



*This case study describes an innovative solar infrastructure investment facilitation platform developed by the International Finance Corporation (IFC) and launched in Zambia in January 2015 with the aim to be replicated in other African countries. **At DFID's request this case study was been expanded to incorporate views of a range of small and large developers. Moreover, additional background information on the program and more generally on the solar energy market in sub-Saharan Africa has also been incorporated.***

In assessing the success of the Scaling Solar Program and the impact it has had, it is useful to first consider the context of renewable energy Independent Power Producers (IPP) procurement programs in Africa. African utilities have until recently largely remained vertically integrated monopolies with IPPs only being introduced on the fringes of electricity markets in order to cater for emergency power needs - Zambia's current situation is a case in point with emergency power imports and generation being used in order to mitigate the shortfall in production from the existing hydro capacity. Incumbent utilities have in the past argued that the unbundling of electricity markets was an ill-conceived approach to market development - leading to excessive returns for private power producers and resulting in unaffordable tariffs for consumers - a view which has subsequently been disproved in many competitive markets.

The evolution in electricity markets has been further hampered by a lack of the requisite experience and skills required to support the introduction of IPPs in both governments, regulators and utilities. The required amendments to policy, legislation, regulation and the rules, codes and standards governing the sector, to support the introduction of IPPs have not been made. In many cases the utility – which is often threatened by the introduction of IPPs – also plays the role of the single buyer or off taker, requiring significant government guarantees in order to meet the bankability requirements of lenders. The lack of precedent and lack of transparent competitive procurement processes have led to further increases in risk and complexity in negotiating the development of new plant.

As environmental policy has changed and falling Renewable Energy (RE) technology prices have captured the attention of African governments, commitments towards the procurement of RE plants have likewise increased. However; due to the complexity and risks described above, only a handful of smaller project developers were initially attracted to these new markets – often spending many years traversing an unsolicited bidding process and relying on their local contacts to drive projects forward.

Certain African electricity markets have learnt a number of valuable lessons from their global counterparts and moved from unsolicited bidding, to offering feed-in tariffs and eventually to conducting reverse auctions with

transparent, competitive bidding programs supported by standardised agreements and highly skilled and experienced personnel that manage the program execution and bid evaluation. This has resulted in de-risking the bidding environment in order to attract globally competitive project developers and to encourage the most competitive bids in terms of project tariffs. The most notable success to date has been the Renewable Energy IPP Program (REIPPP) in South Africa. These programs have attracted a number of larger, globally recognisable project developers, who have in part displaced the first-mover smaller developers.

The net result of this de-risking is that smaller developers are no longer able to compete with the larger developers (often backed by international utilities), who bring stronger balance sheets, cheaper resources, technology and construction costs and who are prepared to accept lower returns than their smaller counterparts. In programs like the REIPPP these smaller developers have in turn changed their business models to become project sponsors that flip their projects to larger more competitive developers after having done a minimum amount of project development to guarantee some return.

It is proposed that a “like-for-like” evaluation and comparison of the risk and structure of the various programs will provide a suitable explanation for the differences in tariffs and returns. Unfortunately, for the early market entrant (smaller) developers, it is unlikely that they will be able to compete with the balance sheets and in-house resources of some of their larger competitors. Given the low project tariffs bid, the trend towards Scaling Solar type Programs will continue in the future.

The Programme

Rationale

As described above, investors developing private solar projects in Africa have been deterred by a variety of obstacles, including high transaction costs, heavily negotiated agreements, and high perceived risk and cost of capital. As a result, the region has struggled with slow, relatively expensive and ineffective solar development, which impedes access to electricity.

Against this background, the rationale for IFC developing the IFC Scaling Solar Program was as follows:

- There were very few solar Independent Power Projects in Africa and any procurement schemes that had been run had taken a long time. There were enough learnings from other procurement efforts to speed up this process;
- Solar is a relatively straightforward technology for which a templated approach could be developed. Solar is not site specific unlike wind and other technologies; and
- A transparent procurement process with standardised documentation and guaranteed financing would attract high quality private investors at competitive pricing.

The Scaling Solar Program should be seen as a further evolution in the de-risking of the bidding environment process to attract globally competitive project developers and to encourage the most competitive bids in terms of project tariffs. In fact, the Scaling Solar Program structure effectively removes material risk from the project and allows developers to compete against one another on a “like-for-like” basis i.e. Scaling Solar has already specified the site, completed a number of the most significant development activities and studies and offer an attractive debt financing package – although developers can utilise their own debt facilities if they are able to secure more competitive financing.

All things being equal, there are few areas left for real competition and differentiation. Three potential areas are: (1) equity returns, (2) EPC pricing and (3) owner’s overheads. Many of the larger developers are supported by resources from their parent utilities, giving them access to engineering and other development staff already being employed. Each company will have a different policy as to how these costs are allocated, but smaller developers will be disadvantaged by (in many cases) having to pay for these services from third party advisors. Scaling Solar therefore removes project risk, but also removes opportunities for smaller developers to compete as the differentiating factors common to most power projects are now beyond their control.

The competitiveness of the Scaling Solar Program has (in Zambia), led to some consternation and complaint from certain developers who were not able to compete in terms of the quality of their bid or their project tariff

(See Section 10 for details). This has also led to a number of other regional markets comparing their own project tariffs with those from Scaling Solar, often without taking into account the varying degrees of risk between their Programs. Ultimately, the returns and tariffs in most of the programs must be assessed from a risk-adjusted point of view. As markets have evolved from an unsolicited, complex and high-risk state to the current status quo represented by Scaling Solar, the returns and tariffs offered have proportionally reduced. Especially significant in the Scaling Solar Program in Zambia is the funding package offered by the IFC, which is extremely competitive and utilises Partial Risk Guarantees and insurance products in order to remove the onus from the GRZ to provide costly guarantees to ensure bankability.

Objectives and scope of activity

The main objective of the Scaling Solar Program is to provide a suite of World Bank Group (WBG) services (financing and advisory) under a single engagement to facilitate the creation of viable markets for solar power in each client African country. The Program expects to reduce development time and uncertainty for bidders and investors, while lowering tariffs for utilities. IFC expects to enable PV projects to be operational within two years of engagement with a country and within 18 months of bid award.

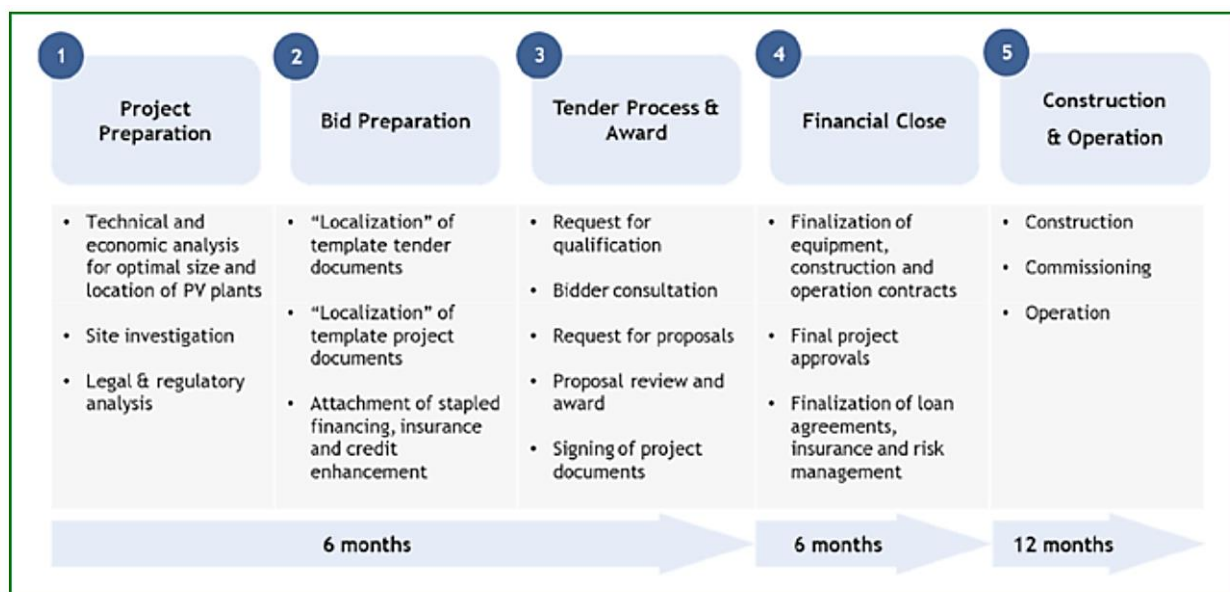
On the investment side, the initiative combines World Bank guarantees, MIGA investment guarantees, and IFC financing to mobilize privately funded solar projects that are connected to the grid.

Moreover, the IFC's Advisory Services (AS) group plays a lead role in supporting client country governments in the preparation and running of the tender on their behalf. Figure 3 below details the process and its associated milestones set up by the Program that IFC AS supports.

Highlights of IFC AS's intervention include:

- Development of key template project documentation that can be then adapted and rolled out to any client country (IFC AS spent a year developing these templates). This activity was funded by DFID, the Dutch Ministry of Foreign Trade and Development Cooperation, the Danish Royal Ministry of Foreign Affairs and DevCo. The Power Purchase Agreement (PPA) and Government Support Agreement were developed from scratch, with support from Linklaters in London, benchmarking all relevant PPAs in similar markets. The overall risk allocation was designed and stress tested by Norton Rose, with a keen sense of balance while ensuring bankability with comments from the IFC Debt Financing team. These templates are designed in a way that can rapidly be tailored to local regulatory and legal specifics. They are then offered on a non-negotiable basis to developers;
- Once a client government engages the IFC AS team under Scaling Solar, IFC AS provides a straightforward package to help countries determine the size and location of projects, localize the template project documents developed above and carries out technical, legal and environmental due diligence with its advisors for the projects. The feasibility studies, site selection and legal due diligence are 'fronted' by the WBG (IFC, International Development Association (IDA)) and other development partners. Speed is achieved with template terms of reference and a bench of high quality advisors;
- The IFC AS team conducts a competitive, transparent auction procedure on behalf of the client government. As part of this auction, each developer is provided access to the technical, legal and environmental due diligence carried out by IFC so that each of them is not required to do this separately; and
- The IFC AS team also, importantly, as part of the bid, coordinates and provides a credit-approved term sheets for financing, political risk insurance and partial risk guarantees. In addition to fully-developed project agreements, the Request for Proposal (RFP) is expected to include term sheets, with in-principle credit committee approval, providing indicative terms available to bidders for limited recourse financing from IFC through its investment operations (IFC Investment), political risk insurance from MIGA and partial risk guarantees from IDA (World Bank Group). This is a highly innovative component of this Program. In the past, developers were required to arrange their own financing and guarantees which often delayed financial close or lead to projects not moving forward.

Figure 3: Scaling Solar Processes and Milestones



Source: *Scaling Solar 2015 documentation*

The fees for IFC's AS are paid to the IFC upfront by Donors and the client government. However, the winning bidder will pay a success fee which is roughly equivalent to the transaction advisory fee. This will be recycled by IFC for the next bid in its Scaling Solar Program so that the Program is self-sustaining in the long run.

Project: Scaling Solar in Zambia

Context

Zambia relies heavily on hydropower as its main source of supply and is currently suffering from a lack of available capacity and lowered production due to insufficient dam water and poor maintenance of hydro plant, the network and dams themselves. This in turn has led to load shedding and procurement of emergency electricity supplies from Mozambique and South Africa. The net impact on both the economy and the government's foreign exchange reserves has been disastrous.

Irradiance in Zambia is considered attractive and PV systems offer an immediate supply option that can be quickly integrated into the grid. Furthermore, the combination of PV and hydro power, offer the opportunity to conserve precious hydro resources during non-peak (daytime periods) by substituting PV and then utilising the hydro resources for shorter peak periods when the PV is not available.

Dispatch of hydro plant is usually undertaken whilst maintaining water levels and compensating for seasonality and times of drought. Unfortunately, Zambia has not been able to utilise this approach as the system is so heavily reliant on their hydro plant. The plant and water resources are therefore never given a chance to recover in order to maintain their efficiency and availability. The incorporation of PV plant will bring relief to the Zambian hydro plant as well as an immediate supply option to mitigate expensive emergency supplies and to power the productive sector.

The latest PV grid integration study by PB Power, reportedly reflects the optimal supply energy mix that the combination offers by allowing for as much as 1,000MW of new PV plant to be incorporated into the current system¹. Whilst hydro levels may recover, there is no question that the energy mix in Zambia requires diversity in order to become more resilient and support the country's economic and developmental goals.

Although Zambia has a number of new hydro opportunities, which are already in development, it is safe to assume (given the existing solar irradiation mapping) that there are also many opportunities for new PV plants – that can be more flexibly positioned than a hydro plant can. These new PV plants may allow ZESCO to

¹ This study is still being assessed by ZESCO and has not yet been ratified and released for public consumption.

manage grid stability and development costs by first siting new plant where there is free capacity available for grid integration.

PV plants can also be sited in off-grid applications to supply rural areas that are not yet connected. In the longer term, Zambia will need to extend its grid or off-grid supply options to try and service the majority of the country which is currently without power. ERB will need to examine their application of grid connection costs, network costs and wheeling costs as more IPPs connect to the grid and grid extension is required. ZESCO will also need to undertake extensive maintenance on its existing infrastructure to ensure security of supply.

The North-South axis between Lusaka and the copper mines will continue to remain the dominant economic driver in the country outside of agriculture and PV can provide options for both mining companies as well as urban manufacturers. With a benchmark cost of US\$ 6c/kWh, large scale PV will be extremely attractive to large off takers (such as the mines) and it is not inconceivable that they will pursue their own supply options in the future. Zambia's geographic position potentially allows it access to a number of neighbouring electricity markets – given the recovery of existing hydro resources, the development of new hydro plant and further PV plant, it is possible that at some stage in the future Zambia may be a net exporter of electricity.

Based on their own understanding of the status quo, the Zambian government has delegated to the Industrial Development Corporation Zambia Limited (IDC) a state-owned investment company, the task to immediately expand the country's PV infrastructure.

Key program developments

In July 2015, Zambia was the first country to officially engage IFC under its Scaling Solar Program with the Zambia's Industrial Development Corporation (IDC) signing an agreement with IFC to explore development of two large-scale solar projects through Scaling Solar by issuing a request for Pre-Qualification (RFQ)². 11 out of 48 of solar developers that applied under the RFQ were selected. The Pre-Qualified solar developers were all experienced and globally recognised at an international level. The request for proposals (RFP) was issued in February 2016 and the winning bids were announced in June 2016. The bids were the lowest PV pricing seen in Africa. The first bid was US\$ 6.02 cent/kWh for a 45 MW project by a consortium of NEON S.A.S./First Solar. The second was US\$ 7.84 cent/ kWh for a 30 MW tracking³ project by ENEL Green Power.

It is important to note that at this point of time the projects in Zambia have not yet reached financial close. According to the Scaling Solar documentation, financial close is scheduled 90 days from commercial close, which is imminent according to the IFC. Zambia plans to launch Round 2 of its Scaling Solar Program at four more sites.

Technical assistance provided by IFC AS

IFC AS provided the following services to support the IDC throughout the Program process (See Figure 3 above for details of the process):

- As part of the bid package IFC AS supported IDC in amending key template project agreements developed for the Scaling Solar Program to the Zambian context;
- IFC AS led the tender process with the IDC as a client, including preparing and the RFQ and RFP and led the bid evaluation process;
- Using standard terms of reference, consultants were hired by IFC AS to carry out the following studies/reports as part of the RFP:
 - a) Site climatic studies (GHI, DNI, wind, dust, temperature, etc.);

² Industrial Development Corporation, *Scaling Solar Zambia Round 1 RFQ*, 2015, Available at: http://www.idc.co.zm/sites/default/files/tenders/Scaling_Solar_Zambia_Round_1_RFQ.pdf

³ There are basically two technologies for mounting solar PV panels, fixed and tracking. Fixed is cheaper per MW, less efficient (since it doesn't follow the sun) but needs less space per MW, so you get more MW in a given area. Tracking is more expensive per MW, more efficient (since it follows the sun) but needs more space per MW, so you get fewer MW in a given area. In Zambia it was decided that bidders should be free to propose whichever they could deliver at the lowest c/kWh.

- b) Grid interconnection, stability and integration studies (installed generation capacity, load curves (seasonal and diurnal), location and characteristics of interconnection point, rights of way for interconnection transmission line, grid capacity and stability analysis, etc.);
- c) Site surveys including geotechnical investigations;
- d) Environmental and social scoping report;
- e) Legal due diligence report;
- f) Tax and accounting due diligence report; and
- g) Insurance due diligence report.

These reports were provided to the pre-qualified bidders and could ultimately be relied upon by the winning bidders. These studies were paid for by funds made available to IFC by Donors such as USAID and DFID.⁴ For this initial Scaling Solar project in Zambia, Power Africa financed the project development costs. However, going forward these costs are expected to be absorbed by the winning bidder.

- IFC AS and IS coordinated the indicative term sheets for financing, political risk insurance and partial risk guarantee products made available from agencies of the World Bank. They also arranged a payment guarantee letter of credit for the developers back-stopped by the Industrial Development Association (IDA).
- IFC AS supported the government of Zambia in additional capacity building activities. Although this was not specifically part of the Program, IFC AS consultants reviewed the technical and legal requirements of a solar project with ZESCO and IDC when carrying out the feasibility studies. When interviewed, the IFC AS team felt that a focus on an actual transaction was the most effective form of capacity building for the institutions involved and that their capacity to understand and run a solar procurement was enhanced. IFC will also place an advisor within ZESCO for the first couple of months of the operational solar project to ensure that everything runs smoothly.

Scaling Solar in other countries

In February 2016, it was announced that Senegal would become the second country to engage in the Program to tender 200MW of PV capacity. Senegal issued its RFQ in August 2016.

In May 2016 it was announced that Madagascar will be the third country to participate in the Program. The government of Madagascar delegated to IFC the task to organize and hold the tendering procedure for a 30 to 40 MW PV power plant. No RFQ has yet been issued.

Recently it was announced that Ethiopia will be the fourth country to participate in the Program. Ethiopia Electric Power signed an agreement with IFC to advice on developing up to 500MW of solar power under the initiative. Although Ethiopia has huge renewable energy potential it currently has an energy shortfall of 500MW, with over 70% of its energy coming from hydropower.

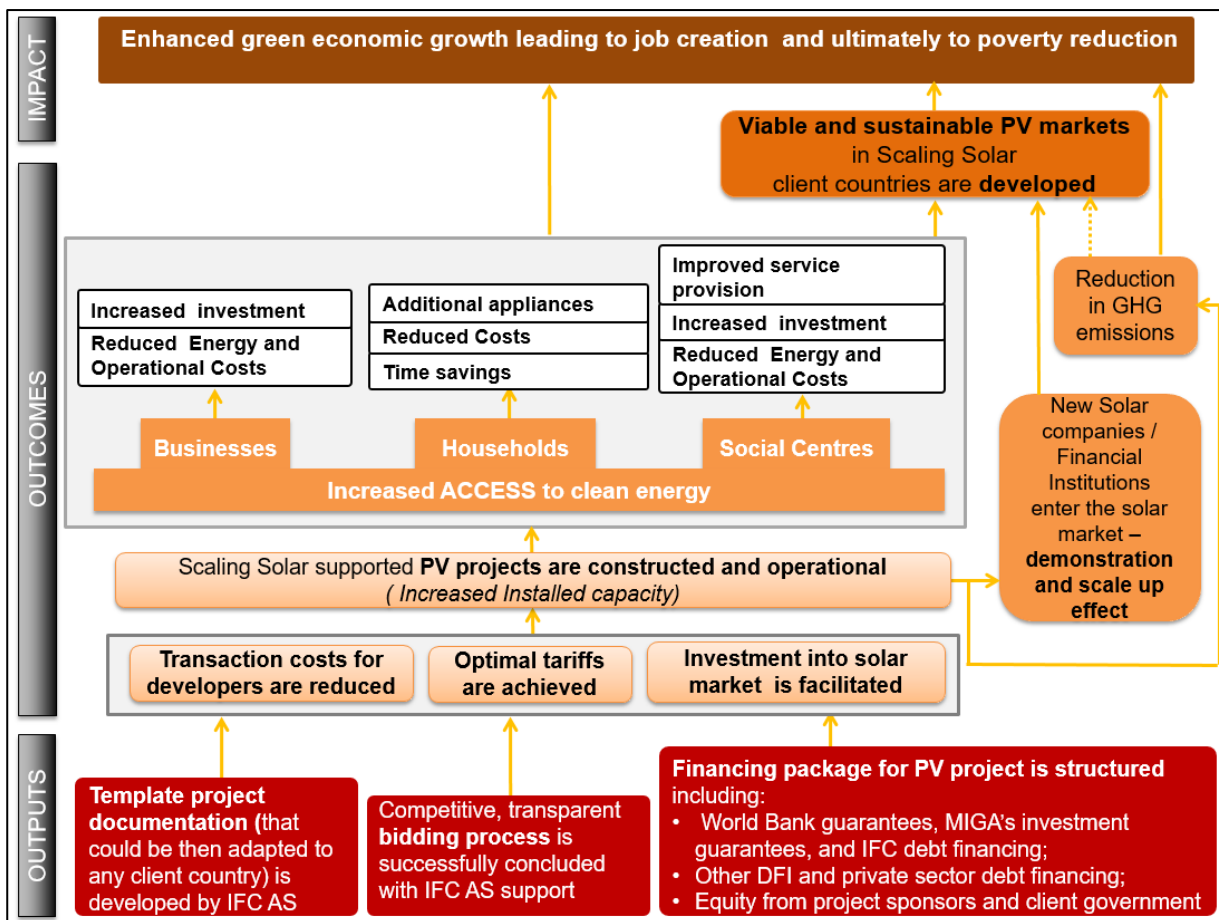
Theory of change

The IFC Scaling Solar Program aims to create a viable market for private solar power projects in Africa that will help governments increase the supply of energy for millions of consumers leading to economic green growth (job creation) and ultimately to poverty reduction. Scaling Solar reduces the development time and uncertainty for bidders and investors, while lowering tariffs for utilities, which ultimately benefits consumers. The chart below provides a general Theory of Change (ToC) for the Program.

Chart 1: Scaling Solar general Theory of Change⁵

⁴ This information was given in an interview with IFC, October, 2016.

⁵ Please note that this ToC has been developed based on the secondary information obtained during the drafting of this case study.



The impact level indicators that IFC is tracking for the Scaling Solar are (i) the value of financing facilitated and (ii) the GHG emissions saved⁶.

In Zambia, the estimated GHG emission saving is 1,401 metric tons/year for both projects⁷. In relation to investment, the exact figures for Zambia are confidential but, it is possible to estimate the total investment by the IFC as a range. There have been few PV projects outside of the REIPPP, therefore as a rule of thumb, we can assume a capital cost range of between \$1.2m/MW - \$1.4m/MW. Given the total installed capacity of both winning projects as 81.5MW and 80:20 debt: equity ratio, the IFC investment in Zambia can be assumed to be between \$78m and \$91m.

Key success factors of the program to date

Key success factors of the program identified to date are as follows:

7.1 Attraction of high quality international investors

The strict pre-qualification criteria, transparent process and guaranteed financing meant that the pre-qualified bidders in Zambia were some of the most recognizable solar developers internationally. The two winning bidders (NEON S.A.S./First Solar and Enel Green Power) had developed over 14 GW of solar globally. The Program was able to attract large scale solar investors and developers who traditionally are not first movers in risky markets, particularly in Africa. Without the Scaling Solar Program, it is highly unlikely they would have bid in Zambia, particularly at the competitive pricing described below.

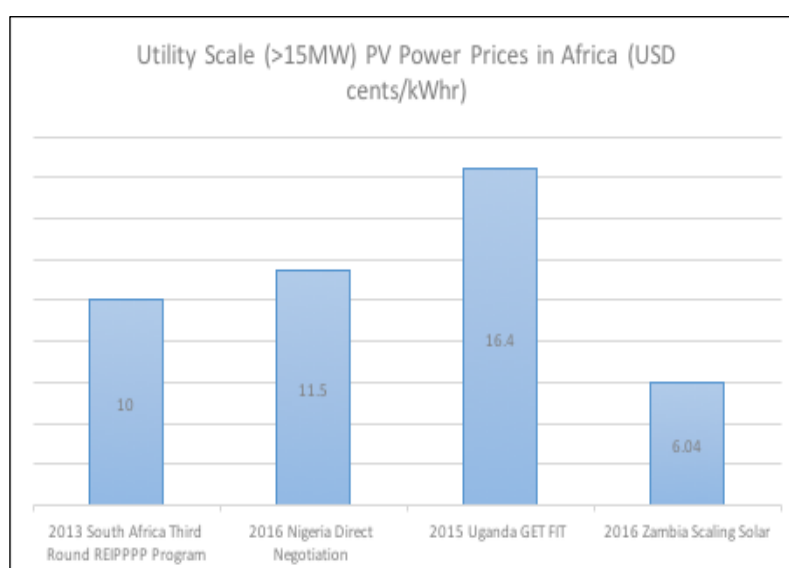
⁶ Outcome level indicators as defined by IFC for the Program were not provided to the Case Study team.

⁷ Source: IFC AS team.

7.2 Pricing

The pricing is the lowest seen in Africa and on par with pricing in the developed world. The first round of the Program in Zambia has made waves in the power project world by achieving prices for solar PV power never seen in Africa before. In addition, these were prices competitive with most conventional power solutions such as natural gas⁸ - see Figure 4. It is particularly impressive as this was Zambia's first procurement round. The closest pricing in South Africa was achieved in the third round following developers' familiarity with the Program and a growing solar market lowering transaction costs.

Figure 4: PV Power Prices in Africa



Sources: South Africa: Eberhart et al., 2014; Nigeria: Ola, 2016; Uganda: GETFIT Presentation 2016; Zambia: Scaling Solar 2015 and IFC interview in 2016

7.3 Speed

The aim of Scaling Solar is to enable projects to be fully operational within 24 months of first government engagement and within 18 months of bid award. The first projects in South Africa took 15 months just to reach financial close from the bid advertisement and this does not include the time for bid preparation (i.e. from first government engagement).⁹ If successful, the timeline for projects reaching commercial operation under the IFC Scaling Solar Program will be much faster than most Independent Power Producers (IPP) have taken to reach financial close in Africa. So far, on this first engagement in Zambia, they are on track to meet this aim.

IFC are on track to achieve bid preparation, tender and financial close within 12 months well below the average for other solar projects in other African countries. In South Africa for instance, projects took 15 months from tender process and award to reach financial close. This does not include the amount of time it took for bid preparation (i.e. Step 1 and 2 in Figure 4). The GET FIT Program in Uganda was similar. It took two years (from March 2013 [first requests for proposal] to end 2015) for the first project to reach financial close. Again, this does not include preparation time for the documents. Pricing in both of the above Programs has been higher than that achieved by the IFC Scaling Solar Program in Zambia although this is also impacted by respective timing and the scale of the projects involved. It is also worth noting that direct negotiation efforts (without a competitive tender) in Nigeria took four years to initial the power purchase agreement and have resulted in pricing of \$11.5 cents/kWhr at the same time as the Zambia tender was achieving six cents.

7.4 Coordinated donor technical assistance

IFC coordinated all the technical assistance and financing aspects of the Program both within the World Bank Group and with other Donor agencies. In Zambia, IFC reported that both USAID and DFID contributed to the

⁸ It is acknowledged that it is not strictly accurate to compare CCGT and OCGT pricing with that of PV without the context of the market requirements; however it is agreed that it is unlikely that NG will come in at below US5c/kWh in real terms – whether it is piped in or converted to electricity and transmitted.

⁹ Exact timelines for development of the bid procurement documents in South Africa are not clear. However, estimates from those involved in the program state that it took an additional year at least. See Eberhard, A. et.al., PPIAF, *South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons*, 2014 <http://www.gsb.uct.ac.za/files/ppiafreport.pdf>

feasibility and legal due diligence required by the projects. This cut down on inefficiencies that can happen if different Donors are supporting different agencies or different projects.

7.5 Scalability

IFC's template standardised approach to project and procurement documents in Scaling Solar means that it can be replicated with very little time required for localised amendments.

Evidence/assessment of economic development/growth contribution

A material difference between the IFC Program and the REIPPP in South Africa, for example, is the manner in which the Programs deal with the localisation and uplifting of local community's economic growth.

The REIPPP approach has been to mandate developers to ensure that local communities are included as minority equity in each project via the creation of a community trust. The trusts are provided with preferential financing by the South African IDC in order to facilitate the investment on their behalf. The revenue stream that flows to the local community is thereafter used to enable development of infrastructure and social services (roads, hospitals, schools etc.). REIPPP therefore takes a direct and explicit approach to driving the improvement of local communities through the development of the power plant. This has been a notable outcome of the REIPPP Program and has proved a successful innovation in ensuring some "trickle-down" of economic benefits to poorer communities.

Scaling Solar takes a different approach. The entire Program is designed to ensure the lowest possible price bid by the developer – in this case the economic benefit is derived by ensuring that the electricity is priced as competitively as is possible. There is also an opportunity for local participation in projects, albeit at a later stage during the project development.

Zambia's IDC will set up two Special Purpose Vehicles for both power plants to be operated by the winning bidders and will initially hold a 100% stake in each of them. On completion of the tendering procedure, both IDC and the two winning bidders will bring in "fresh equity" as part of a Shareholder Agreement (company's articles of association), whereas the share of the winning bidders may not exceed 80% in either case. The remaining (minimum) 20% will remain in the hands of the IDC and will eventually be sold under an IPO (Initial Public Offering) on a stock exchange (Lusaka Stock Exchange LuSE) as soon as the investments become profitable – where Zambian citizens will have the preferential right to purchase the shares.

Both options provide opportunities for driving economic growth – by utilising two very different approaches. A developmental economic approach would argue for the REIPPP mechanism as it is unlikely that the majority of ordinary Zambians will ever be able to afford to buy shares in the power projects. Arguably, if the IDC or other Donors were able to offer local community trusts financing at the same rates as the rest of the debt, there would be no net increase of the project tariff. Given the success of the REIPPP mechanism, the IFC may consider revising or finding alternative means to ensure that local communities benefit from affordable tariffs as well as through some form of equity participation in the plant.

As the solar projects in Zambia are not yet operational, this assessment has not been carried out yet by IFC. However, under the theory of change set out above, increased affordable power generation should contribute to economic growth in the long run. Please also refer to Section 3.1 that details, ex-ante, potential contribution to a PV solar market to Zambian trade and economic activities.

There is no gender aspect to the IFC Scaling Solar Program (see Section 8 for a comparison of the Program with REIPP in South Africa where inclusion strategies have been implemented).

In relation to climate and environment, Scaling Solar supports greenhouse gas emissions reduction objectives in target countries by improving the enabling environment for clean, low-emissions energy. Outcomes in this regard are estimated as greenhouse gas emissions saved through installation of solar energy, in comparison to baseline emissions calculation from the baseline emissions intensity of a particular country. In Zambia, greenhouse gas emissions savings are estimated at 1,401 metric tons per year once both projects are operational.

Other stakeholder perspectives on the program

At face value, the Program seems to be an unmitigated success in Southern Africa – with the first two projects meeting all the initial objectives with regard to timing, size and competitiveness. However; there are a number of concerns that have been raised by Program participants, Donor agencies and government stakeholders.

Tariffs

The most common objection repeated by various power project developers that took part in the Program, relates to the tariffs bid by the winning consortia in the first round. The fully indexed price of ~US\$ 6c/kWh by the NEOEN consortium is closer to US 4.7c/kWh in real terms – astonishing for a first round auction in Africa. However; several developers have questioned the viability of these low tariffs in the long term development of the market. In fact several developers have alluded to the fact that the winning bidders have somehow benefited from an “uneven playing field” – where the winning bidders were given access to benefits from which the unsuccessful bidders were excluded in the Scaling Solar Program. Several other bidders were unable to determine exactly how the winning bidders were able to put forward “such a low tariff” and they have claimed that it has slowed down the solar market generally in Africa as other countries, such as Nigeria, where governments have signed agreements and are now looking for lower tariffs.

On examination, there are a number of reasons that have probably contributed to these low tariffs. The first, is undoubtedly the structure and process of the Program itself – which has already been discussed earlier in the case study. Building on the success of the REIPPP in South Africa as well as other global examples, the IFC have utilised a streamlined bidding process, with transparent risk allocation via standardised documentation and risk mitigation via MIGA, Partial Risk Guarantees and other mechanisms, to mitigate the market and offtake risk that ZESCO and the GRZ pose. As these options were available to all participants, this does not fully explain the lower than expected tariff submitted by the winning bidders and a contributory factor is probably the lower equity returns required by the larger developers discussed later in this section. Some developers have suggested that the winning bidders have very little experience in developing markets and that their inexperience led them to bid such low tariffs. Financial close will be a significant milestone in confirming whether these low tariffs are viable but ultimately, this will be judged over the long run.

On the low tariffs slowing down the African market generally, it is difficult to validate this claim (or otherwise) at this stage especially as, outside of South Africa, so few solar IPP projects have reached financial close. The difficulty has been compounded with rapidly falling prices in solar markets internationally in the last 5 years making an ‘average’ solar price impossible to call. The argument from IFC would be that they have not said Zambia is a benchmark for Africa but that without a well-run competitive procurement, no-one knows what the price of solar is in any particular jurisdiction and that directly negotiated deals or FITs will always run into challenges. This has been demonstrated most recently in Egypt where mid-procurement, they had to revise their feed-in tariffs downwards from US\$ 14.34 c/kWh to US\$ 8.40 c/kWh due to political pressure that the FIT prices were too generous. In Nigeria, where deals have been directly negotiated, the US\$ 11.5c/kWh tariff price, is now looking expensive in light of Zambia and again there is political pressure to reduce them. Without a well-run, transparent competitive procurement, it is difficult to understand what the correct price is and, if Scaling Solar is a success, it will hopefully drive such procurements to be developed at a faster pace than in the past.

There does seem to be an existing issue around the communication of solar pricing. Comparing the Nigerian procurement process with the Zambian procurement process is not a like for like comparison and IFC has de-risked the Zambian deal with a suite of financial and technical products that are not available in those markets. Better communication of what is ‘good value’ in the context of solar projects and what exactly is needed to achieve the Zambian prices may be necessary.

Equity Returns

As with similar procurement Program globally, experienced developers recognise the decreasing risk in PV projects, and are prepared to take lower returns in exchange for the security and transparency that these Programs offer. There is therefore a direct correlation between the risk allocation and the return required i.e. to balance the risk/reward equation. Stakeholders within the IFC have reported that the difference in equity returns is one of the biggest contributors to the lower tariff offered by the winning bidders. This proved to be the case in the REIPPP as well, with companies like Enel Green Power financing some of their project off

balance sheet – given the likely (low) return they could expect in other markets, it made sense to commit these funds to South Africa, even taking into account the currency risk.

Smaller developers have pointed out that they do not have access to this type of funding and consequently they cannot compete in processes like the Scaling Solar Programs, which favour large scale developers backed by global utilities. Although there will be some local participation via the 20% equity held by IDC in each project (and which will be offered to the public in the form of shares in the SPV), there is little chance for local project developers to effectively compete as their equity investors are unlikely to accept these levels of returns.

The equity returns that the winning projects in Zambia are expected to have assumed to generate such low tariffs has been the subject of some controversy. However, as noted above, it is difficult to judge sustainability at this point of the Program but there would be an assumption that IFC will not debt finance a project without thorough due diligence. There was a suggestion from some developers that other Donors are reluctant to get involved with the Scaling Solar Program as they regard the low equity returns as a poor reflection of the risk in Zambia. We have not been able to validate this claim in the timeframe for this study but there is no doubt that for future deals IFC will be required to syndicate and it would be worth getting the view of other DFIs in this space as to why they did not invest in this first round.

Conflict of Interest and Monopolisation

A number of developers expressed concern that there was a conflict of interest between the IFC Advisory teams role and the IFC investment team's role and that IFC should not be 'playing both sides of the coin' and profiting from both the advisory and finance side of the deal. A corollary of that argument is that IFC is creating a monopoly for itself in the procurement of solar. Additionally, developers have claimed that the World Bank is only making its financial products available to companies participating in the Scaling Solar Program.

IFC would argue that they have hired independent lawyers and advisors for the government through this Program to ensure that the risk of such conflict is minimised. However, there is no doubt that optically, this causes challenges. Just how much the IFC advisory side profits from Scaling Solar is unclear.

However, this also needs to be viewed in the context of energy procurement in Africa generally which is a small space with a number of related Donors. In the GET FIT Program, GIZ will advise governments and KfW will finance projects and although they are not the same company, it is hard to argue that they are not related. Similarly USAID and OPIC, DFID and CDC/InfraCo could potentially be open to the same criticism if they were involved on both the advisory and finance sides of an investment.

In response to the monopoly criticism, IFC have said that Asian Development Bank and African Development Bank are looking to create similar Programs to Scaling Solar as they are similar advisory and finance offerings, thus there is no monopoly. There is also still space for procurement Programs for smaller projects < 30 MW which are not covered by the IFC procurement Program e.g. GET FIT. IFC have denied that Scaling Solar has a monopoly on the World Bank financial products.

Pre-Qualification Conditions

Developers have argued that some pre-qualification conditions were unnecessarily geared towards much larger developers. One developer claimed that they were required to have USD \$300 million of investment in place for one 50MW solar project in Senegal. This seems unnecessarily onerous given the equity portion of such investment is unlikely to exceed USD \$50 million. Mezzanine financing was not accepted to bridge any gap in the equity portion.

Unless the pre-qualification conditions impact the quality of bidders, it is difficult for these arguments to hold weight. However, in the long run, it may be worth challenging these pre-conditions if it results in the same developers pre-qualifying on a regular basis creating a monopoly and dependence on a small number of companies.

Project Size & Location

Scaling Solar recognises the limitations inherent in many African grids and seeks to allay them by opting for larger projects in areas with adequate grid integration and the ability to evacuate the power produced. By targeting larger capacity for each project, the Program is able to put more megawatts onto the grid for the

same effort as a smaller project. By increasing the project size and specifying the project site, Scaling Solar is limiting the Program to only those developers that have the financial backing to effectively develop large projects. It is clear that there are a number of local and smaller international developers that have secured other sites and started developing their own (currently unsolicited) RE projects, which are much smaller than the Scaling Solar projects i.e. ~5MW – 20MW, and which cannot be bid into the Program due to the site specification and other Program structures.

There is a viable alternative for these developers - they will need to bid their projects into Zambia's REFIT Program as soon as that gathers momentum in H1 of 2017. This will allow for smaller and more geographically and technologically diverse projects to be developed. The REFIT tariff offered will be a ceiling price to cap government's risk exposure; however the procurement will be run in a competitive manner for a limited amount of capacity per bid round – hopefully stimulating competition and lowering tariffs.

Given that the REFIT Program is fully supported by the GETFIT initiative - which has been successful in Uganda and other countries - REFIT developers are likely to have access to PRGs, standardised documentation, grid connection support and viability gap funding to help de-risk their potential investments. . However it is not clear that the Program will be as well-structured and developers will likely face notable market and offtake risk. Due to the increased risk, smaller size of projects as well as differing access to resources and funding, this will probably lead to higher tariffs than those in the Scaling Solar Program. This Program is currently being supported by the GETFIT initiative, which has been successful in Uganda and other countries.

Capacitation & Training

A concern raised by certain government stakeholders regarding the longer term sustainability of Programs such as Scaling Solar. There is no doubt that Scaling Solar is an effective procurement approach, but there has been little focus to date on the ongoing management of the Program, once the IFC team have handed over. The IFC have adopted a skills transfer approach by including the IDC and ZESCO during the bid evaluation, but based on the current skills and experience levels of staff in these organisations, and the relatively small exposure to these transactions, it is possible that there will be further issues once the procurement has been concluded.

A useful example of this is the current situation in Mozambique, where the Market Operator (MO) is responsible for managing all IPP contracts. The recent financial crisis with regards to misuse of World Bank funding by the Government of Mozambique, has led to a 70% devaluation in the Metical with regard to the US dollar, which has a massive impact on the ability of the MO to pay IPPs – the MO receives revenue in Metical and pays IPPs in USD. The MO has little experience in managing these contracts and is ill prepared to deal with this kind of currency risk.

It is not impossible that Zambia could face a similar crisis in the near future, given their current fiscal constraints with regard to foreign exchange. Zambia reportedly already owes ~\$100m to EdM and Karpower in Mozambique for electricity supplies. Despite all of the IFCs insurance and guarantees, if Zambia defaults on payments in Mozambique or to local IPPs, their risk profile will change dramatically and few developers will want to take part in future procurement Programs.

Regulation

There are a number of other changes required in the enabling environment in general, in order to facilitate the introduction of private sector investment in generation. As an example, licensing applications now need to be made in the context of a competitive market as opposed to the more limited licensing requirements for a monopoly utility. It is not clear that the regulator has taken this into consideration when awarding licenses for the Scaling Solar Program or that there is due consideration for how to manage IPP licenses on an ongoing basis.

The same issues relate to the amendment, application and management of the Grid Code. These issues will become clearer as more IPPs enter the system – it cannot be expected of IFC to address these issues alone; however the concern has been raised that market structure, legislation, regulation and master planning will all need to be revised and updated if Zambia wishes to progress post- Scaling Solar.

Lessons learned for TA Programming

The main lessons learned that can inform future TA Programming are as follows:

Table 3: Scaling Solar Lessons Learned

TA Programming	Lessons
Transaction focused capacity building support could potentially be required for the future success of similar investment facilitation Programs	<p>IFC claim that the capacity of both ZESCO and IDC in Zambia was built through the process of running the tender and preparing the feasibility studies. Consultants have spent time with both agencies ensuring that they understood what was required of them in relation to the project.</p> <p>However, it is unclear right now how developing countries will manage integrating solar into their energy mix and/or if they would require further capacity building to run further procurements without IFC assistance or indeed what capacity has actually been transferred. Monitoring will be required over the medium and long term to see if more focussed capacity building is required.</p>
A well run transparent competitive procurement Program seems to achieve better pricing and is less subject to subsequent revision than directly negotiated Programs	<p>Both Egypt (with their FIT Programs) and Nigeria (with a directly negotiated deal) have challenges with maintaining agreements as to power pricing. This is less open to challenge when a transparent and competitive procurement has been run.</p>
<p>Financing:</p> <p>Investment Facilitation depends on the quality of financing available. It is important to consider financing at the outset of any Program design especially in countries that are perceived as high risk for investors.</p> <p>Standardized financing was made available for all successful bidders for the first time in the IFC Scaling Solar process</p>	<p>Financing is a key driver of pricing in infrastructure projects. If this can be facilitated before bids or tendering, it will avoid many of the delays that have been experienced in other tendering Programs.</p> <p>The Scaling Solar bid was the first bid to include a financing term sheet from IFC as part of the bid process. This standardized the financing and guarantees and has hopefully ensured that projects would reach financial close in a short time from bid award. It also lowered transaction costs for bidders as they were not required to negotiate their own financing and guarantee.</p>
Good template transaction documents and shared due diligence will speed up procurement processes.	<p>Many countries, such as Nigeria, have attempted to develop PPAs from scratch or amend existing power purchase agreements to facilitate different technologies. This has taken a lot of time and negotiation. The shared due diligence exercise also saved costs rather than each developer carrying out their own assessments – legal, environmental etc.</p>
Political buy-in to all aspects of the approach is essential for success	<p>IFC insist that a country must accept all the standard template documents before engaging with them. Certain countries, such as Nigeria, wanted to use their own PPA and IFC refused as this would slow down the process. Nigeria has since struggled to finalize bankable projects.</p>
High quality investors are interested in doing business in Africa – lowering transaction costs and risks will attract quality investors and deliver low pricing	<p>IFC uses development funding to complete the set of feasibility studies required up-front. This, together with the standardized contract documentation, dramatically lowers costs and risks for bidders who only pay for these studies if they are successful. It also lowers the development costs that need to be included as part of the financial model when pricing a project.</p>
The private sector will pay for quality technical services enabling Programs to be self-sustaining.	<p>The IFC model of ultimate charging the investor for technical advisory services provided means that, if successful, the Program can sustain over the long run.</p>

<p>Timelines for Scaling Solar may be too aggressive. It may be worth revisiting to ensure that quality due diligence can be done.</p>	<p>Scaling Solar has committed itself to an ambitious timeline which may not be met in the context of Zambia – projects are required to meet financial close by December. It may be worth revisiting this timeline, even if only by a few months which would still be competitive, to ensure that there is enough time for quality due diligence especially as the Program scales up.</p>
<p>Carefully monitor Scaling Solar's progress and results to assess its impact on longer term solar market development in the continent</p>	<p>Once the Scaling Solar program evolves and the Zambian projects reach financial close and start implementation, IFC and other Donors will be able to make a more informed judgment on whether the program is slowing down the private sector solar market across the African continent – as some developers fear (See Section 10).</p>

The key generic features which have made the IFC investment facilitation Program a success to date and are worth bearing in mind for future TA Programming are summarized below:

- A transparent well run procurement Program is essential to attract quality investors to developing countries;
- Lowering transaction costs for investors can deliver competitive pricing;
- Finance should be considered at the outset of any infrastructure Program design;
- Coordinating Donor funds and efforts under one Program has worked very well to ensure that everyone is focused on the same outcome;
- Self-sustaining Programs are possible as a successful investor will pay for quality technical advice.

Some questions in relation to these features and their applicability to future energy Programming are set out below:

Could the Scaling Solar approach be adapted for other technologies?

IFC, when interviewed for this case study, felt that this approach could not be expanded to other technologies as the key point with solar is that the transaction documents do not need to be site specific. However, they are looking to add a storage element to the solar projects. However, standard financing and shared due diligence are certainly learnings that could be applied to other infrastructure tendering efforts.

What are the opportunities for expansion of Scaling Solar?

IFC see no limits on the number of countries that this could be expanded to provided there is government buy in to the template documents developed by IFC.

Could this approach be adopted for smaller solar projects?

With Scaling Solar, IFC is specifically focused on larger PV projects, which are of greater interest to international developers. However, there is no reason why the Scaling Solar approach could not be adopted for smaller projects <10 MW which may be more suitable to serve less densely populated distribution areas. This type of approach could also be explored for commercial scale captive power/net-metering solutions for industries (100 kW – 5 MW). Although a smaller scale may present some commercial constraints, there is no reason why the principles applied in the lessons learned section could not be explored for these types of projects. IFC's approach of identifying projects, pre-qualifying quality developers, providing quality feasibility studies, arranging standard financing and template documents for each project could be adapted to solar projects at a smaller scale.