



**SHARED  
VALUE**  
AFRICA INITIATIVE

## **ELECTRIFYING AFRICA: THE WAY FORWARD**

**BREAKAWAY SESSION 02**

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THIS DOCUMENT PROVIDES A SUMMARY REPORT ON THE #ASVS19 BREAKAWAY SESSION 2:  
ELECTRIFYING AFRICA: THE WAY FORWARD

## BREAKAWAY DESCRIPTION



Electrification is a major enabler of economic expansion. The Shared Value Africa Initiative research team conducted research and developed a cohesive business-focused strategy to contribute to the generation and distribution of renewable energy in Africa. The key benefit of this strategy is that can be rapidly deployed with low investment cost and scalability.

One of the key questions the research aimed to answer was: how can Africa leverage green power to advance its economy?

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### SPEAKERS:

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## OPENING REMARKS

The four Shared Value Africa Initiative (SVAI) team members conducted research on the various challenges of electrifying Africa and presented possible strategies to approach these challenges from a Shared Value perspective. The research presentation focused on:

- Energy as a factor of economic production and how a lack of energy severely affects low-income earners
- The role of energy in economic sustainability
- Different Renewable Energy power sources
- What an optimum power source may look like.

Energy is a crucial ingredient of economic development and therefore access to energy is fundamental to reducing poverty as well as improving health facilities. Provision of affordable reliable energy to countries in Africa will not only fulfill basic human needs (such as lighting, cooking etc) but will also help advance sustainable development. The key question is: How can we push energy efficiency to fight climate change and foster social-economic development?



## WHAT HAS BEEN DONE IN AFRICA?

ENEL GREEN POWER CASE STUDIES



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#### 1. Ethiopia

As in many African countries, the Ethiopian power grid is often unreliable and the country is often faced with blackouts, which could be fatal in the operations of a hospital. Enel Green Power, in collaboration with an NGO called Doctors with Africa CUAMM, started the Ensuring Energy for Patients project at St. Luke Hospital in Wolisso, Ethiopia, to address this urgent need. An innovative hybrid energy plant was constructed at the hospital to ensure a constant supply of electricity and manage the hospital's power requirements. A project of this nature fosters socio-economic development through supporting access to health care.



#### Brief Overview:

Patient Base: approx. **430 000**

Outpatient Visits per Annum: **100 000**

Hospitalizations: **11 500**

Assisted Births: **3 300 (40 fatal)**

## 1. South Africa

In recent years South Africa has been hit by drought, particularly in the Western Cape province, one of the major contributors to the national GDP, contributing 22% of the country's agricultural economy. As a result, the severe water shortages - with dam levels sitting at below 20% capacity - resulted in five billion rand lost to the economy. Enel Green Power has worked together with small-scale farmers, who are the most impacted, to build a macro-grid for irrigation water pumps. They started this project about two years ago and in the intervening time the farmers' yield has already increased. Through the microgrid intervention, Enel's two targeted farmers (who farm potatoes and fruits such as watermelon and grapes) have doubled their profits, doubled their yields and created more job opportunities. Given the huge opportunity here, Enel has made a long-term commitment to investing in the project. It is hoped that it will be able to scale up in the future, as the farmers are currently only able to use about 5% of their more than 100 hectares of land.



## STRATEGY DISCUSSION: ELECTRIFYING AFRICA

The strategies that have been developed are built on the principle that access to electricity is a direct driver of economic growth. Marnus Botha emphasized, “We cannot grow a concept or ... a company without electricity.”

It is a well-documented fact that continental Africa remains dark. Close to 8% of people living in sub-Saharan Africa, particularly in remote areas, have no access to electricity whatsoever. The SVAI research team emphasized finding renewable energy solutions available within sub-Saharan Africa which can be scaled up and leveraged to achieve the goal, powering Africa. The research was conducted with a focus on selected regions in Central, Eastern and Southern Africa.

Before a solution can be proposed, it is necessary to understand the problem. Why do 80% of people residing within Africa have either no access to or a shortage of electricity, even though innovative, alternative sources are available on our continent?

According to the International Energy Agency, renewables can provide more than 40% of all power generation capacity in the region by 2040 - and the economic growth of sub-Saharan Africa has the potential to increase by 25%. This is huge considering that we are looking at emerging markets and other frontier markets which are not anywhere close to that level. There is a lot of value that can be tapped into if we use the resources we have within our continent.

### **Purpose of the Research: Why are we here?**

“ The researchers aimed to ascertain how to strategically generate energy in order to being able, to an extent, to enable economic growth within sub-Saharan Africa. How do we make sure that our continent can tap into available renewable energy sources to drive economic growth at its best? ”

## RENEWABLE ENERGY TYPES:

### 1. HYDROPOWER ENERGY

The production of electricity by the force of fast-moving water.

#### Viability Per Region

This is determined by high water supply and high-volume flowing rivers in order to construct a hydropower dam, and therefore location is crucial.

Substantial hydropower remains untapped in sub-Saharan Africa in countries like Mozambique, Malawi, Zambia, the DRC, Uganda, Rwanda, Sierra Leone and Nigeria.

### 2. SOLAR PHOTOVOLTAICS (PVS)

The generation of electricity using solar panels fixed on rooftops of residential households and corporate buildings.

#### Viability Per Region

Solar has a lot of potential in Africa largely due to low penetration levels, short project lead times for power generation technology and its ability to scale up the

renewable energy resource.

Some countries with solar power potential are South Africa, Kenya, Uganda, Ghana and Nigeria.

### 3. CONCENTRATING SOLAR POWER (CSP)

These are large solar panels on a far larger scale, using panels as big as tennis courts. CSP uses curvy mirror-line panels that change their orientation throughout the day to follow the sun's path to maximize on energy capture. They make use of storage tanks that save the energy for future usage during winter/rainy seasons.

Morocco has a solar firm in the Sahara Desert, which can generate a substantial amount of energy. South Africa has also a CSP firm in the Kalahari Desert region. Both are powerful sources of energy.

#### Viability Per Region

Some of the sub-Saharan countries with CSP solar plant potential are Algeria, Egypt, Jordan, Tunisia, Namibia, and the already-mentioned Morocco and South

Africa, which have already installed theirs. It is a very viable source of energy that countries can adopt and scale if the budget is not an issue.

## 4. WIND ENERGY

This involves capturing the energy from moving air/wind and converting it into electricity.

### Viability Per Region

According to the World Bank, areas with promising wind potential include Kenya, Ethiopia, Ghana and Senegal. About 97% of the continent's total wind installations are in North Africa. The five biggest wind markets in Africa are South Africa, Morocco, Egypt, Ethiopia and Kenya.

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## 5. GEOTHERMAL ENERGY

Involves converting heat from under the ground - the earth's internal heat - into energy.

### Viability Per Region

The best geothermal reservoirs are in volcanically or seismically active areas. Recent projects in Ethiopia, Kenya, Rwanda, Ghana, and Nigeria speak to the potential and rising interest as geothermal opportunities are also related to gas and oil discoveries.

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## 6. BIOMASS ENERGY

Biomass is organic material that comes from plants and animals. This renewable source of energy is popular in countries where agriculture is a key industry.

### Viability Per Region

Countries with biomass potential are Zimbabwe, Zambia, Malawi, South Africa, Uganda, Ethiopia and Sierra Leone.

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## 7. OCEAN WAVE ENERGY

Ocean wave energy, also referred to as hydrokinetics, extracts energy directly from the surface of the ocean waves. The energy captured is then used for a variety of purposes, including electricity generation, water desalination and pumping water.

### Viability Per Region

Ocean wave energy is one of the least utilized sources of energy. There is no country that particularly uses ocean wave energy, with data on this only coming from the island of Bora Bora. This is therefore an alternative to be looked at for areas near the coast.

## COST ANALYSIS PER RENEWABLE ENERGY SOURCE

From an installation point of view, Solar PVs are the cheapest to install and CSPs are the most expensive, for the simple reason that one needs a large expanse of land as well as acquiring the panels (each roughly 24m x 9m).

Sustainability is paramount and this is where Shared Value comes in. It is important, from an operational and maintenance cost point of view, to see whether a country can maintain and sustain a renewable energy project. Going forward, donors are not going to be in the picture and factors such as logistics need to be considered. For example, in countries such as the DRC, logistics are a huge challenge. The socio-political climate of each country needs to be factored in when doing a cost analysis of the whole project and its viability for a specific country or region.

## FEASIBILITY AND SCALABILITY OF RENEWABLE ENERGY IN SUB-SAHARAN AFRICA

The research involved twelve sub-Saharan countries, looking at three countries in all the regions - East, West, Southern and Central Africa - to understand:

- What is the current landscape of energy in a particular country?
- What is the demand in that particular country?
- What is the total installed capacity of energy in that particular country?

Africa has the potential to generate enough renewable energy to power itself and even export energy to other continents. Solar is the most scalable and feasible that we can tap into as a continent.

### East Africa

Kenya currently has 600 MW of solar energy. 56% of the population are connected to the grid and yet there is not enough energy to power the whole of Kenya.

Solar radiation is the intensity of the rays of the sun that can be harvested to produce energy. Global averages are around 2-2.5 kWh/m<sup>2</sup>/day in countries such as Sweden, and they are doing very well in terms of harvesting that energy. The solar radiation in Kenya is double this intensity at 4-6 kWh/m<sup>2</sup>/day. Therefore there is the capacity and scalability to harness this natural resource.

### West Africa

Nigeria has a population of 190 million and installed capacity of 8,457mW of energy, which is not enough for its needs. However, the Nigerian government's 2020 plan includes a mass installation of solar energy.

## Southern Africa

South Africa is quite advanced in terms of solar PV, with great partnerships between the government and solar PV companies.

## Central Africa

The DRC is powered by hydropower using the Congo River, which has the capacity to power 37% of Africa - but only 3% of this potential is used. It is therefore clear that there is definite room for growth and opportunity for expansion at great scale.

From the above it is clear that solar PV is scalable, feasible and can be implemented in a short period of time: an average between 2.5-4 years.

## POLICY AND LEGISLATION

There are disparities in support policies regarding renewable energy in sub-Saharan African countries. Ghana, for example, is a leader in regulatory policy and fiscal incentive, closely followed by Kenya and South Africa. If we were to create centers of expertise, we could use Ghana, Kenya and South Africa to show the rest of the continent how approach and create the necessary policies to implement renewable energy.

## East Africa

**Kenya:** Kenya has the most sophisticated regulatory framework to support renewable energy, i.e. the presence of private energy generating companies.

**Ethiopia:** In the private sector, investments in the energy sector are encouraged by the Ethiopian Power Corporation.

**Rwanda:** Regulation on renewable energy is not as robust as elsewhere in the region.

### Major Regulatory Barriers:

- Resistance of public sector investment due to lack of accurate, reliable data on renewable energy
- Management and coordination of multiple stakeholders across private and public sector

## West Africa

**Nigeria:** Nigeria has a dedicated task force to drive the implementation and reform of Nigeria's power sector and ensuring the removal of legal and regulatory obstacles to generate private sector investment in the power industry.

**Ghana:** The Energy Commission is mandated to regulate and manage the utilization of energy resources and to coordinate all policies relating to energy.

**Mali:** Mali has a protective renewable energy policy that promotes the generation and utilization of renewable energy.

### Major Regulatory Barriers:

- Lack of policy to attract renewable energy investors' participation in constructive development.
- Intense investment costs prove to be a major stumbling block in the mini-grid connected systems and the ability to commercialize solar home systems.

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## RENEWABLE ENERGY CHALLENGES

- 1. Underdeveloped Policies:** As a result of underdeveloped policies, there is a lack of implementation and inability to adopt renewable energy projects. Basically, if we do not know what we are supposed to do, we will not go about implementing/promoting the message of renewable energy.
- 2. Consumer Education:** As Africans we are accustomed to our traditions, and that includes our traditional sources of energy. There is a lack of awareness of other energy sources and a lack of trust in changing what we already know. Consequently, we are not always aware of the dangers of these traditional methods, e.g. the damaging effects of fossil fuels.
- 3. Access to Finance:** Renewable energy is by no means cheap. It is extremely costly to implement and since people are unaware of its potential, there is suspicion that precludes investment.
- 4. Poor Infrastructure:** Sub-Saharan Africa has major infrastructural issues. Trying to solve these issues across the continent would be a costly exercise.
- 5. Empowering Environments:** Though there are policies in some countries, we find that the practices and frameworks are non-existent, which makes it a disempowering environment. As much as there are elements and individuals who may want to implement renewable energy projects, we find that they do not always get the required support.
- 6. Lack of Technological Support:** This is a challenge across the continent.

### Root Cause: Why is Sub-Saharan Africa not Electrified?

- Lack of Investment
- High Implementation Costs
- Infrastructure/Resource Deficits (countries among the poorest in the world)
- Skills/Education Shortage
- Fight for African Resources

As a result of a lack of Shared Value thinking, Africa's resources - both mineral and labour - have been shrinking, while the rest of the world has been developing and growing from the early 1500s to date.

## SHARED VALUE



Shared Value is a strategic approach to utilizing a social/environmental/economic nexus to increase value for all stakeholders, creating both tangible and intangible value. It is a way of looking at business as a tool not only for building wealth but also for driving social progress.

Renewable energy Shared Value pillars:

- Reconceiving products and markets
- Redefining productivity in the value chain
- Enabling local cluster development.

### STRATEGY: ELECTRIFYING AFRICA

**1. Diagnosis:** Identifying the major root cause and major obstacles.

The research, through diagnosis, identified the major obstacles to electrifying Africa which are: Access to finance.

- Lack of education
- Tech support
- Scalability of projects
- Not enough bankable projects
- Underdeveloped policies

**2. Roadmap:** Marking the main direction forward to advance interest to address the root cause and obstacle.

The main aim is therefore to produce many bankable projects designed with Shared Value in mind to further address the obstacles.

- Setup central institution – policy and legislation, access to finance.
- Identify and equip renewable energy enablers – engage with government, look for favorable conditions, create ambassadors.
- Amalgamate databases – Shared competencies.
- Actively seek bankable projects – ROI, Shared Value, collaboration.
- Feasibility / due diligence – Where, why, what needs to be set up, implementation, how viable they are and how do you measure this?
- Central institutional greenlight and project roll out – Approval.

**3. Coherent Action:** Feasible, coordinated procedures, resource commitments and actions designed to carry out the roadmap.

Example - South Africa:

- i. Establish central institution in South Africa - all supporting due diligence, frameworks, and training materials to be developed.
- ii. Combine and link available renewable energy databases - the amalgamation will provide updated and accurate data to assist with the due diligence.
- iii. Identify favorable countries and renewable energy enablers per country - policies that promote renewable energy.
- iv. Provide in-depth training, materials and framework - this is key in delivering many bankable projects that address obstacles.
- v. Renewable energy enablers actively seek out renewable projects - their objective is to identify the most feasible projects in the country/region.

## OPERATIONALISING SHARED VALUE STRATEGIES



1. Identification of Shared Value initiative
2. Shared Value initiative feasibility determination
3. Implementation of Shared Value initiative
4. Measuring Shared Value outcomes

In conclusion, with the above strategies, the main aim is to address the energy challenges in sub-Saharan Africa within a Shared Value framework. This way, we will produce many bankable projects, create sustainable clusters, shift power into the hands of stakeholders (scalability) and operationalize the ultimate goal of electrifying sub-Saharan Africa.

**Next Step: execution of the strategies with partners**





## Q & A SESSION:



### POINT 1: CORRUPTION

Corruption is often an obstacle when it comes to matters of policy and renewable energy in Africa - public officials putting their self-interests ahead of the people's interests and therefore getting in the way of policy and implementation of renewable energy initiatives. How can this be navigated to drive the electrification of Africa?

### POINT 2: FOREIGN AGENDAS

There are strings attached to accepting assistance from external sources, such as foreign entities promoting their projects locally and claiming the majority of the power produced in Africa for their own countries, i.e. issues of neo-colonialism. How can we minimise this influence and promote local solutions?

### RESPONSE: SIMBARASHE MHURIRO (SVAI AFRICA COUNCIL OF 8)

The key is local participation. People from the local community must be empowered to do the groundwork – speaking to the chiefs, headmen, and road district councils, securing the land and licensing, etc. A local person taking the lead will bring a better understanding of the challenges at hand and how to overcome them to the project, knowing which buttons to push, how to get critical mass, and so on. This way, when international investors become involved, their role is taking the project from pre-feasibility and moving it to bankability.

Another important consideration is financial feasibility - analyzing a project's financial model and looking at how much money comes/stays in the country and gets to the pockets of the common man. Factors like rate and/or tariff negotiation and means/currency of payment need to be critically interrogated before giving a go-ahead to these projects.

A large project is arguably not what is best for a community. Who is left carrying the financial burdens of these projects? Therefore, sometimes having the value addition of local projects is the best way. These projects, backed by the investors or local financing institutions, create more Shared Value for the community, which is also able to retain ownership of the projects.

Policies that regulate profit retention and repatriation can also go a long way in ensuring that the interests of the local people are safeguarded.

### SOURCES OF FINANCES:

1. African Development Bank under its policy of Lighting Up Africa has dedicated \$12.5 billion for the next five years to fund solar electrification projects in Africa.
2. The World Bank has also announced \$1 billion for storage projects in developing countries
3. There is also funding available from USAID.

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