



23/09/2015

WACCA ACTION PLAN FOR THE DEVELOPMENT OF A CLEAN COOKING ENERGY MARKET IN THE ECOWAS REGION

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INTRODUCTION

As part of the assignment for the assessment of forest resources in the ECOWAS region, the consultant was asked to explore the implementation the West African Alliance for Clean Cooking (WACCA) Initiative. To do this, local consultants chosen within participating countries were interviewed about the experiences of their countries regarding this regional clean cooking initiative. An outline was provided to help respondents describe the experience of their countries in the field of clean cooking, their perceptions of WACCA, constraints and opportunities and priority actions needed to achieve the objectives of the initiative.

In this document, we introduce successively, an overview of the context, the strategy, objectives and expected results of WACCA, a critical analysis of the strategy, a review of the strategic choices, a proposed plan of action, a set of priority actions and an institutional organization for implementation of the said actions.

1. CONTEXT

The ECOWAS cooking energy initiative called West African Alliance for Clean Cooking (WACCA) was developed by ECREEE, the ECOWAS Center for Renewable Energy and Energy Efficiency, as part of the regional project entitled "Supporting Energy Efficiency for Access in West Africa "(SEE-WA) to support the implementation of measures for renewable energy and energy efficiency within ECOWAS and its contribution to the initiative Sustainable Energy For All (SE4ALL). An estimated 2.5 billion people worldwide depend on traditional biomass fuels to meet their needs for cooking and heating. A large proportion of the population dependent on wood, charcoal, agricultural waste and animal dung for cooking and heating lives in sub-Saharan Africa. In the ECOWAS region, more than three quarters of the population is dependent on biomass fuels for cooking. In terms of overall employment, income distribution, the wood energy sectors (firewood and charcoal) are in most developing countries, major economic activities particularly in rural areas.

Energy consumption - both in terms of quantity and source of energy used have close linkages with poverty levels. Limited access to energy and lack of access to modern energy services - access to modern fuels and clean cooking facilities are factors that impede economic development and confine more people in the poverty trap. Achieving most of the Millennium Development Goals (MDGs) depends on obtaining better access to energy services for the poor.

In developing countries, limited access to modern fuels and improved stoves specifically contribute to gender inequality as women and children are responsible, in most cases; of domestic cooking, collecting firewood or making charcoal. They are thus disproportionately affected by the health problems associated with cooking. Cooking habits involving inefficient homes using firewood or charcoal have resulted in a high daily exposure of mostly women and children under five years to indoor pollution caused by smoke cooking which is 20 times the maximum level permitted by the WHO and other environmental agencies worldwide (WHO 2005). It is estimated that more than 211,500 premature deaths each year can be attributed to smoke from cooking with biomass and coal in the ECOWAS countries (WHO and UNDP 2009).

Inefficient use of wood fuels has local and global environmental impacts. Around cities growing rapidly, especially in sub-Saharan Africa, the unsustainable exploitation of woodlands and forests coupled with inefficient production of charcoal and non-performing cooking stoves can lead to accelerated loss of forest coverage. Furthermore, adverse effects on global warming are evident when unsustainable amounts of biomass are collected and burned.

To address the many challenges around cooking energy, WACCA initiative will explore all possible avenues to support access to clean energy and more efficient cooking in the ECOWAS region, working on homes, sustainable biofuels (such as firewood taken from the implementation of comprehensive forest management plans, charcoal briquettes produced from crop residues and

other biomass, biogas and bioethanol) and modern fuels. According to the UN Initiative for Sustainable Energy for All (SE4All) WACCA intends to bring energy access for all throughout the ECOWAS region.

The main purpose of WACCA is to improve living conditions (economic, social and health) of the population of ECOWAS countries through increased access to clean cooking facilities and more efficient, sustainable fuels from biomass to modern fuels, thereby reducing local deforestation and greenhouse gas (GHG) emission which has adverse environmental impacts. Three specific objectives are derived from this: i) promote the adoption of clean and efficient cooking equipment and disseminate sustainable biofuels and modern fuels for all households of ECOWAS, ii) ensure the quality and sustainability of cooking equipment distributed in terms of environmental performance and public health in the ECOWAS countries, the quality and sustainability of biofuels disseminated and of modern fuels distributed, iii) introducing an appropriate regional governance mechanism consultation, coordination and funding to ensure coordinated implementation of actions in the field of cooking energy.

WACCA will act at regional and national levels:

Regional Activities	National Activities
Developing a regional strategy for Cooking Energy	Review national policies on energy and cooking update or formulate strategies on cooking energy
Facilitate policy development, regulatory and fiscal measures	Assess existing barriers to the diffusion and adoption of modern fuels and equipment
Leverage and coordinate between existing initiatives and stakeholders in the region	Leverage and collaborate with existing initiatives and stakeholders at the country level
Coordinate a capacity building program for public and private actors	Support the development and modernization of the cooking technology by offering capacity building
Establish a Regional Facility for cooking energy	Support the development of adequate financing mechanisms
Introduce a monitoring mechanism including harmonized monitoring, test protocols and regional standard for cooking technologies and biofuels ²	Establish or update in the target countries matter of penetration of clean and efficient cooking equipment, modern fuels and sustainable biomass energy
Introduce regional safety standards for modern fuels in line with international standards	Launch information and publicity campaigns
Create a regional technological hub for sharing knowledge and organize a regional forum for clean and efficient cooking technologies and sustainable biomass energy	Teach consumers how to appropriately use modern cooking fuels and equipment

ECREEE should act both as contracting authority and implementing agency of WACCA closely with partners. GIZ, GERES, ETC and ICEED are the current regional partners of the initiative, working on similar topics in the ECOWAS countries. Additional technical partners include AEA and AOCI.

These partnerships will ensure that WACCA actually carries and coordinates between existing initiatives and stakeholders in the region. In addition, the World Bank is about to launch the African Clean Cooking Initiative (ACCI) and GACC - the initiative of the United Nations Foundation for Clean Cooking, planned activities in West Africa. Once the respective plans are clearly defined, there is the

desire to establish closer links with these stakeholders to collaborate, to harmonize and complement initiatives and maximizing synergies. The partners will take part in WACCA Regional Advisory Technical Committee and provide advice on current and future activities of the initiative. The regional steering committee will include representatives of participating States and donors to oversee the initiative. ECREEE hosts the permanent secretariat. The initial budget of WACCA for the first four years is estimated at € 7.6 million. However, only 1 million euro was mobilized to this day, which means there is the need to increase its fundraising efforts if it plans to meet its regional objectives.

2. REVIEW OF THE STRATEGY AND GOALS OF WACCA

To implement its action plan in accordance with its mission, the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) submitted a project to the second EU Facility for energy, which was selected. The project "Supporting Energy Efficiency for Access in West Africa" (SEEA-WA) is a regional project to support the implementation of measures 'Energy efficiency in the ECOWAS region. It aims to remove obstacles of a technical, financial, legal, institutional, social and related capacity building that impede penetration of efficient energy in member countries of ECOWAS. Implemented by ECREEE; SEEA-WA tries to combine energy efficiency in synergy with the work on renewable energies underway to expand access to energy.

As part of this project, an energy efficiency policy of ECOWAS and several initiatives on the key areas for energy efficiency measures has been developed, including the initiative on cooking energy.

2.1. Approaches to address issues related to the cooking energy

There are two approaches to solve the problems previously identified:

- The transition to modern and cleaner fuels such as electricity, gas and liquid fuels; and
- Promote a more efficient use of traditional biomass through improved fuel / or improvement of homes.

The cleaner modern fuels are generally more expensive by MJ than solid fuels, and in addition they must be combined with special cooking equipment, the net effect of the use of cleaner fuels is increasing the cost of cooking compared to traditional use or even improved solid fuel. Consequently, without financial support, most of the poor in developing countries would not be able to switch to cleaner fuels in the foreseeable future and will continue to depend on solid fuels for cooking and heating.

So far, improved stoves presented a transitional step on the scale of energy between the traditional methods of biomass combustion and switching to more efficient fuels. Moreover, recent

technological advances have allowed providing advanced homes for cooking and heating at reasonable prices with remarkably higher yields than improved stoves.

In addition, improved biofuels, such as pellets and briquettes are more uniform, easier to handle than traditional biomass - and enable advanced home to be used optimally.

The return on investment for clean technologies, efficient and improved is very important. According to WHOM, a 50% reduction in the number of households using biomass, as the main cooking fuel would be a benefit to society of nearly \$ 91 billion annually, compared to net intervention cost \$ 13 billion. This can often be accomplished through increased productivity and reduced health problems resulting from pollution of the air inside. Making improved cooking technologies accessible to people who depend on biomass energy and coal in traditional homes would result in net savings of \$ 34 billion and generate an economic return of \$ 105 billion per year over ten years. The modern use of biomass energy and advanced home would have even greater economic benefits.

WACCA will explore all possible avenues to support access to clean energy and more efficient cooking in the ECOWAS region, working on homes, sustainable biofuels (such as firewood operated under the comprehensive forest management plans, charcoal product with improved techniques, (char) briquettes crop residues or other biomass, biogas and bioethanol) and modern fuels.

2.2. Goal and Objectives

WACCA aims to improve living conditions (economic, social and health) of the population of ECOWAS countries through increased access to cleaner and more efficient cooking equipment, fuels for sustainable biomass and modern fuels, while reducing (local GHG emissions (deforestation) and global) adverse environmental impacts.

According to the UN Sustainable Energy for All Initiative, WACCA intends to increase energy access for all throughout the ECOWAS region. It expressly provides that:

- ✓ In 2020: 60% of the population has access to clean cooking energy, safe and affordable, including 20% of LPG users and 20% of improved stove users and / or sustainable biofuels users. Such a scenario represents:
 - More than 10 million additional LPG household users as primary fuel in comparison with the situation in 2012;
 - About 15 million households using improved stoves as a primary cooking equipment and / or sustainable biomass fuel as the primary fuel;
 - 700 million tons of wood saved from the operation between 2012 and 2020.

- ✓ In 2030: the entire population (over 100 million households) have access to clean cooking energy, safe and affordable, including 26% of LPG users and 50% of improved stove users / or users sustainable biofuels. This scenario represents nearly 3 billion tons of wood saved the cut between 2012 and 2030.

These objectives are based on alternative scenarios between fuels presented in Table 1, and dissemination of improved stoves. 2020 scenarios are calculated assuming a linear evolution from 2012 to 2020.

The 2030 baseline scenario corresponds to an increase in the number of households using wood and coal as main fuels, taking into account ongoing efforts in this area. The WACCA or voluntarism scenario (which is the goal for all sustainable energy) is built on reasonable assumptions but voluntary substitution of firewood by, firstly, the so-called modern fuels (mainly LPG and bioethanol) and, secondly, for sustainable biomass energy. **Under this voluntary scenario wood energy, now the main fuel for three quarters of the population of ECOWAS countries would lose its dominance in the next 15-20 years to be used by less than a third of the population in 2030.** Population growth will mitigate the impact of these losses of market share. Mass distribution more efficient and cleaner stoves as well as sustainable biofuels will mitigate this pressure, and improve the living conditions of tens of millions.

The proposed scenario should be refined in the future once the additional studies are conducted. This is especially true in terms of sustainable biofuels, where some of the voluntary targets could be established based on the financial assistance that can be mobilized, particularly for sustainable forest management.

Table 1: WACCA scenarios for inter-fuel substitution (% of HH)

Primary cooking fuel	2012	2020		2030	
		Business as usual	WACCA	Business as usual	WACCA
LPG, natural gas	8%	12%	20%	14%	26%
Charcoal	17%	20%	12%	21%	10%
Firewood	59%	48%	34%	42%	20%
Sustainable biomass fuels	0%	2%	8%	3%	16%
<i>S/total biomass fuels</i>	<i>75%</i>	<i>69%</i>	<i>55%</i>	<i>66%</i>	<i>47%</i>

Source: WACCA concept notes

2.3. Specific objectives and expected results

2.3.1. The specific objectives are the following

SO1. Promote the adoption of clean and efficient cooking equipment and dissemination of sustainable biofuels and modern fuels for all households of ECOWAS.

SO2. Ensure the quality, sustainability and accessibility of cooking equipment distributed in terms of environmental performance and public health in the ECOWAS countries, the quality and sustainability of biofuels and broadcast quality and safety of modern fuels.

SO3. Introduce appropriate regional governance mechanism for consultation, coordination and financing to ensure coordinated implementation of actions in the field of cooking energy.

2.3.2. The results related to these specific objectives are the following:

SO1:

- a. Obstacles to the dissemination of clean and efficient cooking equipment, sustainable biofuel and modern fuels are identified at regional and national level;
- b. National governance is strengthened and national energy strategies are adopted cooking and penetration objectives are set at national level;
- c. Public and private actors in production and cooking equipment distribution channels from the clean and efficient biomass, sustainable biofuels have access to a customized capacity building and financing facilities to improve their skills and participate effectively in the creation of a market for products;
- d. Clean and efficient cooking appliances, sustainable biofuel and modern fuels are well known;
- e. Regulatory and tax measures are adopted at regional and national level to promote the mass dissemination of clean and efficient cooking appliances, sustainable biofuel and modern fuels.

SO2:

- a. Cooking appliances sold on the market are efficient, clean, affordable and sustainable;
- b. Biofuels are sustainably produced and distributed through improved and clean production techniques and integrated forest management plans;
- c. Modern fuels can be used in a secure manner;
- d. New and more efficient cooking equipment using biomass and sustainable biofuels are regularly developed.

3. ANALYSIS OF THE IMPLEMENTATION OF THE STRATEGY AND ACTION PLAN FOR WACCA

The implementation of the current strategy was initiated by a regional seminar on WACCA held from 23 to 25 April 2013 in Ouagadougou, Burkina Faso. Participants from energy ministries of the ECOWAS member countries invited for the workshop, helped to draft the framework of a regional action plan. The following items form the basis of the regional WACCA action plan.

- ✓ The policy and regulatory framework,
- ✓ The supply chain of cooking fuel,
- ✓ Actions taking into account gender and economic empowerment of women,
- ✓ Capacity building,
- ✓ Work for a transformation of fuel and cooking appliances market,
- ✓ Standards and labeling,
- ✓ Networking and knowledge sharing,
- ✓ Demonstration / pilot projects for implementation at the regional level,
- ✓ Economic and financial issues (access to financing).

The adoption of this Action Plan framework by Member States was to be followed up by a comprehensive document with concrete actions at regional and national level and shared for validation... Based on this framework, member countries were asked to develop a national action plan with the support of the focal points designated by ECREEE in each member countries.

This framework, as well as the approach and strategy as part of WACCA takes into account the experiences developed by member countries within the framework of clean cooking. Indeed, many projects and programs have been developed in the member states (MS) in terms of promotion of improved and efficient household cooking equipment in general, participatory management of forest resources for the production of wood energy for (e.g. rural markets and beverage Energy in Mali, Niger, and Benin). Others include substitution of wood energy initiatives with other sources of alternative energy (e.g. butane gas, biogas, etc.), development of agricultural by-products or biomass for energy purposes (bio charcoal, etc.).

It should be noted that at the regional level, initiatives have also been developed of which PREDAS remains the most prominent that helped the CILSS member countries develop strategies and medium-term investment plans in the field of domestic fuels. Some of these countries are members of ECOWAS. It must be noted that the implementation of these frameworks has failed because of fundraising constraints.

Some countries such as Benin, Côte d'Ivoire, and Ghana have been supported by the Global Alliance for Clean Cookstoves (GACC), which also aims to assist countries in developing cooking energy services. The United Nations Foundation created the Global Alliance for Clean Cookstoves which is a public-private partnership to save lives, improve livelihoods, empower women, and combat climate change by establishing a global market for clean and efficient solutions for household cooking.

The Alliance works with public and private partners to help overcome trade barriers that currently impede the production, deployment and adoption of clean stoves and fuels in developing countries. The Alliance set a goal of 100 million clean stoves and fuels adopted by 2020.

To address the persistent energy challenges in Africa and build on new opportunities for the transformation of the cooking energy sector, the World Bank launched the African Initiative for clean cooking energy solutions (African Cooking Clean Energy Solutions, ACCES). ACCES aims to promote the widespread dissemination and adoption of clean cooking solutions in Sub-Saharan Africa (SSA) based on private entrepreneurship. By increasing access to modern technologies and cleaner fuels, the initiative seeks to reduce negative impacts on health, environment and socio-economics in traditional cooking practices in SSA. The vision of the initiative is to extend access to technologies and fuels for clean cooking through a participatory, integrated approach, based on private enterprise in a regional development approach. This new initiative builds on the experiences and lessons learned from donors, governments, public and private investment in the field of clean cooking and analytical work on the promotion of sustainable energy operations of the World Bank, as the Lighting Africa program (African off-grid lighting). Overall, the Africa Energy Group of the World Bank (World English Bank's Africa Energy Group - AFTEG) and its assistance program for the Energy Sector Management (Energy Sector Management Assistance Program - ESMAP) implement the ACCESS program in close coordination and through a strategic partnership with the Global Alliance for Clean Homes (Global Alliance for Clean Cookstoves) and the Sustainable Energy for All (SE4A).

ACCES seeks a consultative approach to its commitment to clean cooking sector guided by the following key principles:

- ☐ Catalyze the development of the sector through the promotion of approaches based on private enterprise. Promoting differentiated strategies to make cleaner fuels and technologies accessible and affordable;
- ☐ Maintain a neutral platform (with respect to technologies and fuels to promote), for the promotion of improved stoves efficient biomass while supporting the transition to cleaner fuels;
- ☐ Integrate the gender dimension in the strategies and proper cooking procedures;

- ☐ Align and leverage strategies, programs and partnerships in the country.

In West Africa, the program started the implementation platform in Senegal based on the achievements of PROGEDE2.

3.1. Critical analysis of the WACCA strategy

Defining a regional strategy is not easy because at this level of intervention, the strategy must meet the specific needs of countries based on a strategic analysis and diagnosis, strategic choices and a clean cooking development model shared and validated. In doing so, the targets should be derived from the aggregation of country objectives. That is why it seems necessary to review the regional objectives set in the WACCA strategy, once the strategies and national development model are developed and validated. The approach and the process should integrate the key stages of the strategic approach i.e. strategic analysis, strategic choice and strategic deployment.

Diagnosis of clean cooking in the ECOWAS countries highlights major trends that are:

- ✓ The predominance of unsustainably produced wood fuel for cooking in the ECOWAS region with its negative impacts on the environment, the health of populations, especially women and children and on the socio-economic plan;
- ✓ Inconsistency in markets for substitute products and wood energy efficient cooking equipment in the region;
- ✓ Difficulties in promoting improved stoves and persistence use of traditional stoves with negative impacts on the environment and the health of populations, including women and children.

Clean cooking in West Africa can generate social, economic and environmental benefits, but its financial profitability is seriously jeopardized by its high cost compared to traditional fuels and cooking equipment, which is anyway not subservient to the culinary practices of populations. Therefore, the major challenge for wide distribution of energy services to clean cooking is to create conditions for the development of more efficient fuel and equipment markets including real and lasting involvement of the private sector to promote the development of investment in the sector.

The understanding of the strategic orientation of the sector in terms of external environment, internal resources and skills available, expectation and influence of stakeholders in each country is essential for defining a strategy on clean cooking in the region.

3.2. The WACCA Refinement of strategic choices in the area of clean cooking:

From strategic analysis, choices must be made according to the specific country and region. Thus strategic choice of criteria must be some facts that result from the expectations and influences of the

various countries such as: (i) Determination of the basis of the competitive advantage of each country to develop clean cooking (natural resources endowment, availability of funds, regulatory framework etc.); (ii) Level of understanding of wood energy markets, efficient cooking equipment, fuel switching and constraints of development etc.; (iii) distortions levels not taken into account by the market; (iv) Financing of clean cooking sector, ownership and motivation and constraint for the private sector etc.

We must therefore find a balance between the strategic capacities of countries and industry development options. On this basis, the intervention framework defined by WACCA can be aggregated and remodeled into six pillars:

- ✓ The policy and regulatory framework for development of clean cooking;
- ✓ The development of wood energy markets sustainably produced, improved stoves, modern clean alternative fuels;
- ✓ Promotion of Research / Development for the maturity of efficient technologies and cooking equipment, definition and implementation assurance / quality control systems for clean cooking;
- ✓ Capacity Building for the development of clean cooking sector in countries and in the region,
- ✓ Access to finance for the development of clean cooking sector in the region,
- ✓ The definition and implementation of a gender strategy for balanced development of clean cooking sector.

4. ACTION PLANS PROPOSAL

The strategic deployment is the translation of the strategy and pillars into main actions, through a clearly defined organization, planning of resources and management of strategic change. Successful implementation of the strategy depends on how these elements are combined. For the implementation of the strategy and the pillars, main actions must be implemented both at regional level by ECREEE countries. Based on the experience in the regions, one can outline the following key actions in line with the framework already set:

4.1. Pillar A: The policy and regulatory framework for development of clean cooking

- ✓ Conduct a diagnosis and an inventory of the clean cooking sector in the country and the region,
- ✓ Revise or draft the clean cooking sector development strategy in countries and refine targets and indicators at the regional level (taking into account the consideration of gender equity)
- ✓ Summarize the legislative and regulatory measures identified in pillar B, C, D, E and F in a coherent reform at the country level and define framework guidelines at the regional level to support, promote and stimulate the reforms of the countries for the development of clean cooking sector,
- ✓ Implement, monitor and evaluate the clean cooking development strategies at the country level and in the region.

4.2. Pillar B: The development of sustainably produced wood energy markets, improved stoves, modern clean alternative fuels

Choose products whose market is to be promoted in the country:

This activity must be from a strategic analysis of each country to determine the products with the highest market potential (quality and sustainability of supply, consistency of solvent demand, etc.). This is according to a clear analysis of opportunities and threats in the environment of the country's competitive advantage to develop the market of this or that energy sources or of this or that efficient cooking equipment. For example, in one country where wood energy is still abundant and cheap, efficient stoves market may struggle to grow. You will have to rely on other levers of the action plan to promote sustainable fuels and improved stoves.

- ✓ Establish in each country, the deployment model for market development of products selected according to the following table:

For each product analyze the market, including various elements of the supply, demand and price in order to identify the strengths and constraints to market development in order to identify measures to the booster.

Table 2: Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
OFFER	Product Quality	Compliance with technical, social, environmental standards	Are there product standards? -It is necessary to set standards for the product? What is the added value for the market?	<ul style="list-style-type: none"> - Production of standards for the product, - Development of test protocols; - Development of certification system 	National Regional Regional
	Production Process	Compliance with technical, social, environmental standards	Are there standards of the production process (FMP) or improved techniques (Casamance kiln)? -It is necessary to produce standards for trials; what added value for the market? What level of obligation? Is social regulation respected in the employment of staff (coal) etc.?	<ul style="list-style-type: none"> - Development of production standard - Extension and adoption of efficient production technique (char) - Production of regulations for the bond if there's place - Respect for labor regulations and social 	Regional National

Table 2 (more 1): Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
OFFER	Production Process	Actors in the production	What are the required technical capacity and trades?	Training of actors from production to improved techniques	National
		Barrier production	Are there any laws regulating access to the production and added value for the market	Improve laws and regulations to improve access to production Define the job profile	Regional
		Production costs	What is the level of production costs?	Establish the structure of the prices of products and sectors Analysis	National
	Quantity	<ul style="list-style-type: none"> - Production Level - Historical development and trend - Factors of variation - Sustainability 	Determining the size and characteristics of availability	Product market research; Study of the sustainability of exploitation (wood energy) or manufacturing (improved homes, the metal recovery market)	National

Table 2 (more 2): Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
OFFER	Producer	<ul style="list-style-type: none"> - Profile - Objective and Strategy - Formalization level - Number and evolution - Capacity 	What are the Characteristics of the producers (financial, organizational and influence, etc.), input condition in the production, trade, capacity to adapt to changing market etc.	Study of technical, financial and socio-economic producers to adapt to market developments. And limits the opportunity for private sector involvement in production	National
	Production financing	Ways of Financing	What are the current options for financing the production? (Own resources, bank loans, other loans, interest rate, level of funding etc.) And what opportunities on the national and regional financial market	Study of the production financing conditions (sustainable wood energy, improved stoves, modern alternative fuels)	National Regional

Table 2 (more 3): Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
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OFFER	Product Distribution	Circuits	<ul style="list-style-type: none"> - Actors in distribution strategies, benefits and interrelationships - Formalization level - Product Configuration - Metrology - Transport and inherent costs - Storage and inherent costs - Cost of distribution - Sales Strategy 	<ul style="list-style-type: none"> - Market research - Study of the problem of product distribution for better penetration 	National
	Promotion	Measures	<ul style="list-style-type: none"> - Product Advertising Level - Actors in communication 	Develop and implement a clear communications strategy and targeted product advertising	National
	Product Origin	Measures	<ul style="list-style-type: none"> - Local production - Import 	Develop a procurement strategy taking into account an optimal relief door taxations for imported products and costs	Regional
	Substitute	Type of product	<ul style="list-style-type: none"> - Cost - Threat level 	Define a sustainable balance between the product and its main substitute	National

Table 2 (more 4): Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
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DEMAND	Consumption	<ul style="list-style-type: none"> - Consumption level (quantity) - Historical development and trend - Factors of variation - Price elasticity - Cross Elasticity with the first substitute 	Determine the quantities consumed and the characteristics of the particular demand elasticity in relation to price and first substitute product	<ul style="list-style-type: none"> - Product Market Research - Econometric study of the demand for the product 	National
	Consumer behavior	<ul style="list-style-type: none"> - Need, desire - Practices and consumer habits - Buying Decision 	How to better understand the needs of consumers in energy and cooking equipment and the factors influencing their purchasing decision	Market research	National

Table 2 (more 5): Analysis model type for market development and actions for each product

Market components	Items per component	Settings	Questions	Actions to be taken	Execution level
PRICE	Price level	<ul style="list-style-type: none"> - Historical development and trend - Profitability - Taxation - Grants 	What is the price charged to the consumer, the training, the level of profitability allowed?	<ul style="list-style-type: none"> - Market research; - What financial or in kind transfers (taxes, subsidies) that promote or hinders the development of the market; - Take the suitable regulatory decisions to promote the product market 	National Regional

This model can even be completed by the analysis of competition for each product for which the market needs to be developed to identify for each product the fundamentals of competitive strategy for each product. It involves analyzing the five competitive forces, including their extent and their hierarchy for each product is:

- **Competitors:** wood energy produced in forests without sustainable management plan compared to that produced in managed forests, the production of traditional stoves compared to improved stoves, using improved traditional millstones compared to grinding wheels, etc. are as much competition that weakens the market for products and call for action to be taken either by the states or producers;
- **Bargaining power of customers and distributors:** the weight of intermediaries in the sale of charcoal;
- **Bargaining power of suppliers:** supply ceramic inserts for improved stoves;
- **The threat of substitutes:** the butane gas for the charcoal, etc.

4.3. Pillar C: Promotion of Research / Development for the maturity of efficient cooking technologies and equipment, the definition and implementation of quality assurance systems for clean cooking

- ✓ Set up a support center or the most advanced center in the region for the development and implementation of a program of R / D on the most advanced technologies for clean cooking at regional level.
- ✓ Develop, validate, test protocols for testing the performance of technologies and clean cooking facilities (including the products concerned by pillar B).
- ✓ Set standards for the manufacturing and use of clean technologies and cooking equipment at the regional level and promote their adoption by countries (including the products concerned by Pillar B and new products).
- ✓ Develop quality assurance systems at the regional level and promote their adoption by countries.
- ✓ Focus on the transfer of technologies to diversify the supply at regional level.

4.4. Pillar D: The Capacity Building for the development of the clean cooking sector in the region

- ✓ Develop and disseminate funding and training manuals on the implementation of all pillars, especially the B-pillar and C,

- ✓ Organize the sharing of information and experience as well as networking the country level and at the regional level through training workshops, learning visits, etc.
- ✓ Implement demonstration project at the country level and at the regional level.

4.5. Pillar E: Access to finance for the development of the clean cooking sector in the region

- ✓ Develop a private sector engagement strategy to strengthen financing clean cooking sector capitalizing:
 - The proposed solutions to deal with the constraints of the private sector identified in the product market development model.
 - The motivation of the private sector in the proposed product market development model (grants, tax relief, communication plans financed by the public, etc.).
- ✓ Integrate financing clean cooking sector in the process of preparation and implementation of REDD +, CDM and even NAMMA in countries and at regional level;
- ✓ Promoting public-private partnership for the development of innovative solutions in the clean cooking sector;
- ✓ Build on and find synergies with bilateral and multilateral funding programs for financing sustainable development and REDD + at regional level;
- ✓ Promote the contribution of States, decentralized authorities and community-based organizations for the financing of clean cooking.

4.6. Pillar F: the definition and implementation of a gender strategy for a balanced and equitable development of clean cooking sector

- ✓ Develop and implement a strategy for taking gender into account in establishing the pillars of the country and regional level;
- ✓ Establish a monitoring and evaluation of performance in consideration of gender in establishing the pillars at the national and regional level,
- ✓ Capitalization and sharing of experiences and lessons learned from the implementation of the gender strategy in the clean cooking sector in relation to the program of pillar D.

To facilitate the implementation of this action plan, a plan of implementation or operations plan of priority actions should be established around the following activities:

- Validation of WACCA detailed action plan.
- The organization of national workshops to launch the preparation / updating of clean cooking development strategy based on the pillars defined with an accompaniment of ECREEE methodologically and ensuring the capitalization of experiences and countries donors.
- Summarize actions at regional level for all the pillars, mainly those of pillar C and D in a specific time frame with an assessment of costs.

- Develop a framework for monitoring and assessing the performance of countries in the development and the development strategy of implementation of clean cooking sector.
- Develop a fundraising strategy for the establishment of an easy support to clean cooking sector based on: (i) the canvassing of bilateral and multilateral funds for development cooperation, for REDD +, etc. Positioning itself as intermediary organization with a major comparative advantage proximity to ECOWAS countries and economies of scale; (ii) the development of public-private partnership, etc.
- The organization of reflection for the implementation framework / planning body and control of the development strategy of efficient clean cooking sector.

A detailed and budgeted action plan is annexed to the document.

5. INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION

The establishment of an institutional arrangement capable of supporting policy and development strategy of clean cooking sector is not an easy thing because of several reasons:

- ✓ The development sector requires reforms that justify a steering body able to influence decision makers to facilitate decision and implementation of regulatory measures,
- ✓ The sector is transversal and involves many areas and ministerial department and several administrations by country (Ministry for Energy, Ministry for the Environment, Ministry of Economy and Finance, Ministry for Decentralization, etc.). Moreover, nowadays, will increasingly assertive of our countries to develop renewable energy and energy efficiency often result in a more or less significant outbreak of the energy sector, with the creation of new directions.
- ✓ Risks of conflicts of jurisdiction relating to the appointment of a public institution in charge of this mission,
- ✓ A minor budgets (compensation) for the motivation of the persons designated focal points, etc.

In any event, the question of the appointment of the head of the implementation of clean cooking development strategy in the country is quite delicate. That is why the establishment of an ad-hoc committee seems to be the best organization to get there. Some countries already have experiences it through domestic fuel cells with mixed results (Senegal, Mali, Niger, Burkina Faso, etc.), who often stumbled on constraints such as lack of motivation of those responsible to animate these frames at the end of projects that supported their establishment. The establishment of a structure dependent on the state budget may reduce this risk however given weak budgets of our countries if a donor does not support the initiative it will be difficult. Mali currently has an agency, which deals with domestic fuels this is a structure to emulate. It must be noted also that sometimes the disadvantage of strictly government-driven institutions tend to satisfy only the representation of governments and ministries at the expense of functional multidisciplinary actors. Indeed, the constitution of the team should include the institution responsible for driving the development strategy of clean cooking sector must be composed of technicians in energy and natural resources development, specialists in the field of supply-chain development and product marketing, strategy development, gender analysis, macroeconomic planning, analysts of the legal environment, etc.

Without focusing on a type of structure, depending on different countries, we can make a functional analysis to determine highlighting the following criteria:

- Have an anchor that can influence decision makers for decision and implementation of regulatory measures favorable to the development of clean cooking sector;
- Be composed, in addition to energy and natural resources technicians management skills in the areas of economic planning, development of markets and sectors, the legal environment;
- Have flexibility to transcend sectorial divisions;
- Have a budget to motivate staff and support the strategy planning process, its implementation and monitoring and evaluation, etc.

6. CONCLUSION

The Cooking Energy initiative called ECOWAS West African Alliance for Clean Cooking (WACCA) developed by ECREEE, the center of ECOWAS for renewable energy and energy efficiency, as part of the regional project "support energy efficiency for access in West Africa "(SEEA-WA) is in accordance with UN sustainable Energy for All Initiative, access to energy for all throughout the ECOWAS region. It expressly provides that:

- ☑ In **2020**: 60% of the population has access to clean cooking energy, safe and affordable,
- ☑ In **2030**: the total population (over 100 million households) has access to clean energy, safe and affordable.

The main purpose of WACCA is to improve living conditions (economic, social and health) of the population of ECOWAS countries through increased access to clean cooking facilities and more efficient, sustainable fuels to biomass and to modern fuels, reducing locally (deforestation) and globally (GHG) adverse environmental impacts.

The implementations of the strategy have been marked by a regional seminar on WACCA held from April 23 to 25, 2013 in Ouagadougou (Burkina Faso) with a regional action plan draft, and the following are the framework and base:

- Policy and regulatory framework,
- The supply chain of cooking fuels,
- Actions taking account of gender and economic empowerment of women,
- Capacity building,
- Work towards a market transformation of fuel and cooking appliances,
- Standards and labeling,
- Networking and sharing of knowledge,
- Demonstration projects / drivers for implementation at the regional level,
- Economic and financial issues.

This framework, as well as the approach and clear strategy as part of WACCA takes into account the experiences developed by member countries within the framework of clean cooking as well as global and regional initiatives.

The vision defined in WACCA must consider the following trends:

- The predominance of wood energy produced in an unsustainable way for cooking in the ECOWAS region with its negative impacts on the environment and the health of populations, including women and children and on the socio-economic level,
- The inconsistency of the market of substitute products and wood energy efficient cooking equipment in the region,
- Difficulties for the promotion of improved stoves and persistence of the use of traditional homes with negative impacts on the environment and the health of populations, including women and children.

Clean cooking in West Africa can generate social, economic and environmental benefits, but its financial profitability is proven by its high cost compared to traditional fuels and cooking equipment, which are anyway not subservient to the culinary practices of populations. Therefore, the major challenge to development is to bring fuel market development conditions and clean baking equipment including a real and lasting involvement of the private sector to promote the development of investment in the sector. We must therefore find a balance between the strategic capacities of countries and industry development options. On this basis, it was proposed to aggregate and reshape the intervention framework defined by WACCA six pillars:

- Policy and regulatory framework for development of clean cooking,
- The development of wood energy markets sustainably produced, improved stoves, modern clean alternative fuels,
- The promotion of Research / Development for the maturity of efficient technologies and cooking equipment, the definition and implementation of quality assurance systems for clean cooking,
- Capacity Building for the development of clean cooking sector in countries and in the region,
- Access to finance for the development of clean cooking sector in the region,
- Definition and implementation of a gender strategy for balanced development of clean cooking sector. A detailed action plan has been developed and budgeted for the establishment of these pillars at national and regional level. To facilitate the implementation of this action plan, an implementation plan or priority operations plan was proposed.

To carry the implementation of clean cooking development strategy, criteria have been identified to describe the dedicated structure. Indeed, without focusing on a type of structure, it can be in different countries, making a functional analysis to determine highlighting the following criteria:

- Have an anchor that can influence decision makers for decision and implementation of regulatory measures favorable to the development of clean cooking sector,
- Be composed, in addition to technicians of Energy and natural resources management skills in the areas of economic planning, development of markets and sectors, the legal environment, etc.
- Have flexibility to transcend sectorial divisions,
- Have a budget to motivate staff and support the strategy planning process, its implementation and monitoring and evaluation, etc.

APPENDIX: DETAILED AND BUDGETED ACTION PLAN

WACCA ACTION PLAN																
TOTAL BUDGET: 13,358,909 DOLLARS																
Pillar A: The policy and regulatory framework for development of clean cooking,																
Pillar B: Development of wood energy markets sustainably produced, improved stoves, modern clean alternative fuels																
Result 1: The member countries are supported in the development and implementation of a development strategy of effective clean cooking (PSDSs). 378,607 USD																
	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars
			2015				2016				2017					
			1	2	3	4	1	2	3	4	1	2	3	4		
1.1	Organization of a national consultation to establish a national steering body of the clean cooking development strategy in member countries	Text establishing the Body, its operating procedures and its resources is adopted													-1 Preparatory meeting in each country - 1 international consultant to facilitate the process and draft text developed in each country - 1 validation workshop in each country	98,472
1.2	Define an indicative framework of the national development strategy of clean cooking based on the pillars defined with national action plan	A consensual indicative canvas is developed													-1 Development and validation of a guidance document for the definition and implementation, monitoring and evaluation of SDCP and action plans -1 Meeting Validation	25,466
1.3	The organization of national workshops to launch the preparation / updating of clean cooking development strategy based on the pillars defined with an	Each member country has a SDCP and a validated action plan													-1 National workshop organized by the steering body of SDCP - Work of synthesis and preparation of the body documents	254,669

WACCA ACTION PLAN
TOTAL BUDGET: 13,358,909 US DOLLARS

Pillar C: The promotion of Research / Development for the maturity of efficient technologies and cooking equipment, the definition and implementation of quality assurance systems for cooking

Result 2: an enabling environment for market development and quality assurance system is implemented in the ECOWAS region for the development of clean cooking

8,590,833 USD

	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars
			2015			2016			2017							
			1	2	3	1	2	3	1	2	3	4				
2.1	Establish a center or support center, or the most advanced laboratory in the region for the development and implementation of a program of R / D on the most advanced technologies for clean cooking regional	-1 Center to support is chosen on the basis of criteria -A center of the development plan is developed and implemented (infrastructure, human resources, organization and financial adm. etc.) -A program R / D based on the priority needs of member countries is defined and validated											-1 Consultant to choose the regional center of R / D on clean cooking and preparation of a strategic policy document; - 1 infrastructure project and equipment -1 International consultant to develop an R / D program	7,640,068		
2.2	Develop, validate, test protocols for testing the performance of technologies and clean cooking facilities (including the products concerned by	Effective test protocols available											-Financing R / D for development of protocols -Validation of protocols	509,338		

WACCA ACTION PLAN
TOTAL BUDGET: 13,358,909 DOLLARS

Pillar D: Capacity Building for the development of clean cooking sector in the region

Result 3: actors' capacities are strengthened at the ECOWAS region for the development of clean cooking

3,904,922 USD

	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars
			2015				2016				2017					
			1	2	3	4	1	2	3	4	1	2	3	4		
3.1	Develop and disseminate funding and training manuals on the implementation of all pillars, especially the pillars B and C,	-20 Developed manuals and disseminated by December 2017													-5 International consultants committed	1,018,675
3.2	Organize the sharing of information and experience as well as networking the country level and at the regional level through training workshops, learning visits, etc.	-30 Training workshops 2017													-10 Facilitators consultants -Support participants	848,896
3.3	Implement demonstration test programs in the country-level and regional level	- 3-countries deemed as performing received a demonstration program - 2 Annual Regional fairs (or markets) on clean cooking are organized													-fixed price	2,037,351

WACCA ACTION PLAN
TOTAL BUDGET: 13,358,909 DOLLARS

Pillar E: Access to finance for the development of clean cooking sector in the region

Result 4: funding for clean cooking is promoted

229,879 USD

	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars
			2015				2016				2017					
			1	2	3	4	1	2	3	4	1	2	3	4		
4.1	Develop a private sector engagement strategy to strengthen financing clean cooking sector by leveraging the solutions proposed to address the constraints of the private sector identified in the product market development model; Private sector incentives proposed in the product market development model (grants, tax relief, communication plans financed by the public, etc.).	-All measures to facilitate investment in clean cooking sector are consolidated and popularized in a document for each country and at the regional level													-1 Consultant; - 1 regional workshop mainly targeting employers to better disseminate the opportunities gained through the SDCP	111,035
4.2	Integrate financing clean cooking sector in the process of preparation and implementation of REDD +,	Needs for the development of cooking are funded through the preparation of REDD +													-1 Developing a guidance document for synergy clean cooking REDD + -1 Regional training workshop on	84,889

WACCA ACTION PLAN
TOTAL BUDGET: 13,358,909 DOLLARS

Pillar F: the definition and implementation of a gender strategy for a balanced and equitable development of clean cooking sector

Result 5: gender is taken into account in SDCP ECOWAS region for balanced and equitable development

84,889 USD

	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars				
			2015				2016				2017									
			1	2	3	4	1	2	3	4	1	2	3	4						
5.1	Develop and implement a strategy for taking gender into account in establishing the pillars of the country and regional level	A strategy of inclusion of gender in SDCP and action plans and the countries of the region is developed and implemented																	-1 Consultant on gender and development	84,889
5.2	Establish a monitoring and evaluation of performance in consideration of gender in establishing the pillars at the national and regional level,	Monitoring and evaluation system in place																	-1 Consultant on gender and development	PM
5.3	Capitalization and sharing of experiences and lessons learned from the implementation of the gender strategy in the clean cooking sector in relation to pillar D of the program	-The capital gains due to the inclusion of gender are documented.																	-Support under capitalization	PM

WACCA ACTION PLAN
TOTAL BUDGET: 13,358,909 DOLLARS

Implementation

Result 6: a system for monitoring and evaluation of the SDCP is set up in countries and at the ECOWAS region

169,779 USD

	Activities	Indicators	Calendar (year, quarter)												Elements of the budget	Budget in US dollars
			2015				2016				2017					
			1	2	3	4	1	2	3	4	1	2	3	4		
6.1	Develop and implement a system for monitoring and evaluation of the SDCP at member countries and the region	-A coherent monitoring and evaluation framework between SDCP, country's action plan and WACCA is implemented													- 1 international consultant in planning and monitoring and evaluation - 1 workshop to validate the monitoring and evaluation system	169,779
6.2	Set up a regional database fed by the national databases, reporting system, capitalization and dissemination of achievements,	The monitoring and evaluation manual is available													Supported by the activity 6.1	PM