In Brief

- Development Challenge: An increase in electrification was urgently needed to combat poverty and foster economic development in Bangladesh, especially in rural areas. The National Energy Policy of 2002 commits to “bring the entire country under electrification by the year 2020.”

- Program Solution: In 2003, the Infrastructure Development Company Limited (IDCOL), a state-owned nonbanking financial institution that administers financing for rural energy and renewable energy development projects, launched the Solar Home System (SHS) program. SHS would provide cost-effective electricity to the rural population of Bangladesh. The SHS program was designed to contribute to the improvement of living conditions and a decrease in poverty.

- Program Results: Approximately 3 million SHS have been installed in off-grid rural areas of Bangladesh, serving about 9 percent of the total population. In rural areas the rate of people with access to electricity is up to 40 percent from about 25 percent at the beginning of the program.

Executive Summary

In Bangladesh, around 80 percent of the population live in rural areas, which are strongly deprived of access to electricity. This situation has significant impact on the living conditions and possibilities for income generation of the
rural population. Overcoming this situation can be described as one of the principal development challenges in order to contribute to ending poverty and enhancing the quality of life of the Bangladeshi population. However, several delivery challenges were preventing the government of Bangladesh from achieving quick and sustainable results in this area, namely a lack of financing means, technical knowledge and capacities, as well as institutional weaknesses, which delayed a rapid increase of electrification (particularly off-grid). Furthermore, Bangladesh’s energy policy as well as financial and technical support of numerous donor institutions were focusing primarily on grid extensions, which however are too expensive for very remote areas.

To increase the country’s efforts for off-grid rural electrification, the Infrastructure Development Company Limited (IDCOL) launched its Solar Home System (SHS) program in 2003 with the assistance of the World Bank. The basic mechanism of the program is that IDCOL provides a combination of grants and loans to a number of partner organizations (POs), which pass on the financing means to end users and collect the loan installments. At the same time, the POs are responsible for installation and maintenance of the SHS, hence they can be considered key players for implementation of the program.

Since April 2007, KfW, on behalf of the German Federal Ministry for Economic Cooperation and Development, contributed a commitment of €16.5 million to the program to be used as investment grants and for a refinancing facility to IDCOL for the extension of loans. Various other donor organizations have lent their support to the program since its inception, including the World Bank, GIZ, and JICA.

This case study covers the steps taken related to the service delivery, namely the organization and implementation of the SHS program, as well as its outcomes, and will be guided by three core research questions:

Question 1: What are the main factors that promote successful implementation of SHS programs?
Question 2: Which specific challenges or difficulties did the program face and what can be learned from these experiences?
Question 3: Which factors promoted or hindered the transition of IDCOL’s program to a commercially viable market for SHS and which challenges needed to be overcome?

The research was carried out by reviewing project documents and carrying out interviews with people involved in the program, particularly from IDCOL. It was found that both IDCOL and the POs face a number of implementation challenges, particularly in assuring a high technical quality of the installed SHS and in managing credit risks and dealing with loan defaults by the customers. A further challenge lies in coordinating the installations of SHS with grid expansion activities in order to avoid redundant electrification solutions and hence, a misallocation of resources. Also, ensuring environmentally and socially sound disposal of used SHS batteries has proven to be all but trivial.

Despite certain difficulties in overcoming the mentioned challenges, all in all, the program has been very successful. By April 2014 a good 3 million SHS had been installed in the off-grid rural areas of Bangladesh. KfW contributed to the financing of 444,000 SHS.

One of the principal factors that contributed to this success is the unique financing and service scheme where installation and maintenance of the SHS but also the extension of loans and collection of payments are done by local POs. For this reason this study focuses to a certain extent on their role and capacities in implementing the program.

Introduction to the Case Study

Access to electricity in Bangladesh is one of the lowest in the world. In 2005, only 30 percent to 35 percent of the country’s population were connected to the electricity grid. However, without electricity, possibilities for generating income and improved access to education and health services are made difficult, and with a per-capita income of only US$400 per year (2003), Bangladesh was among the poorest and least developed countries in Asia. Rural areas, where around 80 percent of the population live, were particularly disadvantaged, with only around 25 percent of the population in those areas having a grid connection (delivery gap). An increase in electrification was urgently needed in order to contribute to economic development and, hence, combat poverty, especially in rural areas which relied mainly on traditional subsistence farming. This can be described as being one of the principal development challenges which needed to be overcome in order to contribute to ending poverty and enhancing the quality of life of the Bangladeshi population.
Delivery Challenges

Bangladesh faced four delivery challenges in improving access to electricity in rural areas:

- **Lack of financing.** Funds were needed for the initial purchase and installation of SHS, and credit financing would have to be arranged to make loans to customers to purchase the systems.

- **Limited technical knowledge and capacity.** Specifications for SHS would have to be written and sources of supply found. Companies and their employees would have to be trained in the installation and maintenance of SHS.

- **Institutional weaknesses that delayed the rapid increase of electrification.**

- **Adjustment to existing energy policy.** Bangladesh’s energy policy (together with the financial and technical support of donor institutions) was focused primarily on grid extension. However, it is estimated that only about 70 percent of the rural population can be electrified through grid extension at a reasonable cost. It was clear that under this policy the very rural population living far away from the national grid would be left out. Therefore, stronger financial and technical support for off-grid electrification was required.

The delivery challenge that prevented the government of Bangladesh from achieving quick and sustainable results in this area can be described primarily as a performance gap consisting of a lack of financing means, technical knowledge and capacities, as well as institutional weaknesses which delayed a rapid increase of electrification (particularly off-grid). On the other hand, a design gap in the government of Bangladesh’s energy policy could also be identified: The country’s electrification efforts (together with financial and technical support of numerous donor institutions) were focusing primarily on grid extensions. However, it is estimated that only up to 70 percent of the rural population could be electrified through grid extensions at reasonable costs. With such a policy it was clear that particularly the very rural population living far away from the national grid would be left out. Therefore, stronger financial and technical support for off-grid electrification was required.

Against this background, in 2003 the Infrastructure Development Company Limited (IDCOL) launched its Solar Home System (SHS) program. IDCOL is a state-owned non-banking financial institution that administers financing for rural energy and renewable energy development projects. From 2007 on the SHS program was supported by KfW aiming to contribute to the provision and usage of 100,000 SHS in regions with difficult access in Bangladesh. By pursuing this objective, modern electricity services were to be provided to the population in rural areas of Bangladesh while relying on climate-friendly, renewable energy in a cost-effective way and with involvement of the private sector. By supplying electrical energy for lighting, communication, information technology, as well as for productive uses, the SHS program intended to contribute to the overarching developmental goal of improving the living conditions of the rural population and decreasing poverty.

This case study covers the steps taken related to the service delivery, namely the organization and implementation of the SHS program, as well as its outcomes. Although the delivery processes are strongly influenced by the particular contextual conditions described, the main lessons learned are believed to be potentially applicable also to other similar projects and situations. Against this background, this case study will not only describe the service delivery processes and outcomes of the program, but it will be guided by the following three core research questions:

**Question 1:** What are the main factors that promote successful implementation of SHS programs?

**Question 2:** Which specific challenges or difficulties did the program face and what can be learned from these experiences?

**Question 3:** Which factors promoted or hindered the transition of IDCOL’s program to a commercially viable market for SHS and which challenges needed to be overcome?

Revisiting the SHS program and analyzing the guiding questions above within this case study contribute to gaining knowledge and giving useful insights which may be applied in the implementation of future development programs.

**Contextual Conditions of the Case Study**

It is a generally accepted fact that energy is one of the basic ingredients required to alleviate poverty and socio-economic development. In Bangladesh this counts...
especially for rural areas, where 80 percent of the population live, and which therefore play a major role in terms of agricultural production and other economic activities as well as everyday life. However, Bangladesh’s National Energy Policy (NEP) of 1996 stated as one of the shortcomings of past energy development programs that “adequate attention has not been given to meet the total energy needs of rural areas.” The policy document points out that “for overall national development there is a need to pay special attention so that the energy needs of rural areas for subsistence and productive requirements (e.g., agriculture, industries, and transport) are met on a sustainable basis.” Against this background it was defined as one of the primary objectives of the NEP “to meet the energy needs of different zones of the country and socioeconomic groups.” An updated version of the NEP in 2002 added a further objective with regards to electrification, specifically “to bring the entire country under electrification by the year 2020,” which is in line with the Government of Bangladesh’s Vision and Policy Statement of February 2000.

To support this ambitious goal, several donors (especially ADB, USAID, and DFID) have been supplying considerable amounts of ODA financing for the extension of distribution grids. However, due to the remoteness and low consumer density of many rural areas, major electrification through grid expansion is not a financially viable option. On the distribution level alone, the initial investment costs per household connection in rural areas are estimated at US$240 to US$400. In order to reach also the last 30 percent of the rural population these costs would be considerably higher yet. Many rural electricity cooperatives which have been brought to life under the Bangladesh Rural Electrification Program (of the Bangladesh Rural Electrification Board, BREB) in order to expand distribution systems are in fact making losses. Against this background, the Government of Bangladesh decided to focus increasingly on decentralized electrification solutions based on renewable energies. In fact, concerning the increased use of renewable energies, the NEP of 2002 states: “Priority will be given to the rural areas where national grid expansion is expensive. This will reduce the pressure on the demand of commercial power supply and will help to avoid costly grid expansion and will also keep environment pollution free.” Furthermore, the NEP points out that “innovative new financing opportunities including microfinancing may be utilized to attract private capital to supplement the energy deficiencies in the rural areas and thus to fulfill the aspiration of the poor people.”

These developments led to the start of the Solar-Home System (SHS) Program in 2003, which is being implemented by IDCOL. By April 2014 a good 3 million SHS had been installed under the program in the off-grid rural areas of Bangladesh. IDCOL has a target to finance 6 million SHS by 2017, with an estimated generation capacity of 220 MW of electricity. KfW contributed to the financing of 444,000 SHS.

In fact, the program has been so successful and demand for SHS has become so high that in recent years a parallel and unregulated market for SHS has established itself. In this market products of lesser quality are being offered and environmental standards (for example, for the disposal of used batteries) are not being applied. This presents a big challenge for IDCOL’s program and puts in jeopardy the sustainability of SHS promotion and use in Bangladesh.

Finally, in 2008 Bangladesh enacted the long-awaited Renewable Energy Policy (REP) which also emphasizes the role of renewable energies for rural electrification, and in 2013 (after many years of preparation) the new Sustainable and Renewable Energy Development Authority (SREDA) came to life, whose task it is to support the implementation of the REP.

**Tracing the Implementation Process**

**Previous Experiences with SHS Prior to IDCOL’s Program**

Bangladesh had already had some experiences with SHS prior to the start of IDCOL’s program. From 1997 until 2003 approximately 11,000 SHS were established in off-grid areas largely on a subsidy basis. Implementation was carried out by Grameen Shakti, BRAC Foundation, and several other nongovernmental organizations (NGOs), most of which are also involved in IDCOL’s SHS program. Apart from that, BREB and the Local Government Engineering Division also implemented around 900 SHS pilot projects. Although these early projects were only successful to a limited extent, IDCOL did learn about the organizations implementing the solar programs and the technology being used and therefore could benefit to some degree from these previous experiences.
Launch of the IDCOL SHS Program

IDCOL launched its SHS program in 2003 aiming to ensure access to clean electricity for the off-grid rural areas of Bangladesh and to thereby contribute to the Government of Bangladesh’s goal of reaching 100 percent electrification by 2020. The program started out as a part of the Rural Electrification and Renewable Energy Development Project (REREDP) funded by the World Bank and the GEF. The major component of REREDP was grid electrification, however US$33.7 million was also made available for the dissemination of SHS, which was to be implemented by two parallel approaches by BREB and IDCOL. While BREB pursued a fee-for-service approach with a total funding amount of US$8.8 million IDCOL’s approach was based on an ownership model and total funds of US$24.9 million. The aim for BREB’s component was to install a total of 14,000 SHS while IDCOL was to achieve 50,000 systems, both to be achieved by June 2008.

In the fee-for-service model, an energy service company (ESCO) carries out the investment in SHS and sells the electricity produced at a fee to the consumer. The ESCO remains the owner of the hardware and is responsible for installation, maintenance, and repair including the replacement of components such as controllers and batteries. The end user pays a connection fee and a regular fee—usually monthly, though a fee per kWh is also possible. The end user pays as long as the energy service is delivered and never becomes the owner of the system. However, the end user usually owns the wiring, lamps, and appliances, which are covered by the connection fee.

In the ownership model, on the other hand, a supplier sells the SHS to the end user, who enters into a credit arrangement with the supplier. The ownership of the system is transferred to the consumer when the loan is completely repaid. The suppliers are in charge of maintenance and repairs, which guarantees a higher level of technical expertise. The ownership model was chosen by IDCOL as it was believed to offer better chances of being translated into a sustainable business model, due to closer involvement of the consumers through their actual ownership of the systems. In fact, IDCOL was able to implement its component much quicker than BREB, who got stuck in lengthy procedures of coordination and procurement and could advance only very slowly. While BREB just managed to achieve the goal of 14,000 SHS by June 2008, IDCOL had reached its aim of 50,000 SHS almost three years ahead of schedule. BREB did not further pursue any activities to disseminate SHS following the completion of the REREDP, whereas IDCOL continued on the basis of the ownership model and with the support of several additional donors, and the program is still running very successfully today. It is generally assumed that, at least for the specific case of Bangladesh, the ownership model has advantages in comparison to a fee-for-service approach. Mainly this is due to the simple fact that households prefer to be the actual owners of the systems that are installed on their roofs. This ownership creates a feeling of responsibility and leads to increased caretaking of the systems.

The Concept of IDCOL’s SHS Program

The basic mechanism of IDCOL’s SHS program is that IDCOL provides a combination of grants and loans to a number of partner organizations (POs), which pass on the financing means to end users, procure and install the SHS, and provide after-sales service. The users

Partner Organizations

Local partner organizations (POs) are the key players in implementing IDCOL’s SHS program. On the one hand they are in charge of passing on the loans to the customers and collecting the installments. On the other hand they are responsible for technical installation of the SHS and carrying out maintenance services. Today the program includes 47 POs with a total of around 5,800 field offices and roughly 70,000 employees all over the country.

The POs vary largely in size and monthly installation rates with Grameen Shakti (GS) being by far the largest one, accounting for about two thirds of all SHS installations under the program. In fact, GS is currently one of the largest and fastest-growing rural-based renewable energy companies in the world. Apart from promoting SHS, GS is also involved in the distribution of improved cooking stoves, biogas plants, and organic fertilizer in Bangladesh. GS has set up 45 Grameen Technology Centers (GTCs) under a pilot program to scale up its capacities and train solar technicians.
themselves have to make a down payment of 10 percent of the total costs of the SHS. IDCOL is in charge of overall project management and monitoring, defining the regulations for loan disbursement to the POs, and setting the technical standards for SHS components and installations. However, the POs are the key players in the program, as they are responsible for technical installation and maintenance services as well as for loan disbursement and installment collection. In order to assume part of the financial risk involved and “prove their commitment,” the POs have to contribute a share of the costs of the SHS which is also passed on to the consumers as part of the loan (about 20 percent of the loan amount).

The POs face a number of challenges which need to be properly dealt with in order to successfully implement the program. These are:
- Installing SHS only in those regions which will not be serviced by the electricity grid in the near future
- Assuring high technical quality of the installed SHS
- Implementing an appropriate credit risk management in order to reduce the amount of loan defaults by the customers

IDCOL too has to face several implementation challenges:
- Selecting appropriate POs and ensuring sufficient knowledge and capacities on their side
- Monitoring technical and financial performance of the SHS and POs and implementing procedures for improvement
- Implementing and enforcing quality standards for SHS as well as regulations for disposal of used batteries

These challenges will be revisited below.

The strong point of the program lies in the fact that the POs have a permanent presence in the rural areas, and perform any required maintenance free of charge throughout the duration of the loan when they collect the monthly payments at the customers’ homes. In case any urgent problems arise in between installment collections, the POs will send a representative to carry out the corresponding maintenance or repair works as quickly as possible. If any components fail, the outlet of the partner organizations is less than 15 kilometers away, and a replacement can be easily obtained. After the end of the three-year loan period there is the option of signing a maintenance contract with the PO including regular maintenance visits at a cost of about US$4 per year. However, most customers prefer having maintenance and repairs done only when urgently required and paying the nominal cost for each individual service. PO representatives are generally available most of the time for these customers. Components whose guarantee period is longer than three years (e.g., five years for batteries, 20 years for the solar panels) will continue to get repaired or replaced at no cost to the customer beyond the three-year loan period.

The customers can opt for a 24- or 36-month loan period. To date most have chosen the latter. The POs provide loans with a 6 percent interest rate to the customers. The SHS itself is used as collateral in case the loans are not repaid. Refinancing of the program is made possible via soft loans (with a duration of 8 to 10 years) supplied by IDCOL to the POs. IDCOL receives the required funds from the government of Bangladesh, which in turn receives them from the donor community. The level of grant subsidies was to be reduced over time and eventually phased out with increasing number of systems installed with the intention to transition to a commercially viable SHS market.

Initially the program included SHS consisting of PV modules with a capacity ranging from 30 to 75 Wp. Additionally, the systems include a battery, charge controller, cables, installation materials, and lamps. With such a system it is possible to operate about 4 lamps and a black-and-white TV for more than 4 hours per day. Since numerous households were not able to make a down payment of 10 percent for this type of system, starting in the second half of 2008, IDCOL started offering also SHS with a rated power below 30 Wp in order to enable poorer households with lesser financial means to be electrified also. For even poorer households IDCOL is currently considering to also include smaller systems, i.e., pico solar with a capacity of 3 to 5 Wp.

**Beyond the REREDP and KfW Contributions**

As already mentioned, IDCOL has continued with its SHS program beyond the duration of the REREDP. In addition to the World Bank and GEF several other donors joined the program, namely GIZ, ADB, DFID, GPOBA, IDB, JICA, KfW, and USAID. IDCOL maintains a separate account for each participating donor in order to keep the individual contributions well separated. While disbursing grants and loans to the POs, the respective funds are recorded under the corresponding
donor account. In fact, IDCOL's centralized database has the possibility of depicting the source of funding for each individual SHS.

KfW's contribution was based on a cofinancing scheme with GIZ, which was also supplying grants funded by the Dutch Government in the scope of the Energising Development program. Today, GIZ is still working together with IDCOL in areas such as technical advice on SHS component quality and battery recycling.

In detail, KfW's financial contribution was to be split up between the different components as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Euros (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment grants for SHS</td>
<td>4.6</td>
</tr>
<tr>
<td>Refinancing facility for SHS</td>
<td>9.7</td>
</tr>
<tr>
<td>Investment grants for productive use pilot projects</td>
<td>1.0</td>
</tr>
<tr>
<td>Consultancy services</td>
<td>0.7</td>
</tr>
<tr>
<td>Contingencies</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16.5</strong></td>
</tr>
</tbody>
</table>

The 100,000 SHS that were to be implemented with the help of KfW’s contribution were to be financed as follows:

<table>
<thead>
<tr>
<th>Contribution</th>
<th>Euros (million)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant from KfW</td>
<td>4.6</td>
<td>14</td>
</tr>
<tr>
<td>Loan from KfW</td>
<td>9.7</td>
<td>30</td>
</tr>
<tr>
<td>Loan from IDCOL</td>
<td>8.9</td>
<td>28</td>
</tr>
<tr>
<td>Loan from POs</td>
<td>4.8</td>
<td>15</td>
</tr>
<tr>
<td>Users' own contribution</td>
<td>4.1</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32.1</strong></td>
<td><strong>100</strong></td>
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</tbody>
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The time plan for KfW’s involvement was based on the assumption that 2,500 SHS could be installed per month. However, it soon became clear that actually more than 6,000 SHS were being installed per month, and so the number of 100,000 SHS was reached after just about one and a half years in the third quarter of 2008.

However, since other donors (especially the World Bank) were providing considerable loan resources, only the grants from KfW’s financing contribution were needed for these 100,000 SHS. In fact, since there was a shortfall of grant support from other development partners, in 2009 the KfW refinancing facility was transformed into investment grants as well. By doing so it was eventually possible for KfW to contribute to the installation of 440,000 SHS instead of the initially planned 100,000 systems, though with a smaller contribution to each installed system. By 2012 the investment grants had been fully disbursed and corresponding activities by KfW came to an end. As of April 2015, KfW’s contributions in the area of pilot projects for productive use have also been fully disbursed. About €1 million for these projects has been used for the installation of several commercially operated PV irrigation systems as well as two PV-diesel hybrid mini-grids. However, these projects will not be further analyzed in the scope of this study, which focuses on the SHS component.

**Steering of IDCOL’s SHS Program**

From the very beginning on steering of IDCOL’s SHS program has been carried out by an Operations Committee comprising representatives from IDCOL and all of its POs. The committee meets once every month in order to look after the operational and business aspects of the program, coordinate activities of the individual POs and take strategic decisions. Participating development partners are also invited to attend the monthly meetings. Specifically the tasks of the Operations Committee are to:

- Review project implementation status,
- Resolve issues/disputes relating to project implementation among and between the POs, equipment suppliers, etc.,
- Propose and implement policies relating to the promotional activities, quality assurance programs, etc.,
- Review compliance status of the POs relating to collection efficiency, environmental safeguards, after-sales services, maintenance and repair, etc.,
- Decide about financing terms, i.e., interest rate, tenor, as well as amount of subsidy, and
- Ensure better coordination among the POs in implementing the program.

Apart from the Operations Committee there is a PO Selection Committee in charge of selecting POs through a fair, transparent, and competitive process. The PO Selection Committee was also founded at the very beginning of the program. The major criteria were agreed upon by IDCOL and the development partners and include a fully developed business plan, adequate staffing, staff qualification and technical/microfinance experience, minimum size (number of beneficiaries of MFIs), etc. The PO Selection Committee is headed...
by the Director General of the Bangladesh Institute of Development Studies, a nodal research organization of the country. Other members include representatives from the NGO Affairs Bureau, the Economic Relations Division, and the BREB. The Palli Karma Shohayak Foundation is also represented, a nonprofit company with the principal objective of providing funds to various organizations for their microcredit programs with a view to helping the poor. While in the beginning of the program there were only five POs, the number has risen to a total of 47 today, and a few more POs are currently in the selection process. The total number of branches of the POs amounts to about 5,800 throughout the country.

Finally, the SHS program also includes a Technical Standards Committee (TSC), which was formed at the very beginning of the program with the task of setting forth the technical specifications and standards of solar equipment to be used under IDCOL's program. Furthermore, the committee is responsible for approving solar equipment based on its meeting the required technical specification and criteria and reviewing product credentials of dealers. Grant and credit support is restricted to only those systems which have been officially approved by the TSC. The committee comprises reputed technical experts in the RE sector from universities, engineering departments of govt., and IDCOL.

**Coordination with Grid Extension**

In order to prevent that SHS be installed in rural areas also about to receive a connection to the power grid, it is of utmost importance to coordinate the activities of the SHS program very well with the government’s grid extension plans. Against this background the Implementation Agreement between KfW and IDCOL obliged IDCOL to assure through “appropriate agreements with the POs” that they would install SHS only in areas that had not yet been connected to the power grid and where such a connection could not be expected in the near to medium-term future.

Generally, it is BREB that is responsible for grid expansion in rural areas of the country and it has elaborated a Master Plan with details of the intended grid extensions. However, according to IDCOL, the POs of the SHS program do not have access to that plan. Even the deputy CEO of IDCOL, with whom extensive communication was carried out in the scope of this case study, says that he has not seen the Master Plan since “it is not available in the public domain.” Possibly it is kept confidential in order not to cause commotion in the rural population (because some areas shall be connected before others). Only recently has IDCOL written to BREB requesting to share the grid expansion plan and is currently waiting for a response. It is currently not clear if the Master Plan is being followed or not. In light of this situation, it is difficult for the POs to know where and when the grid will be expanded.

Still, the rules of IDCOL’s program define that in case the electricity grid is extended to a location of a SHS within 6 months of installation, then the value of that system is deducted from subsequent eligible disbursements to the POs. It is therefore the POs who carry the risk of the grid being extended to regions where they are active and who suffer from financial losses if the grid extends sooner than expected. Up to now, out of a total of approximately 3 million SHS there were about 95,000 cases where the electricity grid was extended within six months of installation, which corresponds to 3.2 percent of all installed SHS. If the grid extension plans of BREB were made available to the POs, this number could certainly be significantly reduced. Furthermore, if a grid extension happens within five years of the installation of a SHS the customer has the right to sell it back to the PO at a reduced price. However, experience shows that returning of SHS due to grid expansion is not common, since people tend to keep the system as a backup for the frequent times of grid outages.

**Recycling of Used Batteries (and Solar Panels)**

Another important issue was the disposal of used batteries, which through the lifetime of a SHS need to be replaced several times. Under IDCOL’s SHS program the manufacturers are required to provide five years of warranty for batteries used in systems with a capacity of 30 Wp and above and three years for smaller ones. It is the responsibility of the POs to collect expired-warranty batteries from the users and return them for recycling. In reality, most batteries are used well beyond their warranty period as they are still functional. In fact, IDCOL has a team of 10 full-time inspectors to check the status of expired-warranty batteries. So far, only about 4 percent of inspected batteries had actually been returned for
recycling since they were still working satisfactorily after the warranty expired.

Recycling of batteries means mainly that the lead and, in particular, lead oxides are processed to pure lead for further use as raw material again. Other components such as the plastic casings are also separated and reused. It is the recovery of the lead in the batteries and the potential spilling of acid that are harmful to environment and health if respective procedures are not being followed. However, a significant fraction of used batteries were initially being dismantled and refined under uncontrolled conditions (mainly by recycling the lead and lead oxides in open charcoal fires, a process called smelting) in the informal recycling sector. This caused significant harm to the environment (lead dust deposits) and health of workers and neighbors. Since by ignoring environmental and health standards recyclers in the informal sector have lower costs, they are able to offer the highest prices for used lead acid batteries, which again was an incentive to sell used batteries to the informal sector. By the end of 2012 according to a report by KfW's monitoring consultant, it is estimated that a significant share of SHS batteries were not being recycled correctly in the formal sector.

Against this background, in 2013 IDCOL introduced incentives under which the POs receive US$5 for collection of each expired-warranty battery and the recyclers receive an equal amount for eco-friendly recycling of each battery. In order to receive the incentive, the battery recycling facilities are required to be certified under ISO 14001 (Environmental Management) and OHS 18001 (Workers Health & Safety). This incentive is available for 200,000 recycled batteries, so it is intended as a temporary measure and not a permanent subsidy. To date about 35,000 batteries have been recycled under this incentive mechanism and so far it has increased the rate of batteries recycled in the formal sector by IDCOL-approved recyclers to 70 percent. Furthermore, POs cannot replace old batteries with new ones without collecting the former. This avoids sale of used batteries directly by the users to the informal sector. IDCOL also provides a soft refinancing facility so that customers can buy new batteries in installments. This refinancing facility is also not available unless the old battery is collected and recycled. The customers themselves receive a salvage value amounting to 24 percent of the cost of a new battery from the POs, which is deducted when an expired-warranty battery is replaced by a new one. Together it is expected that these incentives will further raise the share of SHS batteries which are properly recycled in the formal sector.

Concerning the disposal or recycling of the solar panels themselves, a concept has not yet been developed by IDCOL. Since the required warranty for solar panels is 20 years it seems “too early to consider this issue at the moment” and work on developing mechanisms and regulations for eco-friendly disposal of solar panels shall begin at a later time into the program.

**Technical Monitoring of SHS and Quality Assurance**

Since the beginning of the SHS program IDCOL has been carrying out a strict monitoring and quality assurance program in which it maintains 12 regional offices across the country in order to carry out inspections of the technical quality of SHS installations. It is a donor requirement that IDCOL inspects and verifies the quality of 50 percent of the installed systems before extending the grants to the POs, thereby linking the grants to the quality of the installations. In fact, about 50 percent have actually been inspected to date, but IDCOL's own goal is to eventually inspect all installed SHS. IDCOL has continuously increased its inspection staff and today there are 144 inspectors, each of them capable of inspecting more than 350 systems a month, which adds up to a total number of over 50,000 monitored SHS per month. Still it will be difficult, if not impossible, to achieve inspections of all SHS installed under the program. Furthermore, initially problems were observed in data processing with long processing times and losses of data. However, according to IDCOL, these limitations have been mitigated by now, having decentralized the inspection department into regional offices with online submission of data to a centralized database with adequate backup support.

In addition to IDCOL’s own monitoring and quality assurance program, KfW also carried out a monitoring program in which a technical review of SHS (as well as a review of financial performance of the POs which will be described later on) was carried out. KfW’s monitoring program was implemented by a consulting firm in the years from 2007 to 2012. The consulting assignment was implemented in three phases (covering not the entire period, but having some gaps in between), and a total of 11,371 SHS were monitored, which corresponds to
roughly 1.5 percent of all systems installed by IDCOL’s program during the same period. In order to classify the technical performance of the systems four categories were defined:

- Correct installation
- Negligible observations such as shading or wrong angle of the solar module, which can be corrected locally
- Observations that need attention such as the use of inferior quality wire or components not eligible to the technical standards
- Installation deficiencies (problems) which require immediate repairs to prevent technical failure of the SHS, such as damage to or bypassing of the charge controllers.

In the first monitoring phase (June 2007 to May 2009) 1,598 SHS were monitored and it was found that 4 percent of all monitored systems had installation deficiencies, 27 percent of the systems resulted in observations that needed attention, and for 10 percent of the systems only negligible observations were made. This means that 59 percent of the SHS were installed correctly. According to the TOR of the first phase of the assignment, the monitoring procedures provided only a snapshot of the systems’ status shortly after their installation. Therefore, the consultant proposed that in future monitoring also older systems should be included in order to assess how the technical performance changes over time. Critical times in the systems’ life cycle were seen to be at the end of the loan and maintenance period after three years as well as with the end of the batteries’ lifetime. An intensive monitoring of sample SHS covering at least a five-year period after installation was recommended.

This recommendation was implemented in the second monitoring phase (November 2009 to February 2011) where out of a total of 6,082 monitored SHS now only 4,890 were “new systems” (date of monitoring less than twelve months after installation) and 1,192 were “old systems” (date of monitoring more than 24 months after installation). This corresponds to a share of new systems of about 80 percent. Unfortunately, the consultant’s monitoring reports do not mention how old exactly the “old systems” were. Therefore, it remains unclear if these were still within the loan and maintenance period and the batteries’ expected lifetime. The overall results for this phase showed a decrease in technical performance of the systems with now 7 percent of the systems having installation deficiencies, 72 percent with observations that needed attention, and 4 percent with negligible observations. Hence, the number of correctly installed systems without any observations had dropped from 59 percent in the first phase to only 17 percent in the second phase. On the one hand this was due to the older systems included in the samples simply having a larger number of technical issues, which underlines the importance of proper and frequent maintenance. On the other hand it was clearly observed that also the technical performance of newly installed systems had become worse compared to the first monitoring phase. This led to the consultant making the recommendations to the TSC that it should impose standards for the wiring installation (like maximum cable length and cable diameters, quality and mandatory use of connectors, or correct wiring of charge controllers). In consequence, in the second half of 2010 such a checklist for the installation was then issued by the TSC to all POs.

The third monitoring phase (April 2012 to December 2012) then showed that the POs’ more stringent briefing in fact had a positive impact on the technical performance of the inspected SHS. In this phase, out of a total of 3,691 monitored systems, 2,764 were new ones and 927 were old systems. This corresponds to a share of new systems of about 75 percent, so the number of included old systems was now slightly higher than in the second monitoring phase. Furthermore, the definition of new systems had been changed to having a date of monitoring less than six months after the installation. So, compared to the second monitoring phase, the inspected systems were on average slightly older. Like in the second phase, again 7 percent of all monitored systems had installation deficiencies, but the number of systems with observations that need attention was reduced to 55 percent. The number of systems with negligible observations remained small at 6 percent. This means that 32 percent of all monitored systems were flawless, which is almost double the amount compared to the second monitoring phase. In spite of these improvements from the second to the third monitoring phase, the amount of flawless systems was still quite low, with only about one third of all inspected SHS. Against this background the consultant emphasized once more that the focus of the SHS program should lie on the quality of installation and not only on installation rates. The final report highlighted the importance of proper initial installation work, which avoids further attention especially regarding wiring and cabling. Furthermore, the final report pointed out that the POs should inform their existing and new customers
that bypassing charge controllers (which is sometimes
done in order to be able to extract more energy from the
batteries) significantly reduces the lifetime of the batteries
and that in this case, customers cannot claim warranty.
In summary, at the end of the entire monitoring period,
the technical performance of the installed SHS was
still not fully satisfactory. Apparently, still not all solar
technicians of the POs were strictly following the defined
installation procedures and there was still a number of
customers bypassing the charge controllers. But it shall
be emphasized that a positive trend toward improvement
of technical performance of the SHS is evident.

Monitoring of Financial Performance of
the POs

All POs are obliged to report their installation figures
and financial details, such as collection efficiency and
overdue collection rates, to IDCOL on a monthly basis.
Hence, the program is transparent in terms of financial
performance of the POs. Still, KfW’s monitoring program
also included visits to a number of field offices of the POs
in order to verify the reported numbers. The monitoring
results revealed significant discrepancies between the
collection efficiency reported by the POs to IDCOL and
the sample audits carried out in the POs’ field offices. In
the first monitoring phase up to mid-2008, the reported
collection efficiency (percentage of due payments which
have actually been made) was above 95 percent for all
POs while the collection efficiency actually found at
the visited field offices was far less, sometimes even
below 50 percent. The reasons for these differences are
not fully clear, but it is assumed that wrong numbers
were deliberately being reported to IDCOL. A possible
explanation is that according to IDCOL’s rules, systems
installed by branches which fail to ensure an overall
collection efficiency of at least 80 percent can be excluded
from financing through IDCOL. In principle, POs could
also be (temporarily) excluded from the program on
account of insufficient collection efficiency, but so far this
has not happened.

This situation was financially worrying, since it was
found that POs were hardly able to collect any overdue
debt. On the one hand, the reasons could be seen in
simple financial inability of the customers to pay their
installments. On the other hand in some cases it was also
unwillingness to pay due to customers not being satisfied
with the quality of the SHS installments. Consequently,
the overdue portion of the portfolio was growing constantly
in comparison to the regular portfolio, and the overall
credit risk was rising. In order to improve this situation,
IDCOL and the consultant facilitated a workshop for POs
in April 2008 about credit risk mitigation techniques.
Furthermore, the consultant supported IDCOL in the
development of risk management guidelines.

While in the aftermath of the workshop and
development of guidelines the numbers reported by the
POs to IDCOL reflected reality better than before, the
reality itself did not instantly develop very much for
the better. The consultant’s final report from the third
monitoring phase, which ended in December 2012,
states that “Financial management of the program is a
major concern in the consultant’s opinion. The results of
the financial monitoring are highly worrying and, as has
been pointed out at various occasions, put in danger the
overall good results of the program.” Roughly 25 percent
of the visited field offices still had delinquency rates of
30 days exceeding 50 percent, meaning that over half
of the portfolio was paid considerably late and could be
considered as nonreceivable amount. However, finally
borrowers pay up in the end, even if it is after the 30-day
threshold defining nonperforming loans, as evidenced by
the overall collection efficiency of more than 90 percent.
Another 25 percent of field offices showed delinquency
rates between 10 percent and 50 percent, which is also
considered as being too high in the context of sound
financial management. Apparently, the fact that the SHS
themselves act as collateral could not be considered to
be sufficient, as massive removal of SHS for reasons of
nonpayment have not been tested and would present
serious challenges to the POs. The monitoring results
of the economic performance of the POs indicate that
there were significant deficiencies in the implementation
of the financial risk management guidelines which
had been developed with the support of the consultant.
The last monitoring report concluded that “the build-
up of credit risk within the SHS program is enormous”
and “the economic sustainability of the entire SHS
program is in danger.” The urgent recommendation
of the consultant to IDCOL was therefore to strictly
enforce the financial risk management guidelines within
the POs by enforcing, for example, sanctions such as the
temporary exclusion of POs from the program if their
collection efficiency drops below 80 percent.

IDCOL’s own initiatives to improve collection
efficiency encompass a number of measures. For one,
IDCOL has initiated its own monitoring of collection efficiency by regularly auditing the financial numbers of the POs. Inspections of PO field offices are carried out on a random sampling basis and to date IDCOL’s collection efficiency auditors have inspected 2,893 branches of the POs, which corresponds to about 50 percent of the total number. Furthermore, IDCOL pursues to improve loan repayment by the customers through insisting strictly on delivering quality products and services so as to at least reduce customers’ dissatisfaction as a motive for not repaying loans. Finally, IDCOL has also advised the relevant government and local government offices to assist IDCOL’s POs in recovering loans, should this be required. According to IDCOL, by implementing these improvement measures, the overall collection efficiency reached today lies at 90 percent. Although 10 percent of the loan repayments by the users are outstanding, the POs all pay back their loans to IDCOL.

Clean Development Mechanism

In 2012, and with the support of the World Bank, IDCOL’s SHS program was registered as eligible under the Clean Development Mechanism (CDM). This means that the reduced emissions of greenhouse gases by using renewable solar power for electrification can be sold as Certified Emission Reductions (CER). It is expected that by 2016 around 400,000 CERs will be generated which are being sold at a current price of €9 per CER. Of this amount 75 percent goes to the POs and 25 percent is retained by IDCOL as fee. While broken down to the individual SHS this additional income may be minimal, it still represents an incentive to the POs and therefore contributes to the further success of the program.

Results of IDCOL’s SHS Program

IDCOL’s SHS program is considered to be one of the most successful programs of its kind in the world. By April 2014 about 3 million SHS had been installed under the program in off-grid rural areas of Bangladesh. As a result, 13 million beneficiaries are getting solar electricity, which is around 9 percent of the total population of Bangladesh. Today, Bangladesh’s overall electrification rate lies at around 60 percent. In rural areas the rate of people with access to electricity is up to 40 percent from about 25 percent at the beginning of the program. Of the rural population that today has electricity access, about one fourth is being supplied by SHS which were installed in the course of IDCOL’s program. While to date full commercialization has been achieved for SHS over 30 Wp, this is not the case of systems below 30 Wp. However, these subsidies have been strongly reduced from US$90 per system at the beginning of the program to currently US$20. Reaching full commercialization of these systems remains a core aim of the SHS program.

Up to April 2014, more than 65,000 SHS were being installed every month under the program. Considering that at the start of KfW’s involvement in the program monthly installation rates of 2,500 systems were assumed, this must be considered as being an astonishing development with exponential growth rates. The reason for this rapid development lies in the fact that demand for SHS was simply much higher than initially expected. Furthermore, for the POs it was a very profitable business especially due to the rapid decrease in prices for SHS. This was caused on the one hand by general technological advances in the PV industry. But on the other hand, the price reductions were a result of an increase in the number of participating suppliers and of including local shares in the value chain. While initially all SHS of the program were imported at relatively high cost from a limited number of suppliers, as the program expanded, more and more suppliers got enlisted. Many local manufacturers started producing components, i.e., batteries, charge controllers, etc., and some suppliers started assembling their PV modules locally. Local assembly of PV modules and local manufacturing of solar batteries was actually supported financially by IDCOL due to a temporary lack of equipment supply in 2007. As a result of these developments, huge competition among the suppliers set in, which influenced the cost reduction as well as the availability of equipment. Due to these developments, the POs were seen to massively promote the SHS program, which again fueled demand.

In fact, IDCOL’s program has been so successful that numerous entrepreneurs, many of them former employees of the program’s POs, have launched their own businesses to disseminate SHS apart from IDCOL’s program. However, the SHS offered in this market are considerably cheaper and of lesser quality. Furthermore, battery recycling in this market is likely to happen largely in the informal sector, something that IDCOL has strongly been trying to avoid and counteract. Due to the low price of the SHS in this market, there is a great demand, and in fact latest numbers show that the monthly installation rates in IDCOL’s program have
been reduced to about 40,000 systems. It remains to be seen which market will dominate in the future and it can only be hoped that IDCOL’s efforts for introducing technical and environmental standards will not dissolve in the medium to long term. Currently, IDCOL is working in collaboration with SREDA to adopt a national standard for solar equipment to prevent pervasive expansion of poor-quality products in the unregulated market outside IDCOL’s program. Both SREDA and IDCOL have also undertaken awareness raising campaigns to discourage people from buying poor-quality products. In any case, IDCOL has a target to finance a total of 6 million SHS by 2017, with an estimated generation capacity of 220 MW of electricity, and it can be expected that the program will continue on a good path toward reaching this goal.

Lessons from the Case Study

This case study reveals a number of lessons about implementing off-grid electrification programs, particularly for the dissemination of SHS. These lessons are now reflected in the responses to the three research questions posed at the beginning of the case study:

**Question 1: What are the main factors that promote successful implementation of SHS programs?**

Clearly, one of the principal factors that made IDCOL’s SHS program so successful is the unique financing and service scheme where installation and maintenance of the SHS but also the extension of loans and collection of payments are done by local POs. Offering technical and financial services “out of one hand” ensures that customers are not “left alone” after system installation, and the regular debt collection activity leads to a continued relationship with the customers. This combination of technical and financial services is the critical element that is missing in many other countries where programs for the dissemination of SHS have been or are being implemented.

Naturally such a scheme relies critically on strong and capable POs. These must have the technical qualifications for delivering SHS installations and maintenance and repair services. Furthermore, the POs need to have knowledge in matters of credit risk mitigation and management in order to maximize their collection efficiency. Building capacities in both areas usually needs to be supported through respective training measures, especially when a program sees such strong growth rates as IDCOL’s SHS program and there is a corresponding need to continuously increase staffing of the POs. Applying rigid qualification procedures in the selection process of POs is equally important in order to ensure their general suitability.

Pursuing a high level of quality of the equipment, installations, and technical services is a further element which is of high relevance for successful implementation of SHS programs, not only because this will ensure a long lifetime of the installed systems, but also because the resulting customer satisfaction has significant impact on their willingness to repay the loans. One instrument in achieving this is the definition of strict and detailed specifications and performance requirements for the SHS and maintenance procedures. A further component is carrying out independent technical inspections of the systems and linking the provision of grant support to the achievement of a sufficient level of quality. The requirement of long warranty periods for equipment components (e.g., 20 years for panels, 5 years for batteries, 3 years for charge controllers) but also the obligation of the POs to establish post-warranty support structures also contribute to achieving and maintaining a high level of quality of the installations. Finally, it is necessary to also inform and educate the users in order to prevent improper handling of the SHS such as bypassing charge controllers, which leads to battery damages.

Another challenge that could be observed was that technical performance of the SHS has not been fully satisfactory throughout the course of the program. The last monitoring report of KfW’s consultant still identified 7 percent of all monitored systems having installation deficiencies and 55 percent with observations that needed attention. Due to the enormous demand and rapid growth of the program it was hard to ensure a high level of technical capacities with all POs and their technical staff. Furthermore, due to lack of better knowledge many customers were bypassing the charge controllers, which significantly reduces the lifetime of the batteries. This underlines the importance of accompanying POs and consumers with extensive activities for training and education.

Finally, for the specific case of Bangladesh, applying an ownership model has proven to be more successful than a fee-for-service approach. Mainly this is due to the fact that households prefer to be the actual owners of the systems that are installed on their roofs, and that this ownership creates a feeling of responsibility and leads to increased caretaking of the systems.
Question 2: Which specific challenges or difficulties did the program face and what can be learned from these experiences?

A program for off-grid electrification can only be successful in terms of maximizing access to electricity if it is well coordinated with activities for grid expansion. In the case of the SHS program in Bangladesh neither IDCOL nor the POs have so far had access to the grid expansion plan of the BREB and it is hard to comprehend why obtaining access has not been pursued at an earlier stage in the program. If necessary, the government should be involved in order to oblige BREB to share its grid expansion plan in order to avoid SHS installation in areas which are about to be connected to the electricity grid.

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Finally, ensuring environmentally sound recycling of used SHS batteries has proven to be a tedious and lengthy process, since initially the larger share of batteries was disposed in the informal sector. By introducing strict regulations and incentive schemes, IDCOL was able achieve significant improvements, but still a significant share of batteries are being recycled outside of the official scheme. The example from Bangladesh makes clear the outstanding importance of defining regulations and finding suitable mechanisms for their enforcement.

Question 3: Which factors promoted or hindered the transition of IDCOL’s program to a commercially viable market for SHS and which challenges needed to be overcome?

The aim of any subsidized program should be to reduce the subsidies over time and transition to a commercially viable, demand-driven (and not subsidy-driven) market. Announcing gradually decreasing subsidy levels itself can trigger the exploration of existing cost reduction potentials and result in decreased prices for SHS. However, cost reductions, and thereby a reduced need for subsidies, can and should also be promoted by other means.

In IDCOL’s SHS program this was achieved through the promotion of local manufacturing and assembly of SHS components. The resulting competition significantly contributed to cost reductions of the systems, making it possible to continuously reduce the level of required subsidies. In fact, the cost reductions that were achieved and the resulting increase in demand motivated numerous entrepreneurs to found their own businesses for the dissemination of SHS outside of IDCOL’s program. Since this parallel market is not regulated like IDCOL’s program, the SHS offered do not have to fulfill any regulatory requirements such as quality, environmental, and health standards. Therefore it is also possible to produce these SHS at clearly lower cost than the SHS which are disseminated by IDCOL, and subsidies are not required at all.

While the creation of a self-sustaining market is, in principle, a desired outcome, it needs to be pointed out that the SHS offered in this parallel market are of lesser quality. Furthermore, battery recycling in this market is likely to happen largely in the informal sector with all associated damages to the environment and health.

In order to counteract these effects, which eventually are a result of the program’s own success, IDCOL is cooperating with the Sustainable and Renewable Energy Development Authority (SREDA) in order to implement a national quality standard for solar equipment and carrying out awareness-raising campaigns in order to discourage users from buying poor-quality products.

How the Case Study Informs the Science of Delivery

The emerging framework of science of delivery (SoD) identifies five elements that are seen as important factors enabling SoD approaches. The findings of the present case study with respect to those five elements are as follows:

Focus on Measurable Welfare Gains of Citizens

The monitoring activities of IDCOL and KfW have so far focused on counting the number of SHS installed, carrying out technical inspections of the quality of the installed
systems, and overseeing financial performance of the POs. To the knowledge of the author of this study, monitoring of actual welfare gains of the beneficiaries has not been carried out by either party. However, according to KfW’s latest progress report, evaluations of the program carried out by the World Bank do point out the most relevant impacts achieved by the program. These include a general improvement of living conditions through increasing the reliability and quality of lighting (and other appliances): improved lighting extends the time of day which is available for education/learning as well as household and productive activities and operation of radios, TV sets, and charging of mobile phones allows for an improved acces to information. Furthermore, the replacement of traditional lamps through SHS leads to a reduction of health hazards as well as environmental damages.

**Multisector, Interdisciplinary, Multistakeholder Approaches and Partnerships**

IDCOL’s SHS program involves a very large number of different stakeholders from various sectors. These include a total of 47 POs, numerous manufacturers of SHS equipment, recycling companies for used batteries, as well as a number of international donors. Coordination of the respective stakeholder contributions within the Operations Committee of IDCOL’s SHS program has been essential to managing such a complex initiative.

**Use of Evidence to Inform Experimentation, Learn, Adapt, and Measure Results**

Both IDCOL and KfW carried out extensive monitoring activities throughout the course of the program, the results of which triggered the implementation of measures for improvement. An example would be the monitoring of collection efficiency achieved by the POs resulting in workshops on credit risk mitigation techniques. Continued monitoring showed that the taken measures had effect and that collection efficiency could be improved. This procedure of measuring, taking action, and measuring again was also followed in the field of technical performance of the SHS where improvements could also be achieved. However, the experience from IDCOL’s SHS program shows that such learning processes can be lengthy and that improvements often only occur step by step.

**Change Management, Leadership, and Learning from Practitioners**

Previous to IDCOL’s SHS program, Bangladesh’s electrification efforts (together with financial and technical support of numerous donor institutions) focused primarily on grid extensions. However, it eventually became clear that for at least 30 percent of the rural population the costs of grid extensions would be prohibitive and that this part of the population would be left out. The realization of this situation triggered a decisive change in thinking which led to considerable efforts to promote off-grid solutions through SHS. IDCOL’s SHS program was initially launched under the Rural Electrification and Renewable Energy Development Project (REREDP) funded by the World Bank and the GEF, who thereby played a leading role in this change process.

**Being Adaptive, Flexible, and Iterative When Implementing Solutions**

The program has needed to adapt flexibly to a changing environment on several occasions and being able to do so has been an important factor for its success. Above all, it was necessary to react to a demand for SHS that exceeded all expectations. This led to a ramp-up of human resources and significant increase in the number of POs as well as support to local manufacturing and assembly of components due to a temporary lack of supply. Another significant change in the program’s environment is the creation of an unregulated parallel market for SHS, which has triggered actions by IDCOL in order to enforce quality standards also outside of its SHS program.
KfW has been helping the German federal government achieve its goals with respect to development policy and international development cooperation for more than 50 years. KfW’s role in the field of German development cooperation is that of an experienced bank and an institution specializing in development policy. On behalf of the German federal government, primarily the Federal Ministry for Economic Cooperation and Development (BMZ), KfW promotes and supports programs and projects that mainly involve state actors in developing and emerging economies—from their conception and execution through to monitoring their success.

To get closer to projects and programs in partner countries, KfW has regional offices in almost 70 countries in addition to offices in Frankfurt, Berlin, and Brussels.

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