

SOCIAL IMPACT INCENTIVES (SIINC)

GOING LIVE IN LATIN AMERICA



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EMPOWERING VILLAGE INFRASTRUCTURE ANGELS TO ATTRACT INVESTMENT AND CREATE IMPACT AT SCALE

CASE STUDY - MARCH 2017

VILLAGE
INFRASTRUCTURE
ANGELS



VILLAGE INFRASTRUCTURE ANGELS (VIA) HONDURAS

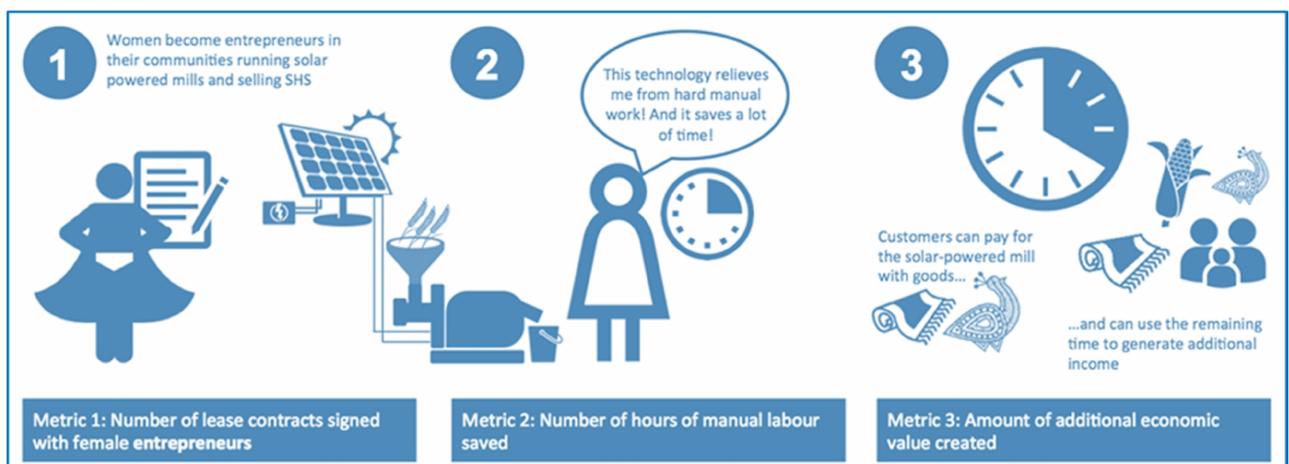
SUMMARY

Village Infrastructure Angels (VIA) is a social enterprise with the vision to give poor communities across the globe access to safe, affordable and renewable energy. Yet it is confronted with the typical fate of true pioneers: A visionary and highly scalable business model meets an investor market that is too shy to tap into uncharted territory and take a high level of perceived risk. This is an ideal opportunity to implement the power of SIINC.

Access to energy for all is a pressing issue and ranks very high on the United Nation’s 2030 Sustainable Development Goals agenda. Around 1 billion people around the globe lack access to electricity, burning 1 US\$ per week per household with kerosene lamps. This translates into more than US\$ 10 billion spent per year. The side effects can be devastating: Burning kerosene is the number one attributor to fire-related, often fatal injuries. It is also suspected to have serious health effects due to indoor smoke, predominantly on children. Yet well-planned and -managed solar power solutions like VIA’s allow communities to run mills, pump water, equip schools and electrify clinics - a scope of impact that reaches well beyond the simple task of lighting.

To date, the staff of VIA was able to provide more than 2 million people with clean, affordable and safe solar energy. By adding agro-processing mills and solutions for other day-time appliances, the social enterprise has the goal to specifically empower women by saving hours of manual labor for the benefit of more productive work and time to support children’s education.

VIA’s main challenge is not the scalability of the model - it is to crowd-in the necessary investment to roll-out its solution across Honduras and beyond. This is where SIINC comes into play: By providing payments for verified performance based on carefully designed impact metrics, VIA has the potential to enhance its revenues and de-risk its financial bottom line. This is a compelling argument for impact investors who so far were hesitant to support the highly promising yet risky pioneer business model.



The SIINC Impact Metrics – Paying for real results (Source: Roots of Impact)



THE SOCIAL ENTERPRISE: A STORY OF IMPACT

THE FOUNDER’S JOURNEY

When Stewart Craine founded VIA in 2012, he had more than 15 years of experience in rural electrification projects on his shoulders. Having started Barefoot Power together with Harry Andrews back in 2005, he knew how difficult it can be to provide safe, affordable and renewable energy to the poorest households. A related challenge was to attract the financial resources to achieve real impact at scale. The market for low-cost solar powered lamps was in its infancy then, making Stewart and Harry early pioneers in what has become a huge market opportunity today and a highly sought-after impact investment sector. But luckily, the story didn’t end there. With a rare combination of persistence, creativity and commitment, Barefoot Power managed to mobilize US\$ 12 million in clean energy investment over the coming years. Today, its solar lamps reach more than one million people in 30 countries and also provide capacity for charging phones, fans, radios and fridges.

“I realized that the business case for lending solar home systems was by far more compelling than selling them for cash”

Stewart Craine, Founder, Village Infrastructure Angels

Stewart was a key driver in this process but the experience created appetite for more. He started feeling a drift from what he perceived to be his mission and saw a wider potential to achieve impact on the lives of the poorest of the poor: by lending - not selling - solar equipment. Therefore - after

Barefoot Power’s Board decided that the company needed a different management - Stewart took the chance to push the boundaries in the solar home market with VIA.

ACCESS TO ENERGY FOR ALL

Access to energy for all is a pressing issue and ranks very high on the United Nation’s 2030 Sustainable Development Goals agenda. Around 1 billion people around the globe lack access to electricity, burning 1 US\$ per week per household with kerosene lamps. This translates into more than US\$ 10 billion spent per year.¹ The side effects can be devastating: Burning kerosene is the number one attributor to fire-related, often fatal injuries. It is also suspected to have serious health effects due to indoor smoke, predominantly on children. The situation is exacerbated if kerosene is used in poor,

¹ The Economist, January 2015

EMPOWERING WOMEN



© Village Infrastructure Angels



crowded communities such as slums, where dwellings are packed together and often made of wood and cardboard². Thus, replacing kerosene lamps with solar powered devices has become a key solution to improving the lives of very low-income communities worldwide.

Yet there are more aspects to consider when striving to achieve a lasting, positive impact on combating poverty. Solar solutions – if smartly designed – have the capacity to cover an entire micro energy infrastructure: from consumer durables, community assets such as mills and irrigation systems to cooking stoves and public services. So why stop at tier 1 solutions when you

“20 years back, it was almost a forbidden idea to build hydro products powered by solar energy.”

Stewart Craine, Founder, Village Infrastructure Angels

are able to empower low-income households much more substantially? Why not think bigger in terms of systematic changes for the benefit of poor communities? By freeing 300 million women worldwide just from one hour of daily manual labor in processing crops, fetching water and collecting firewood, 100 billion hours per year would be saved for productive work or more attention to children’s education. This is the very vision that VIA is built upon: Well-planned and -managed solar power solutions that maximize daytime use of solar energy will allow

communities to run mills, pump water, equip schools and electrify clinics – a scope of impact that reaches well beyond the simple task of lighting.

THE VIA HONDURAS EXPERIENCE

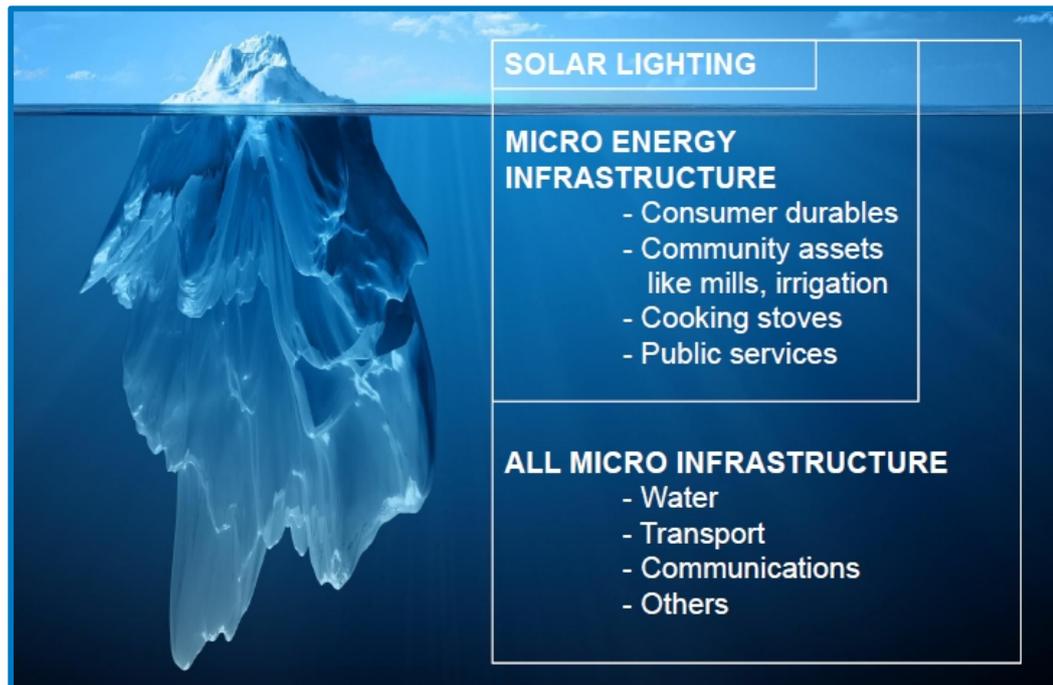
Honduras used to have one of the lowest electrification rates in the Americas region. Recently, there has been some improvement, but access to electricity still varies greatly within the country – from over 98% in major city centers to less than 25% in the most rural departments.

VIA’s pilot project – seed-funded by Rotary Arlington and Texan angel investors – started in September 2014 with 150 households and focused on the isolated areas of the least-served department of *Gracias a Dios*. There, many donor-funded projects involving rural electrification have failed to reach. The reasons seem to be a combination of low prioritization from the government and a lack of funds to reach all households. Another factor is the government’s motivation to bring access to areas of highest population density first. Also, designing cost-effective village power systems that do not depend on subsidies is a major, widely unresolved challenge. Studies such as the Climate Investment Funds Investment Plan therefore estimate that 10% of Honduran villages will not be connected to the national grid in the foreseeable future. The necessity of isolated power systems (mini-grids or solar home systems (SHS)) will affect 80,000 households (400,000 people), out of which only 14,000 have access to such solutions today³.

VIA’s pilot project has demonstrated that there is strong demand for leasing SHS in the *Gracias a Dios* region. One precondition, however, is that the technology is working correctly. Another that people have jobs and other income sources to meet the repayments. The social enterprise integrated these important insights into its model: Beneficiaries are allowed to pay with their products and goods when using agro-processing community mills on top of pay-as-you-go lighting and phone-charging solutions.

² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3664014/>

³ Source: Honduran Department of Finance report on renewable energy, <http://bit.ly/2sbVoNO>



(Graph: Village Infrastructure Angels)

All in all, VIA's business model comprises selecting, purchasing, installing and ensuring correct operation and maintenance of mini-grids, light agro-processing solutions and solar home systems (SHS). It also features important innovations such as 'pay-as-you-go technology' (PAYG): The households leasing the SHS purchase a unique code similar to phone credit topups that, once entered into the SHS via a keypad, will allow the system to work for a 30-day period. This technology is being adapted by VIA to also work in the higher power solar mills.

For the next step, VIA plans to expand the offering to additional 2,700 rural households, with a "Tier 2+" service package that will include standard lighting and phone charging needs at home but also satisfy daytime agro-processing energy needs. Ultimately, solar-based lighting is not sufficient to enable poor communities to work their way out of poverty. Too much time and energy is still used on day-to-day tasks such as processing crops by hand. Taking these burdens off people will thus make room for much more productive activities. Being able to enjoy solar power for day-time energy needs is key: It provides clinics with vital refrigeration, runs community mills using pay-as-you-go technology, and/or supplies small businesses with communications to access their markets. VIA's 2018 goal is to reach 10,000 households in 500 villages across several countries, which will translate into US\$3 million in solar project lending. Key support is being provided by USAID's Powering Agriculture and technical innovations are supported by GSMA.

The following graph illustrates what kind of appliances become possible with Tier 2+ services, as opposed to conventional consumer-focused models of energy access:



Description of a Multi-Tier for Household Energy Access

	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Appliances	radio	radio	radio	radio	radio
	task lighting	task lighting	task lighting	task lighting	task lighting
	phone charger	phone charger	phone charger	phone charger	phone charger
		general lighting	general lighting	general lighting	general lighting
		air circulator (fan)	air circulator (fan)	air circulator (fan)	air circulator (fan)
		television	television	television	television
			food processors	food processors	food processors
			rice cooker	rice cooker	rice cooker
				washing machine	washing machine
				refrigerator	refrigerator
				iron	iron
					air conditioner
Total kWh/year/ household	3	66	285	1464	2267

Source: VIA, based on „Global Tracking Framework“ of World Bank/ESMAP and IEA (2012)

Until this model is established, however, it will be difficult to convince investors to come on board. Stewart and his team are therefore facing a well-known challenge: How to finance this visionary step and bring people at the Bottom of the Pyramid (BoP) one step higher on the access to energy ladder? How to overcome the fact that the major investors in this sector are rather risk-averse and clearly prefer more established geographies such as India and East-Africa? This is the point where SIINC comes into play.

THE FINANCING: HOW SIINC ENABLES SCALE

After the SIINC program for Latin America and the Caribbean (‘SIINC LAC’) was launched, VIA quickly proved to be a compelling candidate for implementation: The social enterprise features (1) a deep potential for social impact, (2) an extensive sector expertise in off-grid electrification, and (3) a huge transferability of the highly innovative business model. If successful, it would have the capacity to serve as a powerful blueprint for replication on a much larger scale.

This was a great opportunity to demonstrate what SIINC is able to achieve: supporting high-impact social enterprises in attracting investment and reaching true scale. In addition, VIA’s impact model shows a strong focus towards the female population, making it a great tool to empower women. This again would positively influence children’s education – especially since girls are often pulled out of school to help with household activities. Other merits of VIA are closely managed impact-related metrics and a deep foot in the solar system scene.

With VIA, SIINC would therefore implement an important mechanism: **incentivizing a highly innovative and impactful business model to crowd-in investment which otherwise would be**



extremely hard to secure⁴. Ongoing premium payments based on verified social outcomes would be able to improve VIA's revenue streams, making its financial bottom line much more attractive for future investors.

The rationale for the SIINC intervention was therefore crystal clear: **to specifically support the wider roll-out of the solar-powered community mills** - a true innovation in VIA's business model. While tested in some regions, the risk around the model's scalability however prevails. Yet it is outweighed by the huge potential of applying the model to other geographies. This is possible due to the fact that similar manual-labor practices exist around the globe, and that the technology is adaptable for poor communities pretty much anywhere.

For Stewart and his team, it took little time to fall in love with the idea of SIINC. VIA had already been in discussions with The Multilateral Investment Fund (MIF, part of the Inter-American Development Bank (IDB), about expanding the Honduras project for SHS. With SIINC, VIA would be able to finally ramp up its roll-out of agro-processing solutions. With the respective contract recently closed, the social enterprise can now earn up to US\$ 195,000 in SIINC payments over a period of four years if it reaches the impact performance targets set out. These payments are structured in a way that the company's cash flow issues are eased and investors can be convinced of the viability of the model. In addition, the IDB will supply technical assistance for the expansion in Honduras. These funds will be used to fund set up costs of the project, build local capacity, establish the systems needed for operations and extract knowledge of the initiative.

Now comes the time for the second part of the SIINC mission: to secure debt investment of US\$ 318,000 to scale the highly impactful model. As of today, VIA is in advanced discussions with several potential impact investors. For them, the ongoing SIINC payments have a very strong appeal: They offer the potential to enhance VIA's revenues and therefore de-risk the enterprise's financial bottom line. This opens up the possibility to prove that there is a market for solar-powered agro-processing – and a huge potential to scale beyond Honduras.

THE IMPACT METRICS: PAYING FOR REAL RESULTS

Agro-milling is a male-centric business in developing countries today. Enabling women to use cleaner, simpler, safer and quieter solar-powered micro-milling technology – as developed by VIA's core technical partner, Project Support Services⁵, – offers great room for female empowerment. In addition, it saves time previously spent on manual labor.

“With women empowerment through solar agro-processing at the heart of the SIINC transaction, it is truly unique in the market.”

Stewart Craine, Founder, Village Infrastructure Angels

The set of impact metrics for SIINC was defined around **three impact key performance indicators (Impact KPIs)** that all include female empowerment in their design:

(1) First, lease contracts signed with female agents (micro entrepreneurs) at the village level serve as one of the triggers for SIINC payments. Within this Impact KPI, new contracts signed with female agents for both lighting and milling will be favored. Contracts for milling are remunerated higher than those covering lighting facilities only. Both, SHS

⁴ For more information on the SIINC mechanism, see „SIINC White Paper“ at www.roots-of-impact.org/siinc/

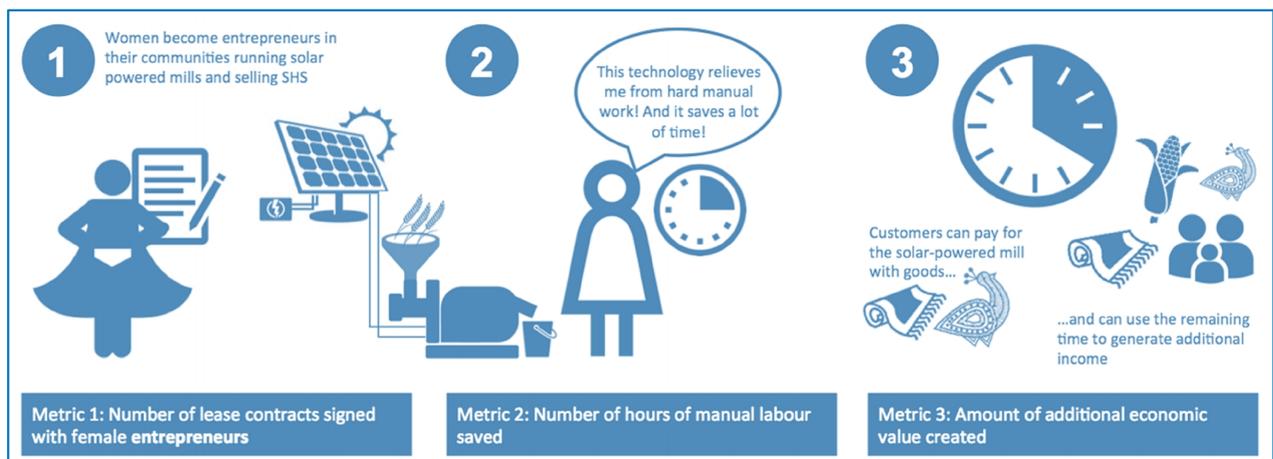
⁵ See www.psspng.com



and solar-powered milling are affordable to low-income household due to the pay-as-you-go technology. This KPI recognizes that VIA is making microfinance loans in deeply rural areas where no microfinance has previously reached, increasing financial inclusion.

(2) The second Impact KPI is the number of hours of manual labor saved for women in local communities. Currently, staple crops are processed by hand in a time-consuming process. The SIINC mechanism rewards VIA for the time saved by women on these activities. The Impact KPI is derived from the effective operation of the mills (based on kWh of energy used using innovative Internet-of-Things technology specifically designed for high power DC power systems) and strongly reflects the benefits for the female population. Ongoing payments will be made in proportion to the number of hours saved, with a minimum as well as a maximum payment defined in the SIINC mechanism.

(3) The third Impact KPI is the amount of additional economic value created for the communities. This is measured through the goods provided in lieu of payment, an offer VIA has come up with to allow households to pay for the milling service with hand-made goods. This approach enables women to convert some of the time saved through the mills, providing an impulse to produce more locally crafted goods. SIINC payments will be relative to the increase in economic output and are again provided with a cap. (Graph: Roots of Impact)



The focus on saving time and increased economic activity comes from VIA's experience in other regions. There, female inhabitants of communities have been overwhelmingly positive about the benefits of the solar-powered mills. Processing crops by hand is a physically draining, time-consuming, and monotonous work that is generally carried out alone. Even if half of the time saved was to be re-invested in producing goods to pay for the service, beneficiaries would very gladly make use of this deal. Producing goods is typically a much more social and creative activity that also brings very positive psychological impacts, particularly in terms of self-esteem.

Through the SIINC transaction, VIA will be able to prove its model in tough business conditions and position itself for a broader roll-out across Honduras and the Latin American region. The SIINC payments are limited to a maximum period of four years. After that time, VIA's operations in Honduras are expected to be financially self-sustainable. By including an innovative barter-style model, even the poorest members of the local communities will gain access to milling services. All in all, the SIINC mechanism ensures that under-served communities will enjoy products and services that they would otherwise never be able to access.



THE FUTURE: HOW VIA WILL FULFILL ITS PROMISE

In theory, Village Infrastructure Angels has designed an ambitious plan for how to catalyze access to energy to all by 2030. With an investment of US\$ 150 to 300 per household, VIA would need US\$ 30 to 60 million to achieve its goal of serving 1 million people by 2020.

On a much broader scale, reaching 1 billion people off-grid around the world would likely require US\$ 30 to 60 billion in financing. If irrigation is included, this huge amount can easily double up. Solar mills are able to provide for staple food processing for 30 households with as little as 150W. This is far less power than ‘experts’ realize is necessary for energy efficient agro-processing solutions. Having this level of efficiency translates into 50 to 75 percent less costs than the International Energy Agency (IEA) estimates. According to the IEA, US\$ 650 billion will have to be invested to reach the 2030 energy for all target.

VIA believes that with traditional approaches and players, this full energy service will not be possible by 2030. There are many geographic markets to which money simply doesn’t flow. This is due to a high level of perceived risk and the substantial cost of delivery, particularly during market entry. By focusing less on how much cash poor villagers can pay, but thinking more about alternative, more productive income-generating purposes, investors could use advanced micro-infrastructure to help the poorest of the poor to unleash their skills and potential. In addition, the VIA model to project finance is by far more efficient than selling solar equipment for cash. With a long-term leasing approach, each partner in the supply chain is freed of the need for working capital and reduces its marketing expenses significantly.

This is why revenue-enhancing and de-risking financial innovations such as SIINC play such a vital role: They are able to crowd-in the necessary investment to fund real pioneer solutions. For VIA, SIINC payments act as a form of ‘revenue guarantee’: If social impacts are realized as modeled, VIA’s investors will have a reliable revenue stream to count on, even if the villagers’ cannot or do not pay fully for the services supplied. Thus with SIINC, there is a real chance that remote areas and populations at the lowest levels of the income pyramid can be reached.

What would be VIA’s main challenge if the US\$ 50 million were secured to deliver access to energy for 1 million people by 2020? “Human resources”, replies Stewart without hesitation, “the right people to put the money to work.”

COMPANY FACTS

Company Name:	Village Infrastructure Angels	www.villageinfrastructure.org
Founded:	2012	
Headquartered:	Kent, United Kingdom	
Regional Focus:	Global	
Major achievements:	VIA’s staff helped 2 million people get access to electricity since 1998	
Financing sources:	More than US\$ 4 million in total raised from angel, impact and Kiva crowd investors plus grants.	
Partners and supporters:	USAID, Millennium Challenge Corporation, Hivos, GSMA, DFID, OPIC, Duke Energy, IRENA, German Cooperation, Rotary Clubs of Greater Melbourne and Arlington, Texas, several angel investors, AFD, IDB, Roots of Impact, SDC.	



THE SIINC PARTNERS AND THEIR ROLES

The SIINC LAC project is powered by:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC



IDB
Inter-American
Development Bank

MIF
Multilateral Investment Fund
Member of the IDB Group



**Roots
of Impact**

SDC

The Swiss Agency for Development and Cooperation (SDC) is the co-creator of the SIINC model and made available the SIINC funds to support and scale high-impact social enterprises in the LAC region. It also acts as the outcome payor.

Roots of Impact

Roots of Impact is the overall project manager of the Public Private Development Partnership, responsible for the SIINC suitability assessment, the structuring of the SIINC transaction and the independent verification of the impact measurement (transaction manager).

IDB

The Inter-American Development Bank, through its Multilateral Investment Fund (MIF), is the contract partner and facilitator in the SIINC transaction. It takes charge of managing the funds on behalf of SDC and performs due diligence on the transaction. In addition, the IDB contributes expertise via its Social Entrepreneurship Program (SEP).

Ashoka

The Latin America office of Ashoka adds valuable local knowledge and network and takes responsibility for identifying potential investees.

New Ventures

New Ventures provides extensive on-the-ground expertise as well as support in finding suitable SIINC candidates.

LINKS AND RESOURCES

Social Impact Incentives (SIINC) White Paper:

<http://www.roots-of-impact.org/wp-content/uploads/2017/05/Social-Impact-Incentives-SIINC-White-Paper-2016.pdf>

Social Impact Incentives Explain Video and Graphs:

<http://www.roots-of-impact.org/siinc/>

Introduction video Village Infrastructure Angels:

<https://poweringag.org/news-events/video/solar-agro-processing-power-stations-village-infrastructure-angels>

Video on Solar Powered Agro-Processing Machines (by PSSPNG):

<https://www.youtube.com/watch?v=xWgevfqlvdU>