Tamil Nadu warms up to solar power

With power cuts sapping Tamil Nadu's upper hand as an auto hub, many companies are taking to eco-friendly solar power to charge their operations. **Karthik H** reports.

There is no doubt that there is an intense power crisis in Tamil Nadu. With major industrial centres like Coimbatore and Tirupur facing close to 14 hours of staggered power cuts each day, the upper hand in infrastructure that the state had enjoyed for many years has been completely wiped away. While recently established industrial units enjoy a 'guaranteed 24x7 power supply' clause in the MoU with the state, older units are not so lucky. Expenses for diesel generation sets are touching new highs each month and the situation just doesn't seem to improve. The gasping state might just have one final trick up its hat.

A recently announced state policy, titled 'Tamil Nadu Solar Energy Policy 2012' envisions the state generating 3,000 MW from solar power by 2015, with intermediary targets set at 1,000 MW each year. A previous such venture into wind energy saw the state becoming one of the largest producers of wind power in the country, with close to 40 percent of India's wind power generation coming from installations in Tamil Nadu. As on March 31, 2012, the installed capacity was 6,970 MW, with another 6,000 MW scheduled to be installed as part of the 12th Five Year Plan. However, the state has come to realise that wind energy is highly seasonal, with some months seeing almost zero generation. Cornered by big industries to keep up its promise of power supply, it was only imperative the state stared straight into the shining sun.

Daimler India CV's Rs 4 crore solar power pilot project uses the roof structure of the Parts Logistics Warehouse. Over 1,000 poly-crystalline solar PV modules, each with a capacity of 280W, have been installed for a total capacity of 300 kW.

Mixed response

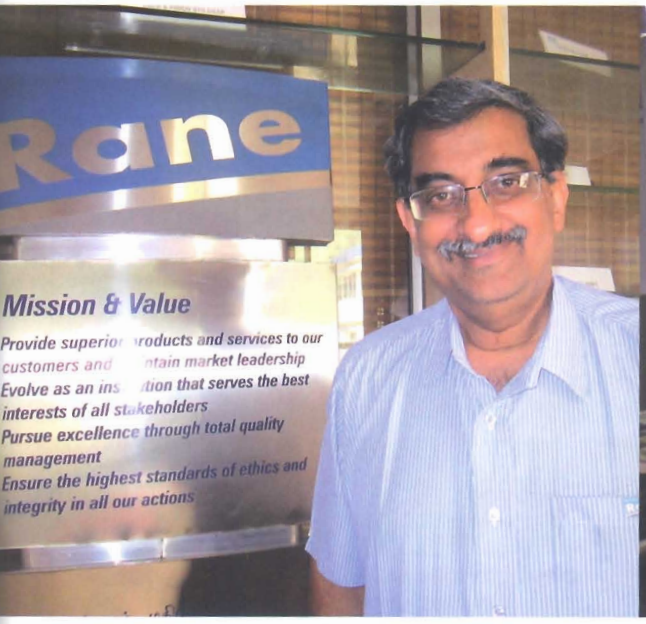
The policy has evoked mixed responses from both OEMs and component suppliers. R Sethuraman, director

TAMIL NADU STATE SOLAR POLICY 2012

Tamil Nadu has made it mandatory for heavy industrial users to source 3 percent of consumption from solar power before December 2012, 6 percent starting from January 2014.

Industrial units can meet the law by:

- By generating captive solar power inside the state
- By buying solar power from other third party developers
- By buying power generated inside the state
- By buying power straight from the state's generation and distribution board at solar tariff



– finance and corporate affairs at **Hyundai Motor India**, says, "At Hyundai, we are studying various options like installing solar panels on the rooftop, installing them at ground level, or purchasing solar power from a third party. However, we are yet to take a decision."

Brake systems manufacturer **Wabco India** has begun ditheringly, initially installing solar panels on the roof of its Chennai facility to power interior and shopfloor lights. "We will take it up on a bigger scale to power machinery too," says P Kaniappan, wholetime director. Kaniappan says that there are certain issues with reaching the target of three percent by the end of this year. "We are not storing the solar power as it costs more to set up that infrastructure. So we can't use solar power if we're working night shifts," he adds. With an expense of about Rs 10-20 lakh as of now, baby steps are all that Wabco India has taken.

However, Kaniappan adds that its upcoming facility in Lucknow, expected to be operational in Q2 this year, will be a full-fledged greenfield facility from the start.

Cost of going solar

One of the factors that play against solar power is the initial cost to set up panels. The state government report states that, on a global level, the increasing production of photovoltaic cells has resulted in the cost dropping by 22 percent for each doubling of cumulative capacity.

The automobile industry, however, says that given the six percent target, the return on investment will take a good seven years. Pashupathy Gopalan, managing director of solar panel manufacturer **Sun Edison**'s South Asia and sub-Saharan Africa's operations, suggests that for an average automobile OEM, six percent would account for anything between 5-10 MW/hour. "Each MW/hour requires 3,000-3,500 solar modules," says Gopalan.

However, there are some OEMs and component makers which are taking measures to develop captive sources of power. **Daimler India Commercial Vehicles** (DICV), which has rolled out its BharatBenz brand of trucks in the recent past, announced the set-up of its first solar power project within its plant at Oragadam, near Chennai, on February 4.

Rane (Madras) Ltd's S Parthasarathy: "A lot of our power saving projects are either cost-neutral or even favourable for us. The cost of going green has been built into our business plan."

Sun Edison's Pashupathy Gopalan: "Each MW/hour requires 3,000-3,500 solar modules."

DICV's Marc Llistosella: "We have a responsibility to society to reduce our carbon footprint."

The company says the solar power focus began last year in line with Daimler's global focus to turn towards green energy, not only in creating environment-friendly products but also to focus on such energies for internal use. This is also in line with DICV's initiative to create better self-sufficiency in power that reduces dependency on conventional power.

According to Marc Llistosella, managing director and CEO, "The pressure on the environment is increasing as economies are expanding rapidly and the demand for power is always increasing. We have a responsibility to society to reduce our carbon footprint. We are happy that the government of Tamil Nadu has taken initiatives in this regard on a large scale. Our first project is set in the right direction and we will take this further."

The solar power project uses the specially designed roof structure, oriented south in direction to increase efficiency, of DICV's Parts Logistics Warehouse. More than 1,000 poly-crystalline solar PV modules, each with a capacity of 280W, have been installed. The total installed capacity is 300 kW. The modules are connected in series, formed as strings and connected to 15 units of 17 kW transformer-less string inverters. DC power produced by solar PV modules is converted into AC power by the string inverters and fed into 415V bus available at the premises.

Rane (Madras) Ltd, the suspension parts arm of the Chennai-based Rane Group, has, in a way, shown big industry how to tackle the power crisis in Tamil Nadu. Given that the company runs three out of its six manufacturing facilities in the state, the power crisis has pronounced effects.

However, ever since the 2008 recession, RML has been taking up power-saving projects on a regular basis, so much so that it has managed to reduce its dependence on diesel generator sets – the only reprieve from the power shortage – from 40 percent in September 2010 to less than two percent at present and compensate it by purchasing bio-mass power from nearby sources.

RML has also installed 100 variable frequency drives (VFD), spending almost Rs 40 lakh on its heavier machinery. It has meticulously mapped each and every machine on the shopfloor in its six facilities, given them a rating, worked out an efficiency model wherein each machine has been allocated a target and worked towards reaching this mark. "Every year, across all our five plants, we run 80-100 such projects," says S Parthasarathy, president, RML.

The process has seen almost all of its machineries being installed with VFDs or certain unique solutions for smaller machinery. "Earlier, we had a hydraulic press that used close to 18,000 units of power each year. We recently converted that into a servo press; it now uses power only when the operation takes place. Now, the machine consumes only 192 units per year," says a visibly proud Gowri Kailasam, senior vice-president – operations at RML's two Chennai plants.

The process, however, is looked at one that is continuous, in that the benchmark for energy efficiency will be constantly renewed. RML's upcoming plant near Mysore is slated to be a greenfield project and will manufacture hydrostatic power steering units and hydraulic cylinders for tractors and other off-highway vehicles.

RML also thinks solar

RML is also currently finalising a 100 kW/hour solar power plant in its Varanavasi facility in Chennai. Located a stone's throw away from major customers like Renault-Nissan and DICV, the plant will aim to source 20 percent of its power requirement for machinery from solar power, despite Tamil Nadu's policy mandating only six percent.

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Rane (Madras) is to set up a 100 kW/hour solar plant at its Varanavasi unit. Gowri Kailasam: "We are not going to store solar power. When we aren't using it in the day time, we will send it back to the state's electricity grid."

Another major step the company has taken, driven largely by stricter environmental regulations in USA – a major location for RML's exports – is to go for trivalent chromium plating for its suspension ball joints where it was using the carcinogenic hexavalent chromium coating, "Just like that Julia Roberts movie," quips Parthasarathy. The new variant of chromium is costlier by 2-3 percent at the product level, but Parthasarathy says this is nothing compared to the positive effect it has on society.

Meanwhile, RML's oldest plant in Velachery in Chennai has come under much scrutiny by the state's pollution control board as rapid urbanisation has turned a once-distant suburb into a bustling residential locale. As a result, most of the operations in the plant are being shifted to the seven-year-old Varanavasi plant near Oragadam. "As our business with Daimler and Renault-Nissan grows, it makes sense to move there. Physical proximity enhances customer relations," says a wistful Parthasarathy. The company supplies safety critical parts like suspension linkages to DICV's light duty and heavy duty trucks. "We are hoping to extend our relationship with Daimler on a global level," adds Parthasarathy.

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Buoyed with orders in hand, RML is looking to double its rack-and-pinion steering meant for power steering units from one million at present in three years' time. RML will also supply to Cosma International and Benteler Group, both of which are suppliers to Ford globally. RML's supply to Benteler alone runs into lakhs of units, some of which go to Ford India and hence to the already-celebrated EcoSport SUV. As for Cosma International, a major order that runs into "millions of units" has been bagged and will be produced at Varanavasi, to be shipped to Canada.

RML's R&D wing, apart from designing future products in conjunction with customers, has also been working hard on customising its shopfloor machinery to reduce power consumption.

Considerable effort has gone into making its steering systems quieter. "With insulation getting better and cars getting quieter inside the cabin, the noise and rattling caused by the mechanical parts of a steering gear have become jarring," says Parthasarathy.

To counter this, RML's R&D wing has worked on reducing the play between the rack and pinion mechanical set such that the vibrations and noise are minimised.

"We have also developed test labs for this purpose. We are now able to identify precisely which portion of a steering gear vibrates and thus work on dampening that," says Parthasarathy. "We realised that we need to compete on cost as well as technology." It is also embracing the digital world by investing heavily into computer aided engineering "to help us predict performance, endurance and minimise errors," adds Parthasarathy.

It is increasingly becoming clear that with the power situation in Tamil Nadu seeing no respite in the near future, innovation in power utilisation seems to be the key to weather the storm. The state seems to have set its priorities right in going for renewable sources of electricity, which is sure to give it some breathing space before ongoing power projects are operational.

Meanwhile, Gujarat has been attracting many an industry. With some skeptics saying that Gujarat is safe in terms of power supply for the next five years, nobody's willing to bet on the long term in any state per se. ■