

PHASE 1 OF THE NSM: HAS IT MADE OFF-GRID SOLAR AFFORDABLE?



EXECUTIVE SUMMARY

In an attempt to make decentralised solar energy affordable in rural areas, the National Solar Mission (NSM) has sought to capitalize on successful models of end-user financing for solar home lighting systems developed in Karnataka and Uttar Pradesh. The subsidy scheme routes government support to the end-user through the already established bank lending system.

Unfortunately, under Phase I, both the initial and revised subsidy schemes have posed problems for banks in terms of high transaction costs and procedural delays. In order to ensure the future of the mission of providing clean energy access for all through continued growth in off-grid solar, the REWG makes the following recommendations for strengthening the financing mechanism.

- **Minimize delays in subsidy approval** by NABARD through enforcement of advance release of subsidy to banks
- In the long term, **eliminate capital subsidies** and replace them with interest subsidies
- **Increasing system limits for bank financing**, both for solar PV and solar water heating systems will increase ticket size of loan, thereby incentivizing bank lending for such systems.
- Capitalize upon the recent RBI decision to **include solar lending in the priority sector** and promote bank engagement
- Ensure **credit access for the end-user**, by encouraging banks to lower their margin requirements for individual systems as well as local micro-grid operators, offer flexible terms of loan repayment, and relax their KYC requirements. Allowing lending through cooperative societies would also add value.
- Use the existing **RBI Lead Bank Scheme**, to provide banks with specific targets for solar lending and track progress of the same at the Block, District, and State levels
- **Clearly communicate** to banks that the benchmark cost is an indicator of the subsidy amount and not of the total loan amount that can be sanctioned

INTRODUCTION

Over the last decade, the promotion of off-grid solar energy has seen some success in several Indian states, such as Karnataka and Uttar Pradesh. Many of these efforts have been recognised internationally for their innovative approach. Access to solar home lighting has been made possible by leveraging the existing extensive banking network to provide bank loans for end-users that circumvent the problem of high up-front cost of solar home lighting systems (SHS). Rural regional banks, such as Aryavart Gramin Bank in Uttar Pradesh as well as the UNEP Solar Loan Programme (2002-05) pioneered this financing mechanism to make available the benefits of decentralised solar energy in rural locations. This has addressed a previously largely overlooked market and proved that rural India is both able and willing to pay for reliable, clean energy. Acknowledging the potential benefits of solar energy, the Jawaharlal Nehru National Solar Mission (NSM) was launched by the Prime Minister in January 2010 under the Ministry for New and Renewable Energy (MNRE). Under the off-grid component of the mission, a capacity target of 200MW was set for Phase I (2010-13), increasing to 1000MW by the end of Phase II (2017) and 2000MW by 2022, including the deployment of 20 million solar lighting systems for rural areas by 2022.¹

To meet these ambitious targets for off-grid technologies, MNRE created a financial mechanism that routes government support to the end-user through the already established bank lending system. A subsidy scheme was set up for off-grid solar, combining a 30% capital subsidy linked to a benchmark unit cost and loans for solar home lighting systems were made available at a subsidized interest rate of 5%.

In January 2012, SELCO India published a paper highlighting the challenges of implementing the NSM from a practitioner's perspective.² Issues discussed included technical specifications and benchmark costs for solar systems, with recommendations to modify the subsidy scheme by eliminating any capital subsidies. Since then, the NSM off-grid guidelines have been revised by the MNRE, with the previous scheme now replaced by a simple 40% capital subsidy based on the benchmark cost. Unfortunately, under Phase I, both the initial and revised subsidy schemes have posed problems for banks in terms of high transaction costs and procedural delays. Although a fairly well established market for off-grid solar has been created in Karnataka and Uttar Pradesh, there is still a clear need to strengthen the financial mechanism to ensure that momentum is not lost. This paper presents a comprehensive list of recommendations to this end.

FULFILLING THE MISSION'S POTENTIAL: ENSURING GROWTH IN OFF-GRID SOLAR

The NSM is an ambitious policy that rightly aims to capture the enormous solar energy resources of India. Considering the number of citizens that still lack reliable access to electricity, the Government of India also rightly champions the social mission of rural electrification. To achieve both of these objectives, both the MNRE and the Ministry of Power promote access to decentralised sustainable energy for the rural poor.

In the case of solar energy, the basic problem in ensuring equal access to all is that low-income households cannot afford the up-front cost of off-grid SPV technologies due to the nature of their cash flows. Solving this problem thus requires a stable financial mechanism that gives poor households access to instalment-based credit through banks loans for off-grid solar home lighting systems (SHS).

The off-grid subsidy scheme shows commitment on part of the government to making decentralised renewable energy affordable. Routing government support through bank lending has the potential to make SHS affordable for a large number of people. However, at present, this potential is not being fulfilled. Although the revised subsidy has solved some of the problems of its predecessor, it has also brought new problems with it and remains incompletely utilized, continuing to slow down the growth of solar lending by banks due to a cumbersome application procedure.

If the off-grid subsidy scheme of the NSM continues to be associated with high transaction costs for both banks and service providers, there is an increasing risk that service providers will choose to develop business models independent of the subsidy scheme. A decline in solar lending means a diversion from the important objective of rural electrification and this would exclude the low-income households that would actually have derived the greatest benefit from SHS. We need growth in off-grid solar, but the fact that there are 400 million Indians who lack access to electricity demands that it should be growth focused on their needs. Government support in making solar home lighting affordable is crucial to achieving this. To ensure greater efficiency in the financing mechanism and continued growth in off-grid solar, we make the following recommendations that are implementable in the near term.

STRENGTHENING THE FINANCIAL MECHANISM

SIMPLIFYING THE SUBSIDY SCHEME

1. Delays in subsidy approval must be minimized

Based on interviews with bank managers of both Regional Rural and nationalized banks in Karnataka, it is understood that there have been severe delays in subsidy application approval by NABARD. Managers report that high transaction costs associated with the administrative burden of applying for subsidies makes small loans for SHS and micro-grids a relatively unattractive component of the loan portfolio.

To solve issues regarding the revised capital subsidy, the application procedure needs to be simplified by NABARD. NABARD guidelines stipulate that the bank shall sanction the loan only after release of subsidy from NABARD. Simultaneously, banks are insisting that the system is to be installed at the premises of the borrower before the subsidy claim is submitted to NABARD. In this process, the system provider has to install the system and wait for payment, which is in many cases takes 5-6 months due to delay in release of subsidy from NABARD. This is despite the guidelines stating that NABARD will release subsidy in 3-4 working days. The delay causes cash stress for the service provider, and creates uncertainty for the customer on whether the subsidy will be approved or not, which could lead to a decreased interest in acquiring solar home lighting systems.

In order to solve this problem:

- Subsidies need to be released by NABARD in advance to banks by depositing them with a Nodal Branch of each participating bankⁱ
- Banks could be given discretionary power to sanction subsidies simultaneously with loans, in order to avoid the delays and mistrust that is created between end-users and banks

ⁱ Subsequent to this paper being written, communication was received from MNRE stating that NABARD has been directed to extend subsidies to RRBs for individuals purchasing small capacity solar and home lighting systems, but our understanding suggests that it is yet to be enforced.

Financing Review of NSM

- Training workshops for bank managers can include information on how to create effective internal processes to deal with applications, and if necessary service providers can also help with completing paperwork.

It must be mentioned that the delay with subsidies have not proved problematic in some cases as demonstrated by the case study on the solar lending programme of Aryavarth Gramin Bank in Uttar Pradesh (see p. 6).

2. Interest subsidy preferable to capital subsidy

Ideally, in the longer term, we advocate for the complete elimination of capital subsidies for off-grid solar. These subsidies could be replaced by a simple interest subsidy allowing end-users to avail of a solar loan at an interest rate of 5%. In line with the objective of the NSM to “commoditize off-grid solar applications”, an interest subsidy is less market distorting and allows off-grid solar to become a regular commodity. In addition, it also translates to lower Equated Monthly Instalments (EMIs) for the end-user compared to the current capital subsidy scheme, matching the cash flow of low-income households. In other words, it would be financing that even low-income households can afford.

The UNEP Solar Loan Programme that ran from 2002-2005 saw great success in promoting market development of SHS in primary goal of the programme, driven by the logic that it should be the increased availability of the loan and not the interest

2. Relaxed criteria for loan eligibility

Default rates in Karnataka are relatively low and given that solar loan sizes are also small, the risk associated with solar lending is comparatively low for banks. The RBI guidelines for small loans under priority sector lending stipulate for simplified criteria for loan eligibility (so-called KYC-Know Your

subsidy that drives demand. UNEP was extremely successful in increasing the enthusiasm around solar lending. Karnataka and Kerala through an interest subsidy that was gradually scaled back. Importantly, the gradual phase-out was the

ENSURING CREDIT ACCESS

On its own, having a subsidy scheme in place is not enough to ensure equal clean energy access for all: the rural poor also need to be able to access this credit, which means banks need to be willing to give them loans for SHS. We welcome the recent RBI decision to include lending for off-grid SHS as a specific item in its guidelines for priority sector lending as a step in the right direction.

1. Encouraging lower margin requirement and flexible terms of repayment

NABARD has instructed in its operational guidelines that banks can insist on margin requirements as determined by RBI norms. While this is a step that could be used in promoting credit access to low-income households and local micro-grid operators, banks continue to insist on high margin requirements. In this situation, there is a need for greater awareness and better communication to all Regional Rural Banks giving them discretion to assess each loan application on its specific circumstances. Further, banks should ensure that as per standard practice for the priority sector, flexible terms of loan repayment sensitive to the livelihood and cash flow of the end-user, are also offered for solar loans.

Customer- norms). It would be perfectly reasonable for solar loans to also be treated in the same manner, as instructed by the recent RBI decision. However, most banks insist on collateral security in the form of fixed deposits and third party guarantees, which often makes it difficult for low-income households to access credit. To overcome this, bank managers should be sensitized

about the necessity to allow for some flexibility regarding eligibility criteria for solar loans.ⁱⁱ

3. Lending by Cooperative Banks/Societies

Currently MNRE guidelines do not allow for subsidies to be availed for systems installed through the financial support of Co-operative Banks/Societies.

These are an important source of credit for many rural end-users, and as such lending through these channels should be considered under MNRE and NABARD guidelines (subject to certain eligibility criteria).ⁱⁱⁱ

As part of increasing the uptake of solar energy, system limits for bank financing, both for solar PV and solar water heating systems need to be increased. With higher ticket sizes of loans, bank lending for such systems is incentivized.

Fig. 1 SWOT analysis of NSM off-grid & subsidy scheme	
Strengths	Weaknesses
<p>Capitalizes upon already established, successful financing mechanisms developed in Karnataka and Uttar Pradesh</p> <p>Growing awareness regarding benefits of solar energy</p> <p>Recent RBI circular on inclusion of off-grid solar loans in priority sector lending</p>	<p>Off-grid targets are not being met</p> <p>Severe delays in subsidy approval by NABARD</p> <p>Benchmark cost is too low for customized, DC systems</p>
Opportunities	Threats
<p><u>Simplifying the subsidy scheme</u> Short-term: minimizing subsidy approval delays Long-term: replacing capital with interest subsidy</p> <p><u>Ensuring credit access</u> Encouraging lower margin requirement Flexible terms of repayment Relaxed loan eligibility criteria Lending by Cooperative Societies</p> <p><u>Using existing banking infrastructure</u> Internal targets for solar lending at banks RBI Lead Bank Scheme – targets and monitoring</p> <p>Clear communication regarding benchmark cost</p>	<p>Apathy of vendors towards NSM → Reduced credit access for the poor</p> <p>Decline in solar lending due to subsidy scheme delays</p> <p>Administrative hurdles stunting solar entrepreneurship</p> <p>Continued lack of electrification in rural areas → injustice in energy access</p> <p>Continued negative social, health and environmental impacts of traditional fuels</p> <p>Opportunity cost of lost contribution of rural areas to economic growth</p>

ⁱⁱ On this issue, MNRE communication suggests that banks are at liberty to determine the documents required for loans and that MNRE is not in a position to advise banks on this issue.

ⁱⁱⁱ MNRE has indicated that the current scheme is applicable till March 2013 and any possible inclusion of Cooperative banks can only be made after this period.

USING EXISTING BANKING INFRASTRUCTURE

The most concrete result of solar lending being included in the priority sector is that banks are instructed as per RBI regulations to ensure that 40% of their total loan portfolio represents lending to this sector. This guideline could be leveraged to incentivize solar lending in states with existing banking infrastructure and incorporate it into credit planning of banks at various levels.

1. Specific targets for solar lending

In light of the perceived high costs and low profitability for banks to provide microcredit for SHS, incentives for them to engage in solar lending remain suboptimal. As articulated in discussions with bank managers, solar lending is often perceived as an activity involving high transaction costs associated with processing a large number of small loans and time-consuming paperwork. The business of solar lending needs to be made more attractive for banks. Developing internal targets for solar loans could help incentivise managers. This could provide the necessary boost for the growth of off-grid solar under the NSM.

2. Mainstreaming through the Lead Bank Scheme

Taking advantage of the RBI Lead Bank Scheme, targets for all banks (Commercial, RRBs, and Cooperative Banks) should be incorporated into the Annual District Credit Plan of each District Consultative Committee. In addition, a sub-committee for solar energy could be set up as part of the State Level Bankers' Committee to facilitate discussion at that level and provide a mechanism for bankers' issues on solar lending to be brought

to the fore. This has been discussed in Karnataka but has yet to see concrete action.

3. Tracking progress through solar loans

Using this banking infrastructure can pay a double dividend in terms of also functioning as a monitoring system. In order for MNRE to be able to track the progress of the NSM's off-grid component, there is a need for improved monitoring of the diffusion of solar home lighting and micro and mini-grids, in order to see where performance lies in relation to targets. REWG research has shown that it is challenging to obtain accurate figures on solar lending from banks.

At the very least, progress in off-grid solar home lighting under the NSM should be monitored using quantitative indicators such as the number of solar loans. The collection and recording of these figures can be made mandatory and reviewed during meetings of the Block Level Bankers' Committee, District Consultative Committee and State Level Bankers' Committee and their recording made mandatory. If district-wise targets are incorporated into the Annual District Credit Plans and these are then monitored, it would not only be possible to track progress and identify areas where solar lending is slow, but it would also put pressure on Lead District Managers to distribute targets down the line and ensure compliance.

CLEAR COMMUNICATION REGARDING BENCHMARK COST

As mentioned in SELCO's January 2012 report, one of the underlying issues of the off-grid subsidy scheme is that the system benchmark cost of Rs.270 stipulated by MNRE, which is the basis for the subsidy amount, is too low for customized, DC systems that include servicing – (see Appendix 1). For these kinds of systems, the 40% capital subsidy only translates into 15-20% of the real cost of the system. One possible way of correcting this is by creating slabs for benchmark costs based on system size- where the benchmark cost increases with decrease in system size. For eg: 10W-20W systems at Rs. 700 per watt peak and decreasing for larger systems.

It has been noticed that branch managers of several banks have misinterpreted the off-grid guidelines and been willing to give loans

only up to the benchmark cost, even though the total cost of a system would lie above this. For example, with the MNRE benchmark cost of Rs270 per watt peak, a 10W system is eligible for a capital subsidy of 40% on Rs2700. i.e. Rs1080. In some instances, banks have been found to sanction loans only up to Rs2700, whereas the real cost of the system may be Rs7000 or more. In this case, the upfront cost for the end-user becomes even higher as the difference falls on him/her (as demonstrated in Scenario 2 of Appendix 1). MNRE/NABARD should clearly communicate that the benchmark cost is an indicator of the subsidy amount and not of the total loan amount that can be sanctioned. Although the benchmark cost limits the amount of subsidy available, banks can and should give loans beyond the benchmark cost up to the full remaining cost of the system.

CASE STUDY: ARYAVART GRAMIN BANK



The solar lending programme of Aryavart Gramin Bank in Uttar Pradesh has been one of the success stories in fostering diffusion of decentralized renewable energy in India. This was recognized in 2008 when the bank was awarded that year's Ashden Award for sustainable energy, as an example of "the significant contribution which the banking sector can make in bringing solar photovoltaic (PV) electricity to rural families".³ Indeed, in many aspects the implementation of the subsidy scheme by Aryavart Gramin Bank (AGB) showcases best practices similar to the recommendations given in this paper.



The bank offers loans for SHS with the MNRE 40% capital subsidy for end-users. AGB is happy with the revised subsidy scheme, stating that the new capital subsidy represents few administrative problems and has resolved issues associated with the previous scheme. Aggregating applications for processing takes some time for the bank, but when the subsidies are finally claimed from NABARD, it only takes 10-15 days for NABARD to release the subsidy. This experience illustrates how ensuring an efficient subsidy scheme and minimizing delays is a process that requires combined efforts of both the bank and NABARD. It could also be a factor of the number of solar loan applications in a particular state and the NABARD office capacity to handle the volume. After the revision of the subsidy scheme in March 2012, other banks in Uttar Pradesh have also shown interest in solar lending.

AGB solar loans are given at a commercial rate of interest as per MNRE guidelines; however, AGB only requires a down-payment of 5% of the total loan amount. The motivation for this is a concern for credit access: the bank is aware that many of their customers are poor and cannot afford to put down a lot of money upfront. This kind of awareness has been created at every level of the organisation, with a lot of effort going into sensitization of branch managers through training and workshops.

To organize these, the bank has shown initiative in utilizing MNRE funds available for capacity

building of banks under the NSM off-grid component, as well as awareness generation programmes for end-users under the same budget head.⁴ For 30,000 systems, MNRE has sanctioned 25 lakhs for awareness generation programmes, plus 5 lakhs capacity building of bank staff and other officials. In addition, the bank has generated approximately 65 lakhs from the sale of carbon credits from SHS over the course of the last year. This money has been put into a Trust to be used for the benefit of customers and the rural population in general, in developing the skills of service centres and rural development projects for farmers.

Lastly, the bank has created a comprehensive incentive scheme to increase solar lending and monitored the resulting performance. The number of solar loans is tracked at the level of the branch, but also for managers and higher levels. Motivation of branch managers is key: this year, a new incentive scheme has been launched with the help of Tata BP, which has been the primary service provider. Branch managers sanctioning 50+ solar loans a month get added incentives. To establish an extensive rural network the bank employs 75 business correspondents, who interact with end users in the villages, helping with payment collection/recovery and monitoring. Every activity conducted by these correspondents is associated with a cash incentive linked to performance.

The enthusiasm of AGB for solar lending is reflected in its initiative to utilize available Government funding and support, taking it from success to success. This experience demonstrates that a well-functioning financing mechanism can make solar lending both a profitable activity for banks and fulfil the social objective of providing energy access to underserved households.

Having said this, there have been some inputs suggesting that, in the recent past AGB has been facing some problems with loan recovery, and this is an important challenge for them to overcome in the future. It appears that there has been maintenance issues in villages in certain specific districts have been lacking. It is likely that these two issues are linked, demonstrating the importance that effective maintenance and servicing plays in ensuring customer satisfaction and timely repayment of loan.

CONCLUSION

The first phase of the NSM has seen some success in developing a financial mechanism for off-grid solar in parts of India. However, much of the cost of market development was borne by service providers. Looking towards Phase II, there is an urgent need to review the implementation of the subsidy scheme and track progress in solar lending. The future of the financial mechanism for solar lending must be secured. However, these efforts

should not only be limited to the government or its ministries and implementing agencies, but also include coordinated efforts by all stakeholders. The NSM subsidy scheme has great potential to make off-grid solar an affordable technology enabling energy access for the rural poor and this potential can be fulfilled through the action points below (Fig. 2, Stakeholder Engagement Plan)

FIG. 2 STAKEHOLDER ENGAGEMENT PLAN FOR STRENGTHENING THE FINANCIAL MECHANISM				
Action	RBI	NABARD	Service Provider	Financing Institution
Minimizing delay in subsidy being sanctioned to banks		Advance release of subsidy	Help with paperwork	Create effective internal processes in application stage
Removing 20% down-payment requirement		Remove from guidelines		Relax conditions for low-income households and local operators
Flexible terms of repayment	Popularize		Ensure repayment occurs	Customize according to cash flow of end-user
Use available funds to sensitize bank managers regarding remaining obstacles		Call for innovative workshops	Organise workshops, with support from experts	Identify proactive managers for training
Specific targets for solar lending – internally and through Lead Bank Scheme	Circulars on inclusion of solar lending as an agenda point in LBS	Provide banks with public targets at the block, district and state level		Internal targets for managers
Tracking progress through the Lead Bank Scheme		Circular on reviewing progress through all levels of LBS		Collect data pertaining to solar lending and make this information available to the public
Communication to banks to clarify meaning of benchmark cost		Issue circular to Head Office of all involved banks		Pass on circulars to all offices/branches

Appendix 1 Figures on the revised subsidy scheme

USING MNRE BENCHMARK COST				
	270Rs / Wp	40% of b.c.	20% of b.c.	40% loan
W	Benchmark cost (Rs)	Capital subsidy (Rs)	Down-payment (Rs)	Loan (Rs)
10	2700	1080	540	1080
12	3240	1296	648	1296
18	4860	1944	972	1944
25	6750	2700	1350	2700

USING ACTUAL COST OF SMALL DC SYSTEMS INCLUDING 1 YEAR OF MAINTENANCE			
	270Rs / Wp		40% of b.c.
W	Benchmark cost (Rs)	Actual cost (Rs)	Capital subsidy (Rs)
10	2700	7000	1080
12	3240	9500	1296
18	4860	13000	1944
25	6750	16500	2700

SCENARIO 1: BANK GIVES LOAN FOR ENTIRE REMAINING AMOUNT			SCENARIO 2: BANK GIVES LOAN ONLY UP TO BENCHMARK COST	
	Actual cost – capital subsidy	20% of loan	Loan = Benchmark cost	20% of loan + remaining amount
W	Loan (Rs)	Down-Payment (Rs)	Loan (Rs)	Down-Payment (Rs)
10	5920	1184	2700	4840
12	8204	1641	3240	6908
18	11056	2211	4860	9112
25	13800	2760	16500	11100

Endnotes

¹ MNRE (2009) JNNSM Mission Document. Available at: http://www.mnre.gov.in/file-manager/UserFiles/mission_document_JNNSM.pdf

² SELCO India (2012) 'The National Solar Mission: A Practitioner's Perspective'. Available at: http://www.selco-india.com/pdfs/nsm_practitioner%27s_perspective.pdf.

³ Ashden Awards Case Study Summary, Aryavart Gramin Bank: <http://www.sei.ashdenawards.org/downloads/AG%20Bank%20summary.pdf>

⁴ MNRE (2010) Appendix 2, Guidelines on off-grid and decentralised solar applications: http://mnre.gov.in/file-manager/UserFiles/jnnsn_g170610.pdf

About REWG (Renewable Energy Working Group)

The REWG is an informal network of social enterprises delivering clean energy solutions in rural areas that has come together to speak in a unified voice and constructively engage with the various stakeholders in the eco-system, especially policy-makers. The initiative is currently being supported by the Khemka Foundation.