Foreword

Grid-connected solar power is a new and rapidly growing sector in India – from almost nil grid-connected solar power in 2009, if everything goes as per the plan, the country will have 2.5 gigawatts (GW) by 2014. It has already installed about 1.0 GW. The Union government plans to install 20 GW by 2022.

The speed of development in the sector has dazzled everyone. Most state governments are rushing to introduce solar energy policies; many have announced (or auctioned) megawatt-scale solar power plants. International and domestic consultancy agencies are regularly reporting on the market, technology or potential of grid-connected solar power. Hardly a month goes by when a major conference is not held on this sector.

But all this is just *noise*. There is hardly any independent research on how grid-connected projects are being implemented, what are the concerns of manufacturers, how are the government programmes performing, how are subsidies being utilised and most importantly, what positive or negative impacts – social, economic and environment – these projects have on the ground. On the clean energy stage, as we found to our surprise, most actors have clear interests: one is either a developer, a technology supplier, a consultant, an NGO implementing small-scale projects, a funding body, or a regulatory institution. But there are no institutions or bodies undertaking policy advocacy or performing a watchdog role.

It was precisely for this reason that we, at Centre for Science and Environment (CSE), decided to setup a small team to monitor and conduct policy research and advocacy on solar energy, including the implementation of the centrally-sponsored Jawaharlal Nehru National Solar Mission (JNNSM).

In the last one year, we have looked at all facets of the national grid-connected solar sector. The CSE team has visited solar projects comingup in Gujarat and Rajasthan – the key states where most grid-connected plants are being built. It has toured Tamil Nadu and Haryana to survey solar power plants. At every site,we have interacted with the project developers and the local community. We have met government officials at the local, state and national levels. This report is the outcome of the year-long research we have done to understand what is working and what is not working in grid-connected solar power.

What emerges is a fascinating picture of a sector that has captured the imagination of the private sector and the government alike. But what we also find is how, in the quest for rapid installation, some very important issues have been disregarded. These issues, if not addressed adequately, have the potential to stop this nascent sector in its tracks.

The very first of these issues is the institutional mechanism and processes through which grid-connected solar projects have been awarded under JNNSM and in other states. Our research on the first phase of JNNSM shows that the procedures for awarding and monitoring projects were questionable and non-transparent. This allowed a few companies to bend rules and corner the bulk of the projects under the first batch. The lesson: we must get our institutional structure and processes right for a transparent, vibrant and competitive solar sector. This lesson must be internalised by the Solar Energy Corporation of India, the institution being setup to implement JNNSM.

The second issue of concern is how to fund the next phase of solar power plants – the remaining 19 GW by 2022 under JNNSM as also the plants under the various state programmes. Despite falling prices, solar

energy remains quite expensive compared to conventional energy.Our estimate is that the grid-parity can only be reached in the next 15 years or more. On top of it, most state electricity boards are facing bankruptcy; even a state like Gujarat, with a profitable electricity board, is not keen on allocating money for the next phase of its own solar programme. There are some domestic sources of funds, such as the National Clean Energy Fund ora cess on electricity generated from fossil fuels, like the Gujarat Green Cess or feed-in-tariff directly supported from the central exchequer. But these sources can at best provide a bridge, and will never be sufficient for an ambitious solar programme.

As far as international funding is concerned, it is too little and cumbersome. Clean Development Mechanism (CDM) cannot support even 10 per cent of the feed-intariff at the price at which carbon credits are being sold today. The Green Climate Fund (GCF) – worth US $100 billion by 2020 –is a possibility. But for that, countries will have to ensure GCF can support feed-intariff for solar energy in developing countries. What comes out from our research is that all sources of funds will be necessary – domestic as well as international – at least in the next 10-15 years for the expansion of solar power in India. In addition, any move to give capital subsidy (for instance, the proposal to give viability gap funding for the second phase of JNNSM) to the solar sector would be counter-productive; feed-intariff remains the best way for the growth of the sector in an efficient and transparent way.

The report has looked atthe domestic solar manufacturing sector and how it has been short-changed by market-distorting practices of American and Chinese companies. Webelieve that a strong domestic manufacturing sector is essential for a bright solar energy future of the country. The report, therefore, recommends supporting the domestic manufacturing sector, including public support for R&D in technology development and manufacturing.

We have spent a lot of time studying the environmental and social issues arising out of the installation of large-scale solar power plants. These issues have been completely disregarded or have escaped the attention of government and industry alike; this is probably because of the popular perception of solar energy being ‘clean’,with no social and environmental externalities. Our research, however, shows that solar power development does affect land and water.

Land, in fact, is at the centre of dispute at most major solar sites. While it has immense potential for upsetting the industry’s growth trajectory, it also provides an opportunity to redefine relationships between communities that own the land and solar power developers who want that land. Our slogan, therefore, is ‘Solar energy needs solar farmers’. But this slogan will not become a reality by just changing policy; it will require a change in mindsets. Our other recommendation is that we must start working on making solar energy more land and water efficient.

For India, solar energy is important not only because it is ‘clean’, but also because it has the potential to play a major role in achieving energy security for the country in future. Our aim is to influence policy and practices to create the best possible scenario for development of a truly clean solar sector. This book, we hope,would be the beginning.

– Chandra Bhushan