

Solar Renewable Energy for Sustainable Development in India: Current Status, Future Prospects, Challenges, Employment

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Abstract: *As the scarcity of conventional energy sources like coal, petroleum, natural gases are increasing and causing the environmental and climatic changes, use of natural resources is growing in the recent years. Solar energy is playing a key role in compensating the electrical energy short fall. India is running one of the largest and most ambitious solar renewable capacity expansion programs. Solar energy is one of the key elements of socio-economic development and also responsible for sustainable jobs creation in the society. This paper aims to present significant achievements, prospects, generation of electricity as well as challenges and investment and employment opportunities due to the development of solar renewable energy in India. In this review, we have identified the various obstacles faced by the renewable sector. The recommendations based on the review outcomes will provide useful information for policymakers, entrepreneurs, solar industries, associated stakeholders, researchers, and scientists.*

Keywords: Solar energy status, challenges, opportunities, employment

REFERENCES

- [1] Carson Schwalbach University of Nebraska Lincoln 2016 How Renewable Energy Benefits Businesses and the Environment <https://digitalcommons.unl.edu/envstudtheses/191>
- [2] Gautam Raina and Sunanda Sinha Outlook on the Indian scenario of solar energy strategies: Policies and challenges doi.org/10.1016/j.esr.2019.04.005
- [3] Article IBEF Indian Renewable Energy Industry Report <https://www.ibef.org/industry/renewable-energy>
- [4] Martin Jens Energy Efficiency and Sustainability the human journey https://humanjourney.us/energy-efficiency/?gclid=CjwKCAjwjZmTBhB4EiwAynRmD8YH7_IV3ZboEe5-sz1nltRniwRCjluKyNnrJns-Pv0Wn1uHOmEWBoCMxgQAvD_BwE
- [5] Clean Energy Group and Smart Power August 2009 Smart Solar Marketing Strategies cleanenergygroup.org/wp-content/uploads/Smart-Solar-Marketing-Strategies.pdf
- [6] Coita Dorin Cristian University din Oradea A MARKETING STRATEGY ON PHOTOVOLTAIC MARKET https://www.researchgate.net/publication/46533354_A_MARKETING_STRATEGY_ON_PHOTOVOLTAIC_MARKET/link/0f316da33829de2215fb7ed7/download
- [7] Article Web FX 5 Proven Strategies for Solar Marketing <https://www.webfx.com/industries/home-repair/solar/>
- [8] Article 3Degrees_4PsCommSolar_WhitePaper_Aug2015 The four Ps of Community Solar https://3degreesinc.com/wp-content/uploads/2016/02/3Degrees_4PsCommSolar_WhitePaper_Aug2015.pdf
- [9] Article EPRI December 2015 Budgeting for Solar PV Plant Operations & Maintenance: Practices and Pricing <https://www.osti.gov/servlets/purl/1234935>
- [10] Article Solar Energy Company Pvt. Ltd Solar business plan https://www.academia.edu/23182184/Solar_business_plan
- [11] Kalpana Ambepitiya Research Gate December 2015 Strategies to Promote Solar Power Energy: A Review of Literature <https://www.researchgate.net/profile/Kalpana-Ambepitiya>

- [12] Vardhan V, P. Raja, Kabirdoss Devi International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue-11S, September 2019 social media as the Next Trend in Social Business Marketing social media as the Next Trend in Solar Business Marketing <https://www.ijitee.org/wp-content/uploads/papers/v8i11S/K113309811S19.pdf>
- [13] Rasa Smaliukienė Research Gate March 2019 a Step-by-step approach to social marketing in energy transition <https://www.researchgate.net/profile/Rasa-Smaliukiene>
- [14] Tahereh Zobeidi International Institute for applied system analysis October 2020 impact of social media on Perceptions and Use of Renewable Energy Sources <http://pure.iiasa.ac.at/id/eprint/17056/1/YSSP%20report%20Tahere%20Zobeidi.pdf>
- [15] Mayowa Ezekiel Akeju Walden University 2021 Profitability Strategies of Solar Energy Businesses in Lagos, Nigeria <https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=11900&context=dissertations>
- [16] Paper IRENA November 2019 Future of Solar Photovoltaic Deployment, investment, technology, grid integration and socio-economic aspects https://irena.org/-/media/Files/IRENA/Agency/Publication/2019/Nov/IRENA_Future_of_Solar_PV_2019.pdf
- [17] FICCI Subgroup on Securing Solar Supply Chain FICCI Solar Energy Task Force Report on Securing the Supply Chain for Solar in India <https://ficci.in/spdocument/20294/Supply-Chain-paper.pdf>
- [18] Paper Irena Energy As A Service Innovation Landscape Brief https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Energy-as-a-Service_2020.pdf
- [19] Paper NREL Best Practices for Operation and Maintenance of Photovoltaic and Energy Storage Systems; 3rd Edition <https://www.nrel.gov/docs/fy19osti/73822.pdf>
- [20] Prasanth Regy, Rakesh Sarwal, Clay Stranger, Garrett Fitzgerald, Jagabanta Ningthoujam, Arjun Gupta, Nuvodita Singh. 2021 ISBN: 978-81-949510-3-2 Turning around the power distribution sector https://www.niti.gov.in/sites/default/files/2021-08/Electricity-Distribution-Report_030821.pdf
- [21] Article Fraser Sherman Updated April 19, 2022 Diversification and its importance <https://smallbusiness.chron.com/diversification-its-importance-77562.html>
- [22] A Discussion Paper February 2010 INFRASTRUCTURE DEVELOPMENT FINANCE COMPANY LTD. Barriers to development of renewable energy in India & proposed recommendations <https://www.idfc.com/pdf/publications/Discussion-paper-on-Renewable-Energy.pdf>
- [23] Seetharaman, Krishna Moorthy, Nitin Patwa, Saravanan, Yash Gupta Elsevier Breaking barriers in deployment of renewable energy <https://www.sciencedirect.com/science/article/pii/S2405844018354240>
- [24] Emrah Karakaya and Pranpreya Sriwannawit April 2015 Elsevier Barriers to the adoption of photovoltaic systems: The state of the art <https://doi.org/10.1016/j.heliyon.2019.e01166>
- [25] Rajvikram Madurai Elavarasan, Leoponraj Selvamanoahar Kannadasan Raju, Raghavendra Rajan Vijayaraghavan, Ramkumar Subburaj, Mohammad Nurunnabi, Irfan Ahmad Khan, Syed Afridi's, Akshaya Hariharan, Rishi Pugazhendhi MDPI August 2020 a Holistic Review of the Present and Future Drivers of the Renewable www.mdpi.com/journal/sustainability
- [26] Shuaib Kamili, under the guidance of Ashish Kulkarni and Yuvaraj Dinesh Babu Nithyanandam. January 2020 Identifying barriers for rooftop solar uptake in MSMEs and development of a mitigating financial framework <https://solarrooftop.gov.in/knowledge/file-62.pdf>
- [27] Vivek Khambalkar, Sandip Nage Research Gate July 2010 Renewable energy: An assessment of public awareness <https://www.researchgate.net/publication/215524573>
- [28] Ramiar Sadegh-Vaziri KTH Industrial Engineering and management 2013 Entrepreneurship and Innovation in Energy and Environmental Technologies; Barriers and Opportunities <https://www.diva-portal.org/smash/get/diva2:629572/FULLTEXT01.pdf>
- [29] Olayinka S. Ohunakin, Muiyiwa S. Adaramola, Olanrewaju. M. Oyewola, Richard O. Fagbenle ELSEVIER January 2014 Solar energy applications and development in Nigeria: Drivers and barriers www.elsevier.com/locate/rser

- [30] Charles Rajesh Kumar, Energy, Sustainability and Society volume 10 January 2020 Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities <https://energysustainsoc.biomedcentral.com/articles/10.1186/s13705-019-0232-1>
- [31] Article Amplify XL October 2021 Solar Inventory <https://amplifyxl.com/solar-inventory/>
- [32] Article NREL February 2021 Documenting a Decade of Cost Declines for PV Systems <https://www.nrel.gov/news/program/2021/documenting-a-decade-of-cost-declines-for-pv-systems.html>
- [33] Arjun Dutt, Pablo Gonzalez, Nikhil Sharma, Lucila Arboleya, and Ruchita Shah Report December 2021 ceew.in Clean Energy Investment Trends 2021
- [34] India Exim Bank (January 2022). "Indian Solar Sector - Fostering Growth and Sustainable Development (Refer to Table 13)". Retrieved 13 February 2022. <https://energy.economictimes.indiatimes.com/etanalytics/reports/renewable/indian-solar-sector-fostering-growth-and-sustainable-development/847>
- [35] Tayal, Manu (27 May 2020). "MNRE Invites Proposals to Develop Institutional Framework for 'One Sun One World One Grid' Implementation". Saur Energy. Retrieved 31 May 2020. <https://www.saurenergy.com/solar-energy-news/mnre-invites-proposals-to-develop-institutional-framework-for-one-sun-one-world-one-grid-implementation>
- [36] "India Set To Propose World Solar Bank & Mobilize \$50 Billion In Solar Funding". Clean Technica. 26 July 2020. Retrieved 27 July 2020. <https://cleantechnica.com/2020/07/26/india-set-to-propose-world-solar-bank-mobilize-50-billion-in-solar-funding/>
- [37] Neslen, Arthur (4 December 2015). "India Unveils Global Solar Alliance of 120 Countries at Paris Climate Summit". AlterNet. Retrieved 6 August 2016.
- [38] Article-India's renewable energy sector to employ one million people by 2030: Study <https://timesofindia.indiatimes.com/city/nagpur/indias-renewable-energy-sector-to-employ-one-million-people-by-2030-study/articleshow/89166223.cms>
- [39] Charles Rajesh Kumar, J.M. A. Majid Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities <https://energysustainsoc.biomedcentral.com/articles/10.1186/s13705-019-0232-1>
- [40] Sameer Kwatra & Charlotte Steiner Article January 2022 India Could Create Millions of Jobs Through Renewable Energy <https://www.nrdc.org/experts/sameer-kwatra/india-could-create-millions-jobs-through-renewable-energy>
- [41] Report IBEF Renewable Energy <https://www.ibef.org/industry/renewable-energy>