we spent with our family & friends. We all relish the best food, especially a lot of sweets. From last couple of years, majority of us prefer homemade food, sweets & chocolates. People are realizing the importance of homemade.

So, this year extend the same idea to the power we consume, which normally comes from conventional sources, which causes pollution. We can make our own "homemade power" too from the sun rays which come to our doorstep every single day... Solar Power.

This year you also must have noticed a significant reduction in fire crackers usage. It's a welcome step towards the initiative of saving the environment. But, did we ever think how much pollution is created to bring the power which electrifies your homes. Just have a look on this small video, which can be an eye-opener.



Should we not become more responsible and move towards Green Power in place of Brown (polluted) Power. Let's take a pledge to move towards this initiative. 'Ujaas Home' gives you this opportunity. Come forward & move a step towards – "Own Your Sun".

It's our moral responsibility to preserve our environment for our future generation. This festive season let's come together with a conscience decision to save - the Mother Earth.

**-Vikalp Mundra**

**Jt. M.D.**

**Ujaas Energy Limited**

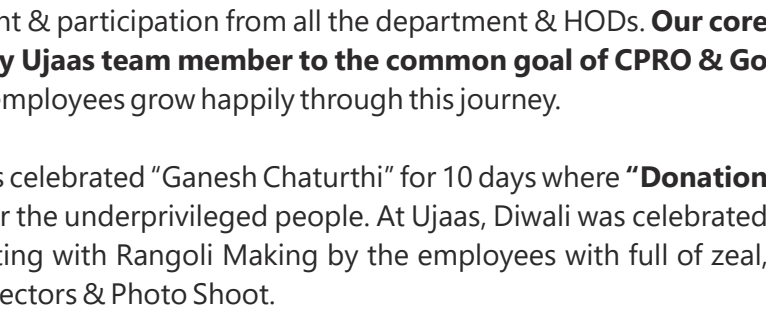
### UJAAS UPDATES

- Ujaas Energy Ltd. bagged contracts to develop over 25 MW of Rooftop Solar across India
- Some of the major allocations are SECI (20.03 MW), WBREDA (1.5 MW), Assam Energy Development Agency (2 MW), Jharkhand Renewable Energy Development Agency (8.5 MW)
- EPC contract to develop 500 kW rooftop solar projects for Oil India Limited



### HR NEWS

HR at Ujaas is continuously thriving to create highly performance driven, meritocratic yet fair and transparent work environment. We have evolved more of a strategic enabler than merely an administrator. We held our 1st **KUDOS Cards** rewards and recognition event last month, wherein the efforts of our high performing colleagues were recognized & appreciated by the Senior Management. The theme of the event was "Musical Antakshri", which saw an overwhelming excitement & participation from all the department & HODs. **Our core mission is to align every Ujaas team member to the common goal of CPRO & Go Cashless** and make our employees grow happily through this journey.



This festive season, Ujaas celebrated "Ganesh Chaturthi" for 10 days where "Donation Drive" was organized for the underprivileged people. At Ujaas, Diwali was celebrated in a traditional way starting with Rangoli Making by the employees with full of zeal, Gift distribution from Directors & Photo Shoot.

**"One Team" – "One Ujaas"**

### CURRENT EVENTS

#### Ujaas participated in 15th Edition IGBC Green Building Congress 2017 in Jaipur

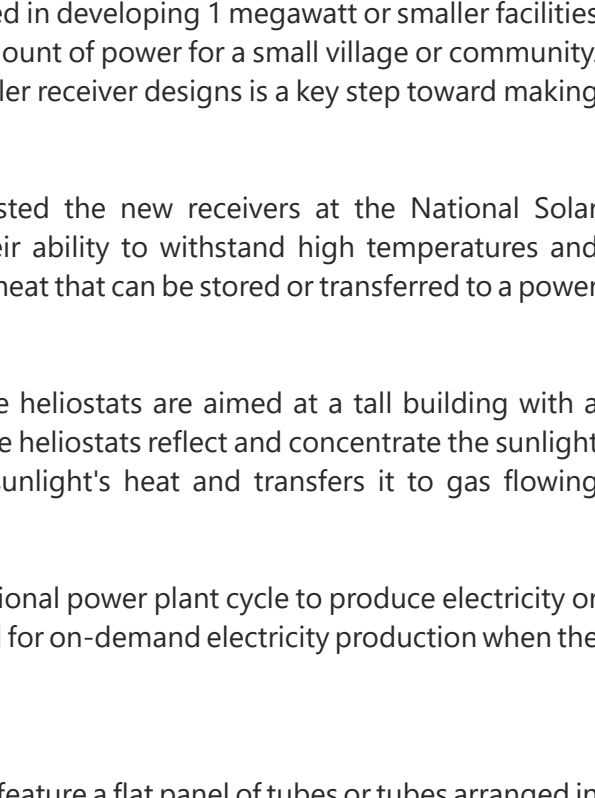
Ujaas was a part of the annual flagship event of IGBC (Indian Green Building Council). This three day event was held in Hotel Clarks Amer in Jaipur, Rajasthan from 04 to 07 October 2017. We observed an overwhelming response from the visitors. The event was marked by international conference, international exhibition & award programs.



### INDUSTRY UPDATES

#### Indian, US researchers developing concentrating solar power receivers to better absorb sunlight

A five-year project co-led by the Indian Institute of Science and the National Renewable Energy Laboratory, sponsored by the US Department of Energy and the government of India, aims to develop and improve cost-effective solar technology for both countries by addressing the barriers and challenges of each market.



Sandia National Laboratories engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 per cent more effective at absorbing sunlight than current technology.

The receivers were designed and studied as part of a Laboratory Directed Research and Development project and are also being applied to Sandia's work for the Solar Energy Research Institute for India and the United States, or SERIUS.

SERIUS is a five-year project co-led by the Indian Institute of Science and the National Renewable Energy Laboratory, sponsored by the US Department of Energy and the government of India. Sandia has led the group's research in concentrating solar power, focusing on scalable systems.

While most concentrating solar power facilities throughout the world are large, Sandia engineer Cliff Ho says India is interested in developing 1 megawatt or smaller facilities that could provide the appropriate amount of power for a small village or community. Improving the efficiency of these smaller receiver designs is a key step toward making that goal a reality.

Sandia engineers developed and tested the new receivers at the National Solar Thermal Testing Facility, studying their ability to withstand high temperatures and pressures while absorbing sunlight as heat that can be stored or transferred to a power cycle to generate electricity.

At Sandia's facility, rows of mirror-like heliostats are aimed at a tall building with a central receiver installed at the top. The heliostats reflect and concentrate the sunlight on the receiver, which absorbs the sunlight's heat and transfers it to gas flowing through the receiver's panelling.

The gas can then be used in a conventional power plant cycle to produce electricity or used with a storage system to be saved for on-demand electricity production when the sun is not shining.

#### Trapping and absorbing reflected light

Conventional receiver designs usually feature a flat panel of tubes or tubes arranged in a cylinder. These designs can absorb about 80 to 90 per cent of the concentrated sunlight directed at them when considering reflections and heat loss, but Ho said design improvements to make the receivers even more efficient are needed to help reduce the cost of concentrating solar power and improve scalability.

"When light is reflected off of a flat surface, it's gone," said Ho. "On a flat receiver design, 5 per cent or more of the concentrated sunlight reflects away. So we configured the panels of tubes in a radial or louvered pattern that traps the light at different scales. We wanted the light to reflect, and then reflect again toward the interior of the receiver and get absorbed, sort of like the walls of a sound-proof room."

Previous research on making solar receivers more efficient has focused on special coatings that are applied to the receiver. However, many of these coatings are susceptible to breaking down over time, which reduces both the ability of the receiver to absorb sunlight and the potential lifetime of the solar receiver itself while increasing costs due to reapplication and repair. Sandia's new fractal-like receiver designs have increased solar absorption efficiency without the need for special coatings.

Ho and the research team developed and tested multiple prototype fractal-like receiver designs scaled in size to work at small- and medium-scale concentrating solar facilities and found the designs that work best for each application.

"India has different market drivers than the US," Ho said. "The competition for renewable energy there is diesel generators, which create a lot of pollution and are extremely expensive. It gives us a little more flexibility to create a smaller concentrating solar power system that will work for their needs."

#### Testing the first 3-D 'printed' solar receivers

The team pioneered the use of an additive manufacturing technique called powder-bed fusion to print their small-scale receiver designs from Inconel 718, a high-temperature nickel alloy. Ho said this novel printing technique provided a cost-effective way to test multiple fractal designs at a small scale and could be used in the future to print entire sections of larger solar receivers.

"Additive manufacturing enabled us to generate complex geometries for the receiver tubes in a small-scale prototype," Ho said. "Fabricating these complex geometries using traditional methods such as extrusion, casting or welding would have been difficult."

The new designs work with conventional heat-transfer fluids for concentrating solar power, including molten salts and steam, but they can also use other media for heat transfer and storage.

Sandia is evaluating the receivers' performance with different gases by flowing air, carbon dioxide and helium through the receiver tubes with the ultimate goal of pairing the new receiver designs with supercritical carbon dioxide Brayton cycles. The term "supercritical" describes the semi-liquid state of carbon dioxide when it is heated above its normal critical temperature and pressure. A Brayton cycle functions by using the hot, pressurized supercritical carbon dioxide to spin a turbine, much like a jet engine, which spins a generator for electricity production.

Ho said both the US and India are interested in pursuing supercritical carbon dioxide to develop the next generation of concentrating solar power technology because it can reach greater efficiencies with smaller footprints.

"The goal of concentrating solar power and SERIUS is to develop efficient, cost-effective solar-driven electricity production with SERIUS storage," Ho says. "The use of a solarised supercritical carbon-dioxide Brayton cycle would increase efficiencies, reduce space requirements and reduce costs associated with current large-scale concentrating solar power systems."

The smaller footprint and cost would help enable the possibility of small-scale (in the 1-10 megawatt range) supercritical carbon dioxide Brayton cycle-based concentrating solar power plants, making concentrating solar power more competitive with other types of renewable energy.

### EMPLOYEE SECTION

#### Why is it important to use solar energy?

The sun is probably the most important source of renewable energy available on Earth.

Sun has provided energy for practically all living creatures on earth, through the process of photosynthesis, in which plants absorb solar radiation and convert it into stored energy for growth and development. The technology advancement today seek to utilize solar radiation directly by converting it into electricity.

Solar energy is a major renewable energy source with the potential to meet many of the challenges that the world is facing. Solar Power is increasing in popularity because it is versatile with many benefits to people and the environment.

#### Solar Is Clean and Safe

Solar is a safe alternative which can replace current fossil fuels like coal and gas for generation of electricity. World Wide Fund For Nature, also known as the World Wildlife Fund (WWF), notes that electricity generation from fossil fuels causes pollution of air leading to acid rain, damaged forest areas, and affected agricultural production. Nuclear power pollutes water and land and has caused environmental catastrophes. Use of solar energy will eliminate these unsafe, unclear consequences from using conventional fossil fuels.

#### Prevents Destruction of Habitats

Pristine forests are destroyed for mining raw materials like fossil or nuclear fuels. Trees constantly remove carbon dioxide from the air and use CO<sub>2</sub> to make their food, and this carbon is then stored in them. When forests are cut for mining raw materials for conventional energy, this major carbon sink disappears and also increases climate change. "Nine out of ten animals on land" live in forests, according to WWF, and a loss of habitats diminishes their populations. Switching to solar power is important to keep these habitats intact for the animals who live there as well as continue to keep the air clean.

#### Combats Climate Change

The emissions from the use of fossil fuels lead to the rise in global temperatures, and changes in weather patterns leading to a cascade of effects. Heat waves, and increase in disease-spreading insects cause health problems especially for children and the elderly.

Climate change has led to increase in flooding and hurricanes due to disturbed weather patterns. Higher carbon dioxide concentration is making oceans acidic and killing marine life, like corals. Climate change causes extinction of species from Sub-Arctic Boreal forests to tropical Amazon forests. Higher temperatures result melting of polar ice caps, reducing habitats for wildlife and also increases sea level. This results in submersion and loss of land along the coast, displacing people. Irregular rainfall or increasing droughts affects agriculture and livelihoods of the weaker sections of society globally.

Solar power can restrict climate change as it produces no carbon emissions. The carbon footprint of solar panels can be offset in as quickly as four years' time. Global warming has to be curbed to a 1.5 degrees Celsius rise, in accordance to the Paris Agreement of 2015.

India announced that it would cut its carbon footprint by 33-35% from its 2005 level which must be achieved by 2030.

#### Affordable and Reliable Energy Source

Technological developments and policy and subsidies by the government have reduced the high costs of solar systems. Solar energy is now competitive with conventional energy sources.

The running costs are less and the initial investment is regained leading to subsequent savings in energy costs. This happens because the input for solar energy is free and clean sunlight while fossil fuels are mined and transported over long distance.

#### A Sunny Future

India has the Tropic of Cancer traversing across it and has clear sky most of the year due to monsoon based climate. Favorable climate, better technology, and tangible goals mean that the future of solar endeavor in India is very bright.

Solar energy cuts carbon emissions and shifts the center of electricity production to the households, making them a stakeholder in energy industry which is unprecedented. Cost-benefit analysis favors domestic Solar plants for a country like India which meets much of its energy needs through imports.

It is certain that the Indian renewable saga will be keenly watched by the world in coming years.

**- Abhinav Lal**

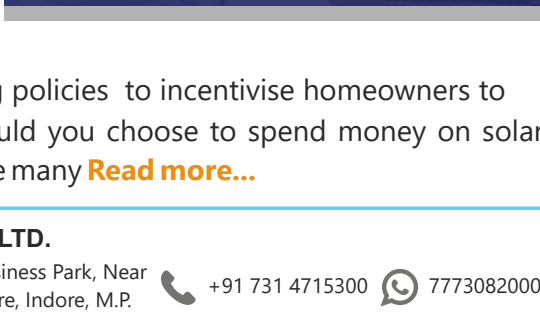
**Assistant Manager (Retail Business)**

### LATEST BLOG

#### 6 Reasons Why you should have Rooftop Solar Panels at home.

The days when solar plants were limited to large solar farms are over in India.

Now, most of the states have net metering policies to incentivise homeowners to install solar panels at home. But why would you choose to spend money on solar panels? Installing solar panels at home have many **Read more...**



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