ICIMI - Off-Grid Community Solar
www.icimi.com

- Project Size: 15 MW, to be completed in 3 Phases
- Project Approved. Feasibility study completed. MoU signed
- Target Market: Off-grid residential market
- Beneficiaries: 42,000 households + 1000 local businesses
- Technology: Solar Photovoltaic Mini-grids

ICIMI takes advantage of the deregulation of the Nigerian energy market and the market-based mechanisms which have led to the entry of many independent power producers into the Nigerian off-grid energy market. The Green Climate Fund (GCF) has expressed interest in providing equity and debt finance for this project. As such, we are looking to partner with energy investors and/or GCF accredited entities with the desire to increase their exposure to the growing African renewable energy market.

Business Model
This 15 MW solar PV project is developed under an innovative shared-ownership model of local ownership, income generation and profit sharing with end-user of power. The project would deploy 18 solar installations with a combined generation capacity of 15 MW to off-grid and under-served communities in north, central and south-west Nigeria. The power generated from the solar systems would be sold directly to end-users pursuant to the term of a bilateral Power Purchase Agreement. The project would be implemented in three phases over a 2-year period. The project would be financed through a special purpose vehicle (SPV). The capital structure of the SPV will consist of equity and debt in a ratio of 55:45%

<table>
<thead>
<tr>
<th>Phase</th>
<th>Size</th>
<th>Equity</th>
<th>Debt</th>
<th>Equity IRR</th>
<th>Project IRR</th>
<th>Equity Payback Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 MW</td>
<td>$4.6M</td>
<td>$3.8 M</td>
<td>35%</td>
<td>20.5%</td>
<td>3.5 years</td>
</tr>
<tr>
<td>2</td>
<td>6 MW</td>
<td>$9.8 M</td>
<td>$8 M</td>
<td>31.6%</td>
<td>19%</td>
<td>3.5 years</td>
</tr>
<tr>
<td>3</td>
<td>6 MW</td>
<td>$9.6 M</td>
<td>$7.8 M</td>
<td>32.3%</td>
<td>19.4%</td>
<td>3.5 years</td>
</tr>
</tbody>
</table>

Project Details

Project Location: Several Locations, Nigeria

PFAN Coach: Albert Boateng
Potou Wind Power Plant – Phase 1

Project Description:
- 25 MW Wind Power Plant
- Grid connected
- Commercial Operation Date (COD): 2021
- 65,700 MWh yearly electricity production
- 40,851 t. GHG emission reduction
- 25 years plant life

Note: 25 MW additional capacity, operational in 2023 for Phase 2

Business model:
1. Set up of a long term PPA contract with a State sovereign guarantee
2. Produce Green Energy;
3. Transmit the produced electricity through the grid; and
4. Receive payment as per the PPA contract.

Debt Ask
Phase 1 only
33.8 Million US$

Indicative Returns

<table>
<thead>
<tr>
<th></th>
<th>Project IRR</th>
<th>Equity IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Payback Period
5 years

Project Location:
Potou, Senegal

PFAN Coach:
Lamine Ndour
Community Solar Energy Platform (CSEP)
This project will develop 100 solar-energy based community activity centers in rural areas of Burkina Faso, complementing the government Multi-Functional Platform program. The project will implement a private sector-led business model to expand access to affordable energy services to rural population on a decentralized basis, while offering key improvements over the existing MFP program. The project will be developed by Sahelia Solar, a leading solar energy project developer in Burkina Faso, in partnership with the Federation Nationale des Groupements Naam (FNGN), a large federation of rural cooperatives in Burkina Faso. The CSEP will be operated by rural electricity cooperative members of FNGN. FNGN currently manages over 160 MFPs operated by its member cooperatives as part of the government MFP program. FNGN will provide technical, financial and administrative assistance to the participating cooperatives for ownership and management of the CSEP. The preliminary design of the CSEP integrates 15 kW of photovoltaic capacity, 60 kWh of storage capacity and electrical agro-processing equipment in a containerized solution, complemented by a mini-grid.

Revenue Model
The Project entails three revenue streams:
- Energy sales to individuals, households and businesses priced at $0.3/kWh;
- Supplemental charge for the use of agro-processing equipment priced at $0.2/kWh;
- Mini-grid connection fees of $10 per connection.

Investment Ask
5.7 Million US$

Indicative Returns
Project IRR
12%

Payback Period
8 years after completion of the project in FY19

Project Location:
Ouahigouya, Burkina Faso

PFAN Coach:
Egny Pierre N'guessan
Betmai Hydroelectric
The Betmai Hydroelectric Project is a proposed 27 MW run-of-river hydro-electric power generation project located on the Pampana River in the Northern District of Sierra Leone. The Project develops the hydraulic potential of the 60 m high Betmai Falls. The Project will be transferred to the Government of Sierra Leone at the end of the 25-year term of the power purchase agreement. The Project also includes a 28 km 66 kV transmission line that will be transferred to the Government of Sierra Leone at the time of commissioning.

Business Model

Project Location:
Northern Province, Sierra Leone

Investment Ask
Equity (30%)  Debt (70%)
31 72
Million US$ Million US$

Indicative Returns
Project IRR  Equity IRR
11% 17%

Payback Period
8 years after completion of project in FY19

PFAN Coach: Albert Boateng
The Waste Transformers

Turning Waste into Opportunity for Socially Inclusive Growth

No or limited energy access? Immature waste management? Waste-related diseases? Limited infrastructure? In Sierra Leone, these are just a few of the daily problems the 1 million inhabitants of Freetown face. This project tackles these issues with a single solution in a way that is smart, green and entrepreneurial. ‘The Masada Waste Transformers’ [JV] will operate 2 x 2 MW Anaerobic Digesters and 40 highly innovative 100kWh small-scale containerized digesters placed at different locations throughout Freetown. The large installations will be fed, by Masada, with already collected municipal organic waste (for which they already have a 20 year contract). The containerized solutions will be run by local entrepreneurs in co-operation with Masada.

Investment Ask

<table>
<thead>
<tr>
<th>Equity (30%)</th>
<th>Debt (70%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 Million US$</td>
<td>17.5 Million US$</td>
</tr>
</tbody>
</table>

Indicative Returns

<table>
<thead>
<tr>
<th>Project IRR</th>
<th>Equity IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>23%</td>
<td>34%</td>
</tr>
</tbody>
</table>

Payback Period

4–6 years after completion of project in FY19

Project Location: Freetown, Sierra Leone

PFAN Coach: Antoine Faye

Business Model

From waste to value, in Freetown

<table>
<thead>
<tr>
<th>SECURITY OF FEEDSTOCK</th>
<th>TACKLES BOTH SANITATION &amp; ENERGY</th>
<th>ROBUST TECHNOLOGIES</th>
<th>NO TRANSPORT OF WASTE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Precontracted processing fee of + 20 $ / TON</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TAKE-OFF GUARANTEED</th>
<th>GREEN CLEAN ENERGY</th>
<th>NUTRIENT RICH FERTILIZER</th>
<th>SOCIAL ENTREPRENEURSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RPA 0.198 cents / kW</td>
<td>$5 / ton fertilizer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FUNDING (in US $ &amp; ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income: $167</td>
</tr>
</tbody>
</table>
Bonergie SARL
www.bonergie.com

The Bonergie Solar Boutique - A last-mile-distribution model for decentralized energy solutions in the agri-food value chain in Senegal
Bonergie SARL is looking for investors to set up a last-mile-distribution model in Senegal which supports the sale and maintenance of decentralized solar installations for productive use with a Pay-as-you-go financing model. Using Solar Water pumps, freezers, fruit dryers and bigger SHS empowers people in rural areas to generate income. Bonergie intends to set up 100 Solar Boutiques in non-electrified villages around 4 existing regional offices. A Solar Boutique is a small profit center which sells and maintains the whole product range of the Bonergie Solar products as well as consumer products and intelligent services like Money Transfer and Access to Internet.

Debt Ask

1.5 Million US$

Indicative Returns

Project IRR
9%

Payback Period

5 years after completion of the project in FY19

Project Location: Senegal

PFAN Coach: David Achi
Translight Solar Limited (TSL), an award winning, innovative solar technology installation, consultation and distribution company is building Africa’s premier virtual electricity grid.

The virtual electricity grid concept involves installing adequate solar power capacity in homes and businesses as the primary electricity generation source, which is far cheaper and more reliable than power from the electricity companies in Sub-Saharan Africa.

The installed solar systems are connected to Translight’s Data Center (TDC) through the internet, for remote monitoring and management. The TDC application collaborates with financial institutions to provide low-interest financing to customers for the purchase of solar energy with monthly payments.

**Business Model**

**The Virtual Electricity Concept**

- Customer applies for loan
- Financial institution pays to purchase solar energy and makes monthly payments to financial institution
- Approved loan to Translight for solar system installation on behalf of customer
- Translight installs solar system at customer’s premise
- Translight manages and services solar installation for customer using its innovative platform

**Investment Ask**

| 5 | Million US$ |

**Indicative Returns**

<table>
<thead>
<tr>
<th>Project IRR</th>
<th>Equity IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.9%</td>
<td>34.78%</td>
</tr>
</tbody>
</table>

**Payback Period**

3 years after completion of the project in FY19

**Project Location:** Ghana

**PFAN Coach:** Marindame Kombate
25MW solar PV power plant: Phase I – 5MW, Phase II – 20 MW

Off-taker: Electricity Distribution and Supply Authority (EDSA)

20-year PPA executed and ratified by Parliament.

Signatories to PPA: SEH, EDSA, Ministr of Finance and Ministry of Energy.

Winner of $100,000 - Access FMO Solar ‘Shark-Tank’ competition

Secured $856,000 grant from the US Trade and Development Agency

Winner – Africa Energy Forum Co-Development Facility

Signed Joint Development Agreement with rAREH for 100% equity for Phase1

Feasibility Study: Phase1 – completed, Phase2 – funded by USTDA, ongoing

Land lease executed: 31 acres for Phase 1 and 120 acres for Phase2

Investment Ask

<table>
<thead>
<tr>
<th>Phase 1 - Total Cost</th>
<th>Phase 1 - Debt Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.64 Million US$</td>
<td>5.73 Million US$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 2 - Total Cost</th>
<th>Phase 2 - Debt Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td>38.1 Million US$</td>
<td>26.67 Million US$</td>
</tr>
</tbody>
</table>

Indicative Returns

<table>
<thead>
<tr>
<th>Project IRR</th>
<th>Equity IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.07%</td>
<td>15.63%</td>
</tr>
</tbody>
</table>

Payback Period

5.5 years after completion of project in FY18

Project Location:
Bo District, Sierra Leone

PFAN Coach:
Olusegun Adaju
This project aims to provide C&I leasing PLC with the following:

- Energy efficient power services in all its offices in Nigeria by reducing energy consumption by 40-50% over a two-year period. This includes reduction of approx. 750,000 Btu/hour of cooling and associated refrigerant losses.
- Reduction by 40-50% of its current consumption of nearly approximately 2,000,000 kWh per annum, including 450,000 kWh per annum at its Headquarters in Lagos.
- Reduction in Carbon footprint for C&I leasing by about 824,100 kg CO₂e per annum. This is equivalent to removing 310 cars from the road doing 15,000 kilometers per annum.
- In two years, achieve carbon neutrality in C&I Leasing’s activities, including its rental vehicles and marine business
- Six PV systems ranging from 150 – 450 kW and with a cumulative capacity of about 2,000 KW, with minimal electrical storage systems (ESS).

### Investment Ask

<table>
<thead>
<tr>
<th>Equity (30%)</th>
<th>Debt (70%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.385 Million US$</td>
<td>1.69 Million US$</td>
</tr>
</tbody>
</table>

### Indicative Returns

- Project IRR: 25%

### Payback Period

5 years after completion of project in FY19

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**Business Model**

[Diagram showing various components such as Efficiency Monitoring, Energy Audit, DISPOSAL RETROFITTING, SOLUTIONS, INSTALLATION, PV SYSTEMS & INFRASTRUCTURE, MONITORING & MAINTENANCE, REQUIRED PAYMENT FUNDING SOLUTIONS, CONSERVATION EFFICIENCY MONITORING]
Aphelion Energy Limited
www.aphelion.energy

Aphelion Energy is electrifying West Africa through solar energy and financing solutions - creating new opportunities for rural businesses with solar systems for productive use, and modernizing rural households. The company does this by building last mile distribution of pay as you go (PAYGO) products and through innovative partnerships with microfinance institutions and agricultural partners. Solutions offered range from plug and play lighting and phone-charging systems, flexible household systems with TVs and fans, to systems that generate income for customers through refrigeration, milling, pumping, and commercial activities. Customers who buy on credit pay via mobile money over 2 to 4 harvests. Aphelion is building a robust credit risk framework and mobile-based data collection to maximize payment performance and track impact. The company is also developing partnerships with microfinance institutions to finance receivables, to improve cash flows and preserve equity for its early investors.

Business Model

Entry level: lighting, phone charging, radio
Flexible systems: TVs, fans, etc.
Revenue generating activities: pumping, milling, refrigeration

Investment Ask

| Million US$ | 2 |

Indicative Returns

<table>
<thead>
<tr>
<th>Project IRR</th>
<th>Equity IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>13%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Payback Period

3.8 years

Project Location:
Côte d’Ivoire

PFAN Coach:
Marindame Kombate
PFAN is hosted by the United Nations Industrial Development Organization (UNIDO) in collaboration with the Renewable Energy and Energy Efficiency Partnership (REEEP).

For further information, please contact:

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Regional Coordinator, West Africa
albert.boateng@pfan.net