12-month Progress Report #2
January – December 2017

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Prepared by Palladium - Managing Contractor for 3i
Working draft for comment by Program Board members
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ACRONYMS AND ABBREVIATIONS

3i  Investing in Infrastructure Cambodia
ADB  Asian Development Bank
AFD  L’Agence Française de Développement (French Development Agency)
AU  Australian Dollars
AWP  Annual Work Plan
CDC  Council for Development of Cambodia
DFAT  Department of Foreign Affairs and Trade
EdC  Electricité du Cambodge
EMS  Environmental Management System
EOI  Expression of Interest
FCS  Fraud Control Strategy
FOM  Financial Operations Manual
FTB  Foreign Trade Bank of Cambodia
HR  Human resources
ICT  Information communications technology
IFC  International Finance Corporation
ITAG  Infrastructure Technical Advisory Group
KWSH  Khmer Water Supply Holdings
LTA  Long Term Advisor
MEF  Ministry of Economics and Finance
MIH  Ministry of Industry and Handicraft
MME  Ministry of Mines and Energy
MIS  Management information system
MW  Mega watt
OC  Oversight Committee
PCL  Palladium Cambodia Ltd
PPA  Power Purchasing Agreement
PWSP  Piped water service provider
REE  Rural Electricity Enterprise
RGC  Royal Government of Cambodia
ROI  Return on investment
STA  Short Term Advisor
USD  United States Dollars
UXO  Unexploded Ordinance
WHS  Workplace health and safety
EXECUTIVE SUMMARY

The Investing in Infrastructure program (3i) is half way through its 5-year duration. 3i’s systems are well established and the program has been able offer private utility companies effective incentives to invest in company startups or expansions that otherwise would not happen. 3i’s offer to finance investment viability gaps are in demand by rural electricity distribution companies that need to expand to otherwise non-viable remote villages. Demand from potable water companies is even larger. At the present pace, 3i is likely to achieve its final targets and allocate its full investment budget ahead of the project end date.

The unexpected high demand from 3i’s initial two priority sectors influenced the decision not to engage in other sectors such as solid waste recycling and water transportation. In Modality 2, 3i was successful in initiating a few projects where 3rd party funding contributed to the investment in utility companies. The future potential is however limited.

A program board decision early in the program to support less well established potable water companies has had a major impact on the type and intensity of the support offered. From initial beginnings as a relatively hands-off grant program, 3i now offers a full package of support that include full designs and trainings. Other key outcomes from this reporting period are summarized below.

10 out of 15 outputs were achieved, with 4 out of the 5 remaining outputs partially completed. Only 1 output was not completed (output 2.1 indicator 2) due to an over-estimation of the number of contracts to be signed in 2017. Lessons from these results have been reflected back into the planned activities for 2018.

3i has leveraged USD 16.01 million in private sector investment with committed grant funds of half that amount.

3i continued to support MIH in competitively tendering new sites in 2017. With support from 3i, six of MIH’s tenders have been released in three rounds during the reporting period. Two rounds of funding for the Direct Permit intervention area were released during the reporting period.

15 contracts for greenfield projects were signed during the reporting period. 6 of them were supported through competitive intervention area while the rest are through Direct Permit.

As a result of lessons learnt from close interaction with the market during 2017, 3i made a number of small and medium adjustments to its offer to increase efficiency and effectiveness. Adjustments to the funding criteria and grant calculation from one round to another and an update to the financial model are examples of these.
The mapping exercise 3i had agreed to conduct for MIH has been finalized and the result was submitted to MIH for comments. The mapping document can assist MIH in its task of regulating the sector and in planning for further support. Support to the Cambodian Water Association (CWA) and capacity building activities for PWSPs were also implemented during the reporting period.

The program conducted a detailed external gender assessment. It improved its overall monitoring system and started the implementation of a workplace safety training for operators and construction staff.

3i assessed the potential risk of land mines and UXO’s and built a safety system around this. Risk assessments were made on 54 sites. 44 of them are rated as acceptable risk level. For the other 10 sites, 3i has commissioned Halo Trust to conduct non-technical survey and/or technical survey.

Interest from Rural Electricity Enterprises (REEs) for network expansion grant electricity expansion intervention area has increased. However, company demand for support for household connection subsidy remained low. Therefore, 3i is unlikely to continue providing support in electricity connection subsidy for efficiency purpose.

Actual grant disbursement is low compared to the total fund committed. However, at the end of the reporting period, it started picking up as the result of the end of the prolonged rainy season.

After two years of implementation, the risks have shifted and reduced. 3i has proven that the concept is viable with support from the RGC. There is sufficient interest from companies, and 3i has been able to turn this interest into viable opportunities for support that meet the test of additionality.

Physical connections started to emerge for a few projects where there was some existing infrastructure. However, connections for the majority of the projects, especially for piped water infrastructure in which the construction is in general slower than electricity projects, are expected start in the next 12-24 months. 3i will develop a system to monitor actual connections over time, independent of company self-reporting.

3i tested interest amongst recycling and water transportation companies for a grant as an incentive to make investments they otherwise would not do. Interest among water transportation companies was low, but there was clear interest from recycling companies in subsidy-based support.

Modality 2 activities focused on a pilot funding round for medium size solar investments and an investment platform with a large piped water company. The pilot solar round allowed 3i to develop robust market intelligence and sector knowledge. However clarity in the rapidly evolving policy and regulatory environment is needed before further 3i interventions are considered. Limited opportunities for modality 2 investments will prompt 3i to scale back focus on this area in 2018.
1. Introduction

1.1. Strategic overview

On 23 March 2017 the Program Board approved the annual work plan in a board meeting, chaired by DFAT and the Council for Development of Cambodia (CDC) and attended by officials from the Ministry of Industry and Handicrafts (MIH), Ministry of Mines and Energy (MME) and Ministry of Economy and Finance (MEF). The proposed Annual Work Plan 2017 focus was the continuation of support to piped water and electricity companies, expecting to commit approximately USD 6 million in 2017 and disburse USD 3.36 million. The Board also approved pilot activities in waste recycling, water transportation and to focus Modality 2 activities on solar energy generation. The Board requested the program consider pro-poor connection subsidies for piped water users and stressed the importance of continued close collaboration with the Royal Government of Cambodia (RGC).

This 12-month report lists progress against the Annual Work Plan 2017.

While 2015 and 2016 were foundational years for establishing 3i’s systems and testing offers to the market, 2017 was the first fully operational year for the program. During the year, it became clear that opportunities to sustainably increase Cambodian households’ access to basic infrastructure that would not have otherwise materialized, was higher than initially thought. Projections based on informed assumptions and signals from early funding rounds demonstrated that demand for investment subsidy funding is significantly more than the amount made available through 3i.

In less than two and a half years, 3i has been able to leverage USD 16.01 million in private sector investment with committed grant funds of half that amount. Projecting forward, if the current pipeline of projects materialise, 3i expects that the total committed funds would double, to reach approximately USD 18 million by the end of 2018, providing increased access for potentially 290,000 Cambodian households or 1,305,000 people to piped treated water and grid electricity. This has implications for the program towards the end of 2018. While realising that not all committed funds will be disbursed due to project cancellation and delays, 3i can only make commitments up to the current investment budget ceiling of USD 19 million. Under its current funding scenario, 3i would need to cease signing contracts before the end of 2018 and move into ‘monitoring only’ mode.

The infrastructure Technical Advisory Group (iTAG) conducted their review mission in October 2017, where the latest insights into the potential scope of 3i and options for expansion of the program were shared. The review team reflected positively on the program’s progress and made 10 recommendations for consideration by DFAT and the Program Board. This included a recommendation to increase the program’s budget and duration.
3i remains the largest Cambodia-specific program offering viability gap financing to infrastructure companies. French NGO GRET’s support (part-funded by DFAT through the Civil Society WASH fund) to companies is focused on offering household connection subsidies although has provided some past support for competitive tendering processes. The French Development Agency (AFD) continues to support the Foreign Trade Bank of Cambodia (FTB) to offer low-interest loans to water companies. A new USAID program called WashFIN will aim to support PWSPs to access finance. A proposed World Bank program with a similar approach to 3i has required further design work. The only area where 3i now offers similar support is in offering connection subsidies for low-income households.

With the program taking shape, 3i has started to invest in media activities. A website is now fully operational and 3i has prepared several social media stories for DFAT.

DFAT and 3i are still closely calibrating 3i’s activities with DFAT’s country program objectives. The main focus was around the future scope for the program, on engagement with partner ministries and on risk. While there was some slowing of government processes in the lead up to the 2017 Commune elections, this did not significantly impact on achievement of project outputs. A similar slowdown in engagement with government is possible in mid-2018.

Major shocks in Cambodia’s economy are unlikely, but new regulations could influence the program; a further reduction in tariffs could make investments in piped water or electricity less attractive. This would not threaten 3i’s ability to support companies, but could see grant sizes increase, wherein lowering possible household connections. A large and unexpected reduction in tariffs would likely lead existing operators to request compensation from the Government of Cambodia if the terms of their licenses were changed. This could in turn increase government’s public fiscal liabilities.

### 1.2. Scope, objectives and structure of the report

This 12-monthly Progress Report has been prepared to comply with the Head Contract #71035 between the Department of Foreign Affairs and Trade (DFAT) and Palladium.

The objectives of this report are to:

- Assess progress with program implementation against the 2017 AWP
- Identify issues and risks having implications across the program
- Fully comply with Head Contract requirements
- Act as an important repository of program knowledge, activity and achievements and identification of lessons to be learned
- Provide a strategic outlook of activities to be undertaken in the next 12-month reporting period
- Analyse program finances for the reporting period

The report is structured as follows:

- Section 2 describes general activity and implementation progress against the outputs
Section 3 discusses the key lessons to be learned from the past 12-months

Section 4 describes activity arising from program management, administration and operations

Section 5 provides an analysis of program budget and expenditure for the reporting period

Section 6 looks back over the reporting period and reports on the main risks faced by the program, and the risk mitigation measures that were undertaken. The section also looks ahead to the next 12-months and identifies the major risks

Section 7 looks ahead and identifies the major work activities for the forthcoming 12-months

2. Implementation progress against Annual Work Plan 2017

3i’s progress over the reporting period will be reported against outcomes and outputs in the 2017 Annual Work Plan (Table 1).

Table 1: 3i’s Indicative Outcomes and Outputs for 2017 (without budget and impact targets)

<table>
<thead>
<tr>
<th>Outcome (dark grey rows) / Outputs</th>
<th>Activities / output indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. INCREASED ACCESS TO PIPE TREATED WATER FOR HOUSEHOLDS AND BUSINESSES</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1.1 Tendered / green field sites</strong></td>
<td></td>
</tr>
<tr>
<td>Tenders initiated in 2016, to be finalised in 2017</td>
<td>* Contracts negotiated and signed</td>
</tr>
<tr>
<td>* Progress monitored</td>
<td></td>
</tr>
<tr>
<td>* Technical support provided</td>
<td>3</td>
</tr>
<tr>
<td>Sites to be initiated in 2017 (greenfield sites) consisting of a) new competitive tenders to be released, or, b) support to direct permitted sites</td>
<td>* Sites assessed and selected</td>
</tr>
<tr>
<td>* Feasibility studies conducted and approved by MIH</td>
<td></td>
</tr>
<tr>
<td>* Environmental assessments conducted</td>
<td></td>
</tr>
<tr>
<td>* EOI released and meetings organised</td>
<td>22</td>
</tr>
<tr>
<td>* Requests for EOI launched</td>
<td></td>
</tr>
<tr>
<td>* Feasibility studies conducted</td>
<td></td>
</tr>
<tr>
<td>* Environmental and due diligence assessments conducted</td>
<td></td>
</tr>
<tr>
<td>Estimated new contracts to be signed in 2017</td>
<td>* Proposals approved by the Oversight Committee (OC)</td>
</tr>
<tr>
<td>* Contracts negotiated and signed</td>
<td></td>
</tr>
<tr>
<td>* Technical support provided</td>
<td></td>
</tr>
<tr>
<td>* Progress monitored</td>
<td>20</td>
</tr>
<tr>
<td><strong>1.2 Direct permit sites (existing companies)</strong></td>
<td></td>
</tr>
<tr>
<td>Verifying and making payments against</td>
<td>* Technical support provided</td>
</tr>
</tbody>
</table>
### Outcome (dark grey rows) / Outputs | Activities / output indicators | Number of Companies
--- | --- | ---
contracts signed in 2016 | * Progress monitored | 
New contracts to be signed in 2017 | * Second round of EOI processed  
* Sites visited and indicative offers submitted  
* Interested companies supported with feasibility study  
* Environmental assessments and due diligence checks conducted.  
* Approval obtained from OC (and DFAT)  
* Contracts negotiated and signed  
* Progress monitored  
* Technical support provided | 12

1.3 Site mapping
Assessment for 306 sites submitted to MIH | * All sites with potential visited and assessed | 

### 2. INCREASED ACCESS TO ENERGY FOR HOUSEHOLDS AND BUSINESSES

2.1 Expansion grants
Verifying and making payments against contracts signed in 2016 | * Progress monitored  
* Invoices checked and processed | 1
New contracts to be signed in 2017 | * All EOI processed  
* Investment plans assessed  
* Environmental assessments and DD checks conducted  
* Recommendation from OC obtained  
* Contracts signed, progress monitored | 8

2.2 Connection grants
Verifying and making payments against contracts signed in 2016 | * Progress monitored  
* Invoices checked and processed  
* Extension considered | 4
New contracts signed in 2017 | * All EOI processed  
* Environmental assessments and DD checks conducted  
* Recommendation from OC obtained  
* Contracts signed, progress monitored. | 10

### 3. NEW AND IMPROVED OPPORTUNITIES FOR TRADE-RELATED BUSINESSES AND INDUSTRIES (Modalities 2 and 3)
Support to investments | * Assessments for investments conducted  
* EOI launched for green electricity generation  
* Environmental assessments and due diligence conducted.  
* OC and DFAT approval obtained | 3
A progress report is provided for each output and output indicator, along with an assessment of whether the specified target has been met or not. This assessment uses a ‘traffic light’ system whereby completion status is rated as follows:

<table>
<thead>
<tr>
<th>Completion status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green</strong></td>
<td>Output was completed by due date or progress is on-track to be completed by the due date</td>
</tr>
<tr>
<td><strong>Orange</strong></td>
<td>As at due date of 31 December 2017: the output is partially completed, or for outputs having a due date beyond the current reporting period (ie. into 2018 as per the 2017 AWP), progress is lagging and some risks exist that the indicator will not be met by the due date.</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>Output was not completed by the due date or progress is well behind or not started; where the due date is outside the reporting period (31 December 2017), significant risks exist that the indicator will not be met.</td>
</tr>
</tbody>
</table>
2.1. Outcome 1: increased access to piped treated water for households and businesses

a) External development

3i’s support in the piped water sector continues to be well aligned with the RGC’s development priorities considering the significant gap between its target of 100% coverage of all Cambodian households by 2025 and the current coverage of around 30% in mid-2017.

In May 2017, prior to the Commune elections, a new tariff policy was brought into effect. The policy defines three levels of tariff for three different ranges of consumption:

- 0-3 m³: tariff is to be charged at the cost of production.
- 4-9 m³: tariff is to be charged to allow 15% profit margin per m³.
- 10 m³ and above: tariff is to be charged to allow higher profit margin per m³.

No tariff variation was set for wet and dry seasons and the policy applies for both public and private piped water operators. The new scheme affects piped water supply providers (PWSPs) differently depending on number of households consuming less than 4 m³ per month in their areas. Given MIH’s limitation in enforcing the policy, some PWSPs were observed to be still charging their current tariffs. However, the pressure from the government to enforce the policy may intensify over time. 3i will continue to closely monitor the tariff trend.

Some changes attributable to the work of development partners active in the piped water sector were also noticeable during this reporting period. WashFIN, a new program funded by USAID and designed to help the PWSPs get access to finance, started its operation in the second half of 2017. Meanwhile, AFD, the French organization that has been providing subsidized loans to PWSPs through Foreign Trade Bank (FTB), is designing its second phase expected to start in 2018. The World Bank’s global Water Sanitation Program (WSP), once an active development partner supporting MIH, was closed as a separate entity of the World Bank. In this changing context it is necessary for 3i to gather a good understanding of the active development partners to identify possible synergies and additional support needed in the sector, as well as to avoid unnecessary overlap. A development partner consultation hosted by 3i is planned in early 2018.

b) Overall Activities and Achievements

3i has continued work in the two major intervention areas initiated in 2016, including supporting PWSPs through direct and competitive permitting processes. The financial and technical support processes in the two intervention areas have also remained largely the same as in 2016. This work has both induced private sector investment in unviable areas and ensured investments are in line with requirements of the Cambodian Government, DFAT and Palladium. Lessons from each round of funding were captured and used to refine the scope and eligibility requirements of new funding rounds.

The mapping exercise 3i agreed to conduct for MIH has been finalized and the result was
submitted to MIH for comments. The mapping document can assist MIH in its task of regulating the sector and in planning for further support. Support to the Cambodian Water Association (CWA) and capacity building activities for PWSPs were also implemented during the reporting period. Details on these activities can be found at the end of this section.

2.1.1. Output 1.1: Tendered / greenfield sites

a) Progress against output

3i continued to support MIH in tendering new sites in 2017, considering that the intervention is one of MIH’s priorities. With support from 3i, six of MIH’s tenders have been released in three rounds during the reporting period. Offering a grant that reduces the payback period to seven years was considered as sufficient for the first three pilot tenders initiated in 2016 where 3, 3 and 4 companies respectively submitted a bid. Therefore, 3i used the same grant calculation method for the six sites. However, only three out of the six tenders succeeded with winners selected while the other three either did not receive complete bidding proposals or no bidder at all. Several lessons learnt were drawn and improvements to the future tender will be made. These are discussed in the next section. Four more tender packages, which have been incorporated with lessons learnt from previous rounds, are under preparation and expected to be launched in early 2018.

Progress with competitively tendered sites continues to be slow compared to Direct Permit intervention areas. 3i will continue to prepare a sufficient number of new tender packages and will immediately commence a new tender after the previous one is completed. Since each tender process takes time, blocking too many sites for tender can limit the potential investment in those sites through the direct permit process. Another benefit of this approach is that failed bidders may bid for the next tender. Releasing lots of tenders at the same time can pose a risk that there will be no bidders for some tenders.

3i’s support to establish piped water infrastructure in green field sites was also done through direct permit interventions. Among the 87 Expressions of Interest (EOI) for grants in direct permit funding round two and three, 38 eligible requests could be considered green field sites.

b) Lessons learnt and improvements for support to greenfield sites

Following three pilot tenders in 2016, some tender procedures were adjusted to increase the robustness and confidence of the tender process, ensure transparency to guard against potential irregularities and respond to the new tariff policy. In the initial procedure, the financial proposal was not opened during the bid opening. This procedure was made to ensure that the financial proposal of each bidder would not influence the judgment of the evaluators on the technical proposal that needs to be evaluated first. However, interested bidders requested that at least the financial proposal on the tariff and other fees proposed by each bidder should be opened during the bid opening to increase the transparency of the bidding process. After discussion with 3i and considering that most parts of the technical proposal can be judged objectively using the clear technical guidelines developed by MIH, MIH agreed to adjust the procedure accordingly.
Some parties expressed concerns to 3i about the length of the pilot tender processes. In response, MIH and 3i discussed a number of solutions. It was agreed that the initial evaluation from 3i of each proposal would be shared to all bidders to enable them to comment.

3i’s initial evaluation and the bidder comments on the evaluation would be then submitted to the representatives of the evaluation committee for evaluation. This additional step was applied successfully in the three tenders in Kampong Thom province.

In response to the change in tariff policy, the new tenders that 3i supports also apply the new tariff scheme. In the tender, there is a fixed tariff for 0-3 m³ that the bid winner must charge. Tariffs in the range higher than the fixed tariff are then considered during bidding (for consumption above 4m³).

It was observed that MIH staff who are responsible for tender activities have proactively taken on more responsibility in tender processes, and have been able to better resolve issues and document processes. As a result, the tender process has become smoother as MIH staff have become more familiar with the process and have increased capacity.

Though providing a grant to bring back the payback period to 7 years was considered enough for the first three pilot tenders initiated in 2017, an internal review process conducted by the 3i team in August 2017 (Annex 4) concluded that additional factors need to be considered in order to determine that the grant is sufficient to attract investors. The grant for the six tendered sites in Kandal, Kampong Thom and Battambang attracted a maximum of two bidders per site. It was concluded that while 7 years should be the maximum period for the investor’s return on investment for tendered sites, concentrations of existing PWSPs in an area can also be a factor for determining the investment appetite of a PWSP. During the tender processes in Kampong Thom, the distance of the tender sites from their existing service areas was one of the main limiting factors for PWSPs’ interest to bid, due to the difficulty in managing multiple infrastructure sites that are geographically separate. Availability of the source water is also another factor cited to limit interest. PWSPs have less appetite to invest in areas where ponds are proposed as the water source. It was agreed that for tender sites in provinces where there are not many existing licensed PWSPs around, the payback period for grant calculation will be brought back to 6 years. Similar considerations will be also made for sites where ponds are proposed as the water source.

While fairness of the process and sufficiency of the grant were among the key factors for the success of site tendering, some little and additional efforts on communication were also found to play a key role. Misunderstanding on the requirement for a bank guarantee, limited awareness of the possibility to expand service areas with more support from 3i and timeliness of the information provision were other factors limiting the number of proposals. 3i will create a list of all issues found and build a system around it to make sure previous misunderstandings are addressed in the new tender rounds.
### Table 2: Progress status against output indicators for output 1, outcome 1 Tendered / Greenfield

<table>
<thead>
<tr>
<th>Output indicators</th>
<th>Achievement/Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenders initiated in 2016, to be finalized in 2017</td>
<td>3/3 companies</td>
<td>After MIH made the official announcement of the winners of the three tenders, 3i conducted full due diligence checks of the three winners and got the approvals to proceed from the OC. There is no change in technical design for the two tenders of Kampong Os and Prek Chrey communes while the PWSP who won Prek Russey commune requested to expand the infrastructure to cover two additional neighboring communes. The offer was amended and approved by the OC and DFAT. Construction on the three sites are making good progress.</td>
<td>Yes</td>
</tr>
<tr>
<td>Sites to be initiated in 2017 (greenfield sites) consisting of new competitive tenders to be released; or support to direct permit sites</td>
<td>44/22 sites/companies</td>
<td>Six sites in Kandal, Kampong Thom, and Battambang were tendered. The tender for one site in Kandal was cancelled after receiving no complete proposals and MIH decided to put the site through a direct permitting process instead. MIH is preparing to retender the two sites in Battambang after receiving no interested bidders in the first attempt. 3 contracts with the winners of the three sites tendered in Kampong Thom were signed by the end of 2017. 10 eligible greenfield sites from Direct Permit round two have been prepared for full feasibility studies. The 3i team conducted initial feasibility studies for another 28 eligible greenfield sites from Direct Permit round three.</td>
<td>Yes</td>
</tr>
<tr>
<td>Signing new contracts in 2017</td>
<td>13/20 companies</td>
<td>Only 13 contracts for greenfield projects were signed during the reporting period. 6 of them were supported through competitive intervention area while the rest are through Direct Permit. The total grant funds committed for the 15 contracts is 3,605,188 while 54,960 was disbursed by the end of 2017.</td>
<td>Some delays</td>
</tr>
</tbody>
</table>
2.1.2. Output 1.2 Direct permit sites (existing companies)

a) Progress against output

Two rounds of funding for the Direct Permit intervention area were released during the reporting period. Process, eligibility criteria and the method of grant calculation of each round were adjusted to increase the program’s efficiency and additionality, respond to market price changes, increase consistency of support between each project and to ensure the number expressions of interest for each round was manageable.

From the first to the second round, the following criteria and processes were changed:

- The minimum number of household for each project was increased from 300 to 800.
- PWSPs who got approval from the respective Commune Chief by the time the EOI was released were also eligible to apply, while in the first round, the PWSPs had to have invested to some extent already.
- While in the first round 3i communicated the opportunity to the PWSPs in the list made by MIH, the call for EOI for the second round was announced publicly.
- While other criteria were changed to increase the number of eligible applications, the criterion that the applicants must not have licenses in other service areas was kept to ensure the potential EOs is in the range that is manageable by 3i.

The number of EOIs increased from 15 in the first round to 40 in the second round of funding. In addition, the companies in the second round had more capital to invest and were considering larger investments. While the average size of the grant in the first round was USD 100,000, the average grant expected in the second round is USD 250,000 with some grants exceeding USD 700,000 in value. Slightly smaller investments are expected for applications from the third round of funding. These results have demonstrated that the potential for piped water sector for 3i is much larger than projected at the beginning of the program.

Prior to launching the third round of funding for the Direct Permit intervention area, an extensive internal review among the 3i team was conducted to draw lessons learnt for the program’s two largest sectors – piped water and electricity. The lessons learned for Direct Permitting, as well as for the program as a whole, can be found in Section 3.

In addition to incorporating the lessons drawn from this exercise, extensive market research was conducted. The following changes were made between the second and third rounds:

- The size of households in the service area must be between 1,000 and 10,000.
- The eligible PWSPs may be licensed in another area but geographic restrictions were introduced requiring that the proposed service areas be located only in the six provinces of Kandal, Kampong Speu, Kampong Chhnang, Takeo, Prey Veng, and Kampong Cham. While the number was limited by 3i for management purposes, the provinces were chosen in response to MIH’s request to give priority to areas around Phnom Penh.
• The maximum grant per household was reduced from 70 to 65 USD per household to reflect the lesson learnt that the grant can be reduced slightly and still trigger the private sector to invest.

• Some prices of input in the financial model were adjusted in respond to changes of market prices and standardized for each project to increase consistency of grant calculation.

• A payback period of 6 years was introduced instead of IRR 15% over five years. The change was made to make it easier for the PWSPs to understand the method of grant calculation.

There was a concern from MIH that small service areas would be excluded from the support. 3i will address this through a specific plan of support to small areas for the next round of funding. The exclusion was made due to the potentially different needs for support for smaller piped water infrastructures.

Out of the 87 EOIs submitted in the two rounds of funding, 24 were withdrawn during the reporting period for the following reasons:

• They were operating under a license held by someone else.
• They were licensed operators or had already received the 20-day announcement by MIH prior to the deadline.
• They wanted to work in an area where there are less than 800 or 1000 households.
• Their requested site was put for tender by MIH.
• They were licensed in another of the proposed service areas (for Direct Permit round two).
• They did not receive the Commune approval before the deadline.
• They decided to drop their request for support as they would like to be in a business other than piped water.
• They were the Commune Chief of the proposed service area giving rise to a potential conflict of interest.
• The proposed site was outside of the target provinces.
• The current production station of the proposed site belonged to the community creating an ownership issue.

Table 3: Progress status against output indicators for output 1.2, outcome 1

<table>
<thead>
<tr>
<th>Output 1.2 indicators</th>
<th>Achievement /Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verifying and making payments against contracts signed in 2016</td>
<td>5/5 companies</td>
<td>Two of the five projects were completed. Out of the USD 621,576 committed for the five projects, USD 308,438 have been disbursed by end of 2017. 2,276 actual connections were reported and 8 monitoring visits have been conducted so far.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
2.1.3. Output 1.3: Mapping sites to determine their potential for investment

a) Progress against output

The site mapping intervention was conducted to support MIH and provide information on sites that were potentially viable for piped treated water facilities, with or without an investment grant and to identify sites that have potential for tender by MIH. The main purpose of the study was to offer MIH an updated policy development tool. The study shows the total required investment and the need for investment grants. As it was a direct request by MIH, there is a good chance this tool will be used.

Initially, Provincial Departments of MIH collected a list of over 300 sites. 3i based their assessment on this list, but added some sites that it already assessed in the preparation for tendering. The method to assess each site contained two steps—a desktop review through Google Earth and a field visit.

In the first step, sites were assessed using Google Earth against five criteria to decide if the site had enough potential to justify a field visit. The five criteria were:

1. Availability of surface water
2. Number of households in the commune
3. Potential to combine two or more communes
4. Density of houses
5. Elevation within the commune

3i balanced these criteria to assess what sites should be visited. During the field visits information was validated and additional information was collected to determine commercial viability gaps. The information collected included:

1. Source of water source (quantity, quality and related issues)
2. Commune characteristics
3. Households’ standard of living and their current water consumption patterns
4. Information on existing operators.
For each visited site, the total investment cost and the return on investment (ROI) were estimated. The end report also gave an indication of the grant needed to make these sites investment-viable.

The mapping reports will also be a useful tool in assessing potential support for 3i, but not only for 3i. Other programs, in particular those in the water and sanitation sector, have requested the report. Another interesting application of the report could be for potential PSWPs. Several companies have already requested information on potential sites from 3i. To date 3i has shared the report only with MIH and DFAT. Further sharing of the report will be at MIH’s discretion, although 3i will encourage sharing to occur.

Table 4: Progress status against output indicators for output 3, outcome 1

<table>
<thead>
<tr>
<th>Output 3 indicators</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitting site assessment to MIH for comments.</td>
<td>Completed 3i conducted a desktop assessment of 313 communes and conducted field assessments of 120 communes. As a result, a report of 113 sites was developed and submitted to MIH.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

2.1.4. Other support provided under Outcome 1

a) Connection subsidy

In response to the Program Board’s request to speed up the connections of poor households to piped treated water 3i designed and implemented a connection subsidy scheme, commencing in August 2017. The subsidy constitutes an additional mechanism of support to PWSPs. Utilising the existing Ministry of Planning ID Poor system, 3i pays the PWSP USD 25 for each connection to poor households within their service area. In order to avoid fraud, the list of ID Poor households eligible for support is provided to the operators when signing the contract. In addition, 3i collaborates with Unicef which provides a connection subsidy in areas affected by arsenic, to avoid any overlap in support to ID Poor households.

By the end of 2017, 14 piped water contracts including the connection subsidy support were signed. Total grant funding of USD 238,900 has been committed for 9,556 ID Poor households. In addition to the ID Poor households, 3i has also committed grant funds for the full cost of connection to schools and health centers in the service areas of the PWSPs. The total grant funds committed so far is USD 4,260. Expenditure on this scheme is expected to be relatively small if the current active projects are representative of future ones. The scheme is still in a testing phase and is likely to need some modifications over time.

A monitoring procedure for the connection subsidy has been developed. However, it has not been tested yet since the PWSPs who have received this support are still constructing the infrastructure. Adjustments to the procedures are expected when they are operationalized.
b) **Training to PWSPs**

In the second half of 2017 the first six PWSPs completed training provided by the Cambodian Water Association (CWA) through the 3i Water Operator Capacity Development initiative. The training was designed to build the capacity of PWSPs to effectively and efficiently operate their piped water infrastructure and supply clean water to their customers.

The training comprised both technical and business management aspects of operating piped water infrastructure and was delivered both in class and onsite. Some specific aspects of the training include optimal pump choice and operation, effective backwash system, testing and controlling water quality, customer service, billing system and taxation. Positive feedback was received from PWSPs on the usefulness and relevance of the training, including the ability to learn from their peers. Early outcomes from the training include that some operators have upgraded their metering system, while others are planning to. Overall, the PWSPs commented that the training responded to their needs.

Building on the success of the initial capacity building activity, in late 2017 3i publicly tendered for a new training provider. One proposal was received from CWA. It’s expected that up to 40 PWSP’s will participate in this next round of training which will commence in early 2018 with an orientation workshop held in Phnom Penh.

**Lessons learnt and improvements for PWSPs training**

Despite the trainees’ reported satisfaction, it was noted that there were different levels of knowledge absorption among the operators, due to the differing levels of sophistication of their existing piped water systems. This caused some trainees to struggle more than others to catch up with the content of the training. Long distance travelling was also a factor leading to some PWSPs missing parts of the training. 3i will incorporate these lessons learnt in the next round of trainings by grouping the trainees geographically and working with CWA to ensure that more attention is provided to operators with less sophisticated systems and those travelling longer distances.

Significant efficiencies have also been gained in terms of the average cost per operator through negotiations conducted by the procurement team, ensuring good value for money. The average cost per operator has reduced from USD 3,150 in 2017 to USD 2,081 in 2018, through a combination of economies of scale and adjustments to the costs proposed by CWA for the 2018 training; an average of USD 3,600 per operator. Adjustments included reducing the length of the reflection workshop which was unnecessarily increased, more optimal geographic grouping of onsite coaching sessions to reduce inefficiencies in travel and staff time and removal of costs for accounting software licenses which were deemed ineffective due to a lack of take-up by operators. In addition, payment milestones will no longer be a fixed fee, but will be expected to vary based on the number of trainees attending each session.
c) Water Conference and Exhibition and Booklet Printing

Commercial viability of rural piped-treated water infrastructure investments has been largely affected by non-optimal tariff policy implementation and a lack of coordination between relevant ministries, especially the Ministry of Industry and Handicraft (MIH) and the Ministry of Public Work and Transportation (MPWT), which has resulted in unnecessary destruction of pipe network during road construction. These two issues were brought up for discussion by relevant stakeholders at the national level through the Cambodian Water Conference and Exhibition 2017, arranged by MIH with assistance from CWA in November 2017.

Considering its relevance to the development of the piped water sector and as a specific request by MIH, 3i provided a financial contribution through CWA to materialize the event. The conference was also an information sharing channel for the RGC’s strategic plan and allowed collaboration on a range of key issues including sharing experiences of other development partners, providing information on available financing opportunities for PWSPs, new technology and products, etc. 200 people attended including participants from government institutions (MIH, MRD, MoEYS, MoE, MoWA, and MPWT), development partners, PWSPs, researchers, university students, supplier companies and financial institutions.

3i also supported MIH and CWA to print a Business Directory and booklet to raise awareness on water quality and tariffs. 3i’s work with existing unlicensed piped water operators has shown that many piped water operators have had their piped water stations built non-optimally by non-expert builders. The Business Directory is expected to help the PWSPs in sourcing quality and price-competitive services and products.

On the water demand side, potential water consumers are always unaware of how a water tariff is set and why different areas should be charged with different tariffs. The reluctance of consumers to pay for water has also contributed to the investment risks of water infrastructure. The booklet provides potential rural water consumers with general knowledge of the benefits of clean water, the process of water treatment, what one cubic meter of clean water means, and thus how a water tariff is set. It is hoped that this will help motivate rural water users to connect and use clean water and to encourage their acceptance of the water tariff.

At least 1500 copies of the books were printed and distributed to attendants of the conferences, especially PWSPs and MIH. 3i’s total contribution towards the conference and booklet printing was just under USD 15,000.

Lessons learnt and improvements for Water Conference and Exhibition and Booklet Printing

The discussions on tariff setting and coordination between relevant ministries were welcome, but could have been more robust. This is not completely unexpected given the sensitivity of the issue and other factors currently inhibiting public debate of governance issues.
However, awareness of the issues amongst the conference stakeholders has been heightened. Further improvement will require clear political will.

As part of output monitoring, though 3i could verify that they were really distributed to attendants of the conference for further distribution at local communities, the books were not used to their advantages since most of PWSPs have not used or distribute the books further and some do not even know the books were in the package provided in the conference. 3i will raise this issue with CWA and encourage more distributions of the booklets from PWSPs to their local community, especially the commune halls.

Despite the issue with the book distribution, lively interaction among PWSPs and the companies providing products and services for piped water infrastructure were observed. Some PWSPs used the opportunity to seek the experiences of their peers, strengthen relations, and publicly challenge MIH on licensing issues. Many PWSP’s also made informal arrangements to support each other with advice and guidance.

2.2. Outcome 2: Increased access to energy for households and businesses (Modality 1)

a) Electricity sector development

Based on a linear trend projection from 2009 to 2016, 80% of all villages are expected to be covered by the grid and 60% of households connected in 2017. Actual figures have yet to be released by the Electricity Authority of Cambodia (EAC). EAC projected that the coverage rate will increase to at least 90% by the end of 2018. The government’s current focus in electrifying Cambodian households has been on expanding the grid network. Household connections will be focused on only after full grid coverage has been achieved.

The grid network extension speed has remained high in parallel with pressure on Rural Electricity Enterprises (REEs) to expand. The government’s new tariff system of March 2016 has been implemented and the tariff reduction promised was materialized. Further reductions are likely.

2.2.1. Output 2.1 Expansion grants

a) Progress against output

3i observed that the requirement to expand to at least 10% of the total households in the first round of funding for expansion grant limited the interest and the ability of REEs to request support. Therefore the requirement was changed to an expansion of at least 1,000 households for the next rounds.

The third and fourth rounds of funding for the electricity network expansion were launched during this reporting period, one in June and the other in October with the same criteria but in different geographical locations. The adjustment of the requirement on household size has proved its effectiveness, as there was good interest from REEs in both rounds. Five and six
expressions of interest were submitted in the second and third rounds respectively.

The same basis for support - a fixed grant of USD 50 per additional potential connection if the cost per connection is higher than 175 and a cap on the support of USD 200,000 per contract, was used in the second (launched in late 2016) and third rounds. However, by learning that several of the companies would have expanded further if this cap had not been there and to achieve higher outreach, another grant calculation criterion was added to the fourth round. For investments where the cost per connection exceeds USD 225 per household, a grant of USD 70 per household will be provided. The total grant is capped at USD 250,000. As a result, applications with a higher investment cost per household were received in the third round.

Compared to support to water operators, there is no real need for technical support to REEs. Electricity expansion grants are, in this way, much closer to what was envisaged in the Program Design Document (PDD). Another interesting observation was the speed of implementation. All REE’s are licensed and have already installed a good part of their distribution network. Once the investment viability constraint has been overcome with a grant, the REE can often expand quickly.

In one or two cases, there were some indications that the operators might have continued with the expansion without our grant. However, there are also cases, especially in the fourth round of funding, that were either cancelled or were not moving forward and this was indicative of unattractive cost sharing from 3i. Despite these cases, the general reflection from the whole 3i team is that additionality in the electricity intervention is harder to demonstrate than in the piped water intervention.

b) Lessons learnt and improvements for electricity expansion

Detailed analysis of each electricity expansion project was conducted in mid-August 2017 with the aim to improve 3i’s adherence to its guiding principles. In general, it was concluded 3i is less sure that the investments supported would happen by themselves in a few years’ time. However, the offer is effective and working and as such does not need adjustment. 3i has and will respond to this realization by keeping the electricity portfolio smaller than the piped water portfolio, making some improvements on pre-screening of intention to invest.

Table 5: Progress status against output indicators for output 1, outcome 2

<table>
<thead>
<tr>
<th>Output 2.1 indicators</th>
<th>Achievement /Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verifying and making payments against contracts signed in 2016</td>
<td>1/1 company</td>
<td>It was confirmed that EDC proceeded with their plan to construct transmission lines for expansion in the area of the REE whom 3i signed the contract with. The REE, therefore, canceled the project with 3i.</td>
<td>Yes</td>
</tr>
<tr>
<td>Signing new contracts</td>
<td>8/8 contracts</td>
<td>8 contracts were signed during the reporting</td>
<td>Yes</td>
</tr>
</tbody>
</table>
2017

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
</table>
|  | period. Out of the total 1,248,190 USD fund committed, 41% has been disbursed by 2017.
|  | 19,778 households are expected to be connected under the 8 projects.
|  | 3 projects have completed their construction in less than a year and 6 monitoring visits have been conducted.
|  | 4 more contracts for expansion grants are expected to be signed in early 2018. |

### 2.2.2. Output 2.2: Provision of support to increase household connection

#### a) Progress against output

Two rounds of funding, the second and the third, were launched in 2017. As the REEs showed positive levels of interest in the first funding round, the criteria were therefore unchanged for the second round of funding. However, only two EOLs were submitted compared to four in the first round. Lessons from the monitoring of connection subsidy interventions, feedback from REEs when releasing the second round of funding and data from the longitudinal study helped explain the limited interest.

Some major adjustments to the funding criteria in the third round of funding were made as a result of the incorporation of these lessons learnt. The calculation of the connection trend (one of the eligibility criteria) of the REEs was calculated for only parts of the service area that have been covered in the network instead of the whole service area like rounds one and two. The changes were done to more accurately determine the connection trend.

For the third round, every connection to an ID Poor household will be provided with the grant of USD 45, unlike in round two where the REE had to achieve a certain number of connections before receiving the grant for every additional connection. The logic behind this change is that the ID Poor household connection trend is assumed to be zero in areas where less than 60% of total households are connected after being covered by the network for at least 3 years. Despite these efforts only 2 complete applications were submitted for the third round.

In addition to the resource-intensive nature of output monitoring for increased connections, the speed of the connection increase of REEs signing contracts with 3i is also very slow. Therefore, it is unlikely that 3i will issue more rounds of funding for the connection subsidy intervention area in 2018.
b) Lessons learnt and improvements

Theoretically, the counterfactual trend, only above which the REEs can get the grant per households of 45 USD, helps ensure additionality for 3i but poses a risk for the REE to introduce any incentive scheme to increase connection rates. They cannot know if the grant from 3i will sufficiently compensate them for their incentive scheme.

For some REEs, the maximum grant of USD 20,000 was not attractive enough for them to submit complete applications with all required documents.

By calculating the connection trend of the whole service area, the additionality argument is less effective as some REEs who have just expanded their network would have seen a large jump in the connections which is not caused by the connection subsidy scheme. Therefore, the third round considered only areas that have been covered for at least 3 years to calculate the connection trend. This is also expected to help increase the efficiency of 3i human resources during monitoring as there will be less need to travel around a large area to verify new connections.

REEs’ lists of customers are not always compiled in a way that makes the connection verification process easy for the monitoring team. Companies were sometimes unwilling or unable to share credible data. Counting only the connections to ID Poor households whose list is agreed upfront will help remove these issues.

Table 6: Progress status against output indicators for output 2, outcome 2

<table>
<thead>
<tr>
<th>Output 2.2 indicators</th>
<th>Achievement /Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verifying and making payments against contracts signed in 2016</td>
<td>4/4 companies in 2016</td>
<td>One of the four contracts with REEs from round 1 was cancelled since the REE submitted an incorrect list of new connections for verification and refused to resubmit the correct list. However, 16,785 USD was disbursed for two contracts for the actual connections of 373 connections. Since the rate of connection increase is slow and the duration of the contract of only one year, the two contracts were extended for one more year.</td>
<td>Yes</td>
</tr>
<tr>
<td>Signing new contracts in 2017</td>
<td>3/10 companies</td>
<td>Only 3 new contracts for connection subsidy were signed during the reporting period. Out of the USD 48,370 fund committed, USD 17,055 was disbursed. More disbursement is expected in 2018 but the amount is still expected to be low.</td>
<td>No</td>
</tr>
</tbody>
</table>
2.3. Outcome 3: New and improved opportunities for trade-related businesses and industries

a) Progress against output

The potential for stimulating 3rd party investments in water and electricity companies remains limited, except for investments in solar energy generation.

Both the piped water and electricity distribution sectors are fragmented with a large number of small companies. Institutional investors on the other hand are typically looking for larger investments of over USD 5 million with ROI requirements (typically) in excess of 20% annually. Even for impact investment funds, the typical size of individual operator companies 3i supports is too small and the ROI too low to be attractive.

Water

One water investment company has explored overcoming the issue of scale by creating a platform company to acquire a number of existing water operators. The company’s view is that this will allow it to reach the scale necessary to attract investment. Better management practices and economies of scale will also improve the ROI and lower the investment viability gap and having multiple operations will reduce overall risk. 3i has signed an agreement to support the company to bridge the investment viability gap to allow the company to raise capital from institutional investors. 3i support is expected to enable the company to raise up to USD 5 million in new capital. There may be an opportunity for 3i to expand support to the company to allow it to raise further funds for expansion in 2018/2019.

3i has also explored an opportunity to get additional funding for its activities from an international family foundation who is interested in supporting development of the water sector in Cambodia. The foundation eventually decided to pursue a strategy of providing loans to the sector instead of grants in order to be able to recycle some of its capital.

3i is also providing advisory support to structure and obtain a significant working capital line of credit for a company which manufactures HDPE pipes used in the construction of piped water distribution networks. The working capital facility will enable the pipe producer to provide credit purchases to its customers in the piped water sector, increasing the available credit for water operators available in the market beyond bank loans.

Finally, 3i has identified a provider of pre-built automatic water treatment stations which can provide treated water for smaller communities of 100-500 households where the scale is too small for traditional water treatment plant and associated operating costs to be economically viable. 3i will launch a pilot for this in early 2018 and further explore the opportunity to roll this out as a franchise model with a technology solution, financing and operating and maintenance services at a larger scale.
Electricity and solar energy

The main area where investors show interest and where companies are looking for investors is the solar energy market.

Cambodia has an estimated potential to develop 350 MW or more of solar generation capacity by 2020 based on reports. Opportunities for developing solar energy exist at multiple levels of the market.

Development of large scale solar farms are likely to be investment viable through support and concessional financing from development finance and clean energy institutions. However, in order to reach Cambodia’s full potential for solar energy, the lower tiers of the demand pyramid (illustrated above) also need to develop. At the current level of market development, investment into the lower tiers of the solar energy sector is still comparatively low due to a number of constraints. Many interested companies and investors still find the risks and uncertainties too high:

- High cost and/or lack of available financing
- Lacking economies of scale and very limited local supply capacity
- No track record with local private sector off-takers
- Benefits and risks of solar not well understood by in-market companies and investors
- Enabling environment

After the Program Board approved the proposed 3i activities in solar, the team initiated several work streams for the sub-sector:

- Feasibility studies were carried out with a 3rd party advisor for three potential solar project sites to gain a better understanding of the investment and electricity generation potential for solar at each site. The studies also provided 3i with up-to-date investment costings and allowed 3i to quantify the investment viability gap and propose a level of investment subsidy to bridge the investment viability gap.

- An extensive mapping of solar projects at various stages of development was carried out to understand market potential, and possible demand for 3i support. The mapping identified more than 25 solar projects in development in Cambodia which are progressing slowly due to limited investment viability, including due to regulatory uncertainty.

- The potential for supporting installation of village-based solar systems was explored in areas that are unlikely to be connected to the grid soon, (within five years or more). The team has carried out field visits to identified off-grid communes in Kampong Thom, Peah Vihear, Siem Reap and Koh Kong provinces, as well as island and fishing...
communities on King Island, Koh Rong Island and Koh Rong Samloem Island. It was concluded that support for village-based solar is not viable, due to the rapid expansion of the transmission grid, lower investment cost and greater investment viability of supporting grid connectivity for such communities and lack of potential partners.

- Investigation was conducted into the potential to install solar power to reduce the cost of electricity for piped water operators and ice making factories. The investigation identified a significant opportunity to support both solar for water operators and ice making factories. However, solar for water operators is at a much smaller scale and larger number of installations and it may therefore be better to support companies who can execute such projects instead of using significant 3i resources to support this opportunity.

- An EOI was launched for an investment subsidy support scheme for solar projects in Cambodia with sizes between 2 and 5 MW to create in-market proof-of-concept projects and validate the potential for solar in the country. The support scheme offered to provide support to bridge the investment viability gap for initial solar projects which meet the set 3i criteria. 3i received four responses to the EoI, two of which meet the 3i criteria. Both projects were approved by the Oversight Committee. During project development and inception, one of the approved projects was found not to have met 3i contractual requirements while the other remains under negotiation following a change to the investors’ original operational requirements.

3i’s exploration of opportunities in the solar sector has highlighted a number of potential investment barriers. While the government has opened the door for selected solar projects, a public strategy for development of decentralized generation in Cambodia is needed including a framework for net metering, a feed-in-tariff policy and other support measures. However, the government is expected to introduce a new regulation in early 2018 which will provide a framework to support rooftop and other solar for self-consumption. 3i research suggests that in the absence of a strong feed-in tariff policy, some form of subsidy (e.g. grants) may be needed to see this sector develop at meaningful scale and to introduce proof-of-concept installations to accelerate emergence of a self-sustaining industry.

Table 7: Progress status against output indicators for output 1, outcome 3

<table>
<thead>
<tr>
<th>Output 3 indicator</th>
<th>Achievement /Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signing new contracts in 2017</td>
<td>1/3</td>
<td>Three proposal packages were approved during the reporting period and one for piped water investment was turned to the contract. While one of two solar energy generation proposal was cancelled, the other remains under development.</td>
<td>No</td>
</tr>
</tbody>
</table>
2.4. Outcome 4: Piloting new sectors

The initial market scoping in recycling and water transportation sectors in 2016 provided good indications that there are potential opportunities for 3i to help increase economic growth in the waste recycling and water transportation sectors. According to the AWP 2017, 3i would pilot a few interventions in the two sectors to better understand the real potential before deciding to fully work in them.

The 3i team was able to identify several potential pilot interventions as the result of a deep dive market study in the two sectors. However, the decision on proceeding with the proposal development has been put on hold for several reasons below:

- The waste sector is complex and operators are reluctant to share full information. It would require a steep learning curve for 3i to become effective. The 2.5 years remaining on the program may not be sufficient.
- Support to recycling could produce impressive results if 3i would be able to match the scale of investments with sufficient funds. Under the present funding envelope, investing in recycling would displace more proven investments in the water sector.
- The recycling sector would require development of a number of safeguards. Environmental protections, workplace health and safety considerations and legal considerations were assessed to be relatively higher risk compared to water and energy distribution interventions.
- 3i expected initially that the nature of the investment would allow smaller one off assessments, but the opportunities that presented themselves raised too many doubts to develop simple, one-off solutions.

3i intentionally postponed the decision to seek more direction from the Scalability Review conducted in October, during which the scope of the program was thoroughly reviewed. However, it was decided that this decision to proceed would rather be brought to the Program Board during the Annual Work Plan meeting in early 2018.

Though no pilot interventions have been materialized during the reporting period, lots of useful information about the two sectors have been collected and recorded. It will serve as a good basis for the team to build on if provided with green light to proceed with the pilot projects.
2.4.1. Output 1: Assessing market opportunities

A full report on this output is included in the Six-monthly Progress Report January – June 2017. Please see that report for details.

Table 8: Progress status against output indicators for output 1, outcome 4

<table>
<thead>
<tr>
<th>Output 4 indicators</th>
<th>Achievement /Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub sectors assessed and recommendation for program board prepared</td>
<td>N/A</td>
<td>Three support packages to increase plastic pellets production in plastic waste recycling and general support for ferry upgrade in water transport were half way under preparation and put on hold for decision to proceed from the program board 2018.</td>
<td>Yes</td>
</tr>
<tr>
<td>Signing pilot contracts</td>
<td>0/2</td>
<td>No contract has been signed as decision to be active in the sector has been put on hold.</td>
<td>On hold for Board decision</td>
</tr>
</tbody>
</table>

2.5. Outcome 5: Studies and Analysis

Access to clean water and reliable electricity are part of the highest level development goals; (Sustainable Development Goals 6 and 7). As such the impact of connections does not need to be proven again by 3i. The iTAG confirmed this in their Scalability Review. Access to reliable electricity and clean water on households and businesses can lead to a wide range of positive impacts. It can improve health, stimulate education, reduce workloads, save costs and stimulate businesses. It can also stimulate investments in sanitation.

Both piped clean water and electricity are likely to improve, especially, opportunities for women. Piped clean water will reduce time spent on tasks specifically allocated to women and girls. Sanitation is more likely to be installed when water is available and reliable water and electricity will make it easier for female entrepreneurs in villages to combine business with care of the household and children.

All the positive impacts that will result from connections are too diverse and complex to capture in a simple quantitative survey. 3i has therefore developed a monitoring and impact assessment system with 3 components:

- 3i monitors progress in construction. 3i’s internal systems place high priority on additionality; a core principle of 3i that means changes are very unlikely to have happened without 3i.
- 3i monitors connections that have been achieved and will develop an evidence based future connection curve.
- 3i assesses a wide range of impacts on lives, family livelihoods and small companies in a variety of ways. Where available, 3i will use evidence from literature, combined with specific in-depth studies and quantitative surveys.

In 2017 3i laid foundations for some of these studies.

In 2018 3i will increase its efforts to communicate the benefits and lessons from its activities.
with a wider audience. Choices about what to monitor and to what extend will be mainly driven by 3i’s communication priorities.

2.5.1. **Output 1: Gender study**

During the reporting period, more efforts were channeled towards gender-focused activities in addition to the comprehensive global literature review on gender perspectives in piped water and electricity infrastructure and the incorporation of women’s perspective into the establishment of piped water projects.

An in-depth qualitative study on gender in the piped water and electricity infrastructures in Cambodia was completed in April 2017, as reported in the previous Progress Report (Jan-Jun 2017).

In addition to the study, the Scalability Review team also conducted further analysis of the program operations from a gender perspective along with verification of reported gender impacts during their field visits. The review team interviewed female beneficiaries, traders, PWSP, and 3i’s female staff. As revealed by the literature review and the gender qualitative study, women who are generally responsible for household chores, receive various benefits through being connected to piped water and grid electricity. More effort in capturing and communicating the positive impacts on women is recommended as the result of this finding.

The interview with 3i staff was structured to understand gender balance in the program itself and how the program’s work on gender can be improved from women’s perspectives. Half of 3i’s technical staff are female. Having women in decision making positions and the gender balance itself is expected to have a demonstration effect amongst relevant stakeholders such as the RGC which is largely male dominated.

The review team also provided additional recommendations on possible improvements to gender work in 3i’s operation. Though most companies working with 3i are family businesses where both the husband and wife are involved, this is not always reflected in the formal contract, as it’s normally men who sign. The recommendations by the review team include:

- That 3i consider having both men and women jointly sign the contract if the business is run by both.
- That the program may benefit from having a gender specialist looking at the program’s operation in more details and possibly develop a Women’s Economic Empowerment strategy.
- Collaborate with other development partners in working to improve household hygiene.

The review team also cautioned 3i not to lose focus on its core mandate, which is to increase access to piped water and electricity. The recommendations will be taken into consideration and incorporated in the Annual Work Plan 2018.

Refer to Annex 5 for 3i’s case study on its approach to gender.
Qualitative Gender Study

A full report on the Gender Study is included in the 6-monthly Progress Report January – June 2017. Please see that report for details.

Table 9: Progress status against output indicators for output 1, outcome 5

<table>
<thead>
<tr>
<th>Output 5 indicators</th>
<th>Achievement/Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalizing gender study</td>
<td>N/A</td>
<td>The study was conducted and final report submitted</td>
<td>Yes</td>
</tr>
</tbody>
</table>

2.5.2. Output 2: Impact baselines

To capture information on the program’s impacts, 3i has used both quantitative and qualitative tools. As planned in 2016, impact data collection for the two types of surveys were initiated and data analysis was also done. The quantitative surveys, which employed cross sectional and before-and-after methods are characterized with large sample sizes for both sectors and aim to quantify the typical potential impact on households subsequent to being connected to piped water and electricity. The qualitative surveys aim to understand how the impact occurs and to capture any qualitative impact that cannot be captured by the quantitative surveys.

In addition, the large quantitative survey was designed to capture impact only at the household level. The qualitative surveys, on the other hand, will also capture the impact of access to piped treated water and grid electricity on businesses and on the private investors 3i supports. Understanding how 3i’s grant affects the investment behaviors and performance of its partners such as construction speed, ability to operate, connection stimulation, etc. will not only help 3i improve its current operations but will also serve as a useful knowledge repository for future programs aiming to achieve similar goals.

For more details on 3i’s M&E system, refer to the case study in Annex 6.

2.5.2.1. Quantitative surveys

a) Method of the surveys

The quantitative surveys are comprised of cross-sectional and before-and-after methods. Data collection was outsourced to a large research company for in-house analysis by 3i staff.

The cross-sectional survey for piped water was conducted with a sample of 400 households in 8 locations and 5 provinces. The main criteria for selecting the locations was the primary alternative water sources that households are using, as this is one of the most important factors in determining the potential impact on households from access to piped water.
The before-and-after survey for piped water was also initiated at the same time in three other locations with a sample size of 630 households. The three locations are in three provinces and in the service areas of three piped water operators 3i is currently supporting.

The cross-sectional survey for electricity was also conducted at the same time. This survey had a sample size of 100 households and covered two locations in three provinces.

The electrified and non-electrified household groups in this comparison study are selected from locations close to each other to ensure that the two groups have similar characteristics. For the before-and-after comparison survey, the non-electrified households are also the baseline survey households, given that they will be electrified via 3i support at a later time.

The timeline for the mid- and end-line surveys for both sectors cannot be pre-determined at this point. It will be conducted immediately after a sufficient number of households get connected. Therefore, up-coming connections are being closely monitored. Analysis of results will be conducted after the second wave of data are collected.

The sample size for electricity surveys is in general smaller than that of the survey for the piped water due to the following:

- There are more outcome variables for the water sector.
- There are a large number of distinct alternative water sources including ground water, river, water delivered by trucks and ponds which can significantly influence the impact of piped water connections. Alternative electricity sources are mainly battery, while solar power is much less common.
- The connection speed for piped water is expected to be slower. This necessitates larger sample size for the before and after survey.
- The control group in the electricity cross-section survey can be used as a baseline sample for the before-and-after survey as well, while this cannot be done for the water sector due to lack of connected households in locations close to the non-connected households in the baseline survey.

b) Result of data analysis

While analyzing the cross-sectional surveys on water and electricity it became clear that the treated and control groups were too diverse to justify a reliable comparison. Variables added to correct for differences were insufficient to correct for the sample errors. 3i will need to rely on a before-after analysis for site specific quantitative data.

2.5.2.2. Qualitative surveys

Research plans to collect qualitative data on 3i's impact on households, businesses and partners were finalized and put under development. A longitudinal study will be used for household and business partner impact studies, while the study method for impact on businesses will be finalized in the first semester of 2018.
In the second half of 2017, the longitudinal study on the impact of access to piped treated water on households was started.

a) Method of survey

Four areas have been purposefully selected for the study to represent different common alternative sources of water including, ponds, wells, river, trucked and piped untreated water. In each area, three visits will be conducted — before, six-monthly, and one year after connection. The evolution of the impact of the utilities around household functioning will be captured from one visit to another.

In addition to households, local authority and medical center workers will be also interviewed to understand the external factors that can affect the impact on households from being connected. They are also expected to be able to provide information on general changes in the communities such as migration, general employment, commune development plan, etc.

Alternative service providers like raw water sellers and non-connected households will be also interviewed to find potential negative impacts from the program and for comparison.

b) Initial findings

During the reporting period, two initial visits were conducted in two locations where river water and trucked and piped untreated water are the common alternative sources of water. The visits were conducted before the actual connections were implemented. Some of the major findings are:

- Raising awareness of hygiene issues including drinking clean or boiled water, washing hands, and using toilets can have a similar impact upon household health status when compared to piped treated water. This is widely known and as a result frequent campaigns from development organisations and public medical centers were made for the community. However, a new Unicef report on hygiene details that unclean storage of water, such as in dirty glassware, is one of the major factors leading to germ absorption in a household. This area will be a focus of the study in the next visits to understand household hygiene practices.

- Rather than not being aware, unhygienic practices were commonly due to forgetting or being lazy to wash hands, children being more careless and drinking unclean water which is more accessible, putting ice (which is normally not cleanly produced) directly with drinking water, eating raw vegetables washed in unclean water or having no money to buy bottled water or build toilets. Some of these unhygienic practices can be reduced when piped treated water is available as it can make these practices difficult to do.

- Seasonality can play a big role in community health, especially for areas close to the river. When there are floods, all respondents reported higher rates of disease, especially in children. Analyzing changes in community health as the result of piped treated water needs to take seasonality into account.
• Learning about water borne diseases from the public health center can be non-representative as some or a lot of households prefer to seek medical advice from private clinics or pharmacies for minor ailments.

• Household willingness to access grid electricity was reported to be a good indicator for household willingness to connect to clean water.

• For one household that seems to be among the poorest in the community and water availability can be frequently one of the arguments between husband and wife, the connection to piped water was reported to be mainly decided by the husband who is the income earner. For other households interviewed, women seem to have equal say in the decision to connect.

• The most reported reason for connecting to piped treated water has been convenience.

• Non-connected households are expected to be worse off once the piped treated water becomes widely available as the alternative water delivery service will be less accessible.

Data collection and analysis on the impact of piped treated water and electricity connections will be one of the priorities in 2019 when construction on a good number of projects are expected to finish and more actual connections occur. The implementation of a monitoring system to capture data on PWSP’s actual connections will be also explored during the next reporting period. This system will utilise software solutions that reduce reliance on the PWSPs’ reports and therefore improve data quality.

### Table 10: Progress status against output indicators for output 2, outcome 5

<table>
<thead>
<tr>
<th>Output 5 indicators</th>
<th>Achievement/ Targets</th>
<th>Progress report</th>
<th>Meeting the targets (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalizing impact baseline studies</td>
<td>N/A</td>
<td>The analysis for cross sectional study for both piped water and electricity were completed. However, the results were not robust enough to draw any conclusion on impact. Similar analysis will be made for the before and after study which 3i hopes to get more robust result due to fixing of fixed effect and ability to control for unobserved variable.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 2.6. Scalability Review

Following their familiarization visit in May 2017, the infrastructure Technical Advisory Group (iTAG) conducted their evaluation mission in October as planned. The aim of the review mission at the official mid-point of the program is to provide DFAT with an independent evaluation of the program’s progress and recommendations on the program’s direction. The team was comprised of two advisors with extensive experience in market development and Public Private Partnerships.
A detailed document providing up-to-date information on 3i progress and options for the program’s future operations was submitted along with several background documents prior to the visit. Four options for the program’s future direction was proposed, ranging from a no-extension option to a substantial increase in the program’s budget and duration of operations.

The iTAG extensively reviewed progress in the sectors that 3i has been active in, including reviewing the appropriateness of 3i’s offer, the potential for support to new sectors, the program monitoring system, the impact on potential beneficiaries and gender. The review team provided a thorough overview of the program’s performance and team dynamics.

Upon full understanding of the program’s potential scope the team were able to provide relevant recommendations for the program’s improvement. A summary of the recommendations are:

- Consider increasing the investment budget of 3i to maximise private investment leveraged, and thereby beneficiaries reached by 3i
- Consider increasing duration of 3i to allow completion of all investment contracts
- Increase the allowable proportional size of grants in the electricity sector
- Decrease the proportional size of grants in the piped, treated water sector
- Scale back 3i’s capacity in implementing Modality 2, but retain some capacity to take advantage of emerging opportunities
- Monitor prospects to partially or fully hand over 3i processes to Government of Cambodia
- Consider opportunities to leverage, for example, Australian industry groups and technical institutions to enhance expertise in target sectors
- Commission specialist gender advice to augment 3i capabilities
- Place heightened focus on monitoring physical connections and their sustainability over time
- Consider how to package and communicate consistent narrative to highlight achievements to date

DFAT’s management response acknowledged and/or agreed with most of the recommendations. However, recommendations on the possible extension and expansion of 3i’s budget and duration will be put to the Program Board for consideration during the Annual Work Plan 2018 meeting. A decision on whether 3i should be adding new sectors will be another major outcome expected from the meeting.

Follow this link [www.3icambodia.org/DFAT-Management-Reponse](http://www.3icambodia.org/DFAT-Management-Reponse) for the full report of the iTAG Scalability Review and DFAT’s management response.
2.7. Cross-cutting issues

a) Environmental protection

Environmental screening

3i’s environmental screening system has been in place and fully operational for two years with no major issues.

The environmental checklist was updated to ensure consistency in information provision amongst the 3i team and quality improvement. 39 environmental checklists were completed and endorsed by the OC during this reporting period.

An issue that is always at the heart of each feasibility study in water is the quality and sustainability of the water source and the impact that extracting water could potentially have on other users or on the downstream environment. A fine-tuned version of the environmental checklist was updated to create more thorough questions on the water source.

Taking water from the larger rivers like the Mekong is rarely an issue, but many smaller streams often don’t supply sufficient year-round water. In these cases, 3i either rejects the request for support or includes a pond in the feasibility study. Often operators select existing large water bodies as a source of water. In these cases, the assessment always includes an assessment of other users and of the management system of the water body and may even include advice from the Ministry of Environment. Permissions to use the water are normally part of the assessment process. In some cases, 3i has supported use of ground water, but only after serious assessment of the availability and the potential impact on other users. When needed 3i has an external expert on standby to assist in the assessment.

In the second half of the year, 3i commissioned an Environmental Advisor to study the potential environmental issues associated with projects where piped water infrastructure is proposed to be established in protected areas. In October 2017, Dr. Dirk Lamberts conducted the field visit at the project site and developed an overall strategy for environmental safeguarding for investments in or in the vicinity of protected areas.

Managing risks from landmines and UXO threats

3i has invested serious time and resources to reduce the risks associated with land mines and UXO’s. Although the risks of injuries can never be fully excluded in a country so recently exposed to a long period of armed conflicts, 3i is implementing a risk reduction system that is fit for purpose.

A Mine/UXO Risk Management Advisor was appointed and mobilized in June 2017. All ongoing projects have been assessed. For new projects, 3i has conducted the initial assessment at a very early stage and will use both risk and value for money arguments to assess appropriate action.

The first step in conducting a risk assessment of 3i project sites is a data analysis and mapping
exercise of all sites against existing data. Depending on the risk level estimated by these initial assessments, a field visit is conducted to evaluate the quality of the map and assess potential risks in more detail. After this, the Advisor will advise 3i if it needs to move forward with non-technical survey and/or technical survey, with the support of an accredited mine action operator. Halo Trust was awarded the contract to conduct non-technical and technical survey and provide Mine Risk Education for 3i when required.

Based on the outcome of these interventions, if risks are considered too high to proceed, 3i can determine not to support (part of) the investment or to conduct clearance to lower the risk of specific areas in the project site. Refer to Annex 7 for 3i’s case study on Mine/UXO risk reduction.

During the reporting period, risk assessments were made on 54 sites. 44 of them are rated as acceptable risk level. For the other 10 sites, 3i has commissioned Halo Trust to conduct non-technical survey and/or technical survey and where applicable conduct clearance in locations where the Mine/UXO Risk Management Advisor has classified as high risk. At the time of reporting, Halo Trust has completed the fieldwork and submitted the reports of 4 sites.

A key lesson learnt is that given pipe networks generally run along adjacent to residential areas, the residual risk from landmines & UXOs is more likely to be acceptable. Despite this, the mine & UXO risk assessment is still necessary to ensure that risks are minimized as much as possible.

In recognition of 3i’s innovative approach to mine/UXO risk reduction, a request was received from the Geneva International Centre for Humanitarian Demining for 3i’s Mine Risk Management Advisor to conduct a presentation on 3i’s approach as a lesson learnt for other relevant organisations.

b) Workplace health and safety (WHS)

Work health and safety training for the private sector

A 3i WHS monitoring template has been operationalized for both piped water and electricity. The team has monitored WHS conditions at all project sites at least once during the construction of the water station, once during the pipe network installation and once for REE’s during installation of the electricity network.

In addition to the monitoring visits, 3i have also contracted a WHS company called ASSIST to provide training in WHS to construction workers and the company owners before the construction starts to ensure that they are aware of necessary protection measures and what to do when accidents happen. 18 trainings, 4 for electricity expansion and 14 for piped water projects were conducted during the reporting period. First aid kits were provided after the training and awareness on child protection was also included in the training. An internal system was developed to ensure that the training will be conducted prior to the start of the construction and during the time where most construction workers will be able to attend.
Some small adjustments were made to the training contents and method of training to increase effectiveness of knowledge transfer and relevance of the contents. Monitoring of the trainings on work health and safety raise a slight concern that some of the safety materials provided have not been used by the workers. 3i will conduct an assessment on the appropriateness of the materials provided and where necessary will adjust the types of materials to fit the work and requirement of construction workers.

**Pond awareness raising**

ASSIST is also contracted to provide awareness raising to people living near the areas where 3i has provided support for a pond excavation. Households with children younger than 10 years and living in less than a 500-meter radius from the pond will be made aware of the potential risk of the ponds for their children. Parents are encouraged to increase their protection measures for children in relation to the pond. In addition, discussions will be held in the community to avoid drowning risk for children.

During the reporting period, one pond awareness session was made for a project that involves pond construction. At least 40 households attended the session. Some of the discussion and measures to be taken by the local community are:

- The villagers requested the PWSP to build fence around the pond. However, the PWSP has already done this himself.
- Concern on the bank erosion was raised. This concern was allayed after the villagers were informed that the slope of the pond will be 45% angle, which is appropriate, and there will be a dike around the pond which also helps prevent erosion.
- Participants agree that children should not get close to the pond and understand that there is a shared responsibility between local authority and villagers, not just the pond owner.
- The participants also agreed that both villagers and local authority should constantly circulate the information of the pond existence to one another and parents should also constantly advice their children to stay away from it.

**Internal personnel management**

WHS activities that were completed in the reporting period for 3i contracted personnel included:

- maintenance of first aid kits for the office and cars
- application of 3i drivers’ code of conduct
- application of vehicle use policy
- ongoing use of the International SOS alert system and regional security forecasts to ensure 3i staff are aware of security risks
- provision of group personal accident, hospital and surgical insurance policies for national staff.
3. Lessons Learnt

Over the last two years 3i has been on a steep learning curve. This type of program was not only new to Palladium, but also to DFAT, the RGC and to Cambodian infrastructure companies. Although the program always had a “grand plan”, many details are adjusted iteratively. This is entirely consistent with 3i’s intent to be a learning program. Each stage of the program creates new challenges and new lessons.

In 2017 3i made payments for the first time, including its first ‘final payment’. This has brought about a shift in focus to monitoring and sharpening of safeguards. The second and third rounds of funding in both the piped water and electricity sector also attracted different companies. Assumptions on market opportunities needed to be adjusted.

Lessons learnt are not an afterthought in programs like 3i but rather an integral part of adaptive management. Programs like 3i will only be successful if they learn and adjust every day. In summary, the major lessons learnt in the reporting period are:

- First of all, the approach seems to be working based on available evidence. This was far from obvious when the program started, but offering grants to bridge viability gaps is showing promise as an effective way to avail basic infrastructure to large numbers of people in a cost effective and sustainable way. Future impact studies will look at issues such as the quality and maintenance of infrastructure assets to interrogate and, hopefully, strengthen this hypothesis.

- Other forms of financial support that were tested in Modality 2 may have some potential, but are harder to establish.

- A major challenge is finding the right balance between building in safeguards and leaving final responsibilities with the companies that are supported. 3i moved further towards the safeguards over the last 2 years and even over the last 12 months.

- The market opportunities in the piped water sector are still large; much larger than the program can handle in the given time and budget. The license approval process however is a constraint in moving faster.

- Fund disbursement was continuously projected and monitored at least on a monthly basis. It was learnt that expenditure projections made for the wet season were more off since the prolonged rain also prolonged or delayed the construction of the infrastructure. Seasonal factors will be included into consideration for future projections. More information such as capital availability, the process of seeking extra capital, the equipment to be used for construction and the guarantee of labor availability are some of the other factors that have been identified and will be checked with the PWSPs to enable better estimates of the speed and likelihood of their construction.

- The exercise done in August 2017 led 3i to a conclusion that for piped water, 3i can still trigger private sector investment with slightly less financial support in the Direct Permit intervention area. However, a slightly different conclusion was made for
Competitive Permit intervention area where it was decided that the grant should be increased for areas with low concentration of existing PWSPs. 3i’s additionality in electricity expansion intervention is harder to justify compared to piped water. Therefore, 3i will keep a smaller portfolio for the electricity sector and divert its support to even more remote areas. The connection subsidy intervention was concluded to scale down due to low interests from REEs.

- Initial construction processes also gave 3i a better idea how long it takes for companies to construct, although it is still too early to judge if the typical 1.5 years for a contract is appropriate or too optimistic.

- Opportunities in the recycling sector have appeared at the initial stage larger than expected. Leaving the opportunity for a long period of time for 3i to get ready before moving full swing into the sector is also not an option as 3i cannot always revisit the same entrepreneur and expect the same opportunity. Despite this, a decision to continue in the sector has been postponed until next year. The Program Board and DFAT will judge if the potential risks for 3i being involved in the sector are worth taking. Investments in larger size solar projects have proved to be too risky for the program to continue its involvement. However, lots of opportunities for smaller scale solar projects have emerged. Combined with much larger opportunities in the piped water sector than expected, availability of additional investment funds for 3i is an important outcome that needs to be confirmed by the Program Board in early 2018.

- Opportunities in the water transportation sector will be harder to find.

- Finally, 3i has been on the forefront of supporting large numbers of companies under DFAT standard contractual conditions. Programs like 3i can operate under the conditions, but will need to find many operational solutions to how to best implement DFAT’s conditions. Programs in similar situations could really benefit from many of these lessons, but that is probably better done on an individual basis rather than presenting them in this document.

4. Program management, administration and operations

Throughout the reporting period, intensive effort was directed towards head contract compliance and the embedding the administrative, financial, human resource and other systems and processes required for managing the program. Key program management activities have been reported to DFAT as Palladium’s contractor. **Overview of contract outputs**

Table II summarizes the head contract outputs (‘deliverables’) completed within the reporting period.
### Table 11: Head contract outputs completed within the reporting period

<table>
<thead>
<tr>
<th>Output</th>
<th>Month submitted</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Work Plan &amp; Budget #1 (2017)</td>
<td>Jan 2017</td>
<td>Output crafted as an ‘Activity Plan’ as requested</td>
</tr>
<tr>
<td>Annex 1 to AWP - Annual financial plan</td>
<td>Jan 2017</td>
<td>Budget for 2017 calendar year plus summary of main financial issues</td>
</tr>
<tr>
<td>Annex 2 to AWP - Risk management plan #4</td>
<td>Jan 2017</td>
<td>Major revision of previous plans to take account of new risk settings; some risks have been de-escalated</td>
</tr>
<tr>
<td>Annex 3 to AWP – Safety &amp; security manual #4</td>
<td>Jan 2017</td>
<td>Revision of previous manuals</td>
</tr>
<tr>
<td>Annex 4 to AWP - 12-month staffing plan</td>
<td>Jan 2017</td>
<td>Summary of staffing plans</td>
</tr>
<tr>
<td>Annex 5 to AWP – Environmental management system (EMS) and environmental screening checklist #2</td>
<td>Jan 2017</td>
<td>EMS as per approval by DFAT in mid-2016; major revision and improvements to the checklist</td>
</tr>
<tr>
<td>Finance &amp; Operations Manual (FOM) edition #3</td>
<td>Jan 2017</td>
<td>Major revision to take account of new Palladium policies &amp; procedures.</td>
</tr>
<tr>
<td>Annex 1 to FOM - Fraud control strategy (FCS) #4</td>
<td>Jan 2017</td>
<td>Minor revision of previous FCS</td>
</tr>
<tr>
<td>Annex 2 to FOM – Grants management manual #3</td>
<td>Jan 2017</td>
<td>Major revision of previous plan to reflect changes in approach undertaken throughout the past year.</td>
</tr>
<tr>
<td>12-month progress report (January-December 2016)</td>
<td>Jan 2017</td>
<td>Comprehensive progress reporting against the 2016 AWP; as agreed previously, financial report to be sent separately and once up-to-date expenditure for the year is available (by 31 January).</td>
</tr>
<tr>
<td>Scalability review preparation report</td>
<td>Jan 2017</td>
<td>This report aims to inform the future scalability review.</td>
</tr>
<tr>
<td>Quarterly financial report #6</td>
<td>Jan 2017</td>
<td>For the period October – December 2016</td>
</tr>
<tr>
<td>Risk management plan #5</td>
<td>Mar 2017</td>
<td>Minor revision of the previous version</td>
</tr>
<tr>
<td>Quarterly financial report #7</td>
<td>Apr 2017</td>
<td>For the period January - March 2017</td>
</tr>
<tr>
<td>Six-month progress report (January – June 2017)</td>
<td>Jul 2017</td>
<td>Prepared to monitor and report on the Program’s progress against the Annual Work Plan and Budget</td>
</tr>
<tr>
<td>Quarterly financial report #8</td>
<td>Jul 2017</td>
<td>For the period April – June 2017</td>
</tr>
<tr>
<td>Handover Plan #1</td>
<td>Sep 2017</td>
<td>Includes all functions to be performed to hand over contract material, supplies, information, documents and other materials to DFAT</td>
</tr>
<tr>
<td>Quarterly financial report #9</td>
<td>Oct 2017</td>
<td>For the period July – September 2017</td>
</tr>
</tbody>
</table>
The contract outputs action plan continues to guide the work of the 3i project and corporate teams on forthcoming outputs for the next two years.

4.2. Human resource and personnel management

a) Team structure and profile

The program organizational structure as at December 2017 is illustrated in Figure 1; staffing inputs for the reporting period are included at Annex 2.

At the start of the reporting period, there were 30 contracted staff (three LTA, eight STA, 19 national staff). As at December 2017 there were 32 contracted staff (three LTA, seven STA, 22 national staff). One LTA and one national staff member departed the program during this period and the contract of three STA were completed.

The gender profile of the program workforce as at 31 December 2017 shows that women remain under-represented amongst international LTA and STA (two women, eight men), and amongst local staff (nine women, 13 men).

b) Recruitment, selection and contracting of personnel

Major achievements in the reporting period include:

- Six new staff were recruited, selected, contracted and inducted: 1 LTA, 2 STA and 3 national staff.
- For the period 1 January - 31 December 2017, Palladium (Cambodia) Ltd (PCL) provided contracting services for 3i national staff. In the period, PCL continued to outsource payroll and taxation services to DFDL.
- Ongoing routine HR services - administration of leave and timesheets, recruitment, selection, reference checks, staff contracting and establishment of a leave tracking system.
- Provision of logistical support systems notably travel movements and per diem management.

c) Corporate personnel inputs

Throughout the reporting period, corporate staff have provided support and guidance to the program. In-country visits included:

- The Associate Program Manager visited in June 2017 as part of the new Operations Managers’ on-boarding process and to provide support on a range of operational and corporate compliance tasks.
- The Program Director visited in August 2017 and again in October 2017 to support and participate in the Scalability Review team’s mission to Cambodia.
- Remote support was provided in the areas of legal and contracting advice, ICT infrastructure and day-to-day support, business registration, banking, administration,
recruitment and corporate finance.

### 4.3. Financial management

A quarterly budget and cash flow was developed for the period, regularly updated and used to guide cash transfers and expenditure. Throughout the period, close attention was given to monitoring of YTD expenditure and the budget forecasting for the forthcoming month and six-month period. In particular, closer attention was paid to forecasting for Investment Costs.

This budget line is expected to make up the greatest proportion of expenditure going forward, and during the reporting period the payment of milestones to operators for 3i supported projects started to grow in number and size. By the end of the reporting period, expenditure on Investment Costs made up almost 33% of the total annual expenditure (see Section 5 for more details). This figure is projected to increase over time as 3i projects mature (see AWP 2018 for details). In comparison, operating costs decreased, representing only 4% of total annual expenditure. Other larger categories include personnel and related support costs, representing 40% of total annual expenditure, and management fees, representing 24% of total annual expenditure.

Payments were made by cash and bank transfer (local and international). The 3i and Palladium teams have sound systems in place to ensure the accuracy and integrity of financial transactions including duty segregation, cash counts, cash book reconciliations, advance/acquittal process and the findings of internal spot checks.

### 4.4. Procurement activity

During the reporting period, procurement activity was undertaken according to program needs and included petty cash and purchase order transactions for ICT assets, staff travel and per diems and routine operations (training venues, stationery, office supplies, goods and services, fuel, insurance, accommodation and so forth).

Vendor-derived agreements were also used in specific circumstances (internet service provision, car hire, English language training, first aid and defensive driver training). Requests for proposals (RFP) were developed and released, and contracts awarded, for higher value goods and services as follows:

- Work health and safety and pond safety awareness training
- Ground water test drilling
- Water operator capacity development program
- Mine/UXO technical services
- Medical and accident insurance for national staff
- Office ITC equipment (PC, laptops, server hardware and software) and furnishings
- Communications training for national staff
Consultancy services for water permit tendering, socio-economic research, civil engineering, environmental management, hydrological services and document translation.
Figure 1. Organisational structure (as at December 2017)

Program Director
Palladium
Alwyn CHILVER

Managing Director/Team Leader 3i
LTA
Peter ROGGEKAMP

Deputy Managing Director
NAT
Mola TIN

Technical Advisor-Investment
NAT

Keavatey SRUN
Sophorn KITH
Phirum HAN
Parinya SOK
Ratanak HOEUN
Soryda EAN

Silthyut SAMEAN
Vireak KONG
Silthyut SAMEAN
Vuthy MEN
Navy HORT
Chandy SENG

Technical Advisor-Water Infrastructure
NAT

Sambo LUN

Financial Advisor
LTA
Morten KVAMMEN

Operation Manager
LTA
Stephanie LYMN

MIS/ICT Specialist
NAT
Kanel ROATH

Finance & Admin. Manager
NAT
Navy CHHOUR

HR & Admin Officer
NAT
Dina KEO

Finance Officer
NAT
Lina SUONG

Driver
NAT
Ponleu TEP

Driver
NAT
Narin BUTH

Driver
NAT
Yath NOUN

Driver
NAT
Piseth MAM

Driver
NAT
Bunra HOR
4.5. Fraud control management

In January 2017, the fraud control strategy (#4) was revised, updated and included as part of the program finance and operations manual (FOM). The fraud control system centers on the design and application of sound financial procedures that minimize opportunities for fraud to occur, document cross-checking amongst 3i staff (with periodic checks by corporate staff), corporate month-end audit and ongoing managerial oversight. Fraud awareness training was undertaken as part of induction for new staff. Only one low-value fraud case relating to a stolen mobile phone remained open at the end of the reporting period.

4.6. ICT infrastructure and networks

ICT procurement and monitoring represented an ongoing part of office management and technical support for the 3i team. Major achievements were:

- Worked with a website development company to setup and host the 3iCambodia.org website
- Regular update of the 3i website content
- Procurement and setup of a 3rd and 4th Network Attached Storage (NAS) to separate between weekly, monthly and yearly backups due to the increase in backup space required
- Asset management as required by 3i and Palladium Head Office
- Maintenance of Palladium SharePoint file sync processes
- Monitoring of backup server processes including local and offsite backup
- Administering and managing 3icambodia.org domain including e-mail and cloud documents (google drive)
- Ongoing maintenance of IT infrastructure and services (mobile phones, laptops, workstations, software, GPS tracking devices for 3i vehicles, alternative phone provider, mobile device management)
- Monitoring and renewal of software/support subscriptions as required by 3i ICT system
- Provision of day-to-day technical support and training to 3i staff (both first and second level support, on and offsite)
- Procurement and setup of ICT equipment (laptop/smart phone) for new 3i staff
- Development of a Business Communications and Bring Your Own Device Policy
- Review and implementation of the new Palladium global IT Security Policy
- Other activities:
  - Business card design and printing for 3i project staff
  - Field trip photos for communication product

4.7. Oversight Committee

The Oversight Committee (OC) established in 2016 has continued performing their essential role in reviewing grant funding proposals and ensuring that all approved policies and procedures have been followed and documented, and that the program design principles have
been fully satisfied. Over the reporting period, 44 new proposal packages for both piped water and electricity interventions were reviewed and approved by the Committee. One among the 39 packages is under Modality 2. The OC also reviewed three separate due diligence checks of two bidding winners, whose funding proposals were approved prior to the selection of the winner. One proposal package for a tender approved by the OC in 2016 was adjusted and resubmitted for approval since the winner requested to expand his service area. The adjusted proposal was both approved by the OC and DFAT.

In addition to proposals of piped water and electricity interventions, two proposals of solar projects were also sent to OC for review and approval. On top of the funding proposals and due diligence checks, the OC also reviewed and approved one concept note from 3i on the connection subsidy to piped water operators. Therefore, in total, there are 47 items reviewed and approved by the OC during this reporting period.

Attached to their approval of the proposals, the OC also provides recommendations and concerns on some areas they found in their reviews of the proposals and concept notes. Below are the summarized comments provided by the OC:

- One of the piped water projects involves installing piped water under the riverbed of Steung Sen River. The OC recommends that 3i provide guidance to the PWSP on how to minimise and manage the environmental and any other ramifications of laying pipe under the bed of a major river to ensure that environmental standards for trench digging across a sensitive waterway are respected by the PWSP.

- The OC recommends that 3i’s offer include clear requirements -- including specifications -- for sludge waste management.

- The OC has concerns on one piped water operator’s appetite to proceed with one investment despite negative IRR after five years as well as the issues the same operator has experienced related to the design of initial infrastructure which will now require replacement. The OC suggests that support for training and guidance is implemented as per 3i recommendation “to contribute in the costs from the detailed drawings and structural design”.
- One project involves extracting raw water from wells and 3i proposes to proceed with the investment only after the positive results of ground water quantity and quality is proved by the drilling test. The OC notes the initial investment in drilling wells prior to commitment to the full grant as a risk mitigation and feasibility cost. If the initial 3 wells do not demonstrate sufficient capacity and quality, then the project will not proceed.

- The OC are in strong agreement with 3i’s provision that large shade trees inside the villages should be protected at all costs from the electricity network installation and recommend it that it be a condition of the grant.

- The OC notes the potential benefits of the schools being connected in the future and would welcome efforts by operators to encourage their connections.

- There are several projects producing lower internal rates of return. The OC recommends 3i flags those investments to track more closely the performance of the operators over time to understand if 3i can still achieve its objectives by providing such grants.

Regarding their review of the pilot intervention concept note to provide piped water connection subsidies to ID Poor households, the OC provided comments as below:

- 3i is recommended to assign additional parameters to understand the potential grant required for this pilot intervention and measure the level of success of the subsidy in inducing additional connection among poor households.

- Potential next steps if pilot is deemed (a) successful or (b) not successful will need to be clarified.

- The OC recognize two risks involving the intervention. One is that the operators may decide that the subsidy program’s management requirements outweigh the potential benefits of the subsidy. Second, the operators may keep some or all of the subsidies rather than pass on 100% of the subsidies to households.

- The OC also note that the subsidy may have a negative effect on the “near poor” who do not qualify as “ID poor.” They suggest one approach to encourage self-selection and to compare before and after connection rate of ID Poor households by delaying offering the subsidy.

Some of the recommendations or concerns such as sludge management requirements, training to the piped water operators, avoidance of cutting shade trees, or having drilling test as conditions for payments have already been applied in 3i’s current contracts, offers and monitoring system. Other recommendations and risks, especially ones related to the pilot connection subsidy intervention are being or will be considered in 2018, when connections of poor households may start.
During the reporting period, the program hosted two meetings with the OC at the 3i office - one in late July and another one in mid-December. The aims of the two meeting were to provide the OC with the update of the program and discuss possible improvements of their roles for 3i, if any. Major discussions or updates made during the two meetings were around connection subsidy to ID Poor households, new sectors (solar and recycling), Mines & UXOs procedures, Work Health Safety trainings, proposals with lower IRRs, result of the Scalability Review and the status of project implementation and lessons learned. Discussions were also focused on how the OC can provide more value to the program and whether there were grounds for inclusion of climate change in the evaluation criteria.

In addition to these discussions, there was also agreement on actions to be conducted or taken for consideration for the next reporting period. These include:

- The OC will come up with a proposal for how they think they can help improve their assessments. One potential area is to provide 3i advice on potential risks and problems the program may face.
- The OC may consider forming sub-committees among themselves to address specific topic areas and develop additional evaluation guidelines that can help improve their assessment of the proposal packages. Some suggested topics include climate change, quality of the operator’s construction and the M&E system.
- The OC will conduct a field visit in 2018 with projects where contracts have been signed.
- 3i will provide an update of the projects approved by the OC every two months.

5. Budget and expenditure

Table 13 outlines the variance between 2017 budget allocation and actual expenditure. Overall, annual expenditure was AU$4,776,824 compared with the revised 2017 AWP budget (after adjustments throughout the year) of AUD$5,182,045. Actual expenditure represents an under-expenditure against budget of AU$405,221 (or -8% variance).

Over the 12-month reporting period January – December 2017, payments valued at AU$4,776,824 were made. By value, most payments were for personnel and associated support costs (international advisers, national staff and advisers - AU$1,878,917), investment costs (AU$1,569,039), management fees (AU$1,133,417), and operations (AU$195,450).

Table 13 provides additional detail including comparison of expenditure against the original 2017 AWP budget. Comprehensive financial results are provided in the quarterly financial report covering the period October to December 2017 (a separate contract output).
**Table 12: Statement of Financial Performance Jan – Dec 2017**

**Statement of Financial Performance (01 January 2017 - 31 December 2017)**

<table>
<thead>
<tr>
<th>Contract Number: 71035 Amendment 1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Name:</strong> Investing in Infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Project Start Date:</strong> 04/08/2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Project End Date:</strong> 31/07/2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Project Currency:</strong> AUD</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contract Value/Project Financial Limitation:</strong> AUD $ 45,389,782</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Budget Category-Expenditure**

<table>
<thead>
<tr>
<th>Budget Category-Expenditure</th>
<th>Original</th>
<th>Budgeted Amounts</th>
<th>Final budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approved Annual Expenditure 2017 per AWP</td>
<td>Approved Adjustments 2017-2018 FY</td>
<td>Approved Projected Expenditure 2017-2018 FY</td>
</tr>
<tr>
<td><strong>Total Management Fees</strong></td>
<td>707,000.00</td>
<td>707,000.00</td>
<td>706,999.40</td>
</tr>
<tr>
<td><strong>Milestone Payments (BoP Clause 2)</strong></td>
<td>707,000.00</td>
<td>707,000.00</td>
<td>706,999.40</td>
</tr>
<tr>
<td><strong>Performance Payments (BoP Clause 2)</strong></td>
<td>326,418.00</td>
<td>326,418.00</td>
<td>326,418.00</td>
</tr>
<tr>
<td><strong>Bonus Payments (BoP Clause 3)</strong></td>
<td>100,000.00</td>
<td>100,000.00</td>
<td>100,000.00</td>
</tr>
<tr>
<td><strong>Total Reimbursable Costs</strong></td>
<td>693,648.00</td>
<td>732,352.00</td>
<td>732,352.00</td>
</tr>
<tr>
<td><strong>Long Term Adviser Costs (ARF) (BoP Clause 4.2)</strong></td>
<td>693,648.00</td>
<td>732,352.00</td>
<td>732,352.00</td>
</tr>
<tr>
<td><strong>Short Term Adviser Costs (ARF) (BoP Clause 4.3)</strong></td>
<td>409,471.00</td>
<td>356,472.00</td>
<td>356,472.00</td>
</tr>
<tr>
<td><strong>Long Term Personnel Costs (non ARF) (BoP Clause 4.4)</strong></td>
<td>638,112.00</td>
<td>681,681.45</td>
<td>681,681.45</td>
</tr>
<tr>
<td><strong>Short Term Personnel Costs (non ARF) (BoP Clause 4.5)</strong></td>
<td>348,604.65</td>
<td>284,145.35</td>
<td>284,145.35</td>
</tr>
<tr>
<td><strong>Adviser Support Costs (BoP Clause 5)</strong></td>
<td>665,173.06</td>
<td>756,227.72</td>
<td>756,227.72</td>
</tr>
<tr>
<td><strong>Operational Costs (BoP Clause 6)</strong></td>
<td>3,256,668.76</td>
<td>3,256,668.76</td>
<td>3,256,668.76</td>
</tr>
<tr>
<td><strong>Investment Costs (BoP Clause 7)</strong></td>
<td>7,165,095.46</td>
<td>4,048,627.28</td>
<td>5,182,045.28</td>
</tr>
<tr>
<td><strong>Sub Total: Expenditure (excl. GST)</strong></td>
<td>7,881,605.01</td>
<td>4,453,490.01</td>
<td>5,700,249.81</td>
</tr>
<tr>
<td><strong>Grand Total: Expenditure (incl GST)</strong></td>
<td>7,881,605.01</td>
<td>4,453,490.01</td>
<td>5,700,249.81</td>
</tr>
</tbody>
</table>
6. Program Risks

The 3i risk matrix was updated in March 2017 and a further revised version will be attached to the 2018 Annual Work Plan. 3i’s approach to managing risks has been tested for the last 2 ½ years with success. Fraud risks have been limited to a few stolen phones and small errors in invoices from suppliers. All were identified and remediated in accordance with agreed protocols. All initial risks related to starting up a program are no longer relevant now that 3i is a well-established program.

Relations with the Royal Government of Cambodia and other development partners are well established. Maintaining cooperative operational relationships will continue to be a focus of program work.

Concerns that 3i would not be able to deliver the expected impact have also eased. The scalability review confirmed that 3i is able to trigger large numbers of companies into investing in basic infrastructure that otherwise would not have happened. The review also confirmed that it is likely that more companies could be incentivized than 3i could handle. Both elements, potential of the market and capacity of 3i, were considered significant concerns at the start of the program.

With over 40 projects in the construction stage, new risks emerge. 3i has developed and is implementing a number of risk reducing strategies specifically for this construction phase, additional to the initial safeguards that included 3i’s fraud controls, its environmental management system and its due diligence checks. The new risk reduction measures are OHS trainings, pond risk awareness sessions and an elaborate mine and UXO’s risk reduction system. All measures are applied with positive early signs. 3i will continue to monitor the effectiveness and if needed fine-tune these systems in 2018. Annex 6 explains 3i’s response to potential thread of landmines and UXO’s.

In 2017, 3i prepared a number of projects related to solid waste recycling and water transportation. If the Program Board decides to expand the program in these sectors, 3i will need to invest time and resources to build high quality safeguards for these sectors.

It will take several years to assess the sustainability of all the supported water and electricity companies. With its present knowledge however, 3i considers the risk that its recipients will not stay in business as low.

In the electricity sector 3i supports existing companies. Once the lines are in place it would be very unlikely that the lines will not be used. The situation is more complicated in the water sector:

- A number of companies that have signed a contract may never start construction. This is not a risk for 3i as payments are on an output basis.
- A number of companies may start the construction, but may delay construction of the full pipe network beyond the duration of the contract with 3i. 3i has anticipated that
a number of contracts will need to be extended. This does not cause any issues at this stage of the program, but it will be something that will need attention later in the program.

- 3i’s outputs are constructed in such way that the construction of the parts with lowest marginal returns need to be finished first (the treatment plant and the large pipes). The last part of the network, with smaller pipes that allow for the households to connect, will have the best return on investments. Operators may postpone some of these pipes, but these investments are financially too attractive to leave.

- 3i’s financial model checks if future revenue allows for operational and maintenance costs. When initial investments are completed, the companies are very likely to make good money of the water company.

3i assesses the risk that climate change or other causes reduces the availability of sufficient year-round water. Changing rain patterns, dams upstream or larger new water users upstream could potentially require the operator to invest in additional sources of raw water, especially in the dry months. 3i assessments have sufficient margin to make this very unlikely during the first 5 to 10 years. By this time companies should be in full operation and the initial investment will have been paid back. The operator could then financially afford to invest in temporary water storage or other solutions. However a more cohesive national approach to water resource management, and clear strategic water management infrastructure priorities, would be needed to make more detailed project-level climate change risk assessments by 3i worthwhile. In the absence such a framework, project level solutions risk being over engineered, leading to financial inefficiencies.

7. Looking ahead

Over the last 2 and a half years, 3i has built a program that is able to encourage water and electricity distribution companies to invest in new infrastructure. It built a capable team, developed an effective offer and designed appropriate safeguards. Relations with major stakeholders are constructive and companies are more and more understanding and appreciative of the stimulus package 3i is able to offer.

In 2017 the program slowly moved from startup mode into a full delivery mode. It was a good time to take stock and set the priorities for the next 2 and a half years. DFAT organized a Scalability Review mission in October to help the program and Program Board to answer a few key questions:

1. Is there a need for major adjustments in the approach 3i has applied so far or are minor adjustments sufficient?

2. Should the program diversify its portfolio of sectors or focus on water and electricity?

3. What is the right level of attention to Modality 2 and 3?

4. Is it justified to consider additional funds?
The Scalability Review gave clear recommendations that were supported by DFAT, as discussed in Section 1. If the Program Board agrees, the Scalability Review will set the tone for 2018 and the years ahead.

1. There is no need to change 3i’s general approach. The program is however at a stage where it will need to invest more efforts in communicating its lessons and successes. Gender issues continue to need attention and it is time to better operationalize M&E systems.

2. The opportunities and potential impact in the potable water sector are such that the review team recommends to make this 3i’s main focus. Electricity distribution and generation (solar) should be the other part of the portfolio. Where it makes sense to do so, 3i can and should support targeted policy development work (with partner ministries) linked to 3i’s investment areas. The review team did not encourage the new sectors recycling and water transportation.

3. Modality 2 has delivered a few interesting projects, but efforts given to this modality should be scaled back. It is however time to explore ways to stimulate a more supportive enabling environment through modality 3 activities.

4. The program could wisely absorb more funds. But this will have limited impact on the 2018 Work Plan.

Based on the above recommendation 3i will prepare a Work Plan for 2018. A board meeting will be requested to comment, amend and endorse this in February of March. Progress and lessons will be captured in 2 semester reports. There are no other major milestones anticipated in 2018.
Annex 1. Achievements to date

<table>
<thead>
<tr>
<th>Output</th>
<th>Jul-17</th>
<th>Dec-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall value of private investment leveraged (AUD)</td>
<td>6,259,335</td>
<td>21,348,800</td>
</tr>
<tr>
<td>Electricity distribution</td>
<td>2,732,224</td>
<td>5,036,938</td>
</tr>
<tr>
<td>Water distribution</td>
<td>3,527,111</td>
<td>16,311,862</td>
</tr>
<tr>
<td>Other (waste recycling, solar, etc.)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of contracts signed (cumulative)</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Electricity distribution</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Water distribution</td>
<td>14</td>
<td>31</td>
</tr>
<tr>
<td>Other (waste recycling, solar, etc.)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total committed household connections</td>
<td>47,136</td>
<td>134,197</td>
</tr>
<tr>
<td>Electricity distribution</td>
<td>14,645</td>
<td>22,184</td>
</tr>
<tr>
<td>Water distribution</td>
<td>32,491</td>
<td>112,013</td>
</tr>
<tr>
<td>Expected number of men and women beneficiaries (committed connections)</td>
<td>212,112</td>
<td>603,887</td>
</tr>
<tr>
<td>Women and girls who will directly benefit from a new electricity connection</td>
<td>33,742</td>
<td>51,112</td>
</tr>
<tr>
<td>Men and boys who will directly benefit from a new electricity connection</td>
<td>32,160</td>
<td>48,716</td>
</tr>
<tr>
<td>Women and girls who will directly benefit from a new water connection</td>
<td>74,859</td>
<td>258,078</td>
</tr>
<tr>
<td>Men and boys who will directly benefit from a new water connection</td>
<td>71,350</td>
<td>245,981</td>
</tr>
</tbody>
</table>

Note:

- One household is assumed to consist of 4.5 persons.
- When there are more than one investment options in a contract, the option that lead to the highest investment or contract value is used to calculate the investment leveraged from the private sector.
- Private sector investment leveraged for connection subsidy is assumed to be zero.
- The contracts that were signed by 3i but not counter-signed by the partners are not accounted for in the calculation.
- Data from World Bank Development Indicators for year 2016 is used to calculate the number of women, girls, men and boys getting connected to piped water and electricity distribution. According to this source, 51.2% of total population are women.
- 1 Australian Dollar is assumed to be equal to 0.75 US Dollar.
Annex 2. 3i Personnel Listing (as at 31/Dec/17)

Notes:

1. These position numbers are to be used for e-filing purposes and to avoid confusion between positions with same titles.
2. Numbers are used throughout the life of the program: when a person leaves or contract ends, the position number is retained and continues to be used.

<table>
<thead>
<tr>
<th>Position #</th>
<th>Type</th>
<th>Title</th>
<th>Person</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>LTA</td>
<td>Managing Director</td>
<td>Peter Roggekamp (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>02</td>
<td>LTA</td>
<td>General Manager</td>
<td>Keith Twyford (Mr)</td>
<td>Resigned</td>
</tr>
<tr>
<td>02</td>
<td>LTA</td>
<td>Operations Manager</td>
<td>Stephanie Lymn (Ms)</td>
<td>In place</td>
</tr>
<tr>
<td>03</td>
<td>LTA</td>
<td>Financial Adviser</td>
<td>Morten Kvaamman (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>04</td>
<td>NAT</td>
<td>Deputy Team Leader</td>
<td>Mola Tin (Ms)</td>
<td>In place</td>
</tr>
<tr>
<td>05</td>
<td>STA</td>
<td>MIS Adviser</td>
<td>Paul Kingston (Mr)</td>
<td>Finished Apr 17</td>
</tr>
<tr>
<td>06</td>
<td>NAT</td>
<td>Technical Adviser – Investments #1</td>
<td>Keavatey Srun (Ms)</td>
<td>In place</td>
</tr>
<tr>
<td>07</td>
<td>NAT</td>
<td>Technical Adviser – Water Infrastructure 04</td>
<td>Vireak Kong (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>08</td>
<td>NAT</td>
<td>Technical Adviser – Investments #3</td>
<td>Sophorn Kith (Ms)</td>
<td>In place</td>
</tr>
<tr>
<td>09</td>
<td>NAT</td>
<td>Technical Adviser – Investments #4</td>
<td>Phirum Han (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>10</td>
<td>NAT</td>
<td>Technical Adviser – Investments #5</td>
<td>Parinha Sok (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>11</td>
<td>NAT</td>
<td>Technical Adviser – Investments #6</td>
<td>Ratanak Hoeun (Mr)</td>
<td>In place</td>
</tr>
<tr>
<td>30</td>
<td>NAT</td>
<td>Technical Adviser – Investments #7</td>
<td>Soryda Ean (Ms)</td>
<td>In place</td>
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**Annex 3. Financial report for the period**

Refer 3i Quarterly Financial Report #10 (October – December 2017); exists as a separate Excel file.
Annex 4. Internal Review of the 3i Offer

Adjusting the offer to piped water and electricity operators

3i internal discussion paper, August 2017

1. Purpose of this paper

Over the last year 3i has offered grants to companies based on its own financial model and on an economic theory that assumes that operators are relatively similar in terms of the incentives that drive them to invest. The economic theory assumes that companies invest when the Internal Rate of Return (IRR), or the payback period is attractive enough to take the risk in light of other investment opportunities. 3i determines the appropriate IRR or payback period on initial assessments and government regulations.

In reality, the investment decisions of operators are complex and influenced by more than just economic arguments. They are also different for each individual. It is therefore necessary to regularly evaluate signs that the offer is appropriate: too generous or not generous enough. 3i’s first round of grants to the Direct Permit and Tender process were evaluated when the second rounds were designed. With the second round of Direct Permit largely processed and with more experience in the tender process, 3i conducted a more in-depth internal analysis of the value of existing grants and of other conditions. A similar process was followed for the electricity related grants.

This paper mainly focusses on the Piped water sector where most of the future grants are expected to be awarded.

The analysis of the offer to electricity companies has been harder, but less elaborate. It seems that companies’ decisions to invest in expansion are more driven by pressure, than by economic arguments. There is certainly a large need for capital and most investments are not really viable without grants. Financial arguments however seem less important in taking expansion decisions.

The assessment of the appropriateness of the size of the grants are largely based on professional perception and subjective observations of 3i’s investment managers and engineers. The assessment is part of 3i’s internal quality assurance system and will be shared with the Oversight Committee. Adjusted conditions for rounds of funding will be discussed with the relevant line ministries.

2. Establishing a grant

The offers made by 3i need to trigger a decision to invest by a company that otherwise would not have invested. The offered grant should also not be higher than necessary to trigger the decision. The appetite of companies to accept the offers are the best indication of the accurateness of the size and conditions. By now 3i has some evidence of around 50 companies in the water and electricity sector that have or soon will accept offers. At least double that number of companies have been considering offers but not followed through for a variety of reasons.

There are however more principles 3i takes into consideration when offering a grant: Value for Money, Neutrality, Sustainability and if the company is a Good Business. These principles influence
each other and therefore require a balance. For example: A lower contribution will give 3i better Value for Money (VfM), but there is a bigger chance of selecting companies that would have invested anyhow. Also, tailor made offers to companies would be more cost-effective (higher VfM), but this conflicts with 3i’s Neutrality principle where similar companies are offered similar support.

There are more factors influencing 3i’s offer, such as the available resources and government priorities. With more resources 3i can support more companies. After the initial rounds, most of the eager companies have been supported and 3i will have to increase its grant (and lower its VfM) to make an offer that triggers less eager companies to invest.

3. Background

3.1. Piped water service providers

3i uses a number of principles to guide decisions on the offer to Piped water companies:

- A theory of change that assumes that low investment viability is a main cause of deciding not to invest in infrastructure: Investment viability is of course only one of several aspects that influence the investment decision. Some other elements include access to capital and opportunity costs. There are also non-financial arguments like investing for children’s future, commitment to the community or pressure from regulators.

- Additionality: In 3i’s definition additionality answers 2 questions:
  - will the investment happen without 3i’s grant? and, if not;
  - how much is the minimal grant needed to change the mind of the entrepreneur?
Additionality relies on what happens in the mind of each individual entrepreneur. Each entrepreneur thinks differently and probably also changes his or her opinion over time. Unfortunately, 3i cannot scan the mind of each entrepreneur and will need to use a generic model to simulate and predict the investment decision.

3i uses economic models based on payback periods and IRR to quantify the basis of entrepreneurs’ decisions. The models were calibrated at the start of the program by assessment of what payback period typical entrepreneurs expected.

For Piped water companies 3i uses a payback period of 7 years for tendered sites and an IRR of 15% over 5 years for unlicensed companies that need to acquire a direct permit.

Additionality is related to triggering a decision of an entrepreneur.

- Neutrality: One of the consequences of 3i’s neutrality principle is that similar companies receive the same support. If for example the 3i offer reduces the payback period of an investment to 7 years, it will do so for all companies that receive support in that specific round of funding. Some entrepreneurs may accept a higher pay back period: 3i pays too much in that case.

Some entrepreneurs only invest when the payback period is less. These entrepreneurs will not accept 3i’s offer. The neutrality principle is introduced to ensure fairness, but reduces the ability of 3i to fully apply the additionality principle.

- Sustainability: The sustainability principle has several aspects. Firstly, when it comes to the offer, there is a requirement that the company be viable in the long run and secondly that
there be enough of a cost share with the operator to ensure that the company feels full ownership over the business.

In practice this means two things: According to 3i’s financial model, a company needs to make a profit after a few years. In the water sector, 3i has limited its contribution to the initial infrastructure investment to 60% of the total investment. By investing at least 40% of the total investment costs, the entrepreneur has too much to lose to bail out, when the water company faces operational or financial hurdles in the future.

*Sustainability is here related to the risk of a company not being in business in the future.*

- **Value for money (VfM):** The value in the VfM principle is related to the impact that the program intends to achieve: improved living conditions, improved health, economic growth and equality. VfM links the allocated resources of 3i to the total potential impact of the grant.

  The most basic indicator of VfM is the number of connected households and businesses divided by the grant. Not all connections however have the same impact. To give some examples: a piped water connection has a bigger impact if the household relied on rain water compared to a household that already had a well in their yard. A water-connection to a health centre has a bigger impact than a connection to a small retailer. A clean water connection to a large poor family may have a bigger impact than a connection to a family that can afford to buy bottled drinking water and if the water connection triggers investments in sanitation, the impact is even bigger.

  Initially 3i developed a VfM approach where companies should compete for support. The ones that give 3i the highest VfM would receive support. 3i could for example auction support. Although this is in theory a good concept, it was considered too complex to implement.

  The contracts that were awarded so far had minimal value for money. Grants in the water sector were limited to 70 USD per potential future connection.

  *Value for Money is related to Palladium’s commitment to DFAT and the RGC to achieve maximum impact.*

The financial grant is not the only tool at 3i’s disposal to balance the offer in the right direction and to avoid offering a grant to companies where the additionality is less obvious. For each round of funding 3i sets pre-conditions and conducts checks. Companies that have already started construction are for example normally excluded. Other conditions are related to companies’ track record, the size of the investment or the commitments to finish part of the construction in a certain time frame.

3.2. **Electricity distribution companies (REE’s)**

Developing a financial expansion model for **Electricity distribution companies (REE’s)** has been a challenge. When a full financial model was developed, it became clear that many of the companies’ investments in extending their network were not given reasonable returns on investment. In too many cases it would have been better to leave the money in the bank. Assessment on a small number of cases found that companies are willing and able to expand if the cost per connection is less than 125 USD per potential future connection.
There is however a wide range of costs per connection that operators seem to find acceptable. There are companies that invest over double this. Unable to develop an economic theory of change, 3i decided to test a financial incentive for investments that were clearly not investment viable. It used the PDD’s initial VfM estimate of 50 USD as a contribution and 125 USD+50 USD = 175 USD as a minimum investment to trigger a grant.

The initial round only resulted in one company that was offered a contract, but later the company decided not to invest. The second round showed much more interest.

The additionality principle was served by the market information that investments above 175 USD per household would only happen if non-financial arguments were used.

The VfM expectation in the PDD indicated a 50 USD per connection. This was used as such.

4. The exercise

For two days the full 3i team analysed all contracts and offers that were accepted or rejected. The team focussed on a number of “errors”:

1. The error of signing a contract were there are indications the company might have done the investment anyhow.
2. The error where the grant was needed to trigger the investment, but a smaller grant might have been enough.
3. The error of a missed opportunity where the grant could have triggered a good investment but the company considered it too low, or 3i’s conditions prevented the company from qualifying.
4. Neutrality errors, where similar companies receive different grant support.

Four teams analysed all interventions.

5. Detailed observations

5.1. Piped water service providers

The offer for direct permit round one was probably not generous enough. There were no cases where 3i should not have supported the operators. In less than 5% of the cases the operator might have accepted a lower offer. It is unclear how much less could have been offered or if this would have affected the likelihood of finishing the investment in a reasonable period of time. A significantly better offer and longer duration contract would certainly have triggered more operators to invest. In the first round the PWSP were not familiar with 3i and its support. If the offer would have been better understood, more companies might have considered requesting support.

In the second intervention (Direct Permit round 2), the situation was very different. There was a self-selection element that led to a much higher acceptance rate than the 9% in round 1. The familiarity with 3i’s offer could also have played a role. On average the size of the investments (as well as 3i’s grant) was more than twice as large as in round 1. 3i thinks that around 60% of the offers were about right. For between 20 and 30% of the operators there is some doubt if the grant could have been somewhat smaller or perhaps was not needed at all.

The low rejection rate of 3i’s offer was an indication that the offer might have been somewhat too generous. The offer was only rejected in around 10% of the cases where 3i conducted a full feasibility study.
It could be that the Neutrality principle, that provides similar companies with a similar contribution, had the downside that 3i paid too much to some operators. This may be a small, but necessary cost.

It needs to be stressed that final conclusions cannot be drawn from initial assessments only. The final judgement is if the operator finished the investment in 5 to 10 years. Early indications of how eagerly an operator accepts a grant are at best a good first indication of additionality.

In comparison, the attractiveness of the competitive tender process is slightly worrying. Only 2 out of 7 sites received the required 3 valid bids. None of the sites offered a grant that was too generous for a real open tender, but in one or two cases, a neighbouring operator might have accepted a lower grant if he could expand his licence area into the tendered commune.

The presence of capable operators in the neighbourhood of the tendered site seems to be a key to the attractiveness of the site.

5.2. REE’s

3i used a different EOI method for the REE’s expansion grants. It examined RGC data in targeted provinces. This approach meant that in both the first and second round, only a limited number of companies could potentially qualify. 3i had to use this approach to match financial commitment and available funds.

The first round only attracted one company. A contract was signed but no investments were made by the company. In the second round 6 companies could have applied; 5 submitted an EOI and were offered a contract; 4 accepted the contract.

The question around whether the grant was the main trigger is harder to answer than in the water sector. The grants certainly brought investments forward in time in all but one case, but the team is less sure that investment would not have happened anyhow in the coming years.

3i issued a third round of funding. 10 companies could have applied; 5 submitted an EOI. 3i is likely to sign 4 contracts; 3 for a 70 USD/HH grant and one for a 50 USD/HH grant.

3i experimented with a slight modification in the second round, offering 2 types of grant: the previously tested 50 USD if the investment was over 175 USD / future connection and a 70 USD per household grant if the direct investment costs were higher than 225 USD.

6. General conclusions

Overall the exercise was considered important by the team. The present offer system was not considered by anyone to be problematic, but a majority of 3i experts were convinced that an improved offer could free up money and therefore improve the overall impact of the program.

The offer in the Direct Permit round 1 was considered “certainly not too generous”, but in round 2, with the same offer, the team identified a few cases where additionality was questionable. Overall these represented only a few percent of all companies that 3i engaged with.

In general, other findings were:

1. an offer that is 10 to 15% lower would have been more appropriate for direct permit interventions.

2. Segmenting the market was considered as a good tool to offer more effective grants.
3. Larger companies are likely to accept longer payback periods.

4. The team recommended making the VfM ceiling dependent on the source of water. The minimum Value for Money criteria of 70 USD could be adjusted based on 3i’s future resources and on how much economic activity happens in the area. This could be done by setting different ceilings for different provinces.

5. The support to MIH tendering of licences for green fields has attracted only a few companies. There are good arguments why some areas are more attractive for tendering than others. The number of existing companies in the vicinity being one. 3i may adjust the offer based on these insights.

6. The issue in the electricity distribution sector is less about the method to establish the grant or the amount of the grant, but more about “Is a grant really triggering investments that otherwise will not happen, or are other forces stronger?” As a result of this discussion, the team agrees that 3i should improve its screening of the likelihood that an operator will invest anyhow, but realizes that this is hard and could create conflicts with its neutrality principle if more subjective information is used.

7. Intended adjustments

7.1. Direct Permits

1. To improve transparency and consistency, 3i intends to replace the IRR method by the payback period method.

2. The offer in Direct Permit round 3 should on average be 10 to 15% less than in direct permit round 2.

3. The mechanism and conditions that assess the operators’ intention to invest anyhow will be sharpened. The conditions however will need to remain objectively validated.

4. The 70 USD per household limit to the grant may be adjusted based on the decisions from the Scalability Review.

5. In some areas where the present access to water is problematic, 3i will consider increasing the 70 USD limit.

6. 3i will investigate other tools to focus on investment with a higher impact.

7. The possibility to actively include schools and health centres will be reassessed.

8. Smaller operators seem to have a lower appetite to invest. 3i could consider a larger grant for smaller operators.

9. The condition that potential grantees should not already have another area under licence should be dropped.

10. The pro-poor connection grant could improve the impact, but is unlikely to change the appetite of operators to invest, especially with the new tariff system. It should therefore not influence the rest of the offer.

7.2. Competitive permit

11. The offer for competitive permits should be somewhat influenced by the presence of other licenced and unlicensed operators in nearby areas.
7.3. **Expansion of REE’s**

12. The offer is effective and working and as such does not need adjustments.

13. The pre-screening of intention to invest should be improved, but not too much improvement should be expected.

14. The additionality issues in this intervention are flagged, but should be addressed at a different level.
Annex 5. Investing in Infrastructure’s Gender Approach

Background

The 5 year, DFAT funded, Investing in Infrastructure program started in 2015 to address financial constraints that prohibit companies offering clean potable water and reliable electricity to households and business in areas that are too remote or not dense enough to be commercial viable. It has offered around 50 companies a grant to make commercial investment viable and will offer other 50 to 100 companies similar investment grants. Between 1 and 1.5 million people and business could get access to clean water and reliable electricity they otherwise would not have had.

3i’s core activities and women economic opportunities

In Cambodia’s society it is very common to see women participating in most of the economic activities as workers, managers or business owners. This is also the norm in family businesses where major decisions are normally taken by husband and wife. The women normally control the finances.

Still, women in rural areas face two major obstacles when they want to start or run a business. Household tasks like cooking, cleaning and childcare are typically done by girls and women, leaving little time to run a business. Secondly, too many rural villages still don’t have reliable water and electricity. Men can commute, but that is harder for women with family obligations.

3i’s grants reduce both constraints. Not only will potable water and reliable electricity be available outside urban centers, but giving access to cheap clean water in their houses will reduce the time needed to assure clean water for drinking, cooking, washing and sanitation. Clean water will also improve health and reduce time needed to care for family members that are ill from water born diseases.

Economic activities in rural areas have normally been limited to agriculture and some basic services. Once electricity and water arrive, rural villages often see a remarkable economic transformation. These opportunities benefit women more than men for the two above mentioned reasons: more time available and the ability to combine household and economic activities.

Benefits of clean water and electricity have wider benefits than saving time and stimulating economic activities. Access to clean water reduces water borne diseases. It benefits nutrition, school attendance and income, especially for poorer households than depend on selling their daily labor. Introduction of TV, radio and internet makes communication easier and exposes children to the world outside the village.

Households are also more likely to invest in latrines when water is available, creating a safer environment for girls and young women. Latrines at schools can reduce drop-out rates of older girls and good lighting allows children to study in the evenings.
Evidence from literature

All these benefits have been well documented in a wide variety of literature. It is no surprise that access to clean water and reliable electricity has been elevated to two of the Strategic Millennium Development Goals (6 and 7). Quantifying the impact on Cambodian lives, businesses and specifically on women’s empowerment is unfortunately impossible when one relies on literature only. There is very little reliable evidence available on how clean water and reliable electricity benefit men, women and children in present-day Cambodia.

All households in Cambodia have access to untreated water from rivers, ponds, water sellers, wells or from capturing rainwater. Richer households often buy bottled drinking water and small village shops offer battery charging services. Literature on the impact of clean water and reliable electricity from India or Africa may be less relevant in Cambodia. Cultural barriers for women to run small businesses on the other hand are much lower in Cambodia.

3i and gender

The benefit 3i will have on providing women with increased economic opportunities was implicitly considered in the design of 3i, but not elevated as a main purpose of the program; it could have been.

3i’s gender strategy has 3 pillars:

Pillar 1: Capturing and Learning: In the absence of reliable literature, 3i developed an elaborate system to capture in more detail how access to basic utilities benefits women and girls. It uses a variety of tools:

1. An initial field assessment was conducted in the first few months of the program. Clean water and electricity came out as high priority for women who now lack the access. The initial research however could not find how it could improve on access.

2. 3i conducted an extensive literature study in gender in order to understand the potential gender impacts of having access to water and electricity. This will guide 3i to quantify these gender impacts in the Cambodian context. The studies of developing countries around the globe unambiguously suggest that access to water and electricity does improve women’s and girls’ health, education, economic opportunities and individual empowerment and safety. Some of the specific findings are listed below.

Health Benefits

Access to piped treated water improves sanitation facilities such as hand washing, toilet and clean drinking water. This can reduce the child mortality rate and the rate of infections due to poor hygiene and sanitation. One study suggests that hand-washing among midwives and mothers using piped treated water can increase the survival rate of children under five years old by up to 44% (globally).

Access to electricity can also reduce the use of biomass fuel for cooking which can cause indoor air pollution, increasing incidence of lung cancer or death. 60% of adult deaths globally,
attributed to the use of solid fuel for cooking, are women. According to the World Bank, access to electricity also potentially links to other health benefits, such as improvements in nutrition due to the receipt of healthcare messaging through television and a reduction in incidents of food poisoning through the use of refrigerators. The World Bank found evidence for these two results however the impact study is not gender disaggregated so the exact impact on women remains unknown.

**Benefits to Education**

Access to water and electricity improves education outcomes for both boys and girls. Access to these utilities can reduce the time and labor demands associated with domestic work such as wood and water collection and cooking. This means that children can save time from domestic work to spend on their schooling and after-school study. It is clear that piped treated water facilitates better sanitation at school and indirectly benefits school performance, especially among girls. Lack of access to sanitation facilities at schools such as safe toilets can lead to high absenteeism rates, poor school performance and high drop-out rates among girls as they find it difficult and shameful to manage menstruation at school.

**Enhanced Economic Opportunities**

As access to these utilities enhances the efficiency of domestic work, women can spend this time on productive work resulting in women’s economic empowerment. In India, time spent on unpaid work such as water fetching accounts for the loss of national income, equivalent to around $160 million. Having access to sanitation facilities enabled by access to piped treated water also improves women’s productivity at work. It allows them to practice improved personal hygiene, resulting in better health, lower absenteeism and improved productivity.

Access to electricity also increases the labor demand for small enterprise. One study shows that electrification in rural Africa results in a 9 percentage point increase in female employment, but no impact on male employment. It is possible that access to piped water and electricity creates an enabling environment for new business opportunities close to home which potentially benefit women the most. Yet there is not enough evidence to prove this stimulus effect.

**Women’s Empowerment**

Access to electricity can lead to women’s empowerment. One study in rural India shows that access to cable television leads to lower acceptance of spousal abuse, lower male-child preference, more autonomy and higher likelihood of sending girls to school. Engaging women in the electricity supply and motive energy can potentially increase the women’s welfare, but rigorous studies are needed to prove this claim. Women and girls have lower risks of harassment and sexual violence if they have access to toilets at home, reducing the need to visit outdoor facilities, especially at night.

3. 3i conducted a large-scale baseline study where the lessons from gender and water / electricity literature were captured in the indicators. The baseline will be followed by
impact surveys that measure how access has changed lives and economics of families. The first surveys will be conducted in 2018.

4. 3i commissioned an independent gender assessment in Spring 2017. The assessment is divided into three main studies including: gender in the transition process, impact on gender roles and responsibilities, and impact of gender on small and medium enterprises.

The first study found that women in rural Cambodia are involved in the decision to establish water and electricity utilities both at commune and household level. A representative from a dedicated Women and Children’s Committee joins the Commune Council to decide whether the utilities are needed in the community. However, women’s representation in public sector work still remains limited. Both husband and wife decide whether to connect and how to install the utilities at home. The tensions during the transition are mainly related to the tariff and connection fee, however the study found that these tensions are not gender-related.

The second study confirms the findings of other studies conducted around the world that women benefit significantly from having access to water and electricity. Similar to those studies, the 3i study found:

- Domestic works are the primary role of women in rural Cambodia and men are the breadwinners.
- Women benefit more than men as women are the primary users of the utilities at home.
- With the availability of piped water, women feel safer and enjoy more convenience because they don’t need to go to the river for bathing and laundring in order to save water at home. This also reduces the need to carry heavy loads of water from the river to home.
- Children have lower drowning risk as they don’t rely on the river for bathing. They also have more time to spend on studies.
- Access to electricity enables the use of computers and internet and extend the study time to the evening class and home study at night.
- The utilities enable indoor toilet facilities to be installed, benefiting every household member, especially the elderly who may find it difficult to commute outside the home. Access to these utilities combined with hygiene and sanitation awareness raising campaign results in better health within the family.
- Availability of utilities can save money on water and electricity consumption because the price of raw water delivery and battery charging is more expensive than the utilities fee.
- Though access to these utilities does not transform traditional gender roles, it is observed that access to these utilities can lower domestic tension and conflict because it reduces household workloads and the dependency of women on men in household work. Access to the utilities does save women’s time from domestic work. This enables women with sufficient capital to establish home-based businesses.
The last study suggests that the availability of these utilities has been a factor in the establishment of new businesses. Uninterrupted supply also helps women to operate their businesses more efficiently and to rely less on their husbands. Lower consumption fees may also enable higher profits, however, there is mixed evidence on the impact of business profitability; some businesses do not increase their profitability because of increased competition resulting from the availability of the utilities and lower market demand resulting from migration.

3i conducts regular in-depth interviews with households. Gender related issues are always present. The interviews not only allow better insights, but also allows 3i to probe gender related issues.

3i interviews a number of women in every feasibility study it conducts for new water companies. Women are asked about specific concerns and suggestions related to the construction and running of the water facility. In general, women are simply content with access to treated water.

Companies that 3i supported are now starting operation. This allows 3i to capture and learn from the actual beneficiaries over the next years. By the end of 2018, 3i expects to produce it first stand-alone gender impact document.

**Pillar 2: Avoiding negative impact**

3i’s staff have been trained on gender and are encouraged to observe and report all potential negative issues related to 3i’s support to water and electricity companies. Most of the reported issues are related to the licensing process and to impact on existing sellers of untreated water and on battery charging stations. So far, no issues have come up that have a specific negative impact on women.

**Pillar 3: Improving where possible**

Over the last 2.5 years, 3i identified a number of areas where additional activities could create greater benefits for households, especially for girls and women:

- Cheap clean water has a larger impact on poor households who often cannot afford alternative sources. 3i now offers a connection subsidy for poor households.
- 3i offers to fully fund the connection of health centers and schools.
- 3i is aware that the benefit of clean water is bigger when people apply basic hygiene, like washing hands. Some operators have intentions to run awareness campaigns on their own. 3i is exploring ways to stimulate such awareness campaigns for others too.
- Most rural utility companies are household enterprises. This becomes clear when contracts are signed, often in the presence of husband, wife and sometimes children. Most cases the contract is signed by the husband, but in a good number of cases the signatory is a woman. 3i is exploring how it can use these as demonstration effect.
Annex 6. Investing in Infrastructure’s Mine/UXO Risk Reduction Approach

Background

The 5 year, DFAT funded, Investing in Infrastructure program started in 2015 to address financial constraints that prohibit companies from offering clean potable water and reliable electricity to households and businesses in areas that are too remote or not dense enough to be commercial viable. It has offered around 50 companies a grant to make commercial investment viable and will offer another 50 to 100 companies similar investment grants. Between 1 and 1.5 million people and other businesses could get access to clean water and reliable electricity they otherwise would not have had.

This approach, at this scale, has never really been used by an aid program before. This newness created many new challenges for 3i. An underlying issue is the question of responsibility. In principle the majority of responsibility rests with the water and electricity companies that own, construct and run their businesses. 3i’s only contractual responsibility to the companies or to the RGC is to pay a certain grant after a pre-agreed construction output has been reached by the grant recipients. The remaining responsibility lies with various levels of the Cambodian government; they give licenses to operate and monitor the businesses.

The 3i Approach to Risk Reduction

The Australian government expects grant recipients to be decent companies that apply high standards on safety, working conditions and the environment, and that this be ensured by 3i, both prior to making any funding commitments and during the course of the funding agreement. While challenges continue to be faced by 3i in providing absolute assurances of this nature, the approach taken by 3i is to invest an extensive amount of time and effort into gathering and reviewing a broad range of information, as well as conducting thorough due diligence processes before signing contracts.

A good example of this approach in action is with regards to the residual risk of incidents caused by anti-personnel and anti-tank landmines, unexploded ordinances or ammunition left over from past conflicts. For simplicity we call these Explosive Ordinances (EO).

Managing residual risk in a cost-effective way has been an area of great interest for demining professionals. In the first years after a major conflict it makes most sense to focus on the worst affected areas, but after some time one should consider shifting efforts to focus on those areas where the chances of incidence are the highest; that is, where construction or agriculture takes place. Such is the approach on 3i. Unintentionally, 3i has become a showcase for how to manage this kind of residual risk after the majority of high risk areas have been cleared.
Brief history of conflict in Cambodia

The war in Vietnam in the 1960’s and 70’s spilled over into Cambodia with troops from both sides fighting battles on Cambodian soil. It split the country and initiated over 25 years of internal armed conflicts and included years of battles between the national government and the communist Khmer Rouge before the latter took full control of the country between 1975 and 1979. Military from Vietnam drove the Khmer Rouge out of the Capital in 1979, but not out of the country. Full peace only returned late in the 90’s, long after an international peace mission that started in 1991.

Government troops, the Khmer Rouge and the Vietnamese army left an incredible amount of UXO’s and ammunition. 600 American bombing raids\(^1\) added a blanket of unexploded cluster bombs and other unexploded ordinances.

Cambodia has identified and largely cleared most larger landmine areas, through assistance provided by donor countries like Australia. Huge progress has been made with clearance of all kinds of UXO’s and residual ammunition. The Cambodian CMAC\(^1\) reported 77 casualties in the first 11 months of 2016. A fraction of the 64,000 casualties since 1979, but a sign that the threat is far from over.

3i Risk Reduction System and Processes

Each water company is required to excavate many kilometers of trenches to place water pipes in the ground. Although the responsibility to avoid accidents is with the water company, the Australian Government requires Palladium and 3i to take all reasonably practicable steps to minimize risks. As a result, 3i developed a comprehensive risk reduction management system for Mines and UXO’s.

The process starts with a detailed map of the proposed pipe network. The map is overlaid with detailed EO database information to give an initial profile of potential risks. An international Mine Risk Management Adviser then assesses if the risks justify a field visit. During the field visit, the Adviser collects a range of information about the site including conducting interviews with local government officials and residents about the history of the area. This information is fed into a modified risk matrix, which presents an initial risk score.

Depending on the outcome, further decisions are taken on whether to engage 3i’s external Mine Action Technical Services provider, HALO Trust, to conduct official investigations on the site, including Non-Technical Survey (NTS) and Technical Survey (TS)\(^2\).

For sites not requiring further intervention, recommendations are prepared and included in funding agreements along with protocols for reporting incidents.

In 2017 and early 2018, 93 projects were assessed. 43 sites required field visits and of these, HALO Trust was engaged to conduct NTS on 20 sites, of which 8 are complete at the time.

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\(^1\) The Cambodian Daily 4 January 2017 quoted from the Cambodian Mine Action Center (CMAC). One third of the 64,000 casualties were killed.

\(^2\) During Non-Technical Surveys, experts assess the EO risk by conducting interviews. During Technical Surveys, experts use equipment like metal detectors to assess areas and dispose of EO’s when found.
of writing. Three sites required further intervention via TS for landmines and UXOs. 20 EOs were found and cleared. In addition, HALO Trust responded to on-the-spot call outs from villagers to destroy other 98 EOs which they had collected or knew existed.

In addition to NTS and TS interventions, HALO Trust is also contracted to provide site-specific risk education sessions to operators and their construction crews to further educate them about the risks of mines and UXO’s prior to construction starting. Mine Risk Education (MRE) materials documenting the basic safety protocols for avoiding and/or encountering mines and UXOs will be provided to all operators. For high-risk sites, the MRE material is coupled with a site-specific risk education session which is tailor-made to the site, providing detailed information on areas to avoid, preferred construction techniques and other risk-reduction actions, as well as further guidance on what to do in the event of an incident.

Case Study

Below is a case study on EO risk management on a potable piped water project in Preah Khae and Kat Phluk Commune, Basesoth District, Kampong Speu Province, Cambodia.

The 3i team developed a pipe network map (See Figure 1) primarily for feasibility purposes. The map is also the starting point for the EO risk assessment.

*Figure 1: Pipe network map in the communes*
The map was overlaid with bombing and landmine/UXO datasets, including data from American bombings. Figure 2 shows the result:

Figure 2: Mine and UXO’s Map in the commune

Between 1965 and 1973 the US dropped 2.7 million tons of explosives on Cambodia – “more than the Allies dropped in the entirety of World War II”. Henry Graber, writing in Atlantic magazine in 2013. Also see: https://www.youtube.com/watch?time_continue=12&v=UwQdlg1kN_A
3i’s Adviser concluded that a field visit was required. In his report he wrote: “The main area of concern appears to be Boeng village in the south east of the network where spot EOD tasks and some landmine clearance took place in 2008. The only other area of concern is the area to the south of Khnang Phum in the north of the network where US bombing records indicate sorties. However, there is not a concentration of spot EOD tasks in this area.”

During the field visit, the Adviser interviewed the Commune Chief and his wife. They stressed that the critical area of the pipe network was around Khnang Phum village: *There have been multiple call outs for clearance to the southern part of the pipe network*. They also mentioned a cache of UXO in the river, by the bridge further west in the village (confirmed by the woman whose husband and brother found the UXO, as well as by the local police). The police stated the last reports of UXO were back in 2005-07.

The village leader of Khnang Phum village explained that there was an army base in the low-lying hill to the north of the village during the 1979-97 civil war. The area was heavily mined. There were many accidents involving cattle in the past, but in the last 6 years there had been no explosions. He said *people freely go there to collect wood and graze their cattle. In the past they were scared, but slowly people feel increasingly confident*. He noted that the village has expanded a lot in recent years, but he was not sure if people were findings items or not. He said they might have found things but not reported, and he was not sure if items were found during recent road construction. This is markedly different to other sites where people are often outspoken that there is almost no risk.

For Boeng village and the southern part of the network, sources stated that many buildings have been constructed in recent years (in the south of the network), without items being found. The commune chief reported that the forested high ground – mostly to the north of the network, people do find items and accidents have occurred. But on the lowlands there are no accidents these days. He stated he did not think there would be a problem constructing the trenches to construct the network in that southern part.

After visiting the communes, the consultant concluded that the risk from landmines and UXOs in the southern part is “acceptable” yet he recommended Non-Technical Survey in the center of Khnang Phum village, with the possibility of selective Technical Survey in both sides of the village.

The HALO Trust undertook this NTS and concluded that the risks could be considered acceptable. The summary of the report states: “*The survey team spent eight days on assessing this […] task. During this period they have conducted 39 Non-Technical Surveys (NTS) and reviewed 3i tasking order. There were no requirements for technical survey (clearance) in the targeted area.*”

With the green light from HALO Trust, 3i offered the water company a grant contract. It added a number of conditions to the contract:

1. Network to follow the agreed track of the pipe network as per the 3i map, and compliance will be monitored and reported on.
2. Attend with workers a HALO Trust facilitated “site specific mine risk education”, and ensure Mine Risk Education (MRE) materials are distributed.
3. Use mechanical excavation methods where possible.
4. When items are found the operator is to stop excavation immediately and inform both 3i and HALO Trust. HALO Trust will be on stand-by for action.

This case study is an example of how 3i manages risks of landmines and UXOs. In some cases, the risk could prohibit 3i from offering support. In all other cases 3i will take all reasonable action to reduce and manage the risks to ensure that the project can proceed and benefit the surrounding community.

Additional benefits accrue to the community through interventions by HALO Trust that are not funded by 3i. For example, where there are significant risk areas in areas adjacent to the proposed network or where there are on-the-spot call outs for assistance, HALO Trust responds to these of their own accord, providing enhanced mine action outcomes for the community resulting from 3i’s initial intervention. This represents an additional value for money outcome from 3i’s risk reduction methodology.
Annex 7. Investing in Infrastructure’s Monitoring and Evaluation System

Background

The 5 year, DFAT funded, Investing in Infrastructure program started in 2015 to address financial constraints that prohibit companies offering clean potable water and reliable electricity to households and businesses in areas that are too remote or not dense enough to be commercially viable. 3i has offered around 50 companies a grant to make commercial investment viable and will offer another 50 to 100 companies similar investment grants. Between 1 and 1.5 million people and business could get access to clean water and reliable electricity they otherwise would not have had.

The figure below shows how 3i’s work lead to the program goals.

3i’s Impact Measurement System

3i has built a monitoring and impact measuring system around each step of the results chain.

The process starts with requesting companies to submit Expressions of Interest. 3i then takes the lead in developing feasibility studies, a basic design and a financial business plan for eligible Potable water companies. 3i also conducts an environmental assessment, due diligence checks and a landmine and UXO risk assessment. The program uses the design and the business plan to calculate the minimum grant needed to incentivise the business to invest.

All preparatory documents are evaluated by an external expert panel that checks the additionality of the program, the sustainability, the consistency and all other relevant parameters.

A similar, but less elaborate process is followed for grant support to Rural Electricity Enterprises where grants are offered to incentivise companies to connect households in remote and otherwise unviable areas.

All contracts that 3i offers are output based. This mean that the company and 3i agree on specific payments for achieving pre-determined physical outputs.

80% of 3i’s work is done before the contracts are signed. 3i conducts monitoring visits to assure proper working conditions and to assess the outputs before payments can be made.
The following section details what happens next; the connections, the benefits for households, for companies and for the local economy.

**Context**

A large number of international studies have both identified and quantified benefits from having access to clean water and reliable electricity. The benefits cut across a wide range of aspects such as gender, household cost saving, economic opportunities, education and health. The benefits from access to clean water and reliable electricity are widely accepted, so much that Sustainable Development Goals 6 and 7 are dedicated to them. 3i considers it therefore less important to prove these benefits exist, but more important to show how people and businesses benefit in specific situations in Cambodia.

The wide range of potential benefits is made even more complex by the diversity of beneficiaries. Socio-economic status and geographic location for example can make a big difference. The diversity forces 3i to make choices about what to measure and capture with what accuracy. A high priority is placed on measuring actual connections as well as reliable models for future connections. The latter is important as most connections will happen after the project has ended. The need to share lessons and results with both governments and the wider development field drives other measurement priorities. A third priority is given to capturing results that can influence new activities. Examples of this are 3i’s understanding of how water and electricity benefits men and women differently or what influences licence and construction decisions.

**Initial Results**

It is still early days to capture impact. At the time of writing, 3i made payments to 27 companies and made final payments to only 6 projects. Companies reported a total of 6,237 connections at the end of 2017. This represents less than 5% of the total expected future connections.

3i has conducted extensive literature reviews and some in-depths interviews. The program has also conducted and commissioned a number of baseline surveys. Over the next year it will be able to observe early impacts, but realizes that behavioural changes that are caused by new access will take time. The focus in 2018 will be understanding and improving changes. More accurate numbers will follow in 2019 and 2020.

**Monitoring Tools**

The tools 3i uses to capture changes and impacts on people’s lives and on businesses are diverse and include:

- Literature reviews to understand the diversity of impacts
- Large cross sectional and before-after surveys to quantify part of the impacts for households and businesses
- Longitudinal in-depth household surveys to understand attitudinal changes and unintended impacts
• Enterprise surveys
• Smaller surveys conducted by 3i staff or local consultants to understand specific topics
• Daily observations from 3i staff
• Focussed investigations in unexpected positive and negative impacts

Results have been and will continue to be reported on in 3i’s 6 monthly Progress Reports. At the end of the program there will be an extensive completion report with all details.

3i has also made communication materials a priority for 2018. Early findings and lessons will be used.