

# PROJECT SUMMARY

## Project DESCRIPTION:

Biomass power plant using sawmills waste as feedstock to produce electricity for rural mini grids the provided electricity will be used by rural households, sawmills and industrial units in the area

## Main Figures:

**INSTALLED CAPACITY: 5 MW** (first phase)  
**POWER MILL AREA: 7 HECTARES**  
**TOTAL INVESTMENT: 19 million USD**  
**HOUSEHOLDS and INDUSTRIAL UNITS TO BE SERVED FROM THIS INFRASTRUCTURE: 20 000 hh**

## Achieved Milestones:

- ✓ Technical feasibility study
- ✓ Financial model verified (stress tested)
- ✓ Feedstock availability and price stability study
- ✓ Factory design, main components, civils works
- ✓ Electricity Offtake's agreements already prospected
- ✓ Project site identified (discussion for acquisition)
- ✓ Seed co-investors identified

## PROJECT STATUS - NEXT STEPS CALENDAR - ESTIMATED MILESTONES BUDGETS



COMMISSIONING Cost: 2,000,000 USD (4 months)  
Turn key status

## MAIN PROJECT VALUE CHAINS



STEP1: SAWMILLS FACTORIES



STEP2: WOOD WASTE (SLABS, DUST, EDGE CUTS, ETC)



STEP3: BIOMASS POWER PLANT

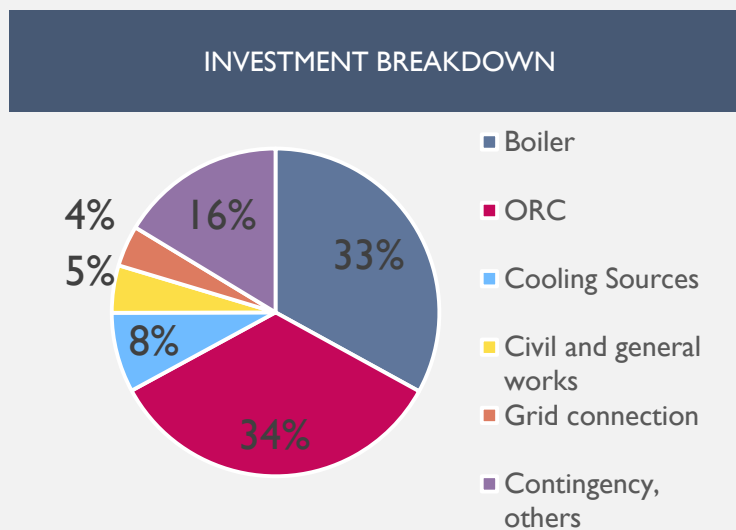


STEP4: RURAL ELECTRIFICATION

# FINANCIAL STUDY

CAPEX	
Item	Costs
Boiler	\$6 544 200
ORC	\$6 759 200
Cooling Sources	\$1 562 800
Civil and general works	\$928 200
Grid connection	\$800 400
Contingency, others	\$3 238 533
<b>Grand total</b>	<b>\$19 833 333</b>

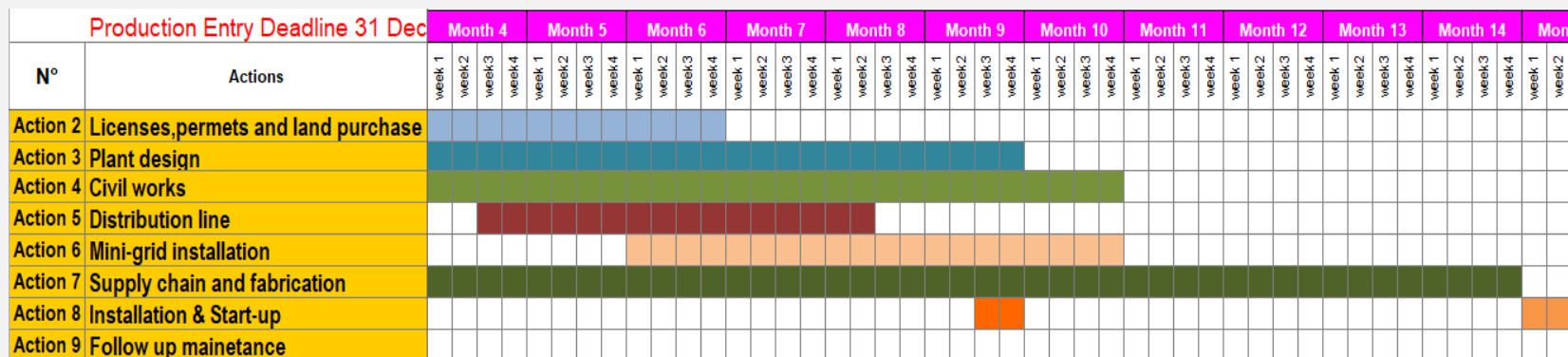
OPEX	
Item	Costs
Feed Stock Annual purchase	\$ 650 000
Transport	\$ 350 000
Operational and Maintenance	\$1 300 000
<b>Grand total</b>	<b>\$2 300 000</b>



Project Financial Results		
Parameter	Value	Unit
First year revenues	7	M\$
Project IRR	16,6	%
Investor (30%) IRR	23	%
Project payback	6	Years
Investor (30%) Payback	4	Years
Project Net Present Value	15	M\$

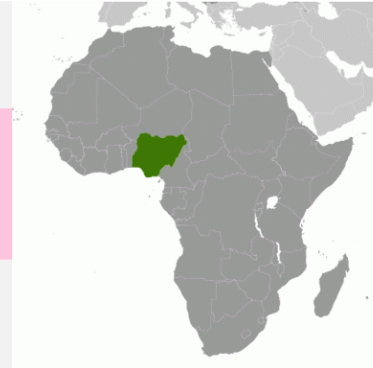
## REQUIRED INVESTMENT: 2 million USD Equity and 10 million USD Debt

Seed Funds budget	Amount in USD
Land purchase	106 500,00
TURBO: first amount to start machine production	125 000,00
Lawyer- local company formalites	7 500,00
Financial consultants	60 000,00
Electrical engineering: finalizing the full grid connection study	260 000,00
Local employees : prearing the land and finalizing licences	16 500,00
Civil Engineering company	250 000,00
Capitalising local company (machines guarantee)	500 000,00
First Turboden Payment for machine shipment	700 000,00
<b>Total</b>	<b>2 025 500,00</b>



# LOCATION: NIGERIA, SUSTAINABLE LOGGING CLUSTERS

## AKURE NORTH AND AKURE SOUTH IN ONDO STATE



**Feedstock Reserves:**  
 List of power plant locations and cluster sawmills numbers:  
**ONDO STATE (5 locations)**  
**Akure North 36 sawmills**  
**Akure South LGA: 88 sawmills**  
 OWO: 52 sawmills  
 Idanre: 26 sawmills  
 Odigbo: 44 sawmills

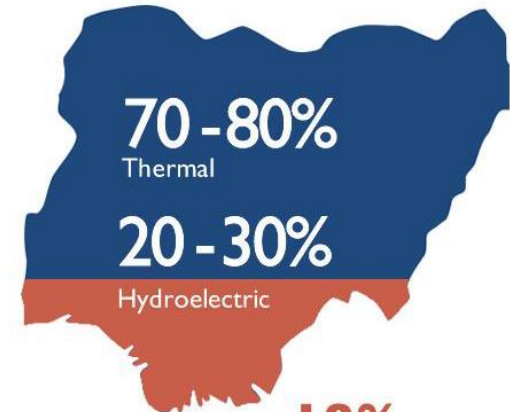
Ondo State has 17 forest reserves, besides Nigeria Government is also supporting private plantations by private investors



## ONDO STATE

# PROJECT OPPORTUNITY: NIGERIA ELECTRICITY SECTOR

Low Coverage & High Costs → good potential for small scale off grids



**40-51%**  
Access to electricity

**6,000MW**  
Current installed generation capacity

**18%**  
Rural access to electricity

**N23.32**  
Residential tariff rate

Source: US Energy Information Administration, International Energy Statistics, 2010; NERC. Multi-Year Tariff Order (MYTO) 2.1, 2015 - 2018

## Nigeria Policy off grid solution to scale (PSRP) Power Sector Recovery Programme

Largest Economy in Subsaharian Africa GDP: \$405 billion	Population: 180 million CAGR: 15% since 2000	small-scale generators (10-15 GW) 50% of population have limited access to grid	<b>\$14B USD annually on inefficient generation</b> Price: \$0.40/kwh +	<b>\$14B USD annually spent on inefficient generation</b>
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Nigeria offers the best off-grid market opportunity in Africa—there is relatively high economic activity, latent demand, and ability to pay in rural areas (85 million unserved people)



**Our Project is beating existing rural electricity tariffs**

Grid / Tariffs (\$/kwh)	Existing tariff	VIFCO selling tariff
BEDC-DisCo / households	0,10-0,11	0,1
Mini-grids (based on REA statistics)	0,3-1	0,3
Diesel generators (Sawmills)	0,21-0,5	0,2

**Scalable opportunity**



**More than 250 000 ton/year**



**Nigeria electrification rate: 45 % (2015)**



**Diesel price increasing**



**Diesel generator**



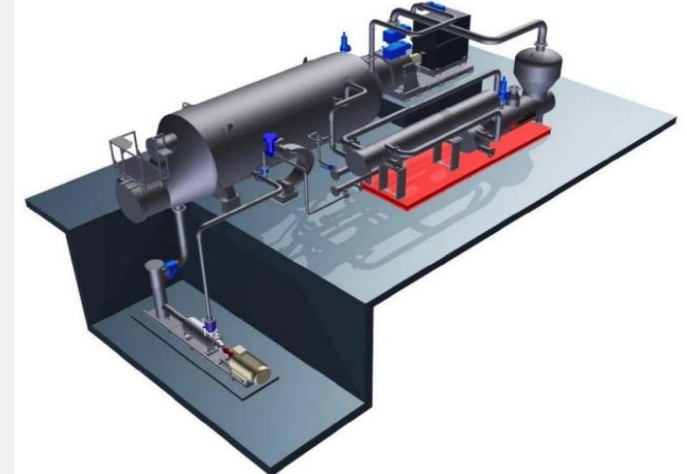
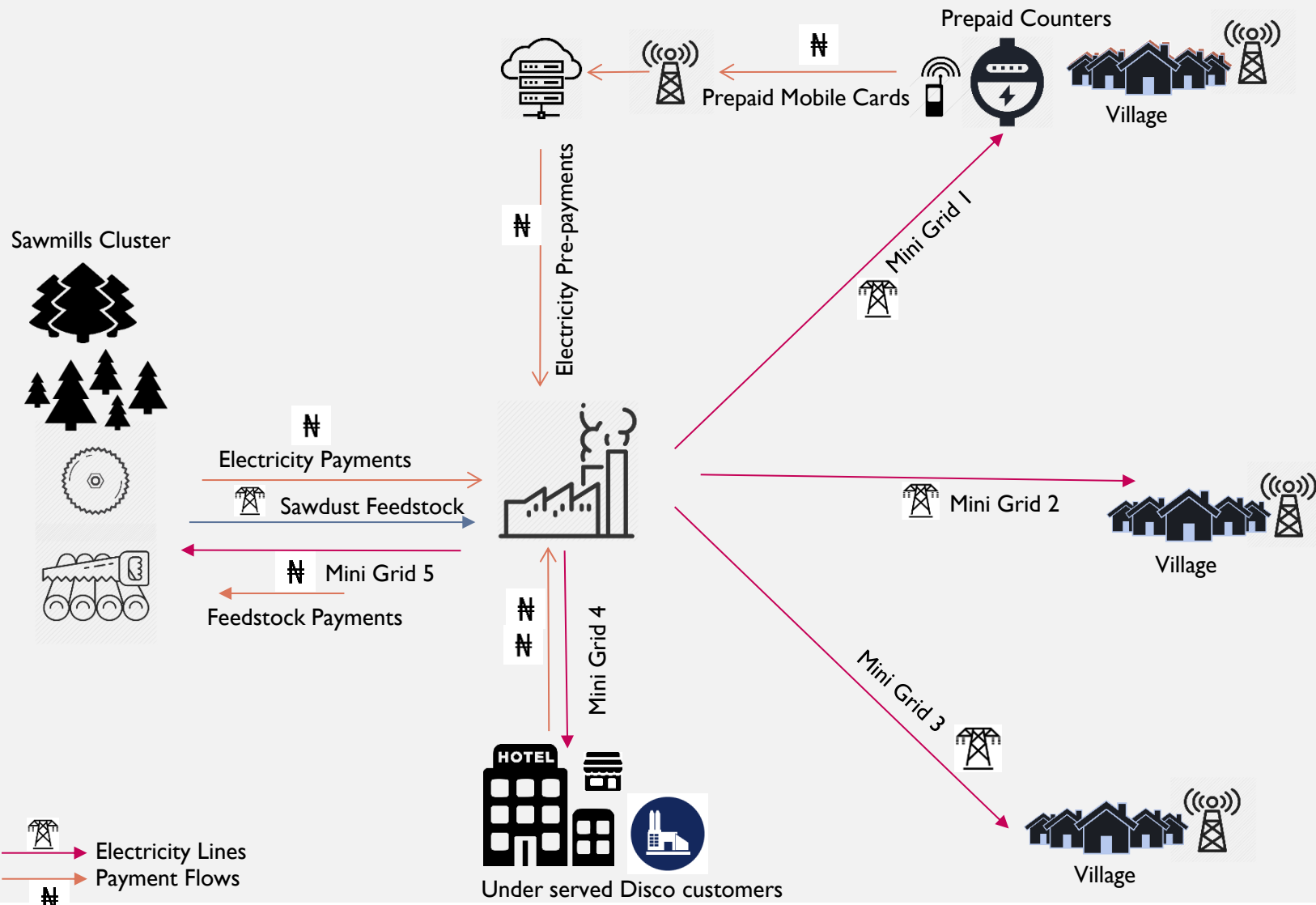
**Factories need H24 electricity supply**



**Electricity lines near sawmills**

# BUSINESS MODEL

## A NEW MODEL REINVENTING THE RURAL ELECTRICITY

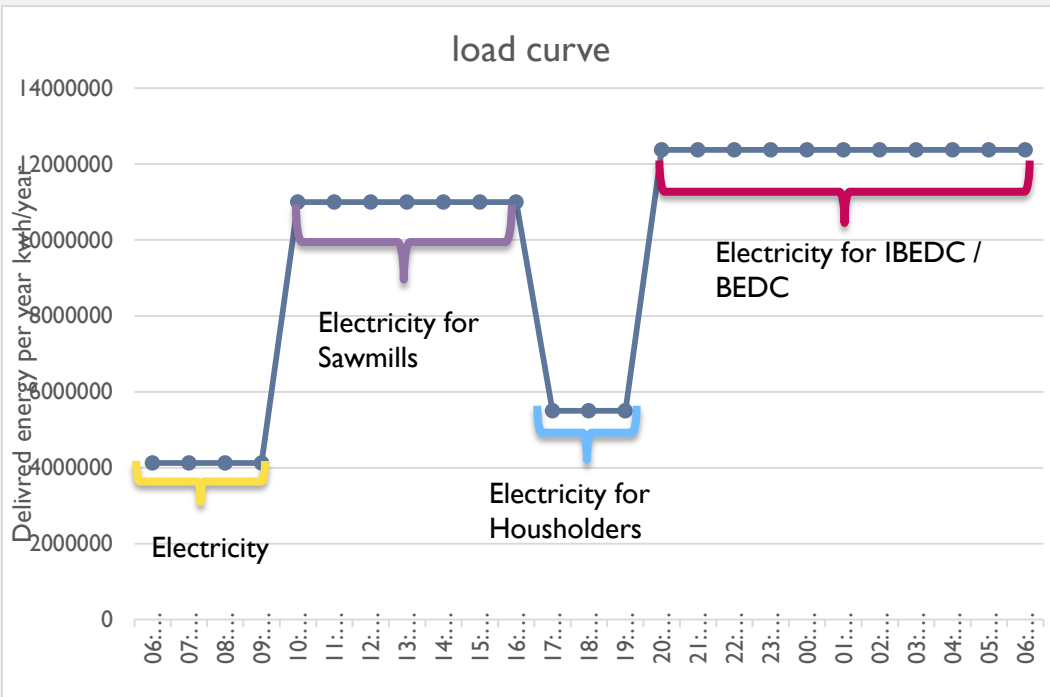


Parameter	Value	Unit
Technology supplier	Turboden Mitsubishi	
Technology type	Organic Rankine cycle	
Installed Power	5	MW
Energy output	33	GWH
Energy for mini-grids	7	GWH
Energy for sawmills	10	GWH
Energy for bedc	26	GWH
Feedstock	50 000	T/yea r

# RISK MANAGEMENT

## Risk Mitigation strategy for safe investment

### OFF TAKERS DIVERSIFICATION



### SCALING UP

**MODULAR SCALING: CAPACITY WOULD BE INCREASED BY ADDING A MODULE OF SAME SIZE FOR AKURE TO REACH 10 MW CAPACITY WITH MORE DIVERSIFIED OFFTAKERS WE COULD REACH BETTER GRID STABILITY WITH MORE EFFICIENT TIME SHARE PRODUCTION**

### MOBILE CHARGE COUNTERS

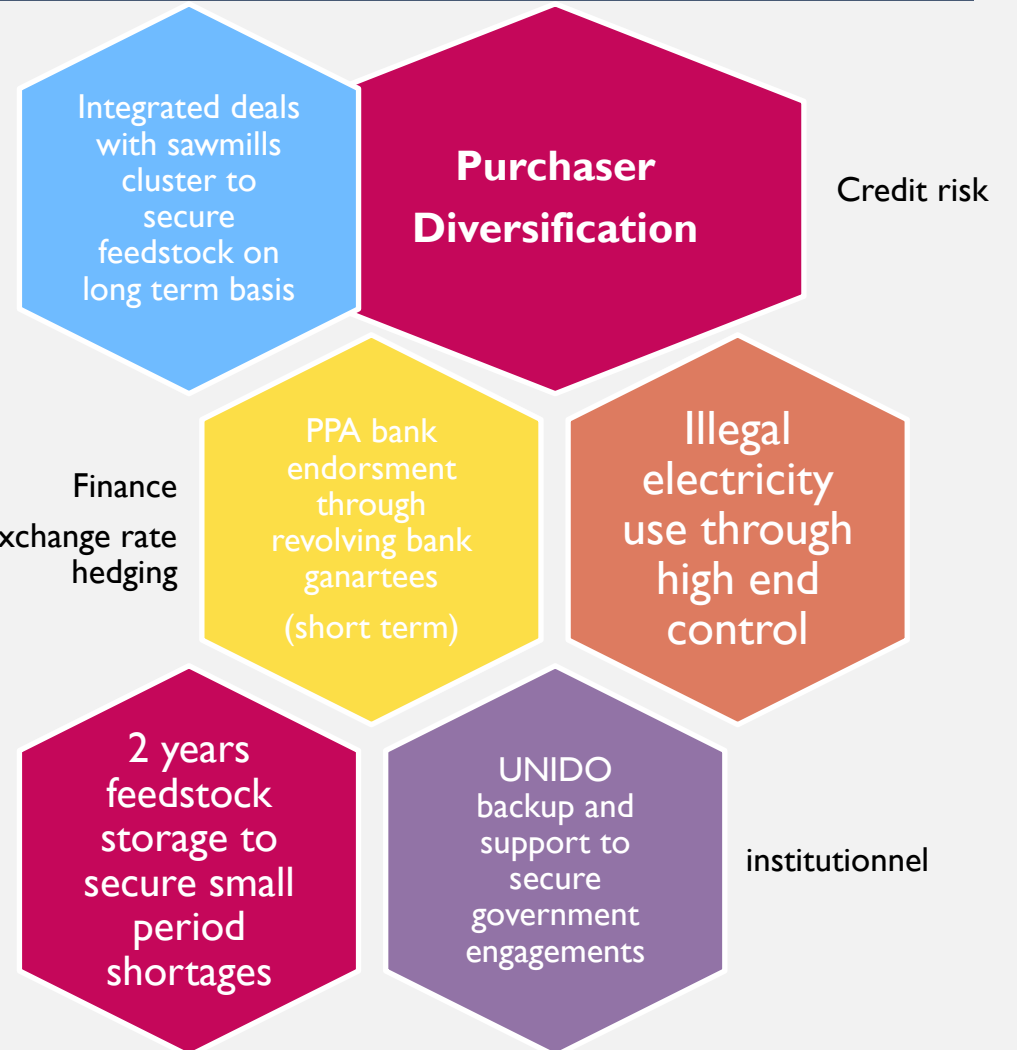


### RISK MATRIX

Feedstock stability

Finance  
NAIRA/\$ exchange rate hedging

+ biomass alternatives in case of sudden wood waste price increase



# PROJECT FOOT PRINTS

## MULTIPLE EXPECTED IMPACTS

### STRATEGIC

- **ENERGY BALANCE SECURITY**
- BETTER RURAL ELECTRICITY LINES COVERGAE
- ENERGY MIX FOR DIVERSIFICATION
- SUSTAINBALE ENERGY AND DEVELOPMENT GOALS FOR ENXT GENERATION
- LOCAL DEVELOPMENT RE ENFORCEMENT FRO BETTER POPULATION ANCRAGEWITH NATURAL FOREST AND LOCAL SECURITY

### ENVIRONMENT

- CARBON NEUTRAL
- **26,000 T/YEAR OF CO2 RESERVED**
- 50 000 T/YEAR OF WOOD WASTE RECYCLED
- 33 GWH OF GREEN POWER
- **END USING OLD DIESEL GENERATORS**
- LOCAL ECONOMY IMPORVEMENT
- COMPTETIVE ADVANTAGE FOR LOCAL ECONNOMY

### SOCIAL

- 50 DIRECT JOBS
- 200 INDIRECT JOBS
- H 24 ELECTRICITY FOR RURAL AREAS FOR MORE THAN **5,000 HOUSEHOLDS**
- Encourage Rural Women Economic Involvement for better Emancipation
- Reduce Diesel Generator Noise (quieter neighborhood)

### ECONOMIC

- COMPETITIVE ENERGY COST ON SUSTAINBALE MANNER
- CIRCULAR ECONOMY EHANCING LOCAL ECONOMIC STAKEHOLDERS
- **PRIVATE INVESTMENT FOR LOCAL INFRASTRCUTURE**