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THE BUSINESS CASE FOR: IMPACT INVESTMENT IN CLEAN ENERGY

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List of Abbreviations

DFI	Development Finance Institution
GIIN	Global Impact Investing Network
IPP	Independent Power Producer
IRIS	Impact Reporting and Investing Standards
PFAN	Private Financing Advisory Network
PPA	Power Purchase Agreement
ROI	Return On Investment
SME	Small and Medium-sized Enterprises
USAID/RDMA	United States Agency for International Development Regional Development Mission for Asia

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Abstract

Impact investment in clean energy has, to date, focused on community-oriented investment such as improved cook stoves and residential solar. These investments tend to occur in relatively small deal sizes and affect populations ranging from hundreds to thousands of people. While such investments create admirable social and environmental impacts, and should continue – it is arguable that they should not be impact investors’ sole focus in the clean energy sector. Rather, there are other larger-impact investment opportunities, with potential to change nations’ broader energy infrastructures and balance, which most impact investors have not focused on, nor pursued, to date. In this paper we explore why impact investors may want to broaden and diversify the types of energy projects they consider, what barriers have been for them to do so to date, and how they might overcome these barriers in the future.

More specifically, this paper will:

- I. Establish the case for why larger-scale, more diverse energy infrastructure investments should be of increasing interest to impact investors;
- II. Discuss why impact investors have not funded these types of projects to date – including existing barriers for impact investors interested in these types of opportunities;
- III. Outline how impact investors, and other stakeholders in the energy investment market, can overcome these barriers in order to increase financing for clean energy infrastructure – and provide specific guidance to help investors approach this diverse range of clean energy investment opportunities.

Authors, Context, and Audience of Paper:

Authors: The lead authors of this paper are Jessie Duncan (a Manager in Deloitte’s Social Impact Service Line) and Sophia Peters (a Manager in Deloitte’s Strategy and Operations division) who manages Deloitte’s work with USAID’s Private Financing Advisory Network (PFAN) in Asia. Both authors have diverse experience across social finance, international development and clean energy policy (full bios are included at end of the paper). The content of this paper was also developed in consultation with Daniel Potash and David Spira, who lead Deloitte’s work with PFAN Asia – and various impact and clean energy investors interviewed during our research process (see list of interviewees in appendix).

Context: This paper was written at the request of the Deloitte PFAN Asia team, following the author’s work for PFAN-Asia on gender lens investing, with the objective of fostering a dialogue among diverse clean energy and impact investors, and clean energy project developers, about both types of clean energy projects being financed across the developing world and innovative mechanisms which could help drive greater capital to the clean energy sector. More specifically, this paper aims to help clean energy and impact investors step back and consider whether their work is helping to finance the clean energy infrastructure needed across emerging economies in the decades to come. This paper also strives to help investors think about what types of actions (from themselves and other stakeholders) can be taken to help support developing countries’ energy infrastructure needs for the future.

Audience: The audience for this paper is two-fold: 1) Clean energy and impact investors, broadly defined, from around the globe but also primarily those who finance energy projects in the developing and emerging economics; 2) Project developers, primarily those working on clean energy projects in Asia (given the opportunities for clean energy project development across Asia and the region's relatively attractive investment climate compared with other emerging market peers).

1. Introduction: Existing approaches to impact investment in clean energy - and shortcomings of these approaches

Impact investing is widely defined as an investment approach that intentionally seeks to create both financial return and positive social impact that is actively measured.¹ This concept evolved out of earlier movements of socially responsible and mission investing in which individual investors began using capital both as a means to express their values and to avoid investments which they perceived to have negative social or environmental impacts. Over several decades (from the 1970's to early 2000s), thinking around how to use financial investments to avoid negative impacts and create positive ones evolved into what is known today as the global impact investing market. According to widely accepted definitions, impact investments include investments in infrastructure, poverty alleviation, environmental improvement and clean energy, economic development, education and health/healthcare— as long as such investments meet defined and measurable objectives for achieving both social and financial returns. Although exact figures vary, the value of the global impact investing market in 2020 is estimated to be between \$400B-\$1Trillion USD.²

While there has been impressive interest and growth in impact investing to date³ - key barriers persist which hold back both the growth of the broader field as well as that of clean energy investments within it. The 2014 JPMorgan and Global Impact Investing Network (GIIN) survey identified “lack of appropriate capital across the risk/return spectrum” and “shortage of high quality investment opportunities with proven track records” as the greatest challenges to growth of the impact investing market from an investor perspective.⁴ Our Deloitte colleagues within the Monitor Institute (now part of Deloitte’s Social Impact Service Line) colleagues have also written extensively about the challenge of the “pioneer gap” of impact investing – the disconnect between the difficult realities of building inclusive businesses that serve the poor and the promises being made by many of the newer, more aggressive impact investing funds and financial institutions.⁵

¹ Definition comes from the 2013 Working Group at the World Economic Forum; aligns with commonly accepted definitions in the field (Calvert Foundation, GIIN)

² Various market sizing figures come from following sources: The Monitor Institute, Investing for Social and Environmental Impact, 2009 ; GIIN, JP Morgan, Impact Investments: An Emerging Asset Class, November 2010; Calvert Foundation, Gateways to Impact, June 2012; Source; From the Margins to the Mainstream; World Economic Forum, in collaboration with Deloitte

³ Growth in capital supplied in impact investing supported by the 2014 Global Impact Investing Network (GIIN) and JPMorgan Joint Survey of leading impact investors. This survey, of 125 impact investors around the globe found that investors interviewed committed \$10.6bn in 2013 to impact investments (according to GIIN and widely accepted definitions of impact investments) and that they intend to invest 19% more – USD 12.7bn – in 2014. These investors in this survey (for which numerical data was available both last year and this year) reported a 10% growth in capital committed between 2012 and 2013 and a 20% growth in number of deals. (JPMorgan Spotlight on the Market, 2014 Impact Investor Survey, . <http://www.thegiin.org/binary-data/2014MarketSpotlight.PDF>)

⁴ Ibid, p. 4 (JPMorgan Spotlight on the Market, 2014 Impact Investor Survey, . <http://www.thegiin.org/binary-data/2014MarketSpotlight.PDF>)

⁵ “Closing the Pioneer Gap” Sasha Dichter, Robert Katz, Harvey Koh, & Ashish Karamchandani, Stanford Social Innovation Review, Winter 2014

Our work with clean energy investors, project developers and social entrepreneurs across South-East Asia (as part of USAID's PFAN-Asia Program) has also revealed a number of challenges more specific to how impact investors approach clean energy investments in emerging markets. There seems to be too great a dichotomy between mainstream clean energy investors (investors seeking opportunities with a combination of financial return and positive environmental impact) and social impact investors (investors who seek a combination of financial return and positive social return across sectors, including energy). The result of this division is that investors who define themselves as impact investors often focus on a small subset of clean energy opportunities in emerging market contexts (small deals predominantly in off-grid solar and clean cook-stoves projects) rather than exploring how to provide financing for larger clean energy infrastructure ventures which have potential for larger social and environmental impacts.⁶ Impact investors' focus on a narrow set of clean energy investments means that their work unfortunately does not consistently help clean energy markets in developing nations reach scale, nor shape the overall energy balance (conventional vs. clean) in such nations, nor enable these nations to build the broader energy infrastructures needed for their economic growth. Overall, impact investors' work with small-scale clean energy projects with quantifiable and near-term positive social and environmental impacts is commendable - but their specific focus within the energy sector has meant that their work has not contributed to helping those across the developing world address broader, systemic energy access issues.

Given this finding, in this paper we urge impact investors to broaden how they perceive of clean energy impact investments and consider more diverse, and larger, energy investment opportunities which have potential to transform broader energy infrastructures and supply in developing nations.

In the following pages we 1) outline the types of social impacts achieved by on-grid energy access, thereby making the case for impact investors to consider a broader set of energy infrastructure development opportunities; 2) explore why investors have not funded these types of projects to date; 3) provide specific guidance on how such investors can overcome these barriers and pursue a broader range of clean energy investment opportunities.

2. Making the case for impact investors to consider a broader range of clean energy projects and businesses

While there are limited examples of impact investors providing capital for large scale clean energy infrastructure projects, there is evidence from the broader global development literature about how reliable access to power improves individuals' employment options, increase their incomes, and drives economic growth at the community level. Many studies from around the globe demonstrate the positive social impacts of energy infrastructure projects, ranging from

⁶ Monitor Deloitte Interviews conducted with representatives from impact investors and subject matter experts on investment for social impact, July-August 2014. For a full interview list, please see Appendix B.

improved health outcomes to greater labor productivity and cleaner air (we detail these studies further below). Perhaps most powerful, recent research in this area also has begun to reveal that as individuals move up the energy ladder - from handheld solar lanterns and cook-stoves to household level solutions such as solar home systems to grid-connected power - the benefits from electricity for the broader households and communities around them increases as well.⁷ This last point means that the social benefits from access to electricity may be more exponential than linear – when a household has access to more reliable sources of power, such as a grid connection as opposed to a solar lantern, the net welfare increase to the householder is larger.⁸

In addition, there are also compelling studies (discussed below) that show that when households and communities obtain their electricity from clean energy sources in particular, the social and environmental benefits created are even greater than when energy is sourced from traditional sources. Renewable energy technologies, when compared to their fossil fuel alternatives, create healthier community environments, safer households, and smaller environmental impacts. **These are all tangible, quantifiable and powerful social impacts that investors can create (and measure) through their investments in large scale clean energy infrastructure – they are a convincing case for investors to diversify their clean energy portfolio.**

The below section lays out in further detail the proven individual and community- level benefits created by access to reliable electricity - thereby further supporting the case for the considerable social impacts which investors can create by pursuing clean energy investment, both at the community and grid level.

Cleaner, Healthier, Less Polluted Environments for Individuals

There are many positive externalities for communities in the developing world that derive from scaling up clean and renewable sources of power generation in the area. At the household level, many of the basic appliances that families use to conduct basic household activities, such as lighting and cooking, have serious risk factors related to health and safety. Some commonly cited examples in the literature relate to household air pollution from inefficient cooking appliances,⁹ such as the fact that household air pollution from cooking with solid fuels causes over 4 million premature deaths from illness annually. Similarly, studies also show that more than 50% of premature deaths among children under 5 are due to pneumonia caused by soot inhaled from that same household air pollution.¹⁰ Kerosene lamps – which create extremely

⁷ This topic has been the subject of several research inquiries under the U.N. Sustainable Energy for All effort (more here: http://www.se4all.org/wp-content/uploads/2014/12/fp_se4all_access.pdf.) Baseline evidence from several sources, including: Khandker, Shahidur et al. “Who Benefits Most from Rural Electrification? Evidence in India.” Policy Research Working Paper 6095. World Bank. June 2012

⁸ Ibid.

⁹ World Health Organization. “Household Air Pollution and Health.” Fact Sheet No. 292. March 2014 <http://www.who.int/mediacentre/factsheets/fs292/en/>

¹⁰ World Health Organization. “Household Air Pollution and Health.” Fact Sheet No. 292. March 2014 <http://www.who.int/mediacentre/factsheets/fs292/en/>

unsafe household conditions for families with no other lighting alternatives – provide another good example of the safety benefits that come from switching to clean energy sources, such as solar lanterns. Finally, diesel generators used for back up electricity in environments with poor or lacking grid-supplied power have much higher concentrations of pollutants and toxic byproducts¹¹ when compared to cleaner sources of electricity that can power a household or even a community. **Overall, all of these data points highlight that there are tremendous health benefits created by access to clean energy sources for basic household uses.**

In addition, access to clean energy not only creates the health benefits outlined above – but also, by definition, creates other broader and long-term environmental and sustainability impacts including the following: reducing developing countries’ levels of greenhouse gas emissions in the present, moving developing countries toward a cleaner energy infrastructure in the future, and reducing harmful pollutants that threaten the welfare of developing countries’ growing populations.

The environmental benefits of utilizing clean and renewable sources of electricity are well-documented. The primary harmful environmental impact of electricity generation is air pollution; since solar, wind, and hydroelectric power all have no associated air pollution emissions, they are far better than their fossil fuel equivalents for the surrounding environment. This includes both chemical emissions related to climate change (such as CO₂) and emissions related to local environmental pollution of air and water (such as SO₂, NO_x and PM₁₀).¹² Similarly, wind and solar require essentially no water to operate and are not fueled by sources close to groundwater. As such, they do not pollute local water resources or strain supply by competing with agriculture, drinking water systems, sanitation, or other important water needs.¹³

Improving Small to Medium Enterprise (SME) Growth

Flourishing small and medium enterprises (SMEs) are critical to helping spur economic growth in developing countries, both at the community level and for the broader economy.¹⁴ Based on this principal, in recent years impact investors have often sought investment opportunities which help promote growth of SMEs. **Since access to power is critical for SMEs to grow and**

¹¹ In general, while newer diesel generators are much cleaner, however older models diesel generators can release 200 to 400 times as much smog-forming nitrogen oxides per megawatt as a new natural gas plant, and 10 times as much as a coal plant. Source: Nelson, Gabriel. “Dirty diesel generators test EPA, demand-response industry.” *Greenwire*. 10 July 2012.

¹² Union of Concerned Scientists. “Benefits of Renewable Energy Use.” http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/public-benefits-of-renewable.html#.VRLk0fnF9iA

¹³ Ibid

¹⁴ The Economist Intelligence Unit and TMF Group, March 2015 “UK: SMEs And Fresh Investment Drive Growth In East Europe”, <http://www.tmf-group.com/en/media-centre/press-releases/smes-and-fresh-investment-drive-growth-in-east-europe>; Ernst and Young, 2014 “SMAC – the next growth driver for SMES in India”, notes that “Small and Medium scale enterprises (SMEs) play a crucial role in the socio-economic growth story of India accounting for more than 45% of the manufacturing output and around 40% of the total export of India as of 2012-13, as per annual report of Ministry of India” (p.1)

operate efficiently and effectively¹⁵, small business growth – and the broader economic growth it enables – is increasingly understood as an important category of social impact created by energy infrastructure investments.

Limited or unreliable access to power can constrain economic activity and growth in a variety of manners, including disruptions in business due to power outages resulting in customer attrition; inventory losses and damages; damaged equipment or manufacturing inputs due to power variability; poor quality final products; and security concerns over inventory and other assets due to lack of light and electronic security measures.¹⁶ The World Bank Enterprise Surveys carried out across 89 nations - the backbone of their annual Doing Business study –show that small to medium firms consider lack of electricity as one of their biggest constraints to doing business.¹⁷ The constraints stem from inadequacies in several aspects of electricity service—access to electricity, availability of electricity and reliability of supply—as well as from cost.¹⁸

Given this link between access to energy and economic activity, investments in clean energy systems that provide better electricity service to SMEs create significant impacts for entrepreneurs and business owners (and indirectly, the economic growth which these business owners enable). Investments in more functional power systems enable small business owners to increase revenues, expand their customer base, hire more employees, expand to more product offering, decrease input costs.¹⁹ **Overall, broad research supports that investments in more functional power systems ultimately improves the welfare of entrepreneurs and businesses and thus, often indirectly, of the households, communities and economies around them.**

Enhancing Local Productivity and Creating Labor Options

In addition, another category of social impacts created by access to power and clean energy systems relates to labor variables, specifically improved local productivity, access to new labor markets, and local employment. The overall logic of this linkage is that improved residential electricity supports time-saving appliances and lighting products and thus frees individuals to move into local labor markets outside the home.

¹⁵ World Bank. “Getting Electricity: A Pilot Indicator Set from the Doing Business Report.” World Bank, 2010. <http://www.doingbusiness.org/~media/FDPKM/Doing%20Business/Documents/Special-Reports/Getting-Electricity-Pilot-Indicator-Project.pdf>

¹⁶ This information comes from a number of sources, including:

- Kerin, U., Dermelj, A. and Papic, I. “Consequences of Inadequate power quality for industrial customers in Slovenia” CIREC 19th International Conference on Electricity Distribution, Vienna, 1-4.
- Singh, Harpuneet & Harjeet Singh Mangat. “Impact of Unreliable Power on a Paper Mill: A Case Study of the Paper Industry Punjab, India.”
- Adenikinju, Adeola. “Analysis of the cost of infrastructure failures in a developing economy: The case of the electricity sector in Nigeria.” Africa Economic Research Consortium. February 2005.

¹⁷ World Bank. “Getting Electricity: A Pilot Indicator Set from the Doing Business Report.” World Bank, 2010. <http://www.doingbusiness.org/~media/FDPKM/Doing%20Business/Documents/Special-Reports/Getting-Electricity-Pilot-Indicator-Project.pdf>

¹⁸ Ibid.

¹⁹ Ibid

A study conducted by Louis Grogan and Asha Sadanand in rural Nicaragua before and after a comprehensive rural electrification effort found a strong positive association in rural areas between having electricity and working for a salary (conditional on an extensive array of observable characteristics).²⁰ As one would expect, there was a strong negative association between electricity in the household and time spent in family agricultural activities or in firewood collection.²¹ This study, and others like it from around the globe, demonstrate how extending the electricity grid and offering full time access to power spurs a local labor market shift in which individuals are enabled to move out of the home and into full time positions which in turn helps them earn higher incomes and even achieve improved welfare outcomes for their families (e.g. better healthcare, access to education).

Promoting Gender Equality

As revealed in the above discussion, reliable access to power can have myriad positive benefits for households and communities across developing nations. In addition, a growing body of research around the social impacts of electrification also highlights the extent to which access to electricity disproportionately benefits women. In the Grogan and Sadanand Nicaragua study mentioned above, the impact of access to electricity on women in the workforce was statistically significant, while the impact for men was considerably lower. (Specifically, this study found that household electrification caused rural women to be about 23% more likely to work outside the home, with impacts particularly concentrated among women under 35.) Similarly, an econometric analysis conducted by Taryn Dinkelman in South Africa found that electrification resulted in a 9.5% increase in the employment of women in electrified communities, primarily due to improved household efficiencies increasing the female labor supply.²² Many other studies support the findings of Grogan, Sadanand and Dinkelman on the gender differentiated impact of access to energy, even across very diverse geographic and socio-cultural contexts mainly stemming from improved efficiencies for women at the household level.²³

Overall, our discussion above presented the growing body of evidence showing that clean energy projects often create substantial positive social and environmental impacts.

²⁰ Grogan, Louise & Asha Sadanand. "Rural Electrification and Employment in Poor Countries: Evidence from Nicaragua" World Development Vol. 43, pp. 252–265, 2013

²¹ Ibid.

²² Dinkelman, Taryn. "The Effects of Rural Electrification on Employment: New Evidence from South Africa". Princeton University. August 2010.

²³ Research for a Deloitte University Press Point on View on the intersection of women and energy showcases a number of correlations related to the significant impact that improved access to energy has for women. An initial data set reveals that data reveals striking gap in income for women with and without energy access across Brazil. A regression model shows that the difference income is indeed correlated to access to electricity and the presence of household appliances, like a washer. More specifically, access to electricity in the data set is found to be correlated with a 10 percent higher income and having a washer with a 33 percent higher income — for both women and men. A correlation of washer ownership with employment, however, only exists for women emphasizing the enabling factor that electricity creates to help women. Source: Census data from Brazil was obtained through the Minnesota Population Center's Integrated Public Use Microdata Series, International: Version 6.3. Data was originally produced by Brazil's Institute of Geography and Statistics Originally published in: O'Dell, Kathleen, Sophia Peters and Kate Wharton. "Women, Energy and Economic Empowerment." Deloitte University Press, September 2014.

The findings of these studies also imply (albeit indirectly) that there is potential to increase the social and environmental benefits beyond those enabled by small-scale energy systems traditionally targeted by impact investments (e.g. cookstoves, off-grid solar) through financing much larger, grid-scale clean energy systems. (It isn't much of a stretch to say that studies which show that access to power creates various health, economic growth and women's empowerment benefits therefore support the case for investments which provide reliable access to power for a greater number of individuals (e.g. larger scale on-grid investments rather than small-scale energy systems more commonly seen as part of impact investors' portfolios today.)

3. Current Barriers: Why impact investors have not made these types of broader, more diverse, clean energy investments to date

Many impact investors interviewed agreed with our thesis that there is opportunity for tremendous social impact through larger investments which help build energy infrastructures in countries lacking them to date – **but they also spoke to a common set of barriers which prevent them from making such types of larger infrastructure-related investments. These barriers are as follows:**

- **Barrier 1: Lack of resources - Scale of impact funds seemingly not suited to large energy infrastructure financing:**

Many impact investors interviewed noted that they simply do not have the resources to finance larger types of energy infrastructure investments – even if they see a strong social impact case for doing so. The average investment deal size of impact investors interviewed (which is generally consistent with the average deal size of the broader market) was roughly \$200k-\$1M, and their clean energy portfolios were between \$60-\$100M total. **Thus, investors noted that even if they were open to the idea of larger energy grid opportunities, they did not have the resources to pursue such projects.** One interviewee noted that “they would be interested in an arrangement where they could put in \$5M and partner with a larger private investor or DFI who would put in another \$30-\$50M – but they had not seen partnering like this in the market.”²⁴ Other investors noted that such an arrangement would be quite unlikely given the debt-equity ratios it would require and difficult exit strategies for equity financing (in other words, the details of the debt-equity terms needed for an arrangement such as that outlined above would very unlikely to occur in the market in reality).

- **Barrier 2: Misalignment between impact funds' investment criteria – and energy infrastructure project requirements (such as time horizon for ROI and overall risk tolerance)**

²⁴ Monitor Deloitte interview with Acumen Fund Clean Energy Portfolio Manager Sean Moore, August 2014

When asked if they would be interested in providing catalytic capital to larger scale-energy infrastructure development, many impact investors noted that such projects would require significant resources and risk from their end and only provide a drop in the bucket for the broader financing needed for such projects. As one investor stated, “catalytic financing within larger projects would be challenging for us because these investments are different than our core work - energy infrastructure financing requires a longer time frame for return on investment than our work in our portfolio – and it includes more regulatory risk than we’re used to since project success is dependent on local governments.”²⁵ Overall, our research found that **a key barrier to impact investors financing clean energy infrastructure development is not only scale of resources required – but also that infrastructure projects require longer timelines and present different risk and execution challenges than those to which impact investors may be accustomed.** The structure (size, time horizons, risk tolerance) of impact investing funds does not make them well suited to these opportunities (e.g. if an impact investor provides \$5M towards a clean energy infrastructure project which is delayed for 5-10 years, such a change may be digestible for a DFI or private investor but is devastating for an average impact investment fund.)

- **Barrier 3: Challenge of establishing direct target beneficiaries from large energy infrastructure investments - and demonstrating how such target populations will benefit in the near-term**

Many impact investors interviewed also noted a key **tension in their work between seeking investments which may be important in the long-term development of a country (e.g. energy infrastructure) versus those which create a traceable and direct impact on a specific population at present (e.g. off-grid solar in a small village in India).** Interviewees agreed that there is a critical need for financing to provide access to energy for (from clean sources) for millions across the developing world in the long-term – but some also noted that they do not feel that they are well positioned to fill this need for several reasons.

First, some of investors from whom they raise funds (those who provide capital to impact investing funds and who usually require reports on the financial and social return on their capital) **not only require evidence of short-term impacts achieved but also want to know about a very specific population which benefits from the project they finance.** For example, some investors – and thus the funds who invest their capital – specifically focus on populations with incomes between \$2-\$4 a day and might require that the projects fund will be able to demonstrate concrete impact on these populations within 2-5 years.

Second, many impact investing funds themselves declare specific target populations which they plan to impact through their projects (even if it’s not required by their investors) and said it can be hard to prove how energy infrastructure investments affect these specific target populations. (Opinions diverged on this matter: some investors said it is

²⁵ Monitor Deloitte interview with Impact investor interviewed , July 2014 (asked for quote not to be specifically attributed)

common sense that building better energy infrastructure will help poor populations and it's not hard to build the impact case around it – others said it is more challenging than one would think, particularly when trying to prove that grid investments reach the poorest income segments or specific population subsets (women, vulnerable minority groups).²⁶ Our research revealed that many large-scale energy infrastructure projects do not align, or translate very well, to investors' impact goals (and often stringent requirements to measure progress towards these goals) around target populations and demonstration of impact in the near term. Energy infrastructure can take 5-10 years to build and it can be challenging to demonstrate that broader grid investments benefit the poorest segments of the population on whom impact investors are sometimes most focused.²⁷ Overall, we found that **the greatest barriers for impact investors in financing clean energy infrastructure is the difficulty of establishing how these projects will accomplish specific, measurable and near-term impact goals for specific target (low-income) target populations (such as job-creation and progress out of poverty for these target populations).**

From our interviews with diverse investors and stakeholders across the clean energy industry, we have found the above to be the three core barriers to why impact investors have to date not made a lot of investments in larger scale clean-energy infrastructures across developing countries – despite the fact that there are considerable environmental and social impacts which could come from such financing. **Given this understanding of existing barriers, our next section outlines ways in which we think that investors – and broader players across the market – can help overcome these challenges in the future.**

4. Guidance for Action

Having established the impact case for these types of investments, below are various pieces of guidance for how impact investors can go about sourcing, assessing, and making more diverse clean energy impact investments:

Guidance Section 1: Tips for Impact Investors to conduct due diligence on energy infrastructure projects

The biggest change that impact investors will face in diversifying their clean energy investments (from small-scale off-grid energy investments to larger projects which may contribute to, link with nations' broader energy infrastructures) is that due-diligence for investments in larger energy infrastructures will need to include an analysis of broader energy markets, and public

²⁶ Various Monitor Deloitte interviews with impact investors August 2014, detailed below. Acumen Fund interviewee noted that it is hard for them to show causation of impact from grid investments (specifically for Acumen's target of impacting populations who live on \$2-\$4 a day, a lot of individuals at these income levels won't get access to grid even if a grid is built.) Other investors interviewed such as John Kohler and representatives from FMO) said that impact case for grid investments should not be hard to make and thus should not be a deterrent for financing.

²⁷ Interviews conducted with representatives from impact investors and subject matter experts on investment for social impact. For a full interview list, please see Appendix B.

utility regulation, in a given country or investment geography. Understanding these parameters will help impact investors select viable projects that meet industry standards within the power sector but also deliver on social impact externalities. (For example, while returns on an investment in an off-grid solar for a village in a country will likely not depend on the broader power infrastructure and electricity regulation in that country – the financial returns and risk of an investment in a large wind plant which will provide energy to a national grid will need to fit within electricity sector regulatory frameworks.) Thus, we recommend the following as a checklist for impact investors to conduct due diligence on potential impact clean energy investments:

Due-Diligence Checklist for Impact Investors considering clean energy investments:

- **Review Independent Power Producer (IPP) industry** in the country – including state regulation of utilities, set prices, etc. – to glean an understanding of the historical landscape
- **Review local partners (and other investors)** who may have financed the IPP industry to date – understand if capital will support a project from scratch or join an existing project
- **Assess underlying economic rationale of the project**, including 1) historical and forecast future utility demand; 2) Size and suitability of technology to the specific area/grid, 3) Size (PPA, site, steam host, etc.)
- **Gain an understanding of energy infrastructure interconnectivity** and actual ability to collect revenues and sell into viable markets, including distance to a transmission line, capacity of that to take power, and reliability, among other factors.
- **Analyze Fuel supply:** logistics of supply and transport of the fuel resources (such as biomass), reliability of the supply to each the project, potential political implications of that supply, etc.
- **Review the financing and construction schedule** against similarly sized projects in parallel regions to understand if the project has proper management, realistic timelines, and viable path to financial sustainability.
- **Other success factors:** ensure the project has a viable, creditworthy buyer (or off-taker), review the pre-feasibility and feasibility studies, and understand the project's potential strategic value to the regulatory body and system operator.

These are factors that are common practice to assess in the infrastructure and energy sectors, but that may be newer for impact investors that have not worked with the electricity industry. These factors should be assessed and balanced with social impact considerations, for which most impact investment shops already have rigorous rubrics.

Guidance Section 2: Tips for impact investors to understand the potential social impacts of a broader range of clean energy investments

Impact investors will screen diverse clean energy investments as they have other investments to date: by assessing opportunities' potential, and timeline, for financial return, social and environmental impacts, and risk profiles. Impact Investors may also face different challenges in evaluating, conducting due diligence, on these new types of energy investment opportunities than they did in previous investments (e.g. mapping out the environmental impacts of a large wind/hydro project is different than doing so for off-grid solar, assessing the social impacts of large scale wind is different than clean-cook stoves). **Thus, below we offer a few tips for how investors can approach and assess the social impacts of new, more diverse potential investment opportunities and project entrepreneurs in clean energy:**

- Learn from previous efforts to measure social and environmental impact of large-scale clean energy investments and project finance – focus on what social and environmental impacts specific types of clean energy projects have proven records in achieving previously. (While impacts of even seemingly similar investments will vary across contexts, analysis of social and environmental impacts of previous energy projects can help investors figure out what types of social/environmental impacts different types of energy projects achieve and thus help them select those investments which align with the financial, social return and risk profile of their portfolios.)
- Consult publically available resources, specifically geared towards impact investors, to gain reference points for how to understand, assess and set reasonable expectations for the social and environmental impacts from large scale clean energy investments. **Top resources to get up to speed on how to approach and think about social impacts of investments include:**
 - **Global Impact Investing Network (GIIN) profiles of impact investments, including some specifically focused in clean energy:** These short case-studies give diverse examples of impact investments including those in those in energy, outline the types of social and environmental impacts they create, and describe how investors and investees can go about assessing these impacts (and making them transparent for the market). See: <http://www.thegiin.org/cgi-bin/iowa/resources/profile/index.html>
 - **GIIRS, a leading platform for helping investors to measure, benchmark, aggregate and report their impact.** Their examples of how companies report impact and case studies may be particular helpful (particularly those from investors/companies in the energy sector) See: <http://b-analytics.net/giirs-ratings>.

Guidance Section 3: Tips for impact investors not only to get smart about how to think about both social and environmental impacts – but also to be equipped to measure both

Impact investors need to be savvy about how to conduct due diligence on the potential future impact of their investment opportunities, how assess these impacts over time, and work with investees to maximize the social impacts of their work. Investors' previous investments in

small-scale community oriented energy investments (e.g. clean cook-stoves, off-grid solar) may have had social impacts which were more intuitive to understand than the type of large infrastructure investments we are recommending they consider. As investors look to potentially diversify their energy impact investments – particularly providing catalytic capital in large-scale clean energy investments – they may need to build a more nuanced understanding about how to think about social impacts of their financing, and what is and is not possible in terms of measuring the short and long-term impacts of their work. Useful resources for impact investors to get up to speed about assessing the impact of their investments include:

- **Introduction to Impact Reporting and Investing Standards (IRIS)** – The IRIS guide and introduction (<http://iris.thegiin.org/introduction>) is a valuable resource to help investors think about setting goals for social and environmental impacts of their portfolios – and evaluating if potential target investment opportunities will likely achieve these impacts, (While it is not specific to clean energy, it is highly relevant for impact investors to think about how to diversify their clean energy investments and to assess the social impacts of new types of energy investments.)
- **The Good Investor, A Book of Best Impact Practice** (<http://www.goodinvestor.co.uk>) and **Inspiring Impact: The Code of Good Impact Practice** (<http://inspiringimpact.org/wp-content/uploads/2013/04/Code-of-Good-Impact-Practice.pdf>) are leading publications – written by impact investors to help other investors around the globe quickly get up to speed on how to think about the social impact of their investments..)

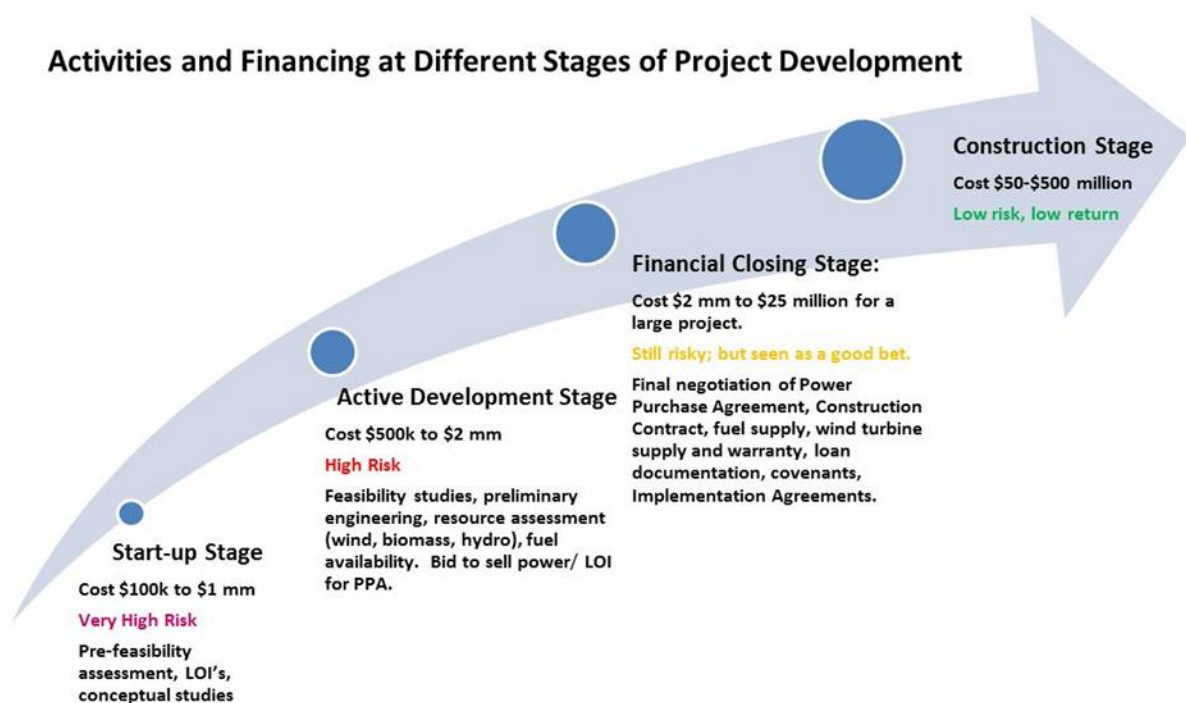
A more exhaustive list of potential resources to consult about how to think about, and measure, both social and environmental impacts of investments is included in Appendix A at the end of this paper. Familiarity with this type of material can help investors think about what kind of impacts their investments can have and potentially help them broaden their energy investments portfolios accordingly.

Guidance Section 4: Tips for impact investors to assess and mitigate the risk of more diverse clean energy investments – including options for insurance and other risk-mitigation measures:

We recognize that risk mitigation is a core part of any investor's due-diligence. Impact investors must be able to access mechanisms for managing risk in order for them to consider diversifying, and expanding, their clean energy portfolios. Our work with USAID-PFAN initiative, Power Africa, and more broadly around clean energy financing in the developing world has provided us with a good understanding of the emergence of risk mitigation products and opportunities for investors (including partial risk guarantees, first-loss provisions from public-sector actors and DFI's, etc.). Many of these tools can reduce the risk in large-scale mature projects but they cannot help early stage projects reach the stage when these tools can be applied. The risk profile of a project changes over time. This is illustrated in the below graphic.

The following graphic shows how a small amount of financing can be catalytic. At the start-up stage of a project, the costs needed are lowest: \$100K to \$1 million. The impact investor

offering financing options at the start-up stage can help lead to a project achieving the next stage of development. Since the risk lowers with every stage of the project achieved, there are more investors available.



The central thesis of this paper is that an impact investor can contribute to financing costs in the start-up stage, when costs are minimal but impact potential is high. Unfortunately, impact investors usually have a low risk tolerance and loss aversion that is driven by their own funders. In order to create a pool of lower-risk, later stage projects, an impact investor could consider a portfolio of early-stage projects that over time would have enough successes to justify the overall investment.

We believe the following tips can help impact investors manage and mitigate risks in larger scale energy infrastructure, and in earlier stage energy projects:

- **Go slow** on projects without creditworthy off-takers. Many countries let their state-owned power companies fall into financial disrepair, and fixing up the entire power sector is beyond the scope of the impact investor.
- **Club together** with experienced investors and lenders in the power sector, so that due diligence costs are lowered. Also, experienced investors and lenders can originate deal flow for the impact investor, where development bridge capital is needed for honest and experienced entrepreneurs.
- **Take a portfolio approach and a long-term perspective**, so that smaller bets are made in greater number of large-scale development projects.

- **Find deals where a relatively small amount of money can provide meaningful progress:** for example, a \$50 million wind project may need a \$100,000 measurement station, which leads to a bankable wind study. Financing for that \$100,000 is exceedingly hard to find but may unlock the \$50 million needed later on.
- **Don't take technology risk.** Technology risk is for venture capital investors. Making a significant and near to medium-term difference in access to power means sticking to tried and true clean energy technologies, of which there are many to choose from.
- **Empower local suppliers,** by strengthening the supply chain, investing in capacity building, training, and supplier financing for local firms that can be competitive in items such as civil works and security. Also invest in technical training, especially for women.

5. Conclusion: Early-stage development as a potential new instrument for impact investors

Impact investors should consider catalytic interventions in large-scale clean energy investment in order to create greater social and environmental impacts, move up the clean energy value chain, and grow the breadth of the impact investing community. Given the importance of access to energy within the international development agenda, there are also a number of international development programs aimed at promoting investment in clean energy projects - such as PFAN-Asia – which can support impact investors as they look for clean energy investment opportunities and diversify their portfolio in this sector.

While there are challenges to attracting impact capital for larger scale clean energy projects, it is clear that there are also substantial positive social benefits which can be created by financing such projects. The challenge for impact investors is thus illustrating how their investment ties to a direct impact on specific populations and communities and having the right set of indicators and tracking tools to allow themselves to do that. Creation of energy-related social impact indicators, and collaboration with impact-oriented investors to define and communicate how clean energy system create the social impact they seek to foster, is also an important role which donor-funded programs (like PFAN-Asia) can provide.

Appendix A: Additional Resources on Understanding, Sourcing Target Investments, and Assessing the Social Impacts of Investments

List of resources relevant to impact investors looking to diversify their investments in the clean energy, particularly geared to help them to **better define, understand, measure and report the social impacts of a broader spectrum of clean energy investments**. This is not an exhaustive list of useful literature in the field – but rather a starting point and a short-list of accessible materials for investors. It is organized by sequential stages of impact measurement (goal setting, framework development, data collection, etc) so resources relevant to more than one stage are included more than once. **Those in bold are below are those which, in the view of the authors, should be top priority for investors with limited time to read the broader literature.**

<i>Subject</i>	<i>Resources</i>	<i>Source</i>
Introduction to Impact Measurement	A Practical Guide to Impact Measurement	http://evpa.eu.com/knowledge-centre/publications/evpa-publications/
	Proposed Approaches to Social Impact Measurement	http://ec.europa.eu/internal_market/social_business/docs/expert-group/20131128-impact-measurement-subgroup_en.pdf
	The Good Investor: A Book of Best Impact Practice	http://www.goodinvestor.co.uk/
Goal Setting	Inspiring Impact: The Code of Good Impact Practice	http://inspiringimpact.files.wordpress.com/2013/02/code-of-good-impact-practice-mar-2013.pdf
	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
	Toniic E-Guide to Early Stage Global Impact Investing	http://www.toniic.com/toniic-institute/early-stage-e-guide/#top
	Guidebook for Impact Investors: Impact Measurement	http://www.purposecap.com/wp-content/uploads/Guidebook-for-Impact-Investors-Impact-Measurement.pdf
	Guidelines for Impact-Oriented Reporting	http://www.social-reporting-standard.de/wp-content/uploads/2011/09/SRS_Leitfaden_120716_en.pdf
	Assessing Impact	https://www.rockpa.org/document.doc?id=156

<i>Subject</i>	<i>Resources</i>	<i>Source</i>
Framework Development & Metrics Selection	Inspiring Impact: The Code of Good Impact Practice	http://inspiringimpact.files.wordpress.com/2013/02/code-of-good-impact-practice-mar-2013.pdf
	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
	Building a Performance Measurement System	http://www.rootcause.org/resources2/building-a-performance-measurement-system-a-how-to-guide
	Toniic E-Guide to Early Stage Global Impact Investing	http://www.toniic.com/toniic-institute/early-stage-e-guide/#top
	Guidebook for Impact Investors: Impact Measurement	http://www.purposecap.com/wp-content/uploads/Guidebook-for-Impact-Investors-Impact-Measurement.pdf
	Measuring Socio-Economic Impact: A Guide for Business	http://www.wbcsd.org/impact.aspx
	Catalogue of Approaches to Impact Measurement	http://svtgroup.net/wp-content/uploads/2011/09/SROI_approaches.pdf
	Double Bottom Line Project Report	http://www.riseproject.org/DBL_Methods_Catalog.pdf
	Evaluation Principles and Practices	http://www.hewlett.org/uploads/documents/EvaluationPrinciples-FINAL.pdf
	Guide to Actionable Measurement	https://docs.gatesfoundation.org/Documents/guide-to-actionable-measurement.pdf
Selecting Indicators for Impact Evaluation	http://www.ngoconnect.net/documents/592341/749044/Selecting+Indicators+for+Impact+Evaluation	
Toniic E-Guide to Impact Measurement	http://www.toniic.com/e-guide-to-impact-measurement/	
Data Collection & Storage	Inspiring Impact: The Code of Good Impact Practice	http://inspiringimpact.files.wordpress.com/2013/02/code-of-good-impact-practice-mar-2013.pdf
	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
	Building a Performance Measurement System	http://www.rootcause.org/resources2/building-a-performance-measurement-system-a-how-to-guide
	Toniic E-Guide to Early Stage Global Impact Investing	http://www.toniic.com/toniic-institute/early-stage-e-guide/#top
	Measuring Socio-Economic Impact: A Guide for Business	http://www.wbcsd.org/impact.aspx

Validation	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
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Subject	Resources	Source
Data Analysis	Inspiring Impact: The Code of Good Impact Practice	http://inspiringimpact.files.wordpress.com/2013/02/code-of-good-impact-practice-mar-2013.pdf
	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
	Toniic E-Guide to Early Stage Global Impact Investing	http://www.toniic.com/toniic-institute/early-stage-e-guide/#top
Data Reporting	Inspiring Impact: The Code of Good Impact Practice	http://inspiringimpact.files.wordpress.com/2013/02/code-of-good-impact-practice-mar-2013.pdf
	Guide to Evaluating Capacity Development Results	http://wbi.worldbank.org/wbi/document/guide-evaluating-capacity-development-results
	Building a Performance Measurement System	http://www.rootcause.org/resources2/building-a-performance-measurement-system-a-how-to-guide
	Guidelines for Impact-Oriented Reporting	http://www.social-reporting-standard.de/wp-content/uploads/2011/09/SRS_Leitfaden_120716_en.pdf
Data-Driven Investment Management	Building a Performance Measurement System	http://www.rootcause.org/resources2/building-a-performance-measurement-system-a-how-to-guide
	Toniic E-Guide to Early Stage Global Impact Investing	http://www.toniic.com/toniic-institute/early-stage-e-guide/#top

Appendix B: Interview List

List of Interviewees consulted in writing this paper follow. These individuals were interviewed in July and August by Jessie Duncan and Sophia Peters to solicit feedback and opinions on impact investment in the clean energy sector.

- Katherine Hill, Formerly managed Acumen's energy portfolio in India/Pakistan, currently Global Supply Manager, Clean Energy, Apple Inc)
- Sean Moore, Portfolio Manager, Acumen Fund
- Robert Vodicka, Small Enterprise Assistance Fund (SEAF)
- Huub Cornellissen, Manager, Investment and Mission Review, FMO Netherlands
- Jonathan Kohler, Chairman, Board of Directors, Toniic & Executive Fellow at Santa Clara University's Center for Science, Technology and Society
- Najada Kumbuli, Sr. Investment Officer, Calvert Foundation
- Gerrit-Jan Brunink, Renewable Energy Fund Manager, Triodos Investment Management BV
- Gerhard Pries, CEO, Sarona Fund

Appendix C: Authors' Biographies

Jessie Duncan is a Manager in Deloitte's Social Impact Service Line. Prior to joining Deloitte, Ms. Duncan worked for five years in international development, including three years in North and East Africa. Ms. Duncan has experience leading engagements with impact investing and foundation clients – her previous projects include assessing microfinance institutions' models of financial-capability building, global expansion strategies for U.S. based impact investing organizations, and helping lead the G8 Impact Measurement Working Group. She is also currently working on research related to impact investing and gender-lens finance (focuses on challenges of lack of intermediaries and common metrics). She also has deep knowledge of clean energy and sustainability issues and spent two years working on international climate and energy policy at the Brookings Institution.

Jessie holds a Masters in Public Affairs from Princeton University and an MBA from the Tuck School of Business at Dartmouth. She received her BA, with Honors, from Stanford University.

Sophia Peters is a Manager with Deloitte Consulting's Strategy and Operations Group. She supports a variety of projects focused on international clients in emerging market: clean energy policy, access to finance, electricity markets, and power project development. She specializes in financial, strategy, and policy analysis, with a specific interest in how consumers make decisions.

Ms. Peters has deep experience working on projects at the intersection of gender, energy, and economic empowerment, with a perspective that women can be a catalyst for economic development goals. She publishes frequently on these topics; her most recent piece, "Women, Energy, and Economic Empowerment," was recently released by Deloitte University Press and presented at the 2014 Annual Association of Energy Engineers Conference.

Ms. Peters has worked on long term projects Latin America, Eastern Europe, Southeast Asia, and East Africa, as well as on U.S. domestic policy for the EPA and DOE. She holds a Master's in Public Policy from Princeton University's Woodrow Wilson School and a Bachelor's degree, with Highest Distinction, from Duke University. She is fluent in Spanish.