GREEN CLIMATE FUND | GPIC 2023

UN Climate Change High-Level Champions

BCG BOSTON CONSULTING GROUP

COP28 UAE

COP27 SHARM EL-SHEIKH EGYPT 2022

GFANZ

UNLOCKING CLIMATE FINANCE FLOWS TO AFRICAN PROJECTS

Project matchmaking session

FROM INVESTMENT TO IMPACTS
4–5 SEPTEMBER 2023, NAIROBI, KENYA

OPENING PANEL

Sophie Mbugua

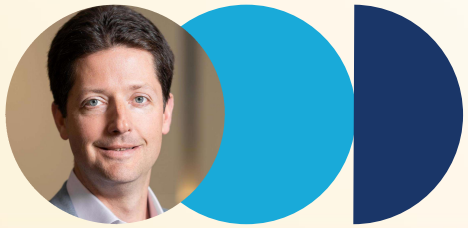
Moderator

Environmental Journalist & Media Consultant

Dr. Mahmoud Mohieldin

UN Climate Change High-Level Champion COP27

GFANZ Africa Network Advisory Board and Facilitator GCF Second Replenishment



Mills Schenck

Head Boston Consulting Group East Africa & global development lead

Managing Director & Partner

MATCHMAKING SESSION
HOW IT WORKS

10 min

Project pitches

5 min

Live feedback

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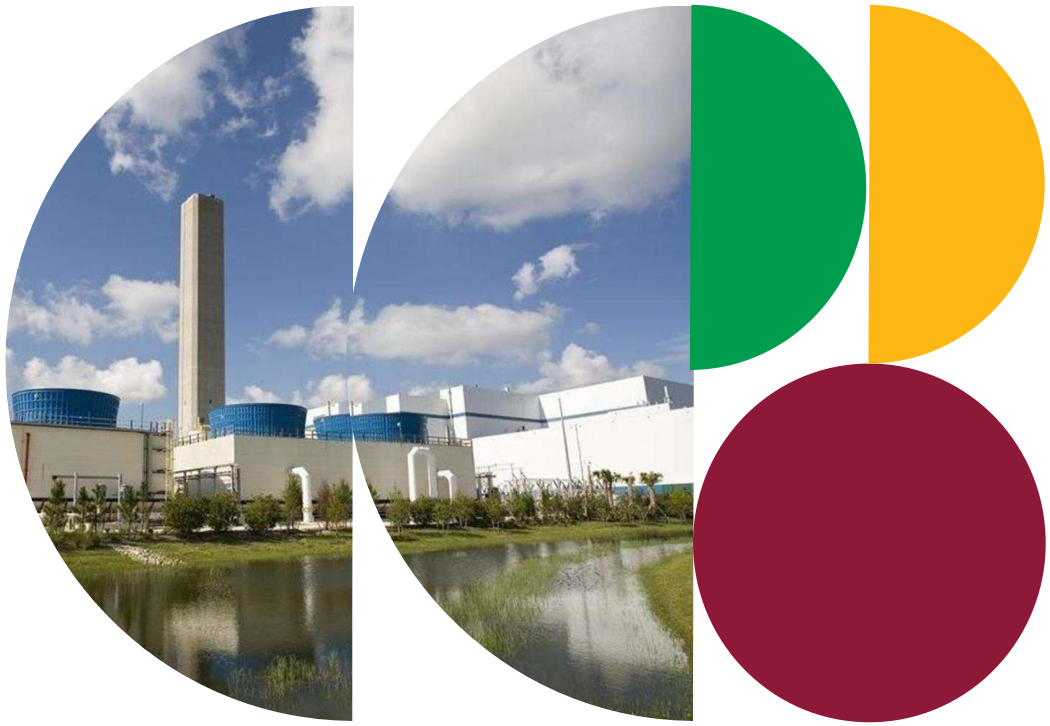
Noble Ekajeh

Managing Director

PHOENIX EDISON

NIGERIA



PHOENIX EDISON
PROJECT OVERVIEW

Phoenix Edison

PROJECT LOCATION

THE WHY

- **Large urbanized(ing) population:** 200+ million population ((est.). 53% urban dwellers with 24 cities with over 1 million population (20 million+ in Lagos).
- **Waste management challenge:** Nigeria currently generates 44 million tons of waste annually disposed in unsanitary landfills or through open burning.
- **Significant unmet & latent power demand:** Installed / available power capacity is 12,500MW / 3,600MW.
- **Emissions reduction & improved, cleaner energy:** With each ton of MSW incinerated, up to 270,000 tons of CO2 can be avoided comparing with the emissions from generators and landfills
- **Strengthen livelihoods:** More affordable, reliable electricity for marginalized communities to engage in income-generating activities, education and healthcare services.

PROJECT FEATURES

Capacity	24MW gross (20.16MW) net
Type of plant	Waste-to-Energy (Incineration)
Construction time	24 months
Inputs nature	Municipal solid waste (MSW), palm kernel chaff, saw dust
Inputs quantity	270,000 tons per year
Production	164,899MWh per year
Off-taker	Industrials + DisCo
Contract tenor	20 years – BOO
Tariff	$0.16/kWh
Documents	Term sheets with industrials + MoU with Anambra State Govt.
Technical studies	Pre-feasibility study

PHOENIX EDISON
CLIMATE RATIONALE

Methane arising from waste decomposition in the landfill has 25x adverse emissions impact as C02

- The project **reduces the input waste volume by up to 95%** and significantly mitigates the need for and pressure on existing landfills in these cities into the future

In 2016, Onitsha one of the three main cities in the state was identified as the most polluted city in the world, massively exceeding the WHO's guideline limit of small particulate matter (PM_{10}) with generator fumes and open burning of waste was a significant contributor

- The project primarily **displaces self-generation by diesel or petrol generators** as grid power is currently unreliable
- Up to **270,000 tons of CO2 annually can be avoided** from emissions from landfills and displacing generators

1. WHO 2. 594 µg/m3 of small particulate matter annually versus WHO guideline limit of 20µg/m3

PHOENIX EDISON

ALIGNMENT TO GCF CRITERIA

SUSTAINABLE DEVELOPMENT POTENTIAL

- 450 construction jobs, 78 permanent and 350 indirect jobs by '27 targeting >70% youth and >30% female staff in a male dominated power and waste industry and improving waste pickers' working conditions
- Promote knowledge transfer and expertise exchange between international & local stakeholders and empower communities to manage and sustain the facility, ensuring its long-term viability and maximizing its impact on energy and waste management

EFFICIENCY & EFFECTIVENESS

- The $0.16c/kWh tariff is competitive with the grid and cheaper than the $0.40c/kWh or more tariff equivalent for diesel or petrol generators
- The project supplies renewable energy baseload 24/7, enabling marginalized communities to replace generators and engage in income-generating activities, education and healthcare services more consistently

IMPACT POTENTIAL

- The plant displaces self-generation by diesel or petrol generators
- It also reduces the input waste volume by up to 95% and significantly mitigates the need for and pressure on existing landfills in these cities with up to 270,000 tons of CO2 annually avoided

NEEDS OF THE RECIPIENT

- Anambra State has a population of 9M residents In 2016, Onitsha one of its main cities was identified by the WHO as the most polluted city in the world
- Anambra State, like many regions in Nigeria, suffers from acute energy poverty with only 365 MW of grid power assigned to the state currently

COUNTRY OWNERSHIP

- At COP26, Nigeria committed to carbon neutrality by 2060. In April 2023, $50M has been committed to its first volunteer carbon market initiative. Nigeria also adopted the NREAP[1] with ambitious targets e.g., 16% of its electricity consumption from RE in 2030 versus 0.8% in 2012
- The Anambra State government has committed to and executed a long-term concession agreement and provided 3 hectares of land as its equity contribution to the project

PARADIGM SHIFT POTENTIAL

- Nigeria delivers 3,6000MW of grid power and generates 44 million tons of waste annually. With just one reference plant in Africa, the project can inspire similar initiatives to grow this untapped sector leading to the replication of other projects

1. National Renewable Energy Action Plans

PHOENIX EDISON
FINANCING STRUCTURE

FINANCING RAISED TO DATE

- Strong participatory interest from leading renewable energy and infrastructure funders
- Received $10 million equity LOI and debt term sheet for N10 billion (about $13 million) so far

INVESTMENT ASK

Total project estimate is $115 million. The proposed capital structure is 70:30 debt to equity ratio – $80.5M (debt) / $34.5M (equity)

- Equity gap and ask: **$24.5 million**
- Debt gap and ask: **$67.5 million**

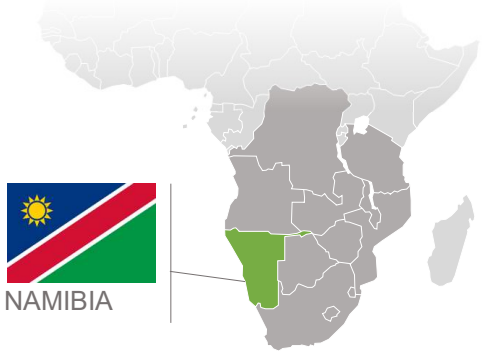
Pieter Rossouw
EMESCO
Commercial Director

Nico Knight
EMESCO
Country Manager - Namibia

SCHONAU SOLAR ENERGY

NAMIBIA

PROJECT OVERVIEW



The Problem

Carbon intensive and ageing generation infrastructure that is insufficient for the regional requirement.

Our contribution

Plant size	125 MW
Location	Karasburg, Namibia
Land size	200 Ha
Technology	Solar PV
Total project value	USD 107 m
Off take	SAPP Markets
Operational	Q4 2025

The Opportunity – THINK REGIONALLY

- Support regional NDP's to meet climate change objectives.
- Leverage & expand existing regional infrastructure.
- Utilizing Namibia's vast natural capital for the benefit of the region.
- Alleviate the energy deficit in the SADC region.
- Reduce energy costs across the region
- Job creation, local & regional
- Economic growth

Supported by:

PROJECT STATUS

Permits / Consent	Status
Environmental Clearance Certificate	Complete
Land Lease	Complete
Consent for subdivision	Complete
Generation License	Complete
Export License	Complete
SAPP Membership	Complete

Above: Eng. Stephen Dihwa (Executive Director, SAPP), Pieter Rossouw (Commercial Director, Emesco), Nico Knight (Country Manager - Namibia, Emesco), Pinehas Mutota (GM, ECB)

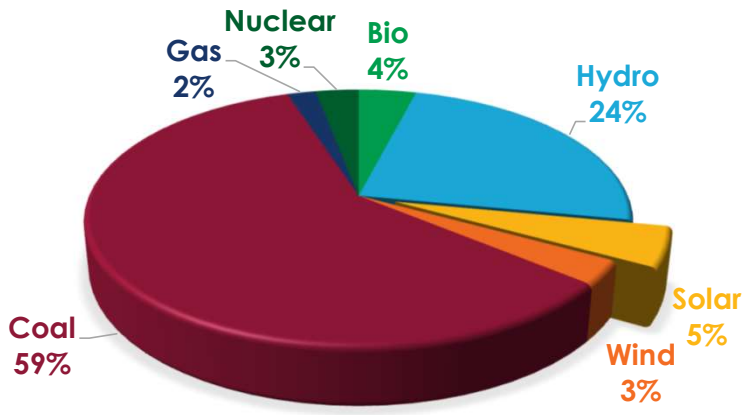
Left: Nico Knight (Country Manager - Namibia, Emesco), Pinehas Mutota (GM, ECB)

CLIMATE RATIONALE

- Limited renewable energy generation capacity within the SAPP grid.
- Grid emission factor of 0.987 tCO2/MWh
- Renewable energy generation is predominantly hydro.
- Climate variability has led to a decline in hydropower generation capacity.
- The project will result in GHG emissions reduction across the SAPP grid of:

335 429* tCO2e annually
1 525 770* tCO2e by 2030

SAPP INSTALLED GENERATION MIX IN MARCH 2021



* Based on Grid emission factor for SAPP - Clean Development Mechanism (CDM) REF: ASB0040-2018, 2018/10/07, v 01.0

ALIGNMENT TO GCF CRITERIA

SUSTAINABLE DEVELOPMENT POTENTIAL

- Environmental: GHG mitigation
- Social: Job creation & technical skills transfer
- Economic:
  - Energy security
  - Energy cost reduction
  - Foreign direct investment

IMPACT POTENTIAL

Utilising world class renewable energy resource in Namibia the SSE project will reduce carbon intensive energy generation throughout the SADC region.

COUNTRY OWNERSHIP

Namibia (Host) & SADC (Beneficiary countries) are involved through their regional energy market (SAPP) has excellent capacity to implement projects of this size and nature.

EFFICIENCY & EFFECTIVENESS

The project leverages:

- Low cost of energy from solar PV
- Second highest solar resource in the world
- World-class Namibian infrastructure
- Namibian regulatory framework

NEEDS OF THE RECIPIENT

SADC lacks foreign direct investment and is exposed to a deficit in the regional energy supply.

PARADIGM SHIFT POTENTIAL

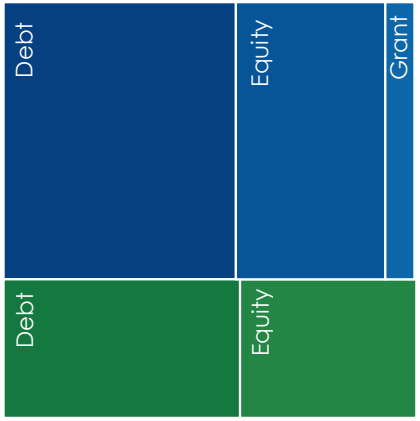
The project will prove that merchant electricity market risk can be appropriately mitigated which will in turn unlock finance for other merchant power producing projects in the region.

FINANCING STRUCTURE

OVERVIEW

Funding	
Total project value	USD 107 m
Finance strategy	Blended Finance
Financial Close	Q2 2024

Required 72%



Secured 28%

FINANCING RAISED TO DATE

	PPF	Debt	Equity
Secured	USD 0.1 m	USD 20 m	USD 10 m
Sources	Dev. Bank of Namibia	Dev. Bank of Namibia	Emesco & Private equity partner

INVESTMENT ASK

PPF	Grant	Debt	Equity
USD 2 m	USD 5 m	USD 50 m	USD 22 m

- Project Preparation Funding
- Concessional Debt
- Grant Funding
- Guarantee
- Equity

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Dr. Ainojie Alex Irune
President/CEO

Ademola Ogunbanjo
Executive VP

Akinbode Bamgboye
CFO

OANDO CLEAN ENERGY

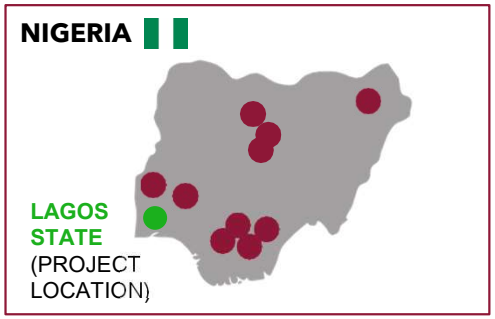
NIGERIA

PROJECT OVERVIEW
– *Project Lightspeed*

OCEL has entered into an agreement with the Lagos Metropolitan Area Transport Authority (LAMATA) for the deployment of electric buses and charging stations, service equipment ("EV Infrastructure") towards the attainment of a sustainable road transport system in Lagos State.

Oando Clean Energy

PROJECT LOCATION



THE WHY

Lagos is a rapidly growing megacity with an inadequate public transportation system

2050 target to achieve carbon neutrality	**~21 million** current population
#1 ranking of fastest growing cities globally	**3rd Largest** agglomeration in the world by 2025
<900 number of mass transit buses in operation in Lagos today serving ~700k commuters daily	**~5,500** number of additional mass transit buses required to meet current demand

PROJECT FEATURES

Energy
OCEL will aim to utilize renewable energy sources to power the charging stations

Charging Infrastructure
OCEL will deploy EV charging stations to sufficiently meet the requirements for an operationally efficient and seamless EV Mass transit system

Electric Buses
OCEL will deploy 2,000 electric buses in Lagos by 2030

PHASED APPROACH

1. Proof of Concept (POC) to ascertain the viability of the sustainable transport strategy
2. Pilot launch additional 50 buses to be deployed along 5 major bus routes
3. Roll-out 2,000 electric buses and support infrastructure in Lagos by 2030

- Two Electric buses deployed along two mass transit routes for proof of concept
- This PoC will drive the imperative adoption of electric vehicles across Nigeria and indeed the African continent
- The PoC will help evaluate four key elements; commercial viability, operations excellence, technology and environmental acceptance
- Plan to deploy 40,000 electric vehicles and supporting charging infrastructure across Nigeria by 2035

Sources: Agence Francais De Development; In-house Estimates BRT: Bus Rapid Transit

CLIMATE RATIONALE

Oando Clean Energy

Environmental Impact

- 1.1 million people died in 2019 due to air contamination in Africa according to a study funded by the UN Environment Programme
- A diesel bus emits 295 Kg (0.2 Tons) of CO_2 per day. Our target is to have deployed 2,000 buses across Lagos State by 2030 – eliminating 185,500 Tons of potential ICE emitted CO_2 per annum

Other impacts include

- Create employment opportunities
- Enhance the transport system's resilience to sudden macro-economic constraints
- Expand access to mobility

How it feeds into the SDGs

7 AFFORDABLE AND CLEAN ENERGY Ensure access to affordable, reliable, sustainable and modern energy for all	✓ 7.1 Universal access to modern energy ✓ 7.2 Increase global percentage of renewable energy	• Use of solar as the primary tool in powering EV infra, E-bus terminals and depots
11 SUSTAINABLE CITIES AND COMMUNITIES Make cities and human settlements inclusive, safe, resilient and sustainable	✓ 11.2 Affordable and sustainable transport systems ✓ 11.5 Reduce the adverse effects of natural disasters ✓ 11.6 Reduce the environmental impacts of cities	• Operational buses (900) in Lagos today emit 243,000kg* in carbon emissions per day • Improve transport systems across key cities through the transitioning of ICE buses to electric buses, realizing savings of 32% in carbon emissions • Improve air quality and reduce noise pollution
13 CLIMATE ACTION Take urgent action to combat climate change and its impact	✓ 13.1 Strengthen resilience and adaptive capacity to climate related disasters	• Reduce illness and premature deaths • Reduce economic losses as a result of lost • time due to climate disasters

https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00201-1/fulltext

ALIGNMENT TO GCF CRITERIA

Oando Clean Energy

SUSTAINABLE DEVELOPMENT POTENTIAL

- Employment of >3,000 drivers and 2,000 additional workers for bus maintenance, depot management, etc. with a targeted female participation of 25%, towards improving women's financial inclusion and economic empowerment
- Enhanced urban mobility leads to improved access to education, healthcare, and social inclusion positively affecting quality of life
- Reduced air pollution through electric buses contributes to better air quality, leading to improved health and well-being for communities

IMPACT POTENTIAL

- The project is estimated to result in a reduction of 3.2 million tons of CO2 equivalent emissions per year by 2035
- The local assembly component generates job opportunities and transfers manufacturing expertise, enhancing sustainable economic growth

COUNTRY OWNERSHIP

- Aligns with Nigeria's 2060 target to achieve carbon neutrality
- Aligns with the second objective on the list of five objectives of the federal government's energy transition plan
- Collaboration with national designated authorities such as LAMATA and other relevant stakeholders ensured project development was consultative and inclusive

EFFICIENCY & EFFECTIVENESS

- The project is expected to generate an NPV of US$2.17bn, and IRR of 18.7%, reflecting the project's economic viability

NEEDS OF THE RECIPIENT

- By setting up a local assembly plant, the project addresses the recipient's need to conserve foreign exchange reserves by reducing dependency on imported vehicles and components
- Meets the need for sustainable urban development by providing efficient and eco-friendly public transportation, which is essential for managing urbanization challenges
- Contributes to the need for climate resilience by introducing a reliable and sustainable mode of transportation that is less susceptible to oil price fluctuations and supply chain disruptions

PARADIGM SHIFT POTENTIAL

- The creation of a sustainable electric mobility industry, catalyzing broader economic and environmental impacts beyond a one-off investment.
- Successful implementation could inspire other regions to adopt similar sustainable transport solutions
- Plans to enable scaling up, including export possibilities, to amplify its impact and drive sustainable change

FINANCING STRUCTURE

Oando Clean Energy

FINANCING RAISED TO DATE

over

USD$3M

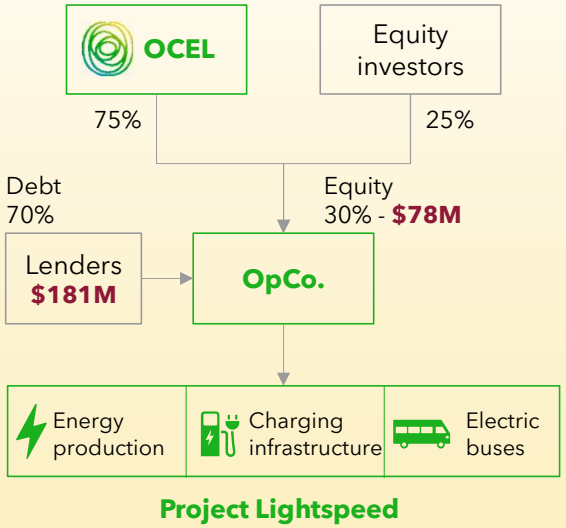
in equity commitment till date*

*$3M in equity is unaudited

INVESTMENT ASK

OCEL is seeking a total capital raise of **$259 million**

Transaction structure



Use of proceeds

Project cost	Total ($M)
Pilot phase	31.5
Roll-out phase	227.5
Total	**259**

Funding phases

- OCEL will set up a new company ("OpCo") to operate the business
- OCEL will make up to [25%] equity available in the OpCo to Equity investors in exchange for an agreed equity capital

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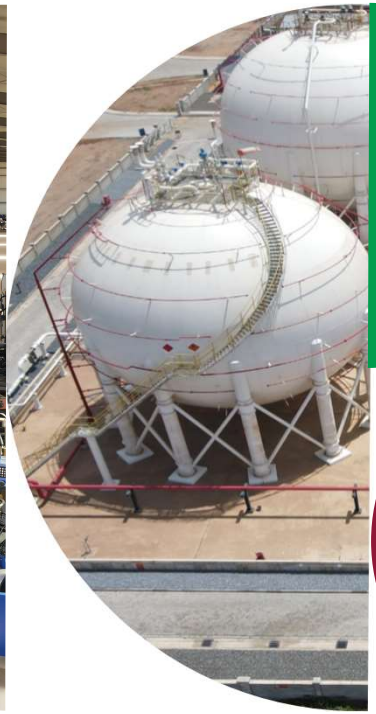
Emmanuel Egyei-Mensah

CEO, Arch Holdings Limited Ghana

ARCH HOLDINGS

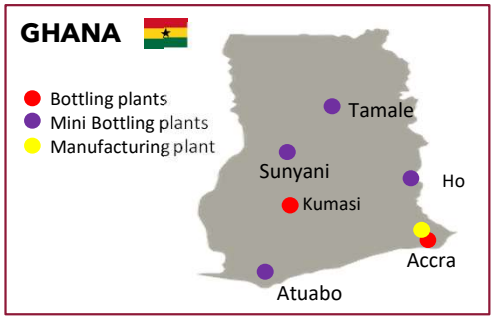
GHANA



PROJECT OVERVIEW - *Saving the Environment, Saving Lives and Reducing Poverty (One LPG Cylinder at a Time)*

ARCH HOLDINGS

PROJECT LOCATION



ARCH HOLDINGS AT A GLANCE

- Ever-growing businesses and the top player in the LPG market in Ghana
- Unique vertically integrated operating model within the downstream petroleum sector
- Efficient Management team with over 200 years of combined work experience
- Good Historical financial performance with US$ 175.7M and US$ 334M in revenues in 2021 and 2022 respectively

WHY LPG

- LPG is a comparatively cleaner source of fuel with a carbon footprint 5 times less than any wood fuel
- Conversion to LPG for cooking would help preserve forest reserves and, save lives lost to Household Air Pollution (HAP) especially among women and children
- In the tropical part of Ghana, it will take over 100 years for wood burning to reach carbon neutrality with LPG post combustion
- LPG is easily transportable & scalable and can generate massive environmental benefits

CLIMATE RATIONALE

ARCH HOLDINGS

IMPACT – KEY HIGHLIGHTS 2023 - 2030

- Save over 4 million metric tonnes of CO_2e on average annually by 2030
- 60,000MT savings in Black carbon emissions which is responsible for about 20% of Global Warming by 2030
- Over 3,000,000 hectares of forest land would also be preserved by 2030
- Eliminating cutting of trees for cooking will help stop the deforestation and desertification of the country

Parameter	Value
Total Carbon Savings over the period (MT)	39,879,617
Black Carbon emissions saved over the period (MT)	60,000
Annual Premature death prevented (no. of adults)	20,979
Annual Premature death prevented (no. of children)	25,641
Incremental societal income from time saved and health services costs saved over the period (in USD' millions)	200
Forest Saved over the period (in hectares)	3,181,166

ALIGNMENT TO GCF CRITERIA

SUSTAINABLE DEVELOPMENT POTENTIAL

- Estimate 7,500 jobs created from distribution network, bottling plant, logistic chain, security, cateres, etc. (SDG 8)
- Contribute to good health, well-being and climate action (SDG 3, 7 & 13) by promoting clean fuel and preventing loss of life
- Promote Industry, Innovation and Infrastructure (SDG 9) in Ghana

IMPACT POTENTIAL

- LPG is clean burning fuel and produces no black carbon with a 5 times lower carbon footprint than wood fuels
- An average of 4M t of CO2e reduced annually by 2030
- About 3,000,000 hectares of forest land would be preserved annually by 2030

COUNTRY OWNERSHIP

- The total number of households in Ghana is 8.4 million (30.8 million people) which is the TAM[1]
- Project will help transition the current 25% users of LPG, amounting to 2.1m households (~7.7M people) to the new model, an incremental 2.1M households by 2030

EFFICIENCY & EFFECTIVENESS

- Per our financing needs, this programme requires more than one lender
- All lenders are required to come under a Common Terms Agreement (CTA) to share security pari passu
- Also, having a long term loan with a lower interest rate is greatly desired

NEEDS OF THE RECIPIENT

- According to the GLPGP Clean Cooking Ghana LPG Investment and Implementation (2019) document, Ghana's capital investment requirement for the CRM model is about €334.9 million
- For the CRM model to be successful, Ghana needs a cylinder pool of about 14 million cylinders (14kg equivalent)

PARADIGM SHIFT POTENTIAL

- The programme is in line with the country's objective is to increase LPG use from 25% of the households to 50% by 2030
- Domestic LPG usage would deepen as the LPG is made available nationwide over the years

1. Total addressable market

FINANCING STRUCTURE

FINANCING RAISED TO DATE

PHASE 1: SUPPLY INFRASTRUCTURE

USD 138 million invested in various critical LPG infrastructure.

PHASE 2: DISTRIBUTION INFRASTRUCTURE

Equity Injected	USD 12 million – Bottling plant USD 2.1 million – LPG Cylinders
Potential Lenders	Spark+ Africa Fund SCSP & AfricaGoGreen Fund For Renewable Energy & Energy Efficiency
Lender Commitment	USD 18.7 million
Status	First bottling plant located in Tema, Ghana is almost complete and would start operation in October 2023 The trial order of 123,000 LPG cylinders has been made

INVESTMENT ASK

PHASE 2: DISTRIBUTION INFRASTRUCTURE (2023-2024 requirements)

Project Description	Investment Cost ($M)	Debt ($M)	Equity ($M)
Construction of 2 major LPG Cylinder bottling facilities	34	23.8	10.2
Construction of 4 satellite LPG Cylinder bottling facilities	16	11.2	4.8
Acquisition of over 2 million LPG cylinders within 2 years	55	55	
Establishment of distribution networks	15	15	
The construction of a composite cylinder manufacturing plant	25	17.5	7.5
Total	**145**	**122.5**	**22.5**

CLOSING PANEL

Dr. Timothy Afful-Koomson

Moderator

Regional Director
GFANZ Africa

Osaruyi Orobosa-Ogbeide

Vice President, Project Development & Investments
Africa Finance Corporation (AFC)

Dr. Daniel Schroth

Director Renewable Energy & Energy Efficiency Department
AfDB

Tariye Gbadegesin

CEO
ARM Harith Infrastructure Fund Managers

Judith Odhiambo

Corporate and Regulatory Affairs
Kenya Commercial Bank Group (KCB)

Demba Diallo

Managing Director, Head of Project Development
Africa 50

Soji Omisore

Deputy Director - Private Sector Facility GCF

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THANK YOU