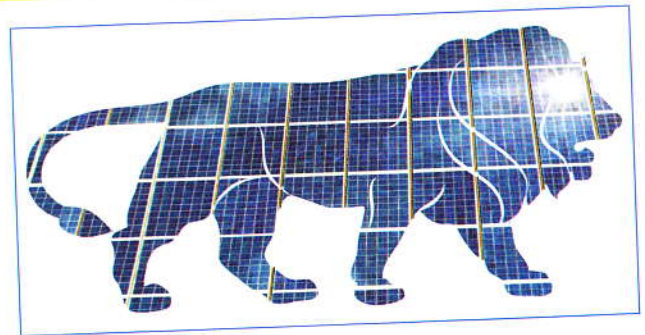


RENEWABLE ENERGY & MAKE-IN-INDIA

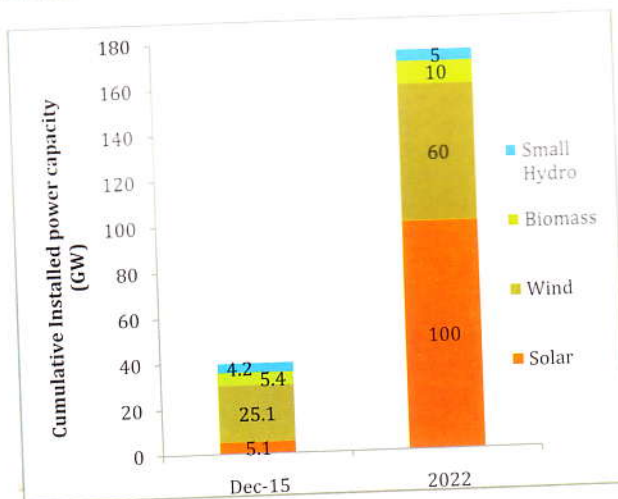
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Interestingly, many of the large utility scale projects and solar parks, forecasted to add 60 GW of solar capacity by 2022, and the wind power projects would be located in rural or peri-urban areas. Hence, a majority of the jobs created under renewable energy projects, skilled, semi-skilled as well as unskilled, would benefit the rural youth.

India's Finance Minister officially announced the country's renewable energy target of installing 175 GW of renewable energy (RE) capacity by 2022, in his 2015 budget speech. This ambitious target, along with the recent launch of International Solar Alliance (ISA) spearheaded by India, has made the country a global leader in renewable energy. India's total installed renewable energy capacity stands at close to 40 GW, nearly 22% of the colossal target. The breakdown of current RE capacity and 2022 target by different RE sources is shown in Figure 1.



Analysis carried out by the Council on Energy, Environment and Water (CEEW) and the Natural Resources Defense Council (NRDC) estimates that more than 10 lakh full time jobs would be created by the solar deployment industry alone, between now and 2022. Similarly, the wind sector would create 183,500 jobs by 2022, as the wind capacity increases to 60 GW.



Interestingly, many of the large utility scale projects and solar parks, forecasted to add 60 GW of solar capacity by 2022, and the wind power projects would be located in rural or peri-urban areas. Hence, a majority of the jobs created under renewable energy projects, skilled, semi-skilled as well as unskilled, would benefit the rural youth.

In order to realise the clean energy goals, the Government of India has launched several schemes such as the Jawaharlal Nehru National Solar Mission (JNNSM), the Biomass Power & Cogeneration Programme and the Small Hydro Power (SHP) Programme, amongst several others. **As the country prepares to scale up renewable energy capacity, it is important to recognise the need for a skilled workforce.**

Job creation potential of renewable energy

Given the population growth rate, India needs to create one crore new jobs every year.

Analysing the jobs created in the solar photovoltaic (PV) sector along with the related skills required in every phase of a solar project to reach the targeted 100 GW of solar energy by 2022, suggests that India will need nearly 180,000 skilled plant design engineers and approximately 570,000 semi-skilled technicians for construction, most of whom will be needed to achieve the targeted 40 GW rooftop solar capacity addition. As many as 75,000 highly skilled workers will be needed within 6 years to carry out annual and ongoing performance data monitoring of solar projects totalling 100 GW. An additional 170,000

workers will be needed annually by 2022 to carry out low-skill operation and maintenance functions for the multitude of solar rooftop and utility scale projects.

Distributed RE for rural livelihood and development

The Indian government is also promoting several distributed renewable energy applications, such as solar pumps, wind pumps, solar food dryers etc., which could stimulate the rural economy by providing power for various economic activities.

Currently, lakhs of Indian farmers are waiting for agricultural electricity connections, while 90 lakh diesel pumps are being used for irrigation. Diesel water pumps are both expensive and hazardous to the environment. Solar water pumps could provide cost-effective and reliable irrigation service, even in remote rural areas. The national and state governments are providing several incentives to promote the adoption of solar pumps. Capital subsidy on solar pumps ranges from 30% to 86% of the upfront cost, depending upon the contribution of state governments, with 30% subsidy share contributed by the Ministry of New and Renewable Energy (MNRE). Additionally, there is a subsidy-credit-equity scheme (40:40:20 per cent) for solar pumps, which is being implemented by NABARD.

In addition to solar water pumps, applications such as solar home lighting systems, solar lanterns, biogas plants, etc. could contribute towards income generation through household based economic activities, in addition to fulfilling the basic energy needs and improving the quality of life in rural homes.

Going beyond household energy needs, rooftop solar systems could also provide access to reliable electricity in Primary Health Centres (PHCs) and primary schools in rural areas, which is critical for the last mile delivery of essential community services. Every second rural primary school in India is un-electrified, while close to 33 million

people in rural India rely on PHCs that currently have no electricity. A study conducted by CEEW and Oxfam-India, estimates that deploying rooftop solar over PHCs and rural primary schools could contribute towards 6% of the 40 GW rooftop solar target of the country. Manpower requirements for distribution, installation, and maintenance of such distributed renewable energy systems would also lead to creation of local jobs.

Filling the skill gaps

India's skilled workforce has struggled to keep up with other global economic powers. According to Shri Rajiv Pratap Rudy, Minister of State for Skill Development and Entrepreneurship, India's skilled workforce comprises only 2-4 per cent of the labor supply, while other countries such as China, Germany and South Korea maintain far more robust skilled labor forces (47, 74 and 96 per cents, respectively).



The job creation potential of the renewable energy sector is significant, it also brings with it the urgent, and the currently unmet need for skilling. Analysis, based on survey responses from forty solar companies in India, highlights the current unavailability of appropriately skilled manpower for construction and commissioning of solar units as a significant challenge to the solar industry. Similarly, wind sector respondents suggested that the current skilling programmes needed to be made more relevant and accessible, such that companies are assured of the high quality of training. This is where the ambitious renewable energy target of the country interlinks with the

Skill India initiative, which aims to skill 40 crore people by 2022.

In recognition of the need for skill development, National Institute of Solar Energy (NISE) is organizing “Suryamitra” Skill Development Program which aims to train 50,000 youths over the next three years, for installation, operation and maintenance of solar projects. The National Certification Programme for Rooftop Solar Photovoltaic Installer (NCPSPi) is aimed at developing skilled and qualified manpower to install rooftop photovoltaic systems throughout the country and is open to technicians, students as well as entrepreneurs. As the government implements these schemes, it will be crucial to develop standardised training programmes that can be implemented through institutes around the country, with training institutes being set up in areas with the most renewable energy potential and upcoming capacity.

Going beyond the need for skill trainings, issues such as access to finance, market information and general awareness amongst the potential customers (which directly determines the bottom up demand), pose significant barriers to entrepreneurs and market players in the renewable energy sector, particularly in rural areas. Addressing these would require an enabling financial ecosystem, resource assessment, common platform for information exchange as well as intensive awareness drives to build confidence and public acceptance for renewable energy applications.

Synergies between different schemes and programmes

During the first Make-in-India Week, focusing on increasing domestic manufacturing in India, the Minister for Power, Coal, and New and Renewable Energy, Shri Piyush Goyal spoke of the need to have end-to-end solar manufacturing in the country. The current annual solar manufacturing capacity in India stands at a meagre 4 GW, cells and modules combined, whereas the annual wind manufacturing capacity stood close to 10 GW. Strengthening domestic manufacturing of solar panels and wind turbines, at competitive prices, would further the objectives of the Make in India initiative while also providing an impetus to the

RE industry and creating new jobs for urban and rural youth.

CEEW – NRDC analysis suggests that skilling for research and product development would be essential for scaling up the manufacturing of PV panels and wind turbines. **Similarly, as several new entrepreneurs enter the market, both to manufacture and deploy renewable energy capacity, it will become interesting to view the synergies between the Startup India initiative and the country’s renewable energy targets.**

Cooperation could extend beyond just national missions. India’s recent pioneering effort to initiate the formation of the **International Solar Alliance (ISA)** brings together 121 solar rich countries on a common platform for cooperation to significantly augment the development, deployment and generation of solar technologies and power. One of the key pillars of the ISA work-plan is to facilitate capacity building for promotion and absorption of solar technologies and R&D among member countries. This resonates with the objectives of the **Skill India** initiative, as well as India’s domestic solar target. While the focus of the International Solar Alliance is going to be global, India’s domestic solar sector could benefit significantly from its recommendations and capacity building initiatives.

The time for transition to an energy future that has a significant component of renewable energy has come. The political support being extended to this sector is unprecedented. It is now that synergies that have been identified between the various ongoing initiatives, offer the opportunity of scaling up the renewable energy production. Access to high quality and relevant training programmes is crucial along with the support to the domestic solar and wind manufacturing market. Leveraging the synergies between the different government programmes for achieving India’s ambitious renewable energy target, could play an important role in furthering the economic development and livelihood security in rural India.

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