

# Local Stakeholder Consultation for Installation of High Efficiency Firewood Cookstoves

VERRA/Voluntary Carbon Standard (VCS)



**C**QuestCapital

**ANGOLA**



# Purpose of the Meeting

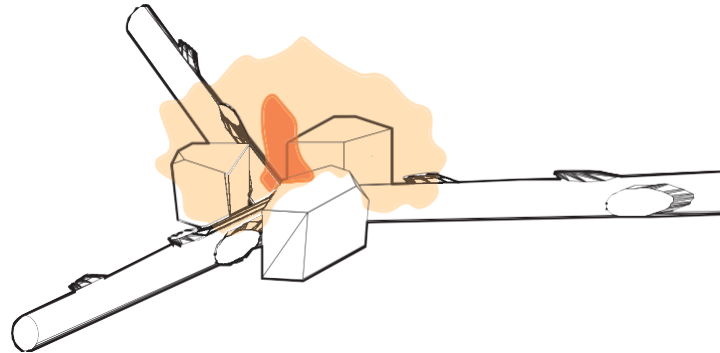
- To explain the background and purpose of our improved cook stove project in Angola
- To seek feedback from participants on project design and implementation
- To address questions from participants about the proposed project and its implementation



# The Baseline



- 34% of Angolas live in rural areas and 76% of them rely on firewood for cooking.
- These households cook primarily on smoky inefficient three-stove fires using large diameter branches and wood logs cut unsustainably from trees on farmland and surrounding forests.
- Open fires achieve only partial combustion of woody fuel, releasing toxic particles (PM2.5) reaching 400 ug/m, 20 times WHO air pollution standards.
- Consistently breathing in wood smoke can cause diseases such as stroke, ischemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer.



# Geographic Scope

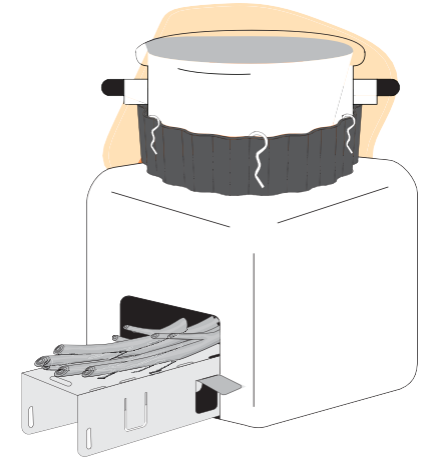
Improved cookstoves will be disseminated across Angola with a focus on rural communities that use traditional, open-fires.





# The Project Stove: TLC-CQC Rocket

- TLC-CQC Rocket Stove is an improved cookstove made of locally produced bricks and mortar and high quality metal parts.
- CQC and its local field partners in Nigeria, Malawi and Zambia have installed 724,600+ TLC-CQC Rocket Stoves in rural households replacing inefficient three-stone fires.
- TLC-CQC Rocket Stove has a thermal efficiency of **34.5%**.
- CQC has commissioned extensive Stress Testing by Colorado State University, USA, to select materials with a 7 to 10 year lifespan.



## Results of Testing the TLC 16 Brick Rocket Stove October 2013

The TLC 16 Brick Rocket Stove was constructed by Aprovecho staff at the Aprovecho laboratory in October of 2013. Aprovecho conducted standard laboratory testing (ASTM 4.2.12) to determine performance metrics related to the stove's fuel use. The stove was configured with a standard pot support and a corrugated duct.

A pot specific to the project was used for the test. It was made of thin gauge aluminum and had a flat bottom. The pot dimensions were 27 cm in diameter, and 12 cm in height. The pot was filled with 5 L of water. The duct that was used for the first two series had a gap of 12 mm (measured at the deepest point) and a length of 7 cm.

The stove was fed with pieces of Douglas Fir cut to the dimensions of 2 x 1 x 40-60 cm. The fuel had a moisture content of 10% (wet basis). During the Cold pot/Hot test Phase the fire was maintained with five sticks. The fire was lit with 50 g of kerosene after it was determined that 50 g was not sufficient. Although a target fuel use of 20 grams was set to match past research it was not maintained during the test series because the fuel rate was already difficult to control at the fuel used. The fuel rate during the test series was about 17 grams.

The pot and top of the stove were brushed before the cold start and at the end of the test to remove the soot buildup. The soot buildup caused a slight fuel amount variation between the test series.



Figure 1: Standard laboratory test setup and corrugated duct.



# The Project Stove: TLC-CQC Rocket

## The Parts and Assembly

CQC has upgraded the metal parts, now made of higher grade metals to last a minimum of 7 years. (Version 8.0)



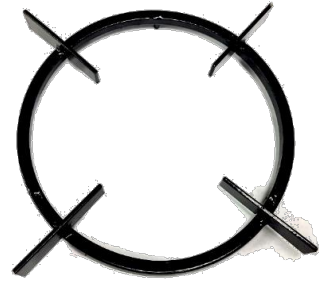
**Fuel Shelf/Brick Mould**

0.6 mm SS 304, ends are 1mm galv. iron



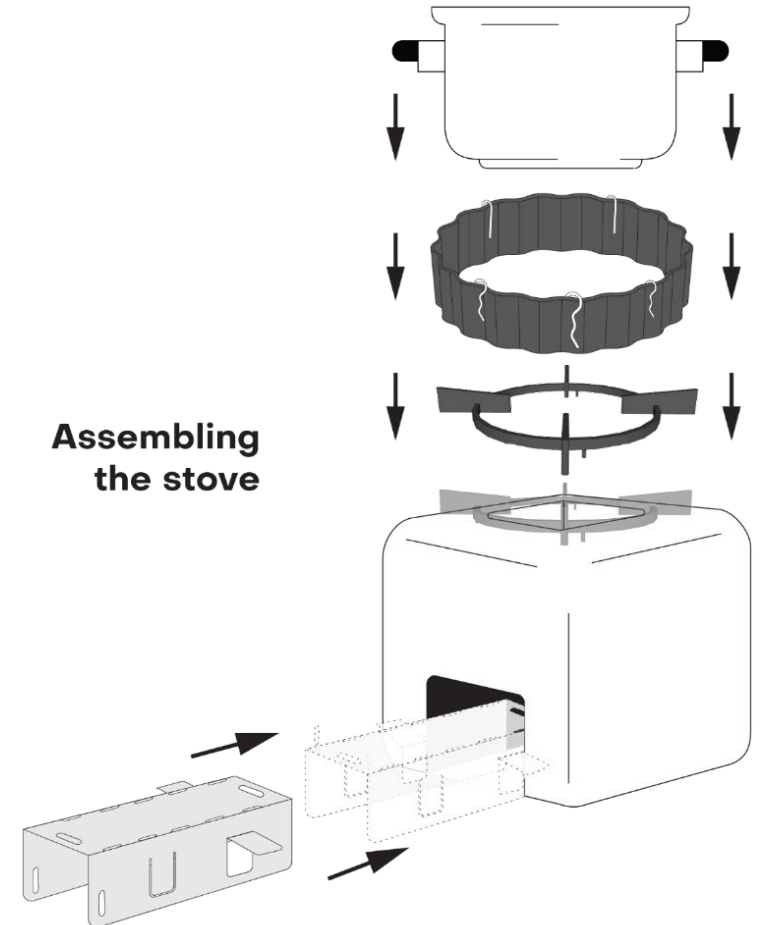
**Pot Skirt**

0.6 mm corrugated galvanized iron with clip



**Stove Top**

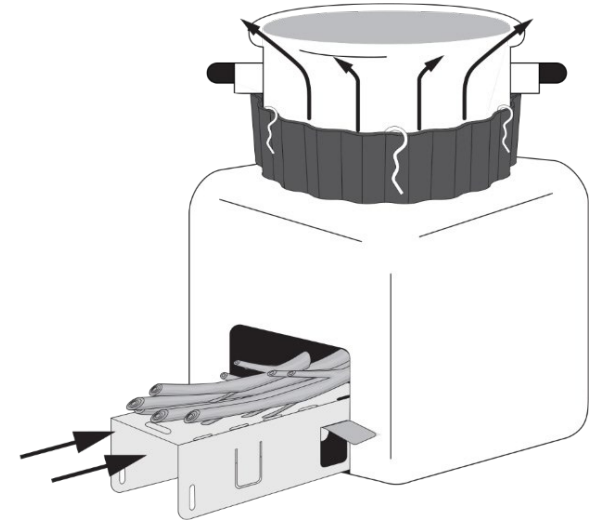
7\*7 mm cold rolled steel



# The Project Stove: TLC-CQC Rocket

## How it works?

- The well-cured 5 inch thick bricks that line the combustion chamber are more durable than metal lined stoves and hold up well with proper maintenance of the outside mortar.
- The well-cured brick walls become excellent heat sinks and a source of radiative heat to keep combustion chamber temperatures  $> 600\text{ C}$  which enables more complete combustion, minimal smoke and a longer simmering duration.
- The stainless-steel stick shelf allows air to flow underneath the wood sticks into the combustion chamber resulting in cleaner more efficient combustion.
- The adjustable corrugated steel pot skirt improves the transfer of heat from the fire into the pot, increasing overall energy efficiency of the stove.



# Benefits for People & their Prosperity

- The TLC-CQC stove and better-ventilated kitchen lowers the incidence of respiratory and heart disease, premature and underweight birth, blindness and reduces the risk of burns and indoor air pollution.
- Switching to twigs and crop residues eliminates the burden of gathering firewood over long distances, reducing the risk of muscle and spinal damage, and reducing risk of physical abuse. Women can regain ~2 hours per day that can be used for other productive activities and needed rest.
- The TLC-CQC stove enables cooking to be fueled with small-diameter branches, twigs and crop stalks and corn cobs that are fast growing, readily available and 100% renewable. Stacking fuel behind the stoves, against walls that reach temperatures around 75 degrees C, help to dry them further and produce near smokeless combustion, decreasing burdens of disease.



Reduction of health risks to women and girls  
-including risk of abuse while collecting firewood.



Money saved and increased access to stable employment through project activities.



Proven time savings in cooking related activities.



Reduction in labor required for collecting fire wood for women and girls.



Ensure reliable and efficient energy increasing household food safety and nutrition intake.



Reduced exposure to smoke inhalation.



# Benefits for the Planet

- Reduced demand for large diameter non-renewable firewood from live trees due to only needing finger-sized woody biomass, i.e., twigs and crop residues, for cooking on the CQC-TLC.
- Avoided deforestation of the forested area due to wood fuel savings made possible by the CQC-TLC.
- Generate increased knowledge and interest in avoided deforestation through education of sustainable forest management and collection of small-diameter woody biomass, twigs, and crop bi-product (corn husks, etc.).



Fuel switching to sustainable crop residues and small diameter wood.



Decrease deforestation through minimal impact on natural resources.



Climate change mitigation from avoided greenhouse gas emissions.

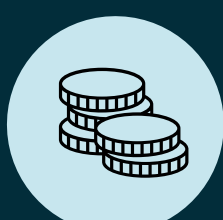
# Threats to the Project & CQCs Identified Solutions

## Human-Induced Threats

- Stove malfunctioning or breaking  
*Solution: conduct routine spot audits up to 2 times per year to identify any stove issues and correct them*
- Carbon Finance does not Impact Rate of Stove Use  
*Solution: community training and sensitization focuses on the co-benefits outlined in the prior two slides as reasons for adoption.*
- Behavior Change Failure Impacts Levels of Adoption Rates  
*Solution: include formal and informal ways positively shape behavior and non-adopts are engaged to understand the barriers to success.*

## Nature-Induced Threats

- Climate-induced displacement/migration causes people to move  
*Solution: the metal parts can be removed from the stove, with the stick shelf a mould to make new bricks in a new location*
- Continued deforestation making firewood hard to find  
*Solution: with modern fuels or electricity rare in much of SSA, stoves also run off crop biproduct and governments should invest in regenerative forestry*



# The Benefits and Sustainable Development

C-Quest Capital has identified nine Sustainable Development Goals (seen on the next slide) that our projects work towards achieving progress in, many may overlap with work you do.

Additional secondary projects, which may be added onto the core project, may result in more SDGs being claimed for assets, labels or claims.

Our projects work towards sustained benefit and improvements for people, their prosperity, and the planet.

CQC projects evolve to meet the needs of the community and seeks to enhance their benefit wherever possible.

*What benefits and costs do you see between your work and this project? Please provide feedback as a valued stakeholder.*

**SUSTAINABLE  
DEVELOPMENT GOALS**

# Benefits, Impacts, and the Sustainable Development Goals

## **SDG 1: No Poverty**

*Improved cookstoves save time (that can be devoted to income generating tasks) and money & employ individuals at the village-level to accomplish project outcomes*

## **SDG 2: Zero Hunger**

*Contribute to improved nutrition status of the households, with direct reliable access to efficient energy source increasing food safety (properly cooked) and nutrition retention.*

## **SDG 3: Good Health and Well-being**

*Reduce fine particulate matter during cooking to improve health and reduce burdens of disease*

## **SDG 4: Quality Education**

*Contribute to community & individual awareness of climate change & sustainable development*

## **SDG 5: Gender Equality**

*Reduce drudgery for women and children, by reducing time spent collecting firewood and cooking*

## **SDG 7: Affordable and Clean Energy**

*Access to clean cooking technologies*

## **SDG 8: Decent Work and Economic Growth**

*Employ country national staff, with focus on women*

## **SDG 13: Climate Action**

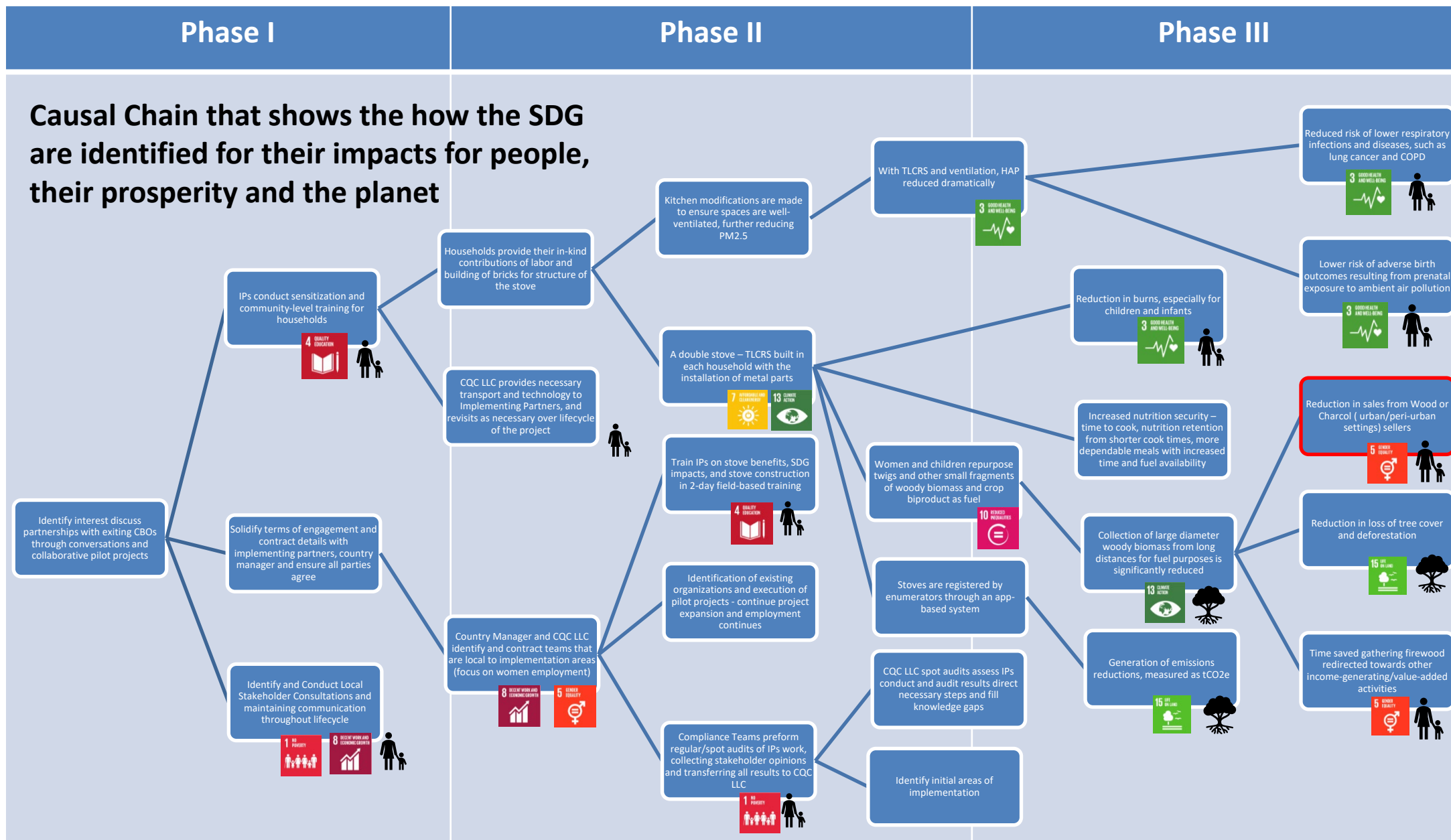
*Emission reduction per stove over 10-year project lifecycle*

## **SDG 15: Life on Land**

*Reduce deforestation from land surrounding project areas*







## KEY

**SDG Labels**

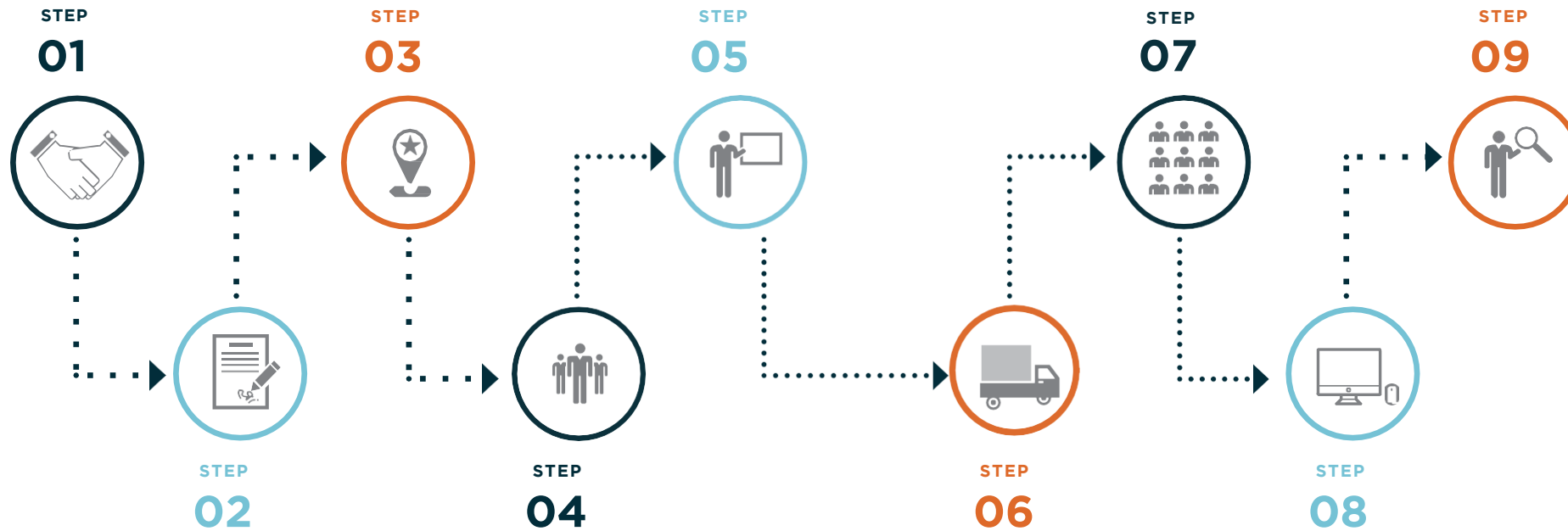
**Planet**

**People/ Prosperity**

**Negative Impact**

**Positive Impact**

# Project Implementation



**STEP 01** Finding Partners  
Partnership is formed through conversation and exploration of collaboration.

**STEP 03** Location  
Determine location of implementation.

**STEP 05** Trainer of Trainers  
Training of trainers.

**STEP 07** Implementation  
Implementation and construction of cookstoves.

**STEP 09** Verification  
Verification and issuance of Carbon Credits with SDG labels.

**STEP 02** Terms of Agreement  
Terms of agreement and contract signed by all parties.

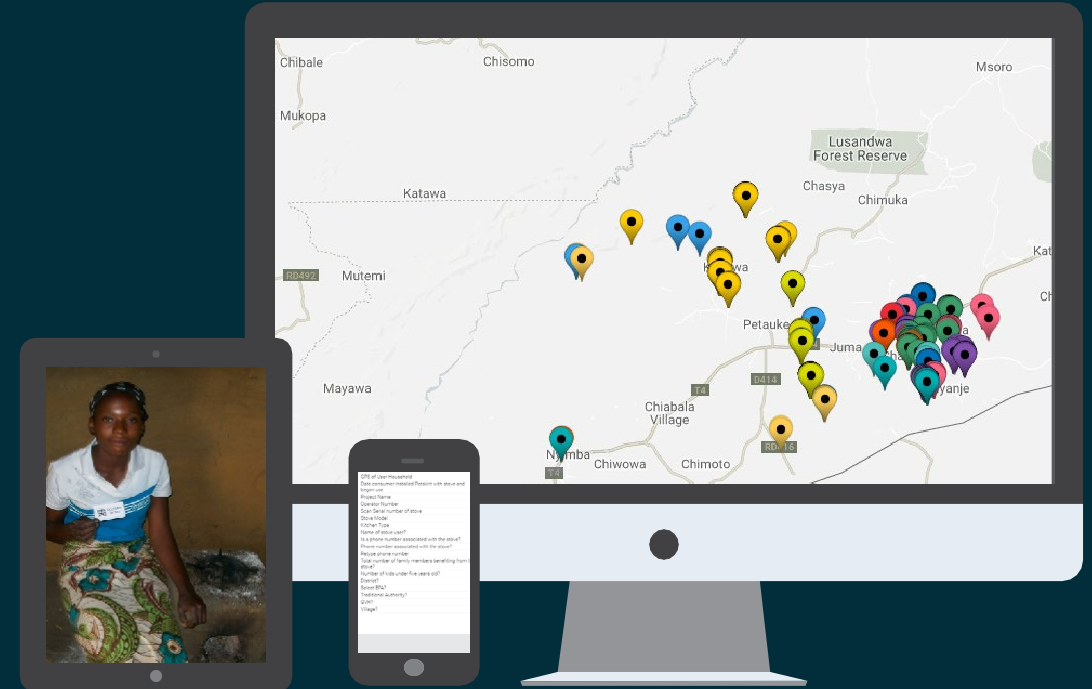
**STEP 04** Sensitization  
CQC and partner to follow cultural customs and navigate traditional authorities.

**STEP 06** Parts Delivery  
Stove parts are delivered to partner organization for implementation.

**STEP 08** Registration  
Constructed and in-use stove registration and third-party review of collected data.

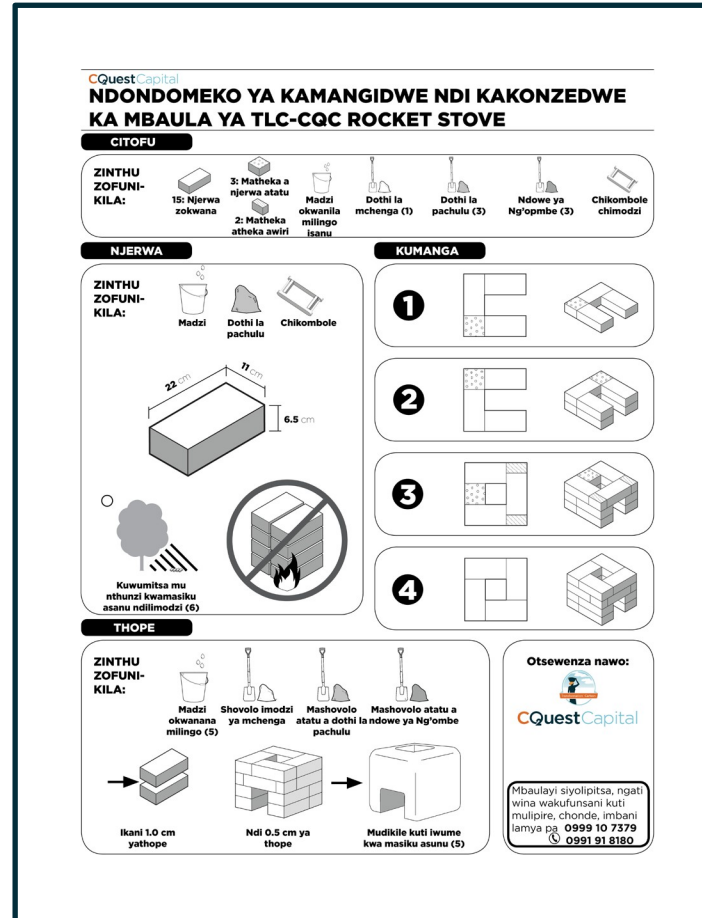
# Project Implementation

- Women and/or community artisans make bricks and build/rebuild their own stoves after training from CQC and partners using brick molds provided and as part of the metal stove kit.
- The registration of each stove includes assigning a unique serial number and collecting GPS coordinates, photographs and date of installation. The household also receives a registration card with the corresponding serial number.

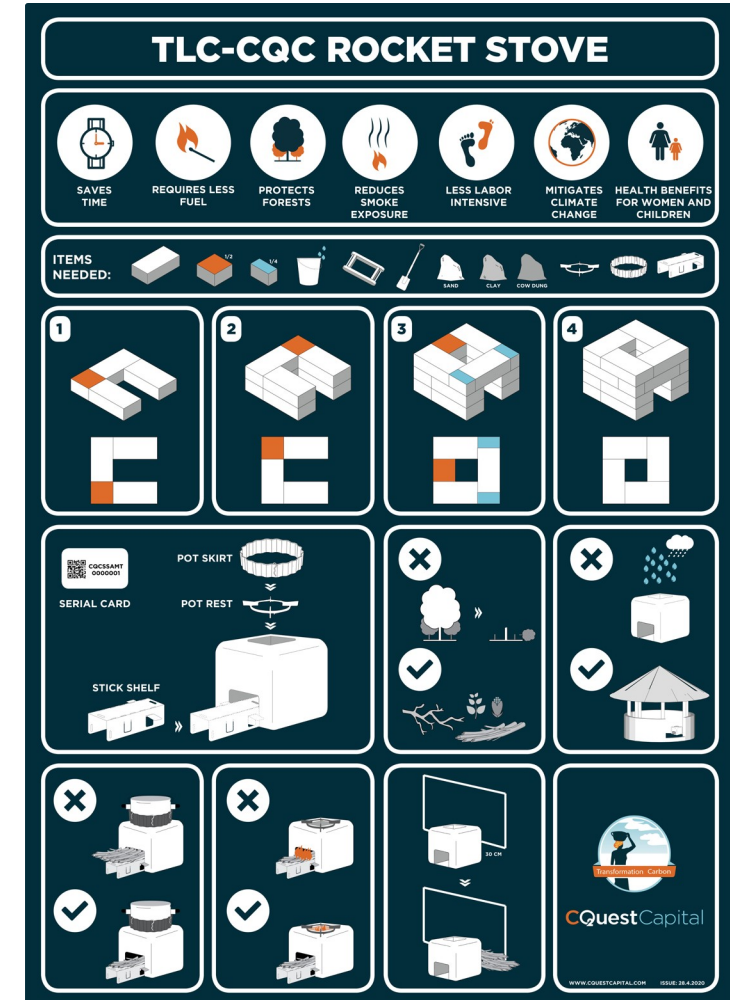


# Project Implementation

- Each household is provided a double-side A4 flyer in the local language from CQC's local partners on how to construct and maintain a TLC-CQC Rocket Stove.
- In addition, several large User Guides and Maintenance Guide Posters are placed throughout each village in the local language.
- Flyers include contact information for grievance and feedback to capture perspectives from beneficiaries in addition to visits several times a year.



Household Flyer



Poster

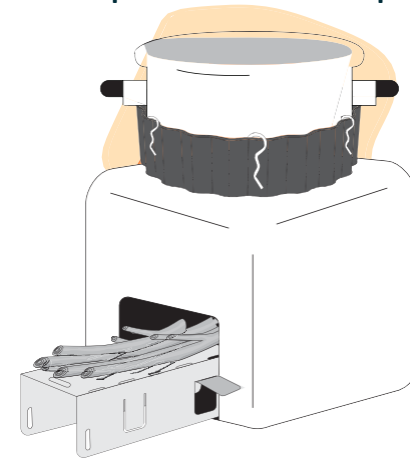
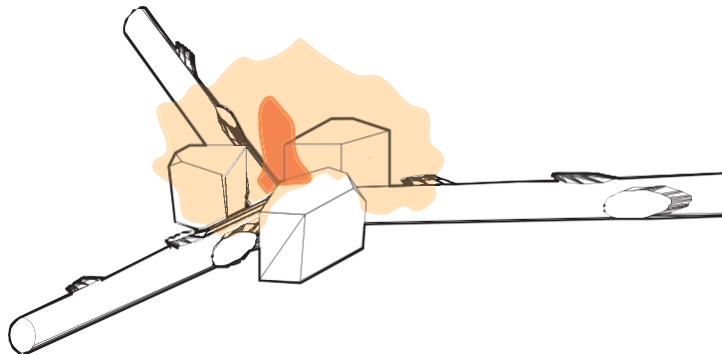


# How the Project is Financed - Carbon Finance

Carbon credits are used to finance the distribution and installation of improved cook stoves in Angola.

The project generates carbon credits by:

- Reducing the amount of fuel from non-renewable sources that is used for cooking by switching from an open-fire (e.g. three-stone fire) to an improved cookstove, which
- Reduces greenhouse gas emissions (mostly carbon dioxide) that contributes permanently to the stock of carbon dioxide in the atmosphere.
- Beneficiary signature during app-based registration on waiver to carbon credits & implementation partners are paid through carbon financing.



This results in **VCUs** or **Carbon Credits**

# How Revenue from Carbon Credits is Used

- Improve stove affordability and availability to a wider range of households
- Finance training on construction and use of improved stoves
- Finance project management & dissemination to targeted beneficiaries
- Finance ongoing monitoring, verification of use, and communication about good stove maintenance



# VERRA/Voluntary Carbon Standard (VCS)

We will register the project under VERRA/VCS - <https://verra.org/project/vcs-program/>

The VCS is a voluntary greenhouse gas accounting standard managed by Verra, a 501(c)(3) not-for-profit organization formed in 2005 and headquartered in Washington, DC.

The project will apply VCS methodology: VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves - <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

This methodology accounts for CO<sub>2</sub>, Methane, and Nitrous Oxide Emission Reductions from the reduced consumption of non-renewable biomass



# VERRA/Sustainable Development Verified Impact Standard (SD VISta)

We will also register the project under SD VISta – a global standard managed by Verra for the certification of projects that generate verifiable sustainable development benefits. This will add SDG labels, assets or credits to credits produced under the VCS.

The project will be registered on the SD VISta registry located here:

<https://registry.terra.org/app/search/SDVISTA/All%20Projects>

SD VISta projects must demonstrate how they advance the Sustainable Development Goals (SDGs) and deliver benefits for people, their prosperity, and the planet.

Feedback will be used in adaptive management practices to have the greatest impact on advancing the Sustainable Development Goals (SDGs).

Continuous feedback is encouraged and welcomed.

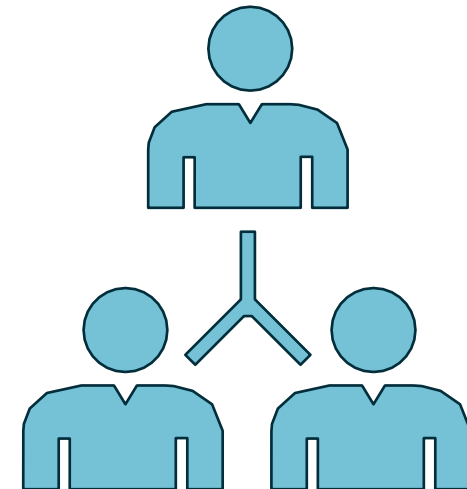




# Constant Communication

Local Stakeholders can continue to engage with the project through the following ways:

- C-Quest Capital's contact information provided at the end of this presentation, including Feedback and Grievance Redress Policy, which is available on CQC website and provided to beneficiaries.
- Through local, implementing partners, once they have been identified
- Contact information that is provided to all end-users and stakeholders during the implementation of the project
- Additional impacted and interested stakeholders are welcome at any period of the project and will be included in future formal meetings with feedback avenues available on CQCs website.



# Project Partners

## Project Implementation:

- **CQC provides the following support:** start-up investment capital, carbon asset development and management, project supervision, contract management and carbon issuance and monetization.
- **Local Implementors:** train households and communities and households in stove construction, use and maintenance; register stoves in data bases to enable monitoring performance and provision of parts and maintenance, manage with local partners the stove tracking & monitoring systems, and facilitate carbon verification
- **Key Government Departments (e.g. Environment, Energy, Forestry):** ensure compliance with sector policies and regulations



# Who is C-Quest Capital?

C-Quest Capital (CQC) is a Washington DC headquartered social impact-investment enterprise with operational platforms in developing countries and a strong focus on transforming the lives of the rural poor.

## Our Mission

To transform the lives of the world's poorest people by providing them access to sustainable energy services and clean energy technologies.

## Our Team

Our Team is comprised of engineers, scientists, lawyers, auditors, and financial analysts specialized in climate and environmental finance, and energy sector project planning and management. Our Senior Managers include founding members of the World Bank's carbon finance business that pioneered the methods, processes, and documentation for carbon asset creation and monetization for North-South trade in carbon emissions reductions under the Kyoto Protocol.

We use our unique experience as pioneers in carbon market development and structured finance for development to conceptualize and pilot new products and markets for verified outcomes in the energy, land use, and health sectors under pay-for-performance contracts.



### Sustainable Land Management

Fostering Regenerative Agriculture to sequester atmospheric carbon in the form of soil organic carbon across smallholder and broadacre farms



### Efficient Lighting

Improving lighting quality, reducing electricity bills, increasing disposable income



### Cleaner Cooking

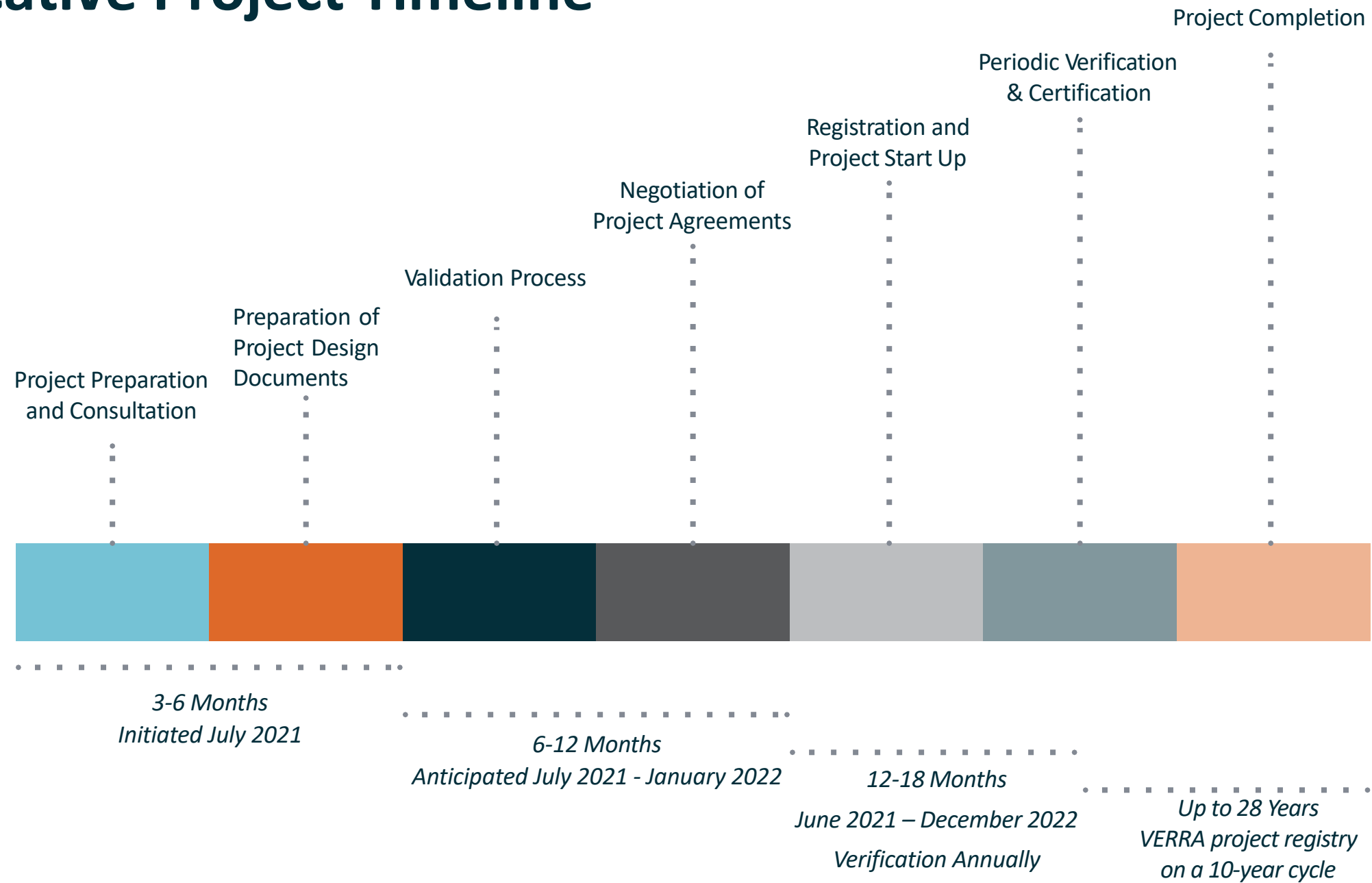
Improving maternal and child health and well-being, reducing drudgery for women and girls, reducing deforestation and land degradation



### Sustainable Energy

Creating local jobs, reducing energy costs, improving reliability, and decarbonizing energy supply

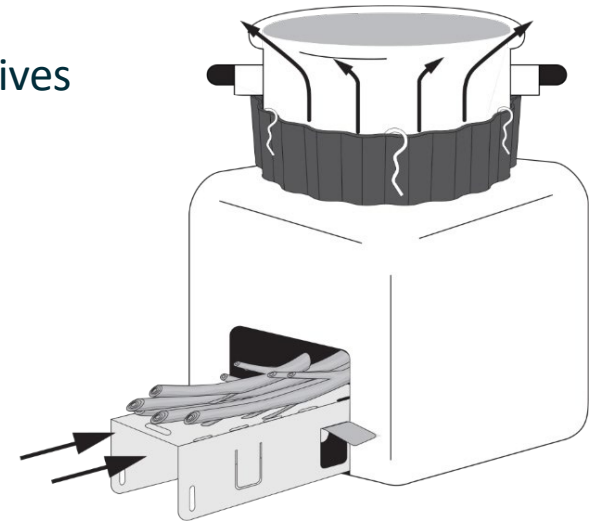
# Indicative Project Timeline





# Next Steps

- Incorporation of feedback & advice received from this Stakeholder Meeting
- Consultations with Government Authorities/Departments to ensure compliance with Sectoral Policies & Regulations on the Environment and natural resources
- Finalize Project Design Documentation
- Preparation / submission to VERRA/Voluntary Carbon Standard
- Consultations with investors to secure funding to meet project targets and objectives
- Seek continuous feedback from beneficiaries, impacted and interested stakeh  
SDGs and consider suggestions to make project improvement.



# Contact Us



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## **Feedback and Grievance Redress Policy**

CQC encourages feedback on projects and general compliants.

*Provide via the country-specific telephone number on Household Flyer, contacting village leadership to approach partners, or via the CQC Website*

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