

Solar Sector: India's Next Employment Hub

While solar energy production has the potential to end the power woes of a country, the added advantage is that it also creates a plethora of new job opportunities for its citizens. Find out the solar scenario in India, job opportunities available, skill set in demand and, of course, the pay package



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The four most useful natural energy resources that would probably remain always available on the Earth are wind, waves, geothermal heat and solar power. Among these, solar power is one of the most cost-effective sources of tapping energy.

Though initial installation and maintenance cost of the solar panels is on the higher side, these are an absolutely green way to generate electricity—free of smoke, gas and chemicals. Higher demand, cheaper materials, lower installation and maintenance costs, better policies and improved standards will surely make solar energy affordable in the near future. Also, initiatives like the Jawaharlal Nehru

National Solar Mission (JNNSM) by the government of India, will lead to strengthening of the manufacturing capabilities and technology advancement, creating many more jobs.

Solar scenario in India

Meeting the increasing demand for electricity and expanding electricity access to remote villages are the two major challenges before India. Moreover, the Indian power sector is highly dependent on coal as fuel (see Fig. 1). "Solar is one sure shot initiative to address this, with coal becoming a rare commodity and carbon footprint and green initiative pushing us to embrace solar energy much more than any other technology," says Prakash Nayak, chairman, IET India Power Engineers Panel.

Sriram Ramakrishnan, CEO, Consul Consolidated, adds, "In India, as there is an increasing gap between supply and demand of power, the solar sector is poised for explosive growth over the next decade." According to a report, India faces a power deficit of about 11 per cent in the overall demand and 12 per cent in peak demand (see Fig. 2). Also, with an expanding economy, the demand for power is growing at the rate of approximately 6 per cent every year.

"Solar power is the major key to bridge this increasing demand-supply gap in energy," says Abhay Singh, director-HR, Applied Materials India.

Though energy conservation is a major concern in the present situation, India can take full advantage of its geographical position as it is a sun-rich country with tropic of cancer passing through it. "On an average, we get more than 300 days of good solar radiation per year as compared to a cold country like Germany where solar photovoltaic systems have made economic sense," says Ganesh Shankar, managing director, FluxGen Engineering Technologies.

"India is fortunate to have over 3000 hours of sunshine annually, which can be utilised as an alternative source of energy with the help of solar photovoltaic (PV) or concentrated solar thermal power technology," says Nayak.

One of the major developments in the Indian solar sector is the JNNSM initiative, which basically aims at generating 20 GW of solar power by year 2020. Prior to JNNSM, for solar PV, the focus of the government was primarily

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on reaching the rural India. JNNSM is neutral to the choice of solar technologies and has provision for the development of all the viable technologies.

"Lot many initiatives like exclusive ministry with renewable energy focus and Jawaharlal Nehru Solar Mission are in execution in various phases and some states like Gujarat, Rajasthan and Haryana are taking the lead," adds Nayak.

There is a close synergy between semiconductor and solar PV technologies. To realise the shift to a decarbonised energy supply, solar PV is a key technology option for India. Ramakrishnan says, "The traditional sources of power generation, like thermal and hydro, have many structural issues resulting in project implementation delays. Therefore solar power projects are being fast-tracked by the government to bridge the demand-supply gap."

The current scale of solar PV manufacturing in India is small in comparison to the global standards, as majority of solar PV manufacturing in the country primarily comprises cell and module manufacturing with the bulk of value addition taking place outside the country.

"Although solar as an industry is still at a nascent stage in India compared to other markets, it is only going to get bigger," believes Singh.

Scope for a 'green' career

In a growing industry like solar power generation, opportunities will also naturally be on the rise.

"As per official statistics, in order to fulfil the 20,000MW installed capacity targets under the Jawaharlal Nehru National Solar Mission, the Indian solar energy industry will need an estimated 300,000 people by 2022 across all domains, profiles and levels," says Singh. Commenting on the scope for a career in this field, Nayak shares, "The scope is unlimited since PV offers a unique opportunity to solve the 21st century's energy and environment related problems simultaneously." He adds, "There are enough opportunities in production and project execution of

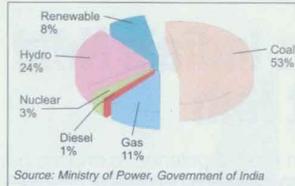


Fig. 1: Power generation capacity in India, by source of energy total 153 GW
Source: Ministry of Power, Government of India

solar projects as massive plans are being laid by every state."

The launch of JNNSM creates excellent opportunities for start-ups and entrepreneurs to jump into this industry, consequently creating jobs. "Once the government steps up the support and protection of the domestic solar manufacturing companies, we will see a rise in the manufacturing sector. If enough support is provided, in the near future, we might even face the shortage of skilled manpower," says Vineet Arya, head-marketing & communications, Tata Power Solar Systems.

With the recent launch of a Solar Research Energy Institute, and with more such research centres expected to be set up in India soon for both solar photovoltaic and solar thermal technologies, career opportunities in this sector are only going to increase.

"There will be demand for better electronics products like solar charge controllers, solar inverters and energy monitoring systems that are more suited for Indian conditions," says Ganesh Shankar. "There will also be a lot of scope for field work, which has more to do with connecting systems like solar panels, mounting structures, batteries, charge controllers, inverters and the load in setting up power plants," he adds.

Skills required

Skills required depend on the function to be played in the organisation. Usually, candidates are expected to be an expert in product development processes and troubleshooting machines, with a good insight into the manufacturing processes, analytical bend of mind and

also knowledge of financial aspects of project report preparation, cost estimation and proposal preparation. Knowledge of power electronics will be an added advantage as they will have to deal with power electronics systems like charge controllers and inverters.

"The skill set required in solar manufacturing units tends to be slightly different from the ones in other departments like marketing, sales and administration. For marketing and sales in the solar sector, an aspirant can focus on getting an MBA from a reputed college combined with the relevant business development experience in executing large projects," says Arya, adding, "For designing and developing core solar systems, a B.Tech/M.Tech graduate is desirable, who has the potential to design and develop systems. For installation, BE degree/diploma holders in civil infrastructure/switch yards are required, who can work as project managers."

The opportunities are unlimited as the potential of power generation is also unlimited. "A candidate would need diploma in engineering for standalone testing or integrated testing of a system, whereas a graduate in engineering with electrical and electronics is usually responsible for commissioning of large systems," says Nayak. He further states, "Postgraduates would be required to look at the higher value-adding possibilities, research and design of systems. PhD graduates would address optimisation of solutions and invention in bulk storage systems and new technologies like organic solar modules."

Most solar companies prefer a BE degree even for the position of a sales manager. They also expect the candidate to be enthusiastic and passionate about the industry, having a good understanding of the solar PV market, and capable of dealing with both domestic and international players.

Singh says, "A degree in engineering, finance, business development, quality control or marketing is the basic requirement. In addition, there is

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Year	Energy requirement (MU)	Peak load (MW)
2001-02	589,650	95,757
2006-07	761,863	130,944
2011-12	1,058,440	176,647

Source: Ministry of Power, Government of India

Fig. 2: Trends in energy requirement and peak load of India over last ten years

a significant and growing requirement for mechanical and electrical engineering diploma holders for installation, commissioning and certification of solar modules and farms.”

Commenting on why engineers with any background would be able to take up jobs in solar sector, Shankar says, “It pretty much involves all fields of engineering. However, an engineer with electronics or electrical background would be able to appreciate the system with circuit parameters like current, voltage, power and resistance.”

Since it has more to do with power generation, those with power engineering background can also play a great role in doing feed-in systems.

Roles in the solar sector

Solar sector offers many varied roles, including solar energy system installer or designer, sales consultant, installation electrician, engineering technician, photovoltaic design engineer, fabrication technician and installation foreman.

Singh says, “Entry-level positions start from trainee engineers in manufacturing, system and project design, installation, operation and maintenance, procurement, etc.”

Adding to the kind of role candidates would perform, Ganesh Shankar says, “Field job may not require great qualification, and a diploma holder may be able to perform as good as an engineer. Product design, on the other hand, would be better suited for engineers with a good knowledge of circuit design.”

“Technicians will be required for assembly testing of cells and panels and also for installing and testing the panels at site,” says Nayak. Talking about his company PenA (Power Engineering and Automation), Nayak adds, “We hire people for testing and commissioning of PV systems and also designing the system with initial exposure to working at site.”

For the position of sales and marketing manager, those who have an experience of three to five years in the solar industry are preferred. A sales and marketing manager is required to research and develop marketing strategy, identify business partners like distribution agents, contractors and vendors for supporting sales and delivery, organise service, maintenance and installation, support the local market and prepare budget for the business. He is also accountable for profit and loss.

R&D of solar systems that are tailor-made for Indian conditions could also be a great career opportunity as enough homework is apparently not done in India before the technology is adopted.

Pay package

“Solar power being an industry where domain knowledge and research form an integral part, attracting and retaining the right talent is very important. Therefore pay package here is one of the best in the industry,” says Singh. A solar PV design engineer’s salary ranges from Rs 325,000 to Rs 520,000 per annum. In the case of a solar power engineer the basic pay starts from Rs 300,000, and for a solar system administrator it varies from Rs 125,000 to Rs 850,000 depending upon his experience.

“At Consul, we advocate that the pay package should not be the sole criteria in deciding on a job. One should also look at the company, its prospects and the growth opportunity it can provide,” says Ramakrishnan.

“Today, the market for engineers is in a very bad shape. The good part is that many engineers are interested in core engineering,” says Nayak. “One more issue is employability. Only 30 per cent of the engineering graduates are employable, which has resulted in lower entry-level salaries. Monthly salaries for diploma technicians are in the range of Rs 10,000 to Rs 15,000. Graduate engineers earn Rs 20,000 to Rs 25,000,” he adds.

In the near future...

There is a significant emphasis from the government’s side on training and creating a pool of people for the job opportunities in the renewable and solar sector. “The Directorate General of Employment and Training (DGET) of Ministry of Labour & Employment has been tasked to incorporate renewable energy in the syllabus of two-year regular ITI courses of seven trades, namely, electrician, electronics, fitter, turner, sheet metal works, plumber and welder,” says Ramakrishnan.

Under its human resource development programme, the ministry supports educational institutions in developing the necessary framework for undertaking renewable energy courses at undergraduate, postgraduate and PhD levels.

Major initiatives include fellowship, sponsorship of chairs at IIT Bombay, designation of renewable energy chairs at select institutions, and grant for upgrading library and laboratory facilities. In addition, course curricula and study materials are being developed for postgraduate, undergraduate, diploma and ITI levels.

“Also support is being provided to the state nodal agencies and NGOs for undertaking short-term training programmes besides programmes for capacity building. Short-term training programmes are being organised at block and district levels to attract youth from rural areas to work in installation, operation, maintenance and repair departments,” says Ramakrishnan. ●

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