

Barriers in Off-Grid Solar Installations in Commercial Buildings in India: Perspective of Channel Partners

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Abstract: India, a developing country, has been witnessing exponential growth in the past few years. Such a growth is expected to lead to an increase in energy demand, for which, India is heavily dependent on fossil fuels. In light of this situation, it is critical that the nation develops all domestic energy resources. Solar energy is renewable, abundant, and environmentally beneficial; and thus, it offers an alluring answer to the country's mounting energy problems. India has comprehensive policies to realize the huge potential of solar energy, both at the central and state levels. This paper comprehensively assesses the perspective of channel partners in installation of off-grid solar systems in commercial establishments and brings forth implementation of government initiatives, need for improvements, and the lacunas in availing the incentives. The paper also presents suggestions given by channel partners for better acceptance and implementation of such initiatives. In order to fully utilize solar energy, it is imperative that action be taken to reduce the obstacles, as reported by the channel partners.

Keywords: Channel partners, Government policies, India, Solar energy

Introduction

The long-term supply of energy from sources that are accessible, inexpensive, and ecologically friendly is critical for future economic growth [1]. Between 1990 and 2040, there is a projected 48% increase in global energy consumption. Without targeted policies, the world population growth and the GDP growth of all countries will result in a continuous increase in the amount of energy consumed [2].

India is a significant player in the world energy market. Since 2000, the world's population has more than doubled, driven by both rapid economic growth and population growth. By 2030, it is expected to surpass all previous records for population size. The year 2019 saw the achievement of nearly universal household access to electricity, which means that in less than 20 years, over 900 million people have acquired an electrical connection. India's energy sector and policy makers will face enormous challenges as a result of the country's ongoing urbanization and industrialization. There are significant variations in energy use and service quality between states and between rural and urban areas. Concerns about the cost and consistency of the energy supply have paramount importance [3, 4].

India has historically relied mostly on fossil fuels to meet its energy needs, which has raised concerns [5, 6]. The world's fossil fuel reserves are depleting quickly. Furthermore, the burning of fossil fuels causes climate change, specifically the emission of greenhouse gases, which has an immediate effect on the environment. Since energy is responsible for the production of environmentally harmful substances during its production, distribution, and consumption, the energy sector plays a crucial role in this regard. For modern civilizations to survive, there must be a consistent and easily available source of energy. It is therefore imperative to make the switch from conventional to renewable energy sources more quickly in order to meet the world's energy needs, both now and in the future. Renewable energy is the solution to these growing energy-related issues because it is abundant, endless, and

advantageous for the environment. Due to this, the country is now compelled to actively seek out alternative energy sources, such as small hydro, solar, wind, and biofuels [7].

The National Institute of Solar Energy in India estimates that the country has 750 GW of solar potential. There are 300–330 sunny days per year in the majority of India. This is approximately three times India's installed electricity capacity at the moment [4]. Commercial buildings sector in India is consuming about 8% of the total electricity and is growing at a much faster pace as compared to the other sectors [8]. Although adoption of decentralised solar technologies, specifically solar PV and solar thermal, is still very low, the Indian government has launched numerous policies and programmes at the national and state/UT levels to promote these technologies, according to the review of the literature. The goal of the study was to investigate the impediments to off-grid solar system adoption in commercial buildings and collect suggestions for solutions.

Methodology

The study was conducted in six Indian states/Union Territories (UTs) based on the total installed solar capacity under various government programmes. There were both government and private commercial buildings which were selected for the study. Key respondents were the channel partners involved in installation of off-grid solar systems in the chosen commercial establishments. Questionnaires and secondary sources were employed as research instruments. The researcher ensured confidentiality of the data at every stage of the data gathering process because most of the stakeholders selected for the study did not want their names or the names of their organizations to be disclosed.

Results and Discussion

The data revealed that more than two-thirds of the channel partners felt that there had been an increase in the up-take of SPV/SWH systems because of government intervention in terms of policies, programmes and incentives (Table 1). The channel partners in favour of this felt that after the capital subsidy was removed, the SPV/SWH market went down, thus, depicting that government initiatives had a positive impact. Other reasons cited were awareness generation campaigns run by the government and mandating the use of SPV/SWH systems in a few states/UTs. The channel partners not in favour of this stated that the government initiatives needed to be consistent and one should be able to tell the building owners/managers the scenario in coming years.

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Table 1: Opinions of Channel Partners on increase in SPV/SWH installation base because of Government Initiatives

| Has there been an increase in adoption of SPV/SWH systems because of Government Initiatives? | Categories of selected States/UTs | | | | | | Total (N=36) |
|--|--|-------|---------------------------------|-------|--------------------------------|-------|--------------|
| | High (Gujarat, Rajasthan) (N=12) | | Medium (Punjab, Haryana) (N=12) | | Low (Delhi, Chandigarh) (N=12) | | |
| | SPV | SWH | SPV | SWH | SPV | SWH | |
| | N (6) | N (6) | N (6) | N (6) | N (6) | N (6) | |
| Yes | 5 | 4 | 4 | 4 | 4 | 4 | 25 |
| No | 1 | 1 | 1 | 2 | 2 | 2 | 9 |
| Cannot Say | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| Total | | | | | | | 36 |
| SPV = Solar Photovoltaic systems, SWH = Solar Water Heating systems | | | | | | | |
| Reasons cited | | | | | | | |
| Reasons cited for 'Yes' | <ul style="list-style-type: none"> • After removal of capital subsidy, SPV/SWH market has gone down • Large-scale awareness generation campaigns is being done by Government and thus, building owners/managers are more aware of the benefits of SPV/SWH systems • Use of SPV/SWH has been mandated in few states/UTs, thus increasing the installation base | | | | | | |
| Reasons cited for 'No' | <ul style="list-style-type: none"> • Capital Subsidy scheme is not consistent • Timely release of capital subsidy is not there | | | | | | |
| Reasons cited for 'Cannot Say' | <ul style="list-style-type: none"> • Government support has been there for long, so can't say if sudden spurt in adoption of SPV/SWH is because of that | | | | | | |

Responses of Channel Partners on Barriers faced by them while applying for/availing the Government Incentives for SPV/SWH installations

Table 2 throws light on the barriers reported by channel partners while applying for/availing the government incentives. As many as 34 out of 36 channel partners reported that the most significant barrier in availing capital subsidy was that it was not released in time by MNRE. A few of the channel partners reported that no money had been released and thus, their money was stuck. Seventeen of the channel partners reported that there were fake channel partners in the market which were not certified by MNRE. However, they claimed to be certified and misled the building owners/managers.

Sixteen of the channel partners reported that applying for/availing capital subsidy was a time consuming process, ranging from three months, to two to three years from submission of application to release of capital subsidy from MNRE, thus acting as a barrier. It had various sub-stages like submission of application to state nodal agency, scrutiny of application by state nodal agency, submission of application to MNRE by state nodal agency, project approval and finally release of capital subsidy after commissioning and verification of the projects. Also, lot many documents were required to be submitted including customer agreement form, undertaking form, declaration form, capital subsidy reimbursement form, affidavit and photographs etc. Further, 12 of the channel partners said that the policies, programmes and incentives offered by the government were not consistent. They shared the recent example of withdrawal of capital subsidy without any prior notification to the channel partners. Twelve of the channel partners also reported that there was lack of transparency in the policies regarding who is the target beneficiary, who will give the incentives and the procedure to avail the same. Further, nine of the channel partners reported that the

market for SPV/SWH systems was unstable because of lack of standardization of the systems and their costs. One of the channel partners also stated that when China entered the market, the prices went down but at the same time, the performance of the systems was also affected. Thus, the building owners/managers had a bad experience. Eight of the channel partners also shared that forms for submission of application and the documentary requirements for the same kept on changing and it took time to get acquainted with the new forms. Table 2 presents the barriers as major, medium and minor.

Table 2: Responses of Channel Partners on Barriers faced by them while applying for/availing the Government Incentives for SPV/SWH systems

| Barriers faced by Channel Partners while Applying for/Availing Government Incentives for SPV/SWH systems | Categories of selected States/UTs | | | | | | Total (N=36) |
|--|---|--------------|---------------------------------|---|--------------------------------|--------------|--------------|
| | High (Gujarat, Rajasthan) (N=12) | | Medium (Punjab, Haryana) (N=12) | | Low (Delhi, Chandigarh) (N=12) | | |
| | SPV | SWH | SPV | SWH | SPV | SWH | |
| Type of Barrier | N (6) | N (6) | N (6) | N (6) | N (6) | N (6) | N* |
| No timely release of capital subsidy by MNRE | 6 | 5 | 6 | 5 | 6 | 6 | 34 |
| Fake Channel Partners misleading building owners/managers | 1 | 3 | 7 | 3 | 2 | 1 | 17 |
| Time intensive process in terms of submission of application, site inspection | 2 | 4 | 2 | 2 | 3 | 3 | 16 |
| Inconsistent Policies, Programmes and Incentives as they are withdrawn without any notification | 1 | 3 | 1 | 4 | 0 | 3 | 12 |
| Lack of transparency in policies regarding who will give the incentives, how much incentive will be given and what procedure to follow | 2 | 2 | 3 | 0 | 3 | 2 | 12 |
| Unstable market for SPV/SWH systems because of no standardization of systems and their costs | 2 | 2 | 2 | 1 | 1 | 1 | 9 |
| Application forms and documentary requirements keep on changing | 1 | 2 | 2 | 1 | 1 | 1 | 8 |
| SPV = Solar Photovoltaic systems, SWH = Solar Water Heating systems | | | | | | | |
| *The total sample is exceeding N because of multiple responses given by the respondents | | | | | | | |
| Major Barriers | Medium Barriers | | | Minor Barriers | | | |
| <ul style="list-style-type: none"> No timely release of capital subsidy by MNRE Fake Channel Partners misleading the building owners/managers Time intensive process in terms of submission of application, site inspection | <ul style="list-style-type: none"> Lack of transparency in policies regarding who will give the incentives, how much incentive will be given and what procedure to follow Inconsistent Policies, Programmes and Incentives as they are withdrawn without any notification | | | <ul style="list-style-type: none"> Unstable market for SPV/SWH systems because of no standardization of systems and their costs Application forms and documentary requirements keep on changing | | | |
| ≤ 10 responses = Minor Barriers, 11-15 responses = Medium Barriers, > 15 responses = Major Barriers | | | | | | | |

Responses of Channel Partners for Suggestions to overcome barriers faced by them and the Building Owners/Managers while installing SPV/SWH systems and availing Government Incentives for the same

It was suggested that awareness generation campaigns by Government should be taken up at large scale, targeting various sections of the society using the right mix of media. Further, it was suggested that the documentary requirements for incentives should be relaxed and online mechanism should be introduced for submitting the application. Further, the channel partners opined that the same application should be considered for both the incentives namely soft loan and capital subsidy. Regarding the issues related to rejection of soft loans by bank, it was also suggested that SPV/SWH systems should be brought under priority sector lending to fasten up the soft loan process. Moreover, the collateral requirements should be eased out, which was the main ground for rejection of loans. Since there was delay in release of capital subsidy by MNRE to the channel partners, it was suggested that advance capital subsidy should be released to the state nodal agencies in the beginning of each financial year. It will give an assurance to the channel partners that their money will not get stuck and they would be motivated to achieve the states’/UTs’ targets for solar installations.

It was further suggested that new manufacturers should be checked for any malfunctioning since they often misled the building owners/managers posing as MNRE certified channel partners, even when they were not certified. Channel partners suggested that the policy documents of MNRE and the state nodal agencies should clearly spell out the targeted benefits for different categories of consumers and the process of availing the different incentives. Other suggestions were continuation of capital subsidy scheme for the commercial sector and soft loans and interest subsidy to be made functional. Also, channel partners suggested having quality assurance of the SPV/SWH systems by way of some certification so that local vendors are not able to mislead the building owners/managers. The details of the suggestions for the barriers reported by the government officials have been presented in Table 3

Table 3: Responses of Channel Partners for Suggestions to overcome barriers in the process of installing SPV/SWH systems and availing Government Incentives for the same

| Barriers Reported | Suggestions |
|--|--|
| Lack of Reliable sources of Information | <ul style="list-style-type: none"> • Awareness generation campaigns by Government should be taken up at large scale, targeting various sections of the society • Government should effectively make use of the right mix of media. Most of the building owners/managers stressed on using the social media, apart from having the websites |
| Unclear and Technical Content | <ul style="list-style-type: none"> • Mobile based Application should be developed for better reach of information (Refer to Annexure XI) |
| Rigorous and time consuming process in terms of Documentary requirements for Incentives Time intensive process in terms of submission of application, site inspection | <ul style="list-style-type: none"> • Documentary requirements for incentives like capital subsidy and soft loans should be relaxed and same application should be considered for both the incentives |
| Poor online mechanism for submission of online application for SPV/SWH | <ul style="list-style-type: none"> • Online mechanism for submission of capital subsidy application should be introduced for both SPV and SWH • Software to be regularly updated to prevent any technical glitches |
| Rejection of Soft Loans by Banks | <ul style="list-style-type: none"> • SPV/SWH should be brought under priority sector lending • Collateral requirements should be eased out |
| No timely release of capital subsidy by MNRE | <ul style="list-style-type: none"> • Advance release of capital subsidy should be there by MNRE to facilitate target achievements by states/UTs |
| Fake Channel Partners misleading building owners/managers | <ul style="list-style-type: none"> • New manufacturers should be checked for any malfunctioning • Mechanism for registration of dealers with MNRE should be there, other than the channel partners |
| Lack of transparency in policies regarding who will give the incentives, how much incentives will be given and what | <ul style="list-style-type: none"> • Policy documents of MNRE and SNAs should clearly spell out the targeted benefits for different categories of consumers • Process of availing the different incentives has to be illustrated for ease of understanding |

| | |
|---|---|
| procedure to follow | |
| Inconsistent Policies, Programmes and Incentives as they are withdrawn without any notification | <ul style="list-style-type: none"> • Capital subsidy should not be withdrawn • Interest subsidy and soft loan should be made functional |
| Unstable market for SPV/SWH systems because of no standardization of systems and their costs | <ul style="list-style-type: none"> • Standardization of SPV/SWH systems should be done to ensure quality |

Conclusion

Solar energy has become one of India's most important renewable energy sources to meet its constantly expanding needs in light of environmental concerns. For the same reason, off-grid solar energy is essential because it can be used locally and in a decentralized manner. The study has emphasized on the barriers brought forth by channel partners. To overcome these barriers, suggestions given by the channel partners for better implementation and acceptability of government initiatives have also been compiled and analyzed. The recommendations made in the study will go long way in improving the acceptability and implementation of government initiatives for increasing the installation base of off-grid SPV/SWH installations in the commercial sector as long-term solutions have been recommended. With concentrated efforts and higher solar energy deployment targets, India has the potential to be a major player in the global push towards solar power.

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