MECS Modern Energy Cooking Services

Ghana

MECS - Intention for change

# Energy for cooking in Ghana: Analysis of Stakeholder Net-Mapping Exercise


Submitted By

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Loughborough University

ESMAP Energy Sector Management Assistance Program

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# Executive Summary

Modern Energy Cooking Services (MECS) is a programme by the UKAid led by the Loughborough University (UK) to promote the use of modern energy cooking services and fuels such as electricity, liquefied petroleum gas, biogas, and ethanol. The programme is being undertaken in 15 countries in the Global South with specific focus on the promotion of cooking with electricity (e-cooking). E-cooking has the potential to positively influence the achievement of the Sustainable Development Goal 7 (SDG7) through the increased use of modern energy cooking fuels and the reduction in the number of households dependent on solid fuels as their primary cooking fuels. The MECS program believes that "*the transition from biomass to modern energy cooking in a single country will likely occur in the coming together of the policy, the supply chain and the needs of the customers"*.

Key to achieving the mandate of the MECS programme is an understanding of the number of key players present in the MECS space, the roles and responsibilities of these players, and the linkages and coordination between the players in the attainment of MECS goals. This report contains the output of views generated from the net-mapping exercise, which was conducted as part of MECS Ghana activities. The thematic areas that were discussed and covered in this report are:

*The Understanding of MECS in the Ghanaian Context:*

- Through the net-mapping exercise, three (3) distinct views on cooking were provided. Firstly, cooking was described as the application of heat to make food stuffs edible. Secondly cooking was described as the transformation of raw food to edible food without specifying what processes goes into it while thirdly cooking was described as every process that goes into making food edible such as blending, cutting, grinding, etc.
- In understanding MECS importance in Ghana, the reduction or elimination of indoor pollution was cited as the main reason.
- Several modern energy fuels and technologies were noted to be available globally. In Ghana, those that could be promoted in the MECS agenda include electricity, LPG, biogas, electric stoves, microwaves, rice cookers, etc.

*Players in MECS space in Ghana:*

- A number of players were noted to be associated with the cooking sector in Ghana. These players cut across government institutions, NGOs/CSOs, development partners, private sector, and Research and Development institutions. Despite the huge numbers of players identified in the cooking space, only a limited number were identified to be specifically focused on the promotion of modern cooking services. LPG and biofuels were identified as the major fuels of focus. Attention on electricity for cooking has been non-existent, according to stakeholders.

  In terms of linkages between players, a reciprocal relationship was established and measured as either strong, moderate or weak. Players exhibited different types of linkages. For example, government agencies that are better placed in formulating policies on MECS have a weak relation with Research and Development agencies who are supposed to produce evidence-based research works to inform policies.

Research and Development institutions and Development Partners, however, have a strong relationship which is critical for funding the work of Research institutions that produce the evidence needed for policy making.

*The Market Potential of cooking with electricity in Ghana:*

- The market potential for e-cooking in Ghana exists. For instance, there is a growing market of electrical appliances ranging from imported brand new and second-hand appliances such as blenders, water heaters, bread toasters, deep fryers, etc., which should be given attention in order to further the MECS discourse. Socio-economic and environmental effects such as labour saving and less indoor pollution were also identified as factors that can bolster the market potential of MECS in Ghana.
- Yet there are a number of issues that need to be addressed to ensure that the market potential is realised. The cost and stability of electricity supply, cost of appliances, high e-waste from appliances, further research into MECS, and promotion of technologies and sensitization programmes were some of the issues cited in the net-mapping exercise that need to be addressed in the country.

*Policy Environment concerning electricity for cooking:*

- National policies, plans and programmes such as the National Energy Policy, Renewable Energy Master Plan, Ghana Country Action Plan for Clean Cooking, Cylinder Recirculation Model of Distribution and Sustainable Energy for All Action Plan (SE4ALL) on MECS targeting modern cooking fuels such as LPG and biofuels as well as improved and efficient biomass stoves and technologies exist in Ghana.
- No policy exists on e-cooking in Ghana.

*Drivers of MECS in Ghanaian households:*

- Factors such as convenience of use, low indoor pollution, time saving and increased income, were the highest rated driving factors for e-cooking while perceptions of high cost of electricity, lack of policy environment, and electricity safety-related issues were the highest rated constraining factors of e-cooking.
- In terms of LPG, accessibility and ease of use were among the highest rated drivers for its utilisation for cooking, whereas fear and safety of use was the highest rated constraining factor.

*Strategies in relation to electricity for cooking:*

- Proposed strategies useful for the promotion of e-cooking in Ghana included the undertaking of empirical research into e-cooking, embarking on intensive consumer education on e-cooking, developing favourable pricing systems, developing consumer financing schemes and affordable pricing schemes for appliances.

*Recommendations:*

1. Strengthening the linkages and coordination among key players in the MECS space.
2. Developing and implementing a policy focused on e-cooking.
3. Enhancing affordability of electricity and e-cooking appliances

# Contents

# Abbreviations and Acronyms

| | | | |
|---|---|---|---|
| ACEP | Africa Center for Energy Policy | ISEES | Institute for Sustainable Energy and Environmental Solutions |
| AfDB | African Development Bank | ISSER-UG | Institute of Statistical, Social and Environmental Research – University of Ghana |
| AGSI | Association of Ghana Solar Industries | JICA | Japan International Cooperation Agency |
| ASS | Association | KNUST/TCC | Kwame Nkrumah University of Science and Technology – Technology Consultancy Center |
| CCA | Clean Cooking Alliance | LNG | Liquefied Natural Gas |
| COPEC | Chamber of Petroleum Consumers | LPG | Liquefied Petroleum Gas |
| CSIR-IIR | Council for Scientific and Industrial Research – Institute of Industrial Research | MCA | Millennium Challenge Account |
| CSO | Civil Society Organisation | MECS | Modern Energy Cooking Services |
| DANIDA | Danish International Development Agency | MESTI | Ministry of Environment, Science, Technology and Innovation |
| DAASGIFT | Daasgift Quality Foundation | MLNR | Ministry of Lands and Natural Resources |
| Dev't | Development | MMDAs | Metropolitan Municipal and District Assemblies |
| EC | Energy Commission | MoE | Ministry of Energy |
| ECG | Electricity Company of Ghana | MoFA | Ministry of Food and Agriculture |
| EPA | Environmental Protection Agency | NEDCO | Northern Electricity Department |
| ESMAP | Energy Sector Management Assistance Program | NPA | National Petroleum Authority |
| FC | Forestry Commission | NGO | Non-Governmental Organisation |
| GCMC | Ghana Cylinder Manufacturing Company | OMC | Oil Marketing Company |
| GHACCO | Ghana Alliance for Clean Cooking | PURC | Public Utilities and Regulatory Commission |
| GHG | Greenhouse Gas | REAG | Renewable Energy Association of Ghana |
| GIZ | German Society for International Cooperation, Ltd | SDG | Sustainable Development Goals |
| GLIPGOA | Ghana LPG Operators Association | SNV | Netherlands Development Organisation |
| GNPC | Ghana National Petroleum Corporation | STEPRI | Science and Technology Policy Research Institute |
| GNGC | Ghana National Gas Company Limited | SUDRA | Sustainable Development and Relief Associates |
| GSA | Ghana Standard Authority | SYND | Strategic Youth Network for Development |
| GFS | Ghana Fire Service | UENR | University of Energy and Natural Resources |
| Gov't | Government | UN | United Nations |
| GRA | Ghana Revenue Authority | USAID | United States Agency for International Development |
| IPPs | Independent Power Producers | VRA | Volta River Authority |

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# 1 Introduction

Biomass still remains the dominant fuel for cooking by households in most developing countries despite the strides made over the years in transitioning to more improved and modern sources of energy (Sana, Kafando, Dramaix, Meda, & Bouland, 2020). Liquefied Petroleum Gas (LPG) has generally been the focus when it comes to the promotion of modern cooking fuels in the developing world due to the low particulate and monoxide emission levels, its relative abundance as well as low cost compared to others. Other energy sources such natural gas, kerosene, and renewables have also been promoted somehow.

The promotion and use of electricity for cooking (E-cooking) is another important agenda due to its associated benefits. E-cooking can contribute greatly and make a positive impact in achieving the Sustainable Development Goal 7 (SDG7) by increasing the use of modern energy cooking fuels, thus reducing the number of households dependent on biomass and solid fuels as their primary cooking fuels.

MECS is a 5-year programme funded by the UKAid and managed by Loughborough University with significant partnership from the Energy Sector Management Assistance Program -ESMAP- (World Bank). The MECS programme aims to accelerate the global transition from biomass-based cooking to modern energy cooking services to address the clean cooking challenge. Several modern cooking fuels such as liquified petroleum LPG, ethanol, biogas and electricity are addressed under the MECS programme. In addition, the use of electricity as a modern cooking fuel has somewhat not received the needed push unlike improved biomass technologies, and is therefore the focus of the MECS programme. This programme is being implemented in 15 countries in the Global South including Ghana (Energy Sector Management Assistance Program, 2020).

The MECS-Ghana project is a subsidiary of the main MECS programme, hence, operates within the broader MECS framework. The First Phase of the project, spanning over a period of two years seeks to understand, build local knowledge on the dynamics of cooking behaviours and cooking energy services amongst various stakeholders in Ghana.

The net-mapping exercise or activity is one of the key work packages for the MECS Ghana project. This activity made recourse to the *Energy for Cooking Landscape Review Report* (2020) and the *Household Baseline Survey* to determine the participants to include in the exercise. The purpose of the net mapping activity is basically to bring together diverse stakeholders to share their views or opinions on the discourse surrounding cooking especially, modern energy cooking services in the Ghanaian household. The exercise further aims to contribute to the achievement of the main objectives outlined in the MECS-Ghana project document as listed below:

- To successfully engage with varied stakeholders to understand the cooking behaviours and energy usage for different foods prepared by different classes of households in urban Ghana.
- To engage with diverse stakeholders to propose alternative and sustainable alternative modern energy cooking services that are compatible with cultural norms, taste and preferences.
- To experiment and document the efficiency gains of modern energy cooking services versus existing cooking services available to households in urban Ghana.

- To understand the factors that will drive the transition process to the enhanced use of modern cooking services.
- To develop an e-cook book that will provide relevant perspectives on the modern cooking services in order to promote e-cook.

This report continues with Section 2, which gives a description of the methodology adopted for the net-mapping exercise. It also discusses the potential of cooking with electricity by Ghanaian households from the perspectives of the key stakeholders in the cooking and energy sector. In Section 3, the report covers the findings from the stakeholder net-mapping exercise, giving insight on the general perception of cooking and modern cooking services in Ghana and characterising the various elements of the e-cooking socio-technical and policy environment in the country. Section 4 of the report carries the conclusions being drawn, while recommendations for the MECS programme are advanced in Section 5.

# 2 Methodology

A multi-stage approach was adopted for the net-mapping exercise. The activities involved in the approach were categorised into 4 stages, viz. the preparatory stage; stakeholder engagement/net-mapping exercise; synthesis stage and the report writing stage. Figure 2.1 captures these various steps and processes that were undertaken by the team.

Figure 2.1: Stages in the net-mapping exercise


Source: Authors' own construct

The Preparatory Stage involved the planning and feasibility of activities for the net-mapping event considering the prevailing COVID-19 pandemic situation. A list of potential stakeholders was drawn to be part of the net-mapping exercise. These stakeholders included individuals and organisations whose activities and mandates are linked to the use of energy either for cooking or lighting in Ghana and, were deemed capable of contributing meaningfully and extensively to the net-mapping exercise. Among these were government and non-governmental organisations, commercial sector players, private sector players, civil society organisations, academia, and many more.

As part of the planning process for the exercise, a working meeting by the research team was held, in which decisions were taken on the format and the structure to be adopted for the facilitation of the net-mapping exercise given the exigencies of the COVID-19 disease protocols. These included finalisation of the stakeholder list, configuration of the sitting arrangements in the workshop venue, and the approach to facilitate the net-mapping exercise. To ensure that the national COVID-19 safety protocols such as social distancing are adhered to during the net-mapping exercise, stakeholders were put into four clusters to discuss the various topics and questions. Each cluster was made up of a mixture of stakeholders from different organisations (see appendix 12.1 for a list of participating organisations). A table was also set up in the middle of the venue where responses from all participants from the plenary session were collated.

The Preparatory Stage also involved the drafting the question guide (see appendix 12.2). The guide covered the themes that underpinned the discussion: understanding of MECS; the players in MECS space; the market potential of cooking with electricity in Ghana; policy environment concerning electricity for cooking; drivers of MECS in Ghanaian households and strategies in relation to electricity for cooking.

The Second Stage of the net-mapping exercise involved the hosting of stakeholders and running of the net-mapping exercise workshop. The three-hour event was held under strict COVID-19 guidelines and precautions, with participants observing social distancing at a spacious and well-ventilated conference center. The event started with the arrival and registration of participants, who were then directed to their allocated cluster table. A total of 20 participants from various government institutions, non-governmental organisations, commercial sector, private sector, civil society organisations, and academia took part take in the exercise. The questions designed for the exercise were addressed in the plenary and clusters sessions.

The first topic which was the understanding of MECS was addressed in the plenary session in which participants answered the questions on different color sticky notes and signposted the names of their organisations underneath. The various answers produced were then placed under the questions on the flip chart paper at the center of the conference room (See appendix 12.5). The question covered general knowledge of the participants on the understanding of cooking and modern energy cooking services. Also, participants were questioned on their knowledge of the various modern energy cooking fuels and technologies available in general as well as the ones that were available and used in Ghana. Crucially, the participants also discussed the key players in the modern energy cooking services space, classified these players into broad categories (Government Agencies, Private Sector, Research and Development Institutions, Development Partners and CSO's/NGO's), and discussed how these broad categories of players coordinated their activities towards the MECS agenda. By way of measuring the level of

coordination among the players, the participants were asked to rate the inter-relationships among the broad category/classification of players, thus whether there exist weak, medium or strong linkages between the broad categories of players. The participants assigned weak linkages to players who rarely coordinate their activities and this was symbolised by a dotted straight line or circle. Medium linkages are assigned to broad categories of players who somehow coordinate their activities and have limited communications. Medium linkages are symbolised with light straight line or circle. Strong linkages are assigned to broad categories of players who actively coordinate and have joint activities and also have constant communications. Strong linkages are symbolised by thick straight line or circle.

The Third Stage of running this net-mapping exercise involved a synthesis of the results from the stakeholders' feedback during the workshop by the Ghana MECS team. The team had a working meeting on the 20th and 21st May, 2021 whereby the various responses from the plenary and cluster sessions were synthesised according to thematic areas. This involved collating all the responses from the different stakeholders and transferring them onto a master card, depending on the patterns of responses. This process yielded the syntheses on various topics from the different cluster Tables (See Appendix 12.6). These synthesised outcomes have then been transformed into readable diagrams using Word SmartArt to support the analysis.

The Final Stage in the net-mapping process was the writing of the final report. The report brings together all the thoughts, processes and activities that have been carried out during the entire process.

# 3 The Understanding of MECS

This section focuses on the understanding of MECS by first and foremost examining the construction of cooking in the Ghanaian context, and the general understanding surrounding modern energy cooking services. Also, an understanding is elicited from stakeholders' perspectives, their general knowledge on modern cooking fuels and technologies used around the world. We further zoom into those modern energy cooking fuels and technologies that are present and being used in the Ghanaian landscape.

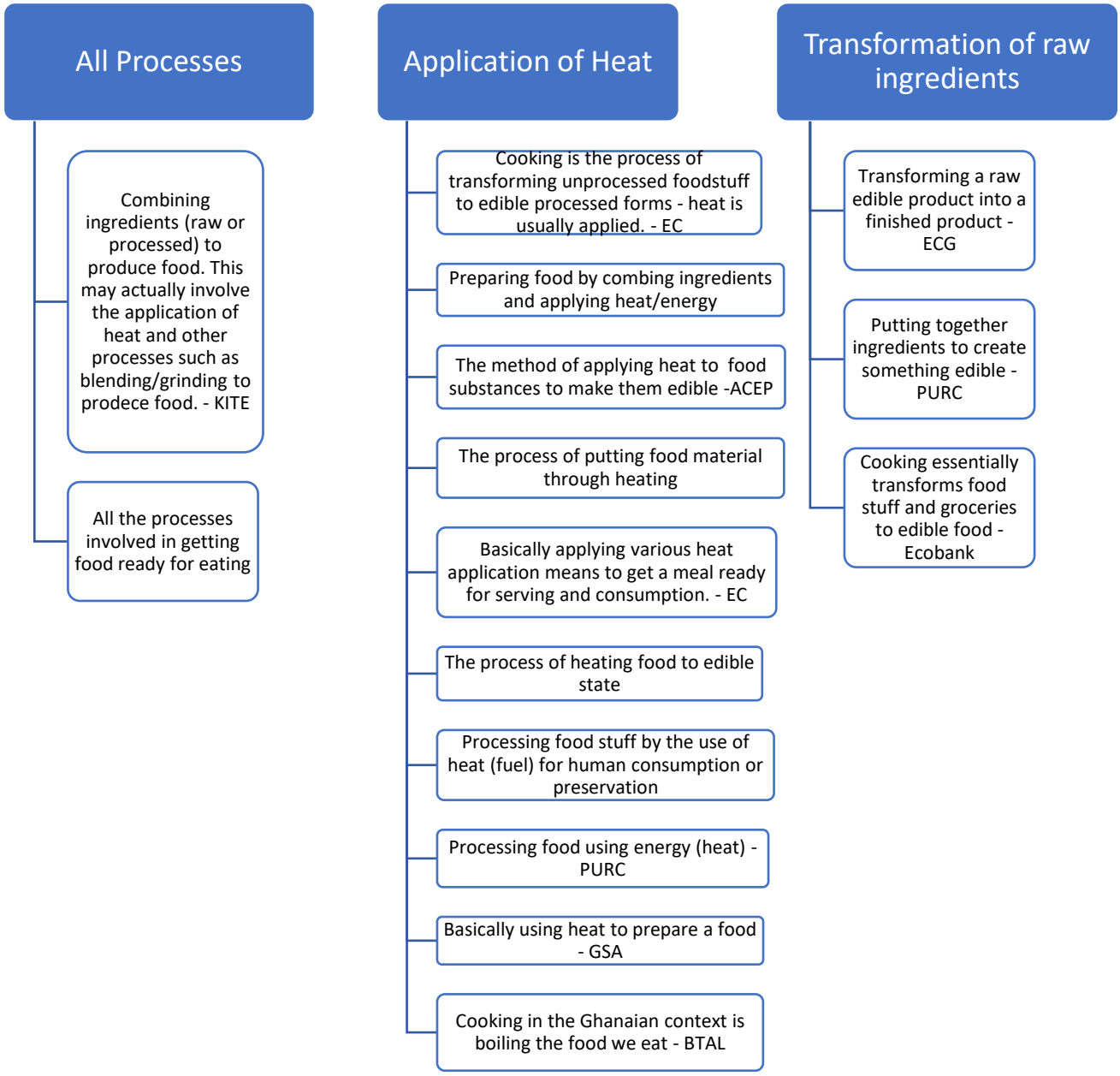
## 3.1 Construction of the Concept of Cooking

Understanding the concept of cooking is very vital for the exercise since it is the premise on which the net-mapping activity is being conducted. Analysis from the stakeholders' responses showed that three distinct views are held in relation to what the concept of cooking is (Figure 3.1).

The first group held the view that cooking involves all the processes that go into getting food ready for eating. This therefore would include the preparation of ingredients and the application of heat to ingredients to get meals ready. A representative from KITE, a research institution was one of the stakeholders that held this view. The second group of responses from stakeholders described cooking as mainly the application of heat to food ingredients in order to get them ready for eating. This conceptualisation of cooking was the dominant concept among stakeholders, with participants from government institutions such as the Energy Commission (EC), Public Utilities and Regulatory

Commission (PURC) and Ghana Standards Authority (GSA) and other non-government institution representatives all aligning with this view. The other set of responses, together construct cooking as the transformation of raw ingredients into edible food. This definition, however, was general and did not give the specific activities or processes that go into cooking. In general, it can be concluded that the application of heat from a fuel to food materials is the main idea, which majority of stakeholders associate with, when the concept of cooking is discussed.

Figure 3. 1: Stakeholders understanding on the concept of cooking



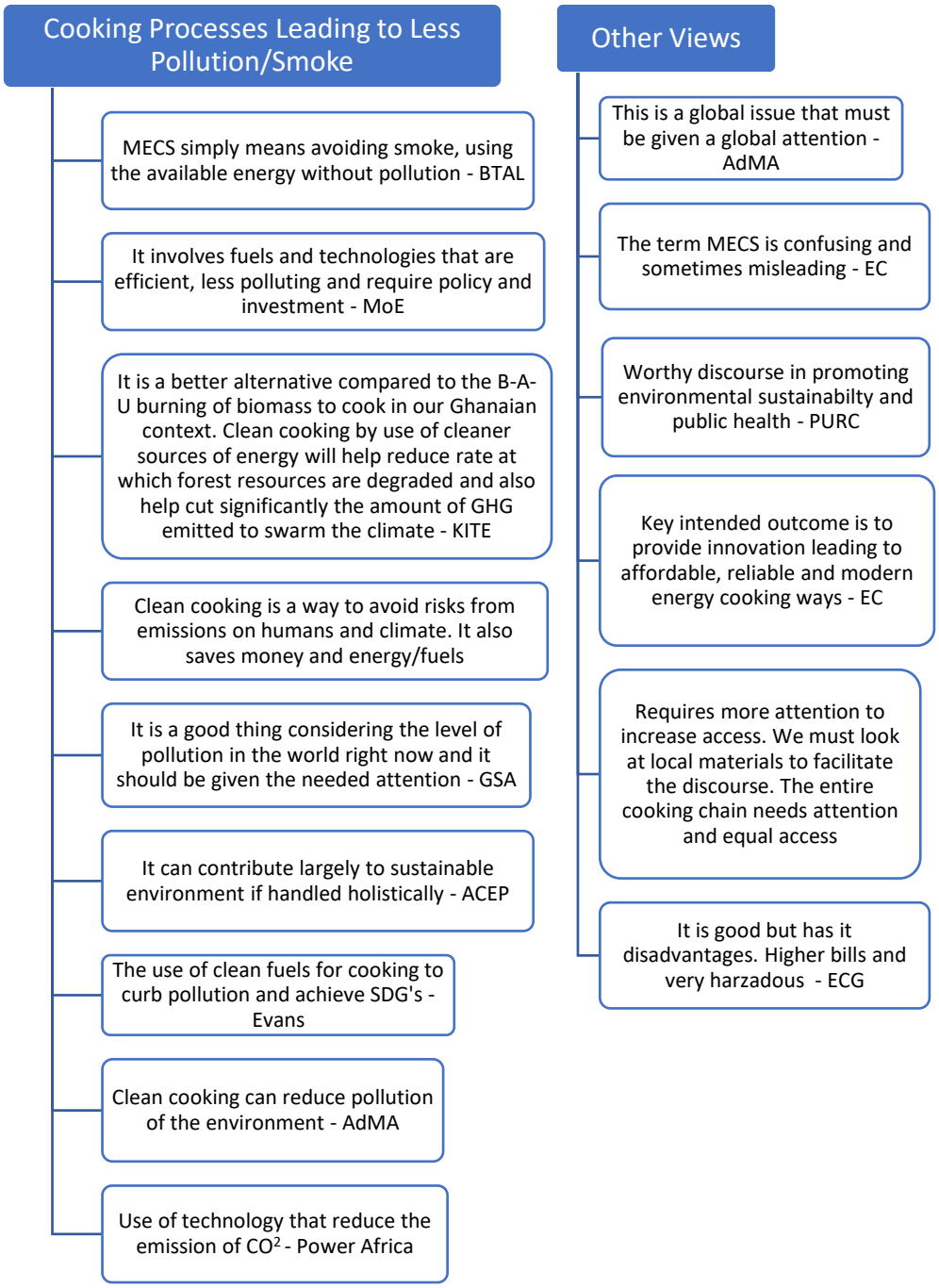

Source: Authors' own construct

## 3.2 General Perspectives on MECS discourse

MECS is a field that has been explored in Ghana by several governments and institutions. The advocacy and promotion of the use of modern energy services such as LPG in Ghanaian households have been ongoing for a long period of time based on the negative effects associated with the use of solid or polluting fuels in cooking. As a result of the importance of this discourse, we sought to examine stakeholders' perspectives and understanding of the MECS discourse as well as their stance on the subject matter.

The reduction or elimination of indoor pollution/smoke in the process of cooking when modern energy services are adopted in households was cited as the most important factor leading to MECS in Ghana. Other factors cited included environmental related issues such as reducing the rate of forest degradation and greenhouse gases (GHGs). Figure 3.2 presents the various views stakeholders expressed about the MECS discourse. Despite the fact that this was a plenary session and stakeholders were to give their individual views, the general consensus on the importance of MECS from the responses gathered shows that the MECS agenda is important considering the current cooking culture in various developing countries in which majority depend on polluting fuels such as firewood.

Figure 3. 2: Stakeholders understanding on the MECS discourse




Source: Authors' own construct

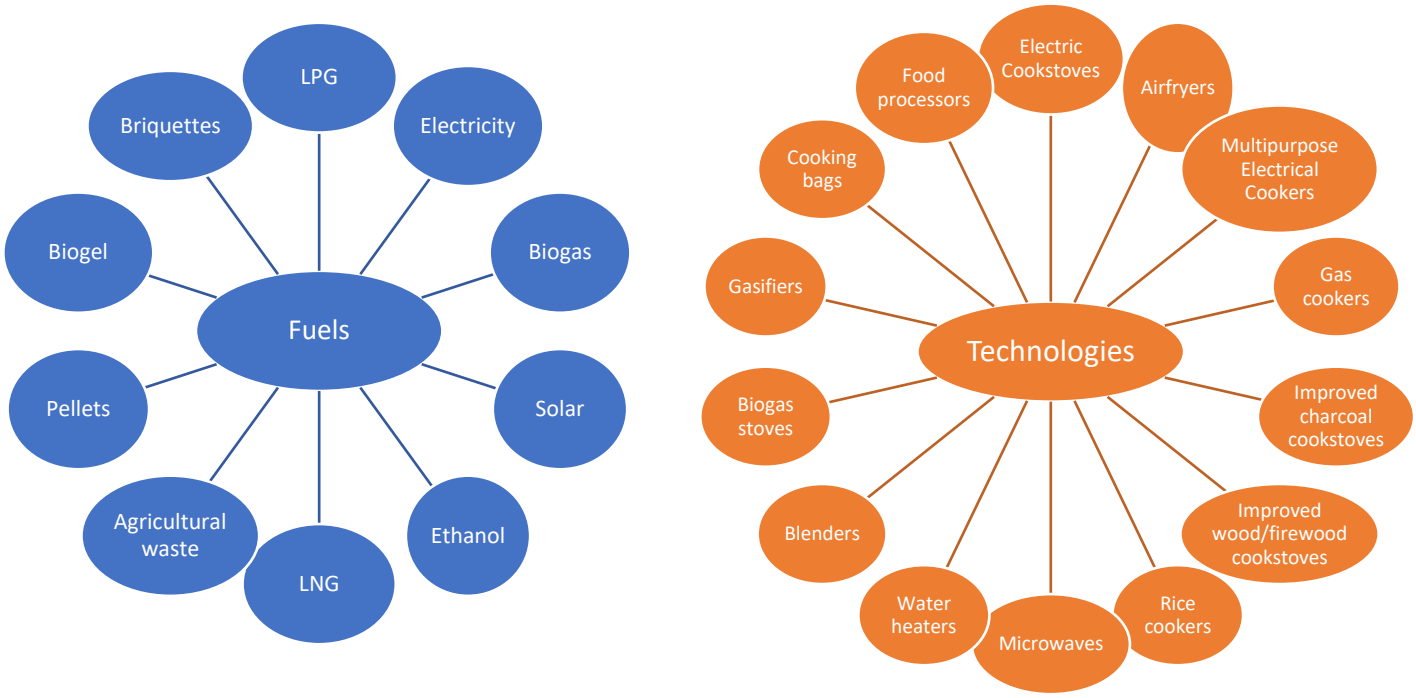
### 3.3 General Knowledge on Modern Cooking Fuels and Technologies

As noted in the previous section, the application of heat is key in the cooking process and considered by majority of the stakeholders as the central factor in cooking. Thus, the technologies being used with these are indispensable to help achieve the end product, hence, the need for stakeholders to share their knowledge on them.

The stakeholders itemised several fuels and technologies when they were asked to share their knowledge on modern energy cooking fuels and technologies that exist in general. Some of these fuels were well known and used across most parts of the world and Ghana. However, others are still being used by a small fraction of society and yet to popularised. The fuels that were listed include LPG, electricity, biogas, solar, ethanol, liquefied natural gas (LNG), agricultural waste, pellets, biogel, and briquettes.

Similarly, the technologies that are used with these fuels are also numerous and not common in every part of the world. Among the various modern energy cooking technologies that were mentioned are electric cookstoves, air fryers, multipurpose electrical cookers, gas cookers, improved charcoal cookstoves, improved wood/fire wood cookstoves, rice cookers, microwaves, water heaters/kettles, blenders, biogas stoves, gasifiers, cooking bags, and food processors (Figure 3.3).

Figure 3. 3 Examples of the various modern cooking fuels and technologies found in general



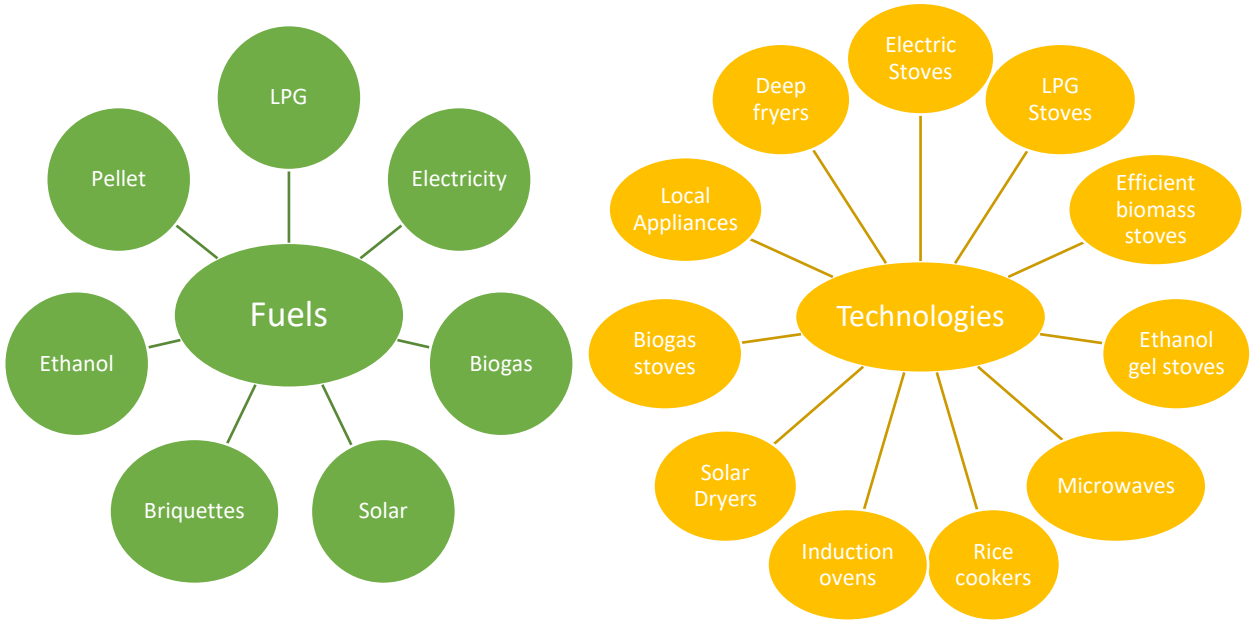

Source: Authors' own construct

### 3.4 Knowledge on Modern Cooking Fuels and Technologies in Ghana

Despite the high dependence on biomass for cooking in Ghana, a number of modern energy fuels and technologies being used by Ghanaian households were identified. These included LPG, electricity, biogas, solar, briquettes, ethanol, and pellets. In the same vein, technologies such as electric stoves, LPG stoves, efficient biomass stoves, ethanol gel stoves, microwaves, rice cookers, induction ovens, solar dryers, biogas stoves, local appliances (such as fufu processing machine and oven), and deep fryers were listed as being used in various households in Ghana (Figure 3.4).

It is therefore clear that the presence of modern energy cooking services are not new in the country. Yet, the use of these MECS is limited to a small percentage of households across the country. For examaple, statistics show that about 25% of households use LPG for cooking whereas on electricity, the indication is that less that 1% of households use electricity for cooking as of 2019 (Energy Commission, 2020). To ensure that more households migrate unto the use of MECS, initiatives such as policies, advocacy /awareness creation on MECS and its associated benefits are needed.

Figure 3. 4 Examples of modern cooking fuels and technologies used in Ghana




Source: Authors' own construct

# 4 Players in the MECS Space in Ghana

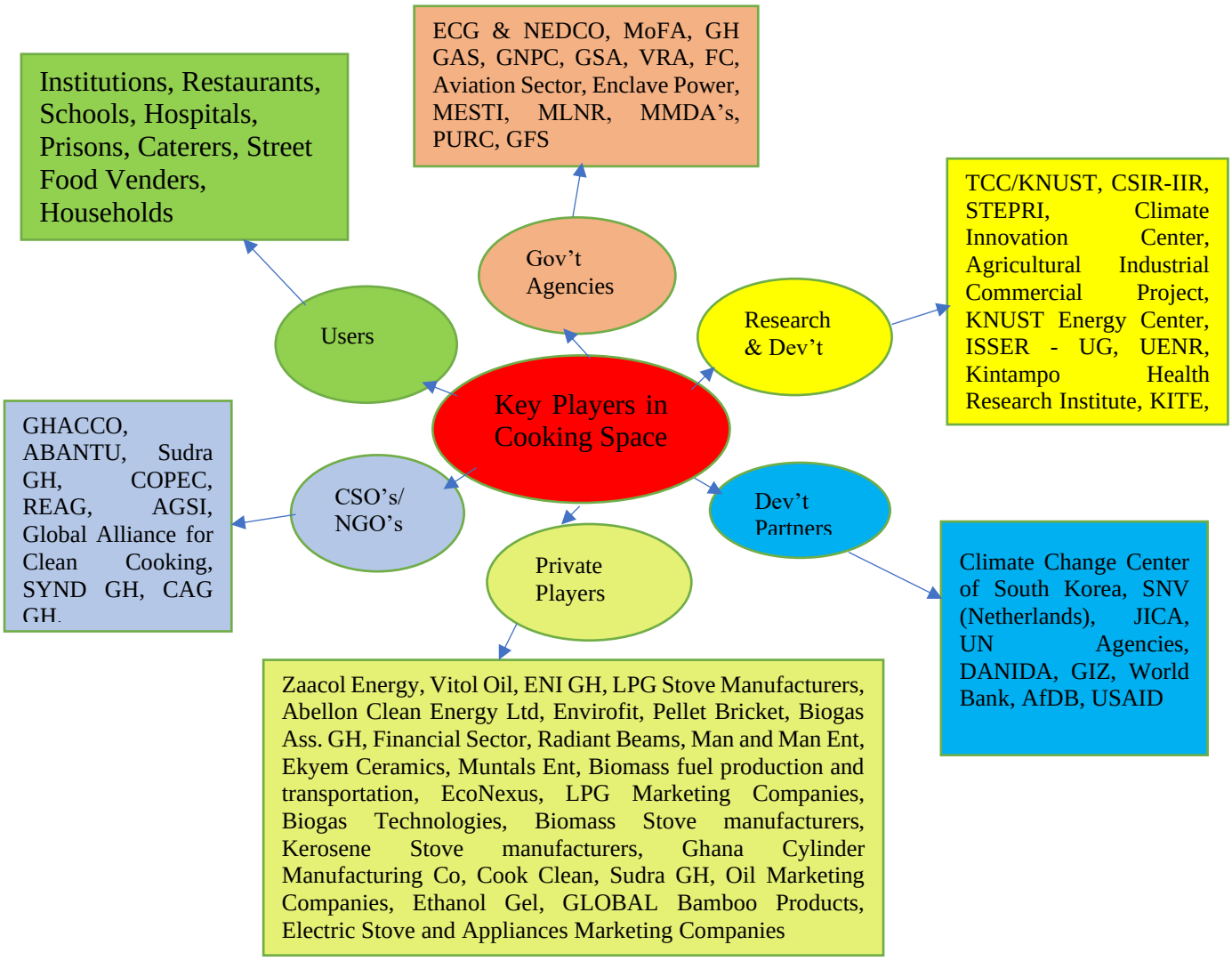
This section looks at the key players in the cooking space in Ghana in relation to fuels and technologies. Specifically, the section analyses how these key players are strongly, moderately, or weakly connected in the cooking space based on different net-mapping outputs. In addition, the section focuses on the key players promoting modern energy cooking services in Ghana and their key mandates related to the promotion of MECS. Using networking visualizations (weak, medium and strong), the section also shows

how aligned the key players' priorities are to MECS agenda, and how much these stakeholders influence policy regarding modern energy cooking services. A Likert scale of 1 to 5, where 1 is no influence, 2 is limited influence, 3 is moderate influence, 4 is important influence and 5 is very important influence, was used to underpin this prioritisation exercise. The section further reports on how weak, medium and strong the level of coordination among these stakeholders are and why. Finally, the section also reveals visual presentations on how the alliances/linkages between the stakeholders promote the use of electricity and LPG.

### 4.1 Key Players in cooking space

Several stakeholders are associated with the cooking sector in Ghana with new stakeholders emerging with the expansion in the MECS discourse. The key players that were identified during the stakeholder engagement exercise were grouped into 6 broad categories. Out of these categories, 5 were identified to be directly involved in the promotion of cooking while 1 group, which was identified as the users, make use of the fuels and technologies that are promoted for cooking (Figure 4.1).

Figure 4. 1: Categories and list of key players in the Cooking Space in Ghana



The 5 major categories that were identified (Figure 4.1) as shaping the cooking space in Ghana are: Government Agencies, Research and Development Agencies, Development Partners, Private Players and Civil Society Organisations and Non-governmental Organisations.

**Government Agencies:** Government agencies are the main institutions that have the mandate and authority to implement policies and also provide the financial support to undertake projects related to MECS. They are therefore key in providing the conducive situation/environment that will support the MECS agenda. Institutions and agencies identified under the government agencies in Ghana are Power and Utilities Agencies, Government Ministries, and Local Government Authorities. Specifically, these are the Electricity Company of Ghana (ECG), Northern Electricity Department (NEDCO), Ministry of Food and Agriculture (MoFA), Ghana National Gas Company Limited (GNGC), Ghana National Petroleum Corporation (GNPC), Ghana Standard Authority (GSA), Volta River Authority VRA), Forestry Commission (FC), Aviation Sector, Enclave Power, Ministry of Environment, Science, Technology and Innovation (MESTI), Ministry of Lands and Natural Resources (MLNR), Ministry of Energy (MoE), Energy Commission (EC), Public Utilities and Regulatory Commission (PURC), Metropolitan, Municipal and District Assemblies (MMDAs) and Ghana Fire Service (GFS).

**Research and development agencies**: These agencies are active in conducting thorough research and development of innovations that are accepted by households to ensure full adoption of innovative and clean energy technologies. They also train and educate on the use of new technologies and programmes related to MECS. Research and development agencies identified as steering activities within the cooking space are: KNUST Energy Center, ISSER-UG, Kintampo Health Research Institute, CSIR-IIR, UENR, STEPRI, Climate Innovation Center, TCC-KNUST, and Agricultural Industrial Commercial Project.

**Development Partners:** Development agencies have constantly provided the financial support and collaborated with several other players through initiating programmes that address the needs and challenges in the world. The UK Aid for example, is the funding organisation for the MECS programme. The development partners listed by the stakeholders are: The Netherlands Development Organisation (SNV), Japan International Cooperation (JICA), Danish International Development Agency (DANIDA), World Bank, USAID, African Development Bank (AfDB), Climate Change Center of South Korea, UN Agencies, and GIZ.

**Private Players:** A number of private players were identified to be involved in the cooking sector as they provide varied services and products to households for their cooking needs. The players that were identified are: Zaacoal Energy, Vitol Oil, ENI GH, LPG Stove Manufacturers, Abellon Clean Energy Ltd, Envirofit, Pellet Bricket, Biogas Association of Ghana, Financial Sector, Radiant Beams, Man and Man Enterprise, Ekyem Ceramics, Muntals Ent, Biomass fuel production and transportation, EcoNexus, LPG Marketing Companies, Biogas Technologies Africa Limited, Biomass stove manufacturers, Kerosene stove manufacturers, Ghana Cylinder Manufacturing Company, Cook Clean, Oil marketing companies, Global Bamboo products, and electric stove and appliances marketing companies.

**Civil Society Organisations and Non-governmental organisations:** These organisations have been providing constant support, advocacy and relief programmes in the cooking sector. The organisations that

were listed by the stakeholders are: Ghana Alliance for Clean Cooking (GHACCO), ABANTU, Sudra GH, Chamber of Petroleum Consumers (COPEC), REAG, AGSI, Global Alliance for Clean Cooking, SYND GH, and CAG GH.

**Users:** Another group that was identified by stakeholders, but which is not directly involved in the promotion of clean cooking fuels nor technologies, is the user group. The user group comprises all the end-users of clean fuel and technology to accomplish their cooking needs such as restaurants, caterers, street food vendors, schools, hospitals, prisons and households. These groups benefit from the end products of the various initiatives and services by the major group of stakeholders that were identified. Yet, indirectly this group contributes to the promotion of MECS through a horizontal linkage by avenues such as word of mouth and demonstrations.

## 4.2 Key Players Promoting MECS in Ghana and Linkages between the Players

Among the various players that were identified to be associated with the cooking sector in Ghana, stakeholders that partook in the net-mapping exercise were required to identified the key players from the various groups whose mandate are directly related to MECS and also rate the strength of the linkages between these stakeholders. The alliances and rate of strength of these key players are shown in Figure 4.2.

Per the specific institutions that are promoting the MECS agenda in Ghana (see Figure 4.1), institutions like the ECG, MoE, EPA, NEDCO, NPA, Ghana Gas, GCMC, and EC were identified as key players under the government agencies. The Private Sector had institutions like Abellon, Sudra GH, Zaacoal, Man and Man Enterprise, CC GH, and Ghana LPG Operators also with their mandate directly linked to MECS agenda. UK Aid, SNV, AfDB, DANIDA, JICA, USAID, World Bank, and GIZ were the development partners providing financial support to advance MECS in Ghana. Research and Development like KNUST/TCC, CSIR-IIR, ISSER-UG, KNUST Energy center have over the years undertaken research and projects that are related to the MECS agenda. CSOs/NGOs like GHACCO, CCA, DAASGIFT were seen to be the main organisations that are promoting through advocacy and awareness of MECS in Ghana.

The linkages between the various groups of key players were measured by looking at how strongly, moderately or weakly they are connected in the cooking space in promoting the MECS agenda. There is a reciprocal relationship between the players as indicated by the use of bi-directional arrows used in the Figure 4.2. The stakeholders concluded that the relationship among government agencies is strong. This therefore enables them to assist or support each other in expanding the MECS agenda. The inter-relationship between government agencies with the Private sector, Development partners and CSOs/NGOs was identified as being medium by stakeholders. However, a weak inter-relationship was identified to exist between government agencies, research and development agencies.

The inter-relationship among players in the private sector in achieving MECS activities was described as medium. However, a weak inter-relationship was identified between the private sector and development partners and research and development agencies. A strong inter-relationship was identified between the private sector and CSOs/NGOs. Strong inter-relationships exist among Development partners and

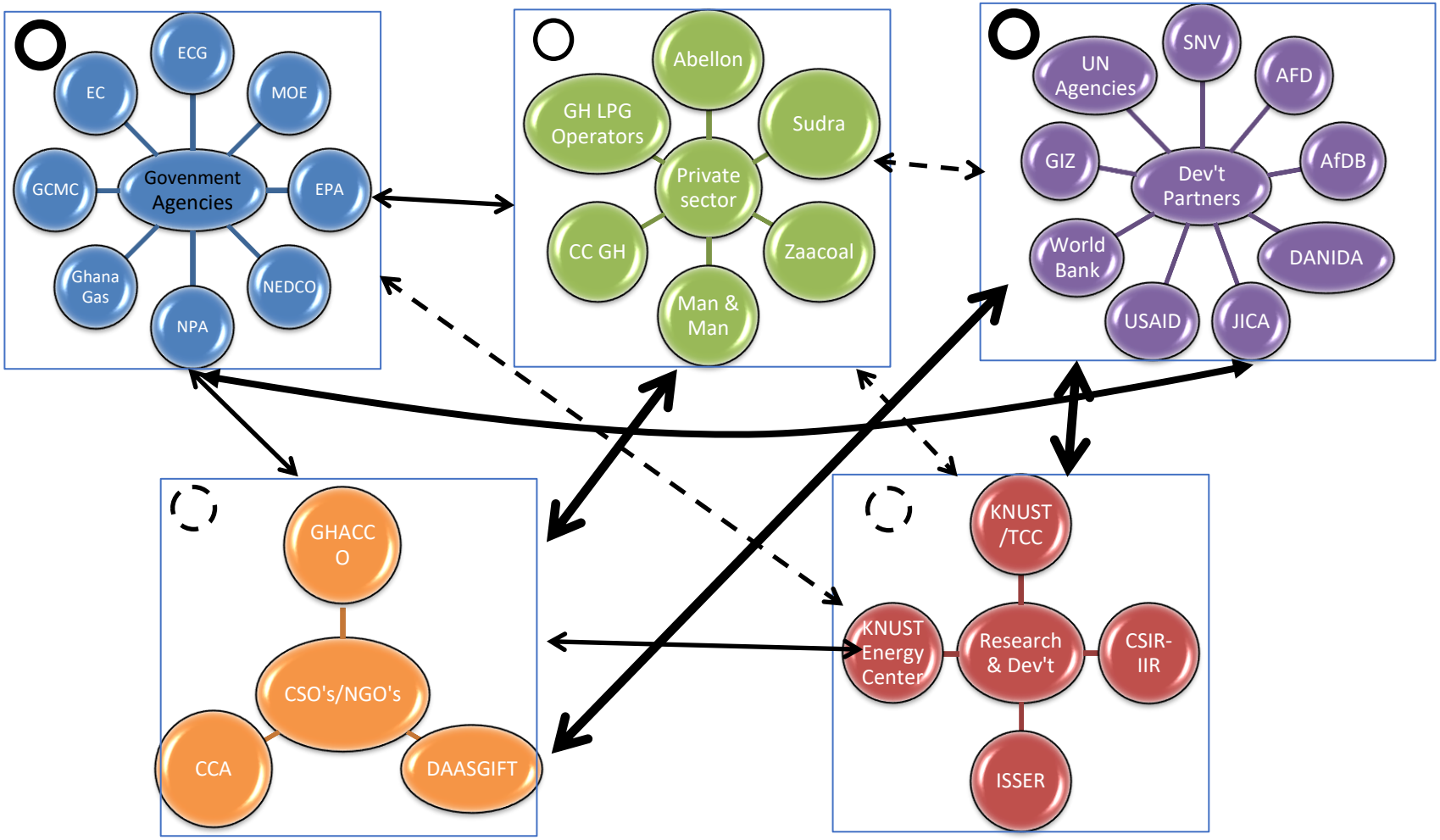
between Research and Development, as well as between CSOs/NGOs, noted by the stakeholders. The inter-relationship between Development Partners and Government agencies was identified as medium. On the other hand, the relationship between Development Partners and the Private Sector was identified as being weak.

Research and Development agencies have a weak relationship among themselves. This same relationship was identified between them and key players in the private sector and government agencies. However, a strong relationship between Research and Development agencies was identified with Development Partners whiles a medium relationship with CSOs/NGOs was also identified.

Finally, between CSOs/NGOs, a weak relationship was identified. A medium relationship was identified to exist between CSOs and NGOs and Government Agencies as well as between Research and Development institutions. A strong relationship, however, was identified to exist between CSOs/NGOs and the Private Sector and Development Partners.

Research and Development Institutions are supposed to produce evidence-based research that informs policies and supports the development of MECS initiatives. A weak linkage between R&D Institutions and government implies weak and ineffective policies targeting the promotion of MECS without adequate research backing, which in most cases are bound to fail. Both parties will need to work to strengthen their interlinkages to ensure effective and research-driven policies to drive the MECS agenda. Also, the mandate of Development Partners in providing the financial assistance to R&D Institutions is important for advancing their research activities towards MECS initiatives. The strong relationship existing between these important groups of stakeholders is one that should be maintained and improved for the promotion of MECS in Ghana. Any weakening in the relationship will thus negatively affect the individual mandates of stakeholders in advancing MECS.

Figure 4. 2: Groups of key players promoting MECS in Ghana depicting their alliances

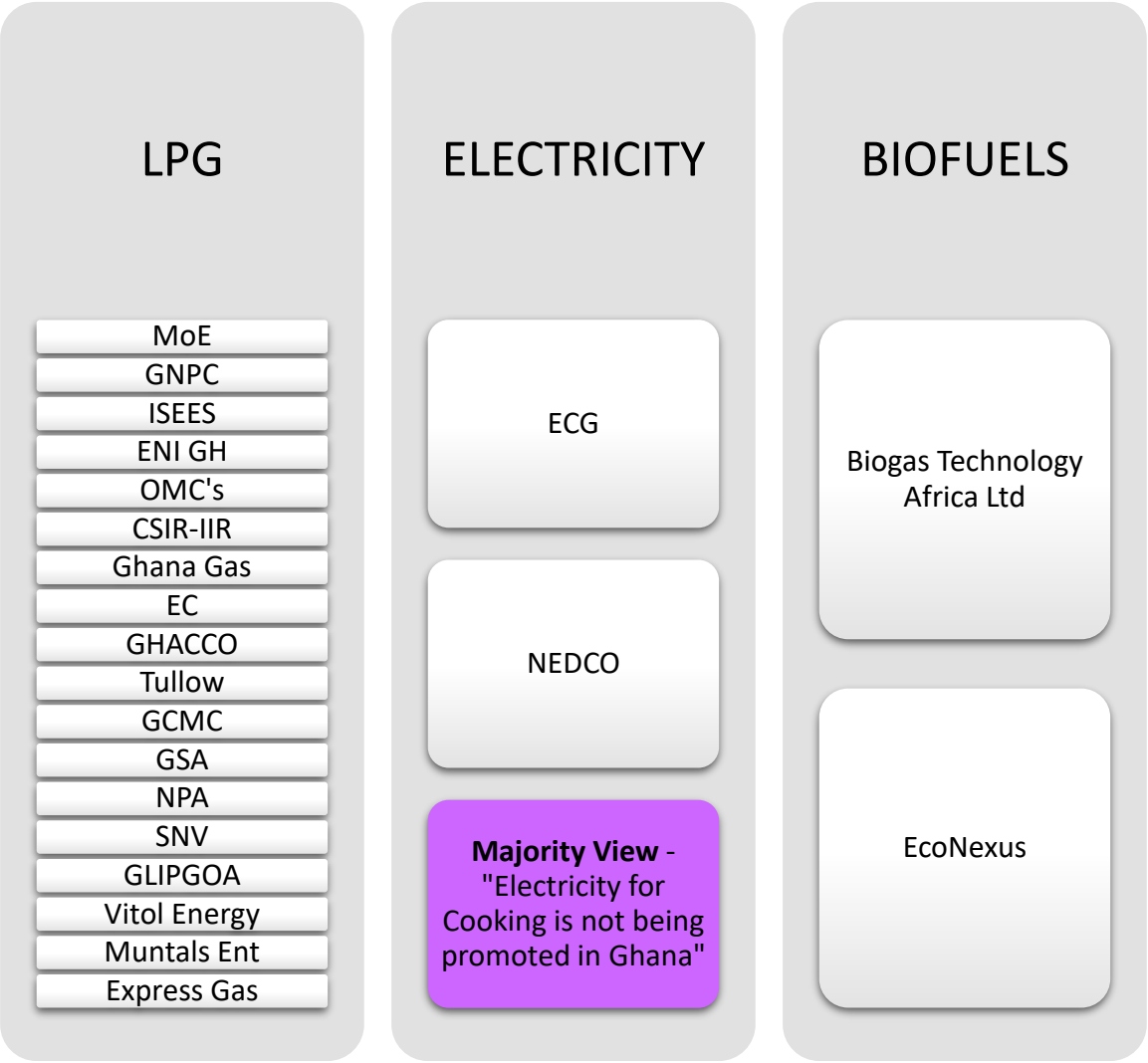



| Legend | |
|---|---|
| | Strong linkage |
| | Medium linkage |
| | Weak linkage |

### 4.3 Players Promoting Specific MECS in Ghana

The existence of the different forms of modern fuels in Ghana suggest that key players might specialize in the promotion of specific fuels as their mandate. Figure 4.3 shows the modern cooking fuels that are being promoted in Ghana and the players that are in charge of these promotional programmes and activities.

Figure 4. 3: Players that are promoting different types of modern fuels in Ghana




Source: Authors' own construct

The participants at the net-mapping exercise concluded that out of the various modern cooking fuels that are presently being used in Ghana, only LPG has received the best promotion and attention from policy makers and other stakeholders. This confirms the present situation in Ghana whereby LPG is the most utilised modern cooking fuel and more so, because majority of the policies and interventions towards clean cooking by the government have favoured it. Some of the players that have been involved in the promotion of LPG are MoE, GNPC, ISEES, CSIR-IIR, GSA, NPA, Vitol Oil, and many others. The use of biofuels

is also receiving some form of promotion mainly from private sector players such as Biogas Technology Africa Ltd and EcoNexus. Views on the utilisation of electricity for cooking was rather inconclusive, with majority of the stakeholders asserting that, electricity for cooking in Ghana has not received any form of promotion and therefore, no player can be identified in its promotion. However, a few were of the view that the provision of electricity by utility companies such as ECG and NEDCO indirectly promote the use of electricity for cooking, since they are the main suppliers of electricity in the country.

### 4.4 MECS Key Player Cluster – Mandate of Key Players, Alignment of Mandate to MECS agenda and the extent of influence of key players on Policy

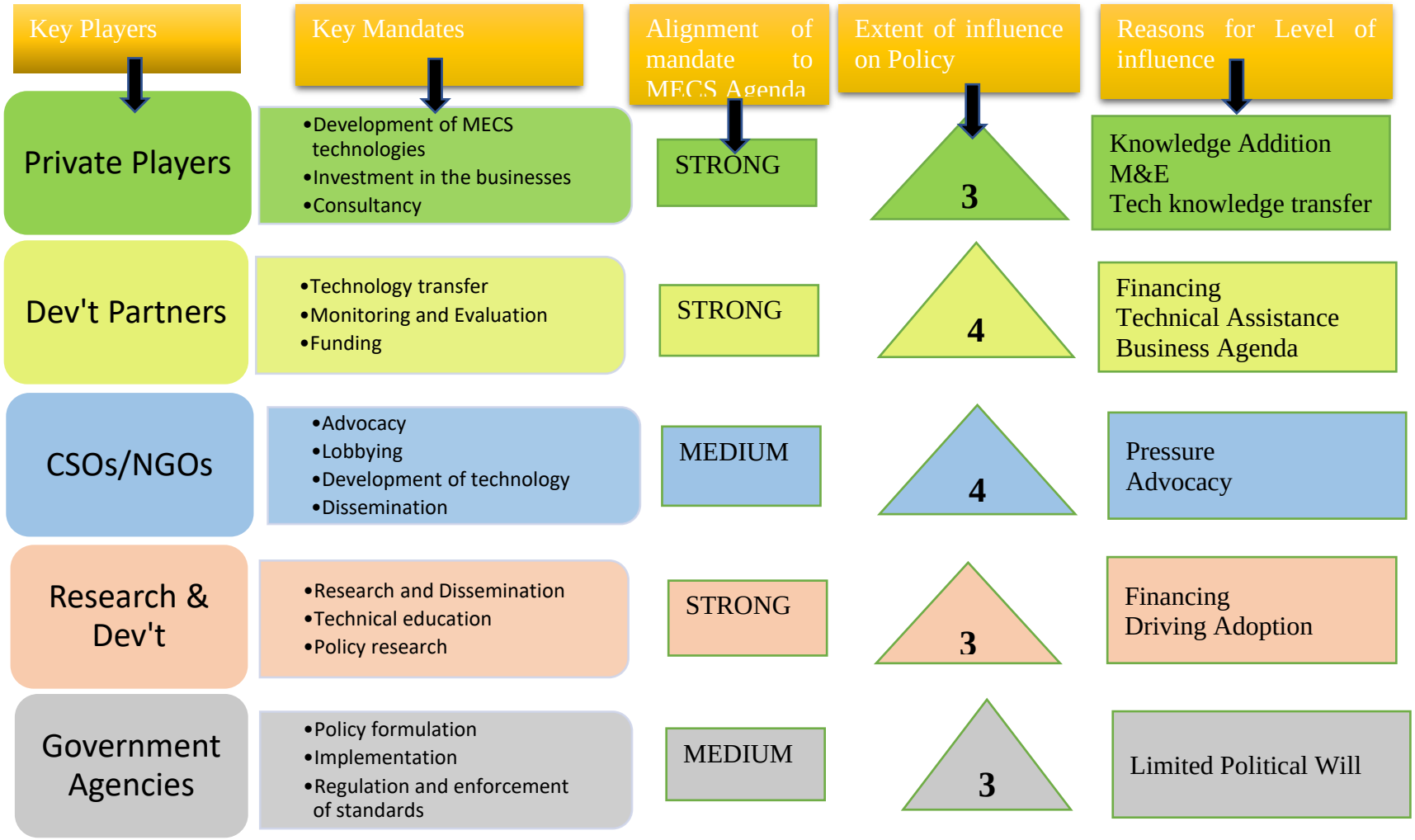
The mandates of various players in the MECS space are important in influencing and driving policy that will promote clean cooking in the country. The net-mapping exercise sought to identify the mandates of the key players, the alignment of these mandates to the MECS agenda and the extent of influence the players have on the policy. The exercise also solicited the reasons accounting for the level of influence on policy. The feedback from stakeholders in response to these thematic issues are depicted in Figure 4.4. The measurement of the extent of influence of the players on policy was undertaken via a Likert scale of 1 to 5: 1 is no influence, 2 is limited influence, 3 is moderate influence, 4 is important influence and 5 is very important influence.

Private Players, Development Partners, and Research Institutions were identified by stakeholders as the key players with the strongest alignment of mandate to the MECS agenda. These groups of stakeholders when given the opportunity to embark on MECS projects are able to successfully ensure its completion and achievement of objectives. Private sector players are noted for investment in businesses that support MECS and provide consultancy services for clean cooking programmes. However, their influence on policy is described as average. Some of the reasons attributed to this is because their mandate is mainly to add onto knowledge, provide monitoring and evaluation services, and technology knowledge transfer.

Despite the mandate of government agencies and CSOs/NGOs to MECS agenda in Ghana, the alignment of their mandates to MECS activities was identified as medium. Stakeholders noted that, government agencies for example, lack the political will to embark on MECS projects even though they are in the best position to push this agenda. This is because they are better placed to formulate and implement policies and also ensure the regulation and enforcement of standards related to MECS activities. Also, CSOs/NGOs through their mandate, are able to put pressure on government agencies through advocacy and lobbying to formulate and implement policies.

From the various mandates that are entrusted to the various groups of players in the MECS space in Ghana, it can be concluded that the success of any clean cooking programme will require the invaluable support of all the players. For instance, the strong alignment of the mandate of Development Partners to MECS and strong influence on policy can be used to strengthen the influence of research institutions on government, which is needed to provide better policy on e-cooking and conducive environment for MECS to thrive.

Figure 4. 4: Cluster of mandate, strength and influence of key players in MECS space in Ghana

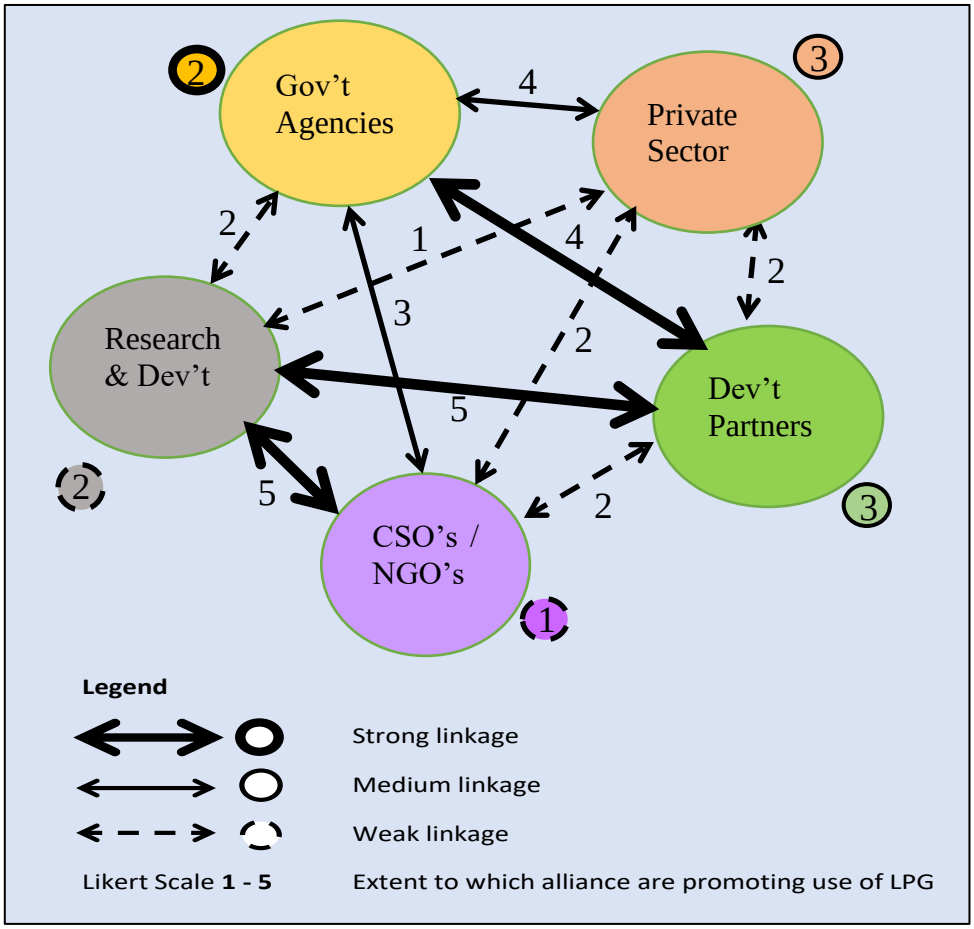



Source: Authors' own construct

### 4.5 Level of Coordination Among key players and the extent to which the alliances are promoting the use of LPG

The net-mapping exercise examined the level of coordination that exists among the players in the MECS space and the extent to which these alliances are promoting the use of clean cooking fuels. There was a consensus among stakeholders that no coordination exists between players in promoting electricity for cooking, since it was not seen as a subject of focus in the country. Figure 4.5 therefore presents issues on the use of LPG for cooking. The bi-directional arrows show that there is a reciprocal relationship between players in the MECS space. Also, the Likert scale (Likert scale 1 to 5, where 1 is very little extent, 2 is little extent, 3 is neutral, 4 is large extent and 5 is very large extent) was used by stakeholder to rank the extent of the alliances between the players in the promotion of LPG for cooking.

Figure 4. 5: Measurement of the coordination among key players and the extent of promoting LPG




Source: Authors' own construct

An overall assessment of the level of coordination among players and within themselves showed a weak relationship. From Figure 4.5, it can be deduced that there is a weak coordination between Private Players and Development Partners, CSOs/NGOs, and Research and Development.

Development partners were however, seen to be have a strong coordination with Government Agencies and Research and Development agencies. Stakeholders attributed this to the provision of funding from the Development Agencies to Government agencies for the support of clean cooking programmes. Government agencies have a strong coordination when dealing with players within the same group while CSOs/NGOs and Research and Development Institutions on the other hand have a weak coordination with other players within the group.

In terms of the strength of the alliances in promoting the use of LPG, the alliances between Research and Development and CSOs/NGOs were ranked the strongest as well as the alliance between Development Partners and Research and Development. The alliance between private sector players and research and development was ranked the weakest. Although some groups of players have been able to establish a strong coordination with other groups and within the groups, the number of weak coordination and linkages between players in the MECS space should be addressed and measures taken to ensure that players are able to improve their relationships so as to achieve the MECS objectives.

# 5 The Market Potential of Cooking with Electricity in Ghana

This section focuses on the market potential of cooking with electricity in Ghana. The net-mapping exercise assessed the following thematic areas: stakeholders' candid opinions on cooking with electricity in Ghana (the possibility or impossibility of this agenda and why); the technologies and/or appliances that are used to cook with electricity in Ghana; the socio-economic and environmental effects of using electricity to cook in Ghana; stakeholders' assessment on the availability and affordability of electricity in Ghana. A Likert scale of 1 to 5, where 1 is strongly disagree, 2 is disagree, 3 is somehow agree, 4 is agree and 5 is strongly agree, served as the tool with which participants rated the extent to which the current electricity supply and pricing systems favor or disadvantage the use of electricity to cook in Ghana.

## 5.1 Stakeholder Opinions on Cooking with Electricity (e-cooking) in Ghana

A key objective of the net-working exercise was to seek stakeholders' opinions on the potential of e-cooking happening in Ghana. Three schools of thoughts emerged from the discussions. The 'possibility group' believe that it is possible for households in Ghana to undertake e-cooking on the basis of all the positive attributes, notwithstanding the negative components (Figure 5.1). The 'possible if...group' feels until certain fundamental pre-condition measures are untaken, there is ambivalence as to whether it is possible for e-cooking to take shape in Ghanaian homes or not. The group supporting the 'impossible' school of thought argued against the possibility of e-cooking taking root in Ghana because of high tariffs and unreliability of electricity supply at present. It is therefore important that such issues are targeted and addressed in order to be able to better sell the idea of e-cooking to all stakeholders and encourage adoption.

Figure 5. 1: Opinions of stakeholders on the possibility of cooking with electricity in Ghana

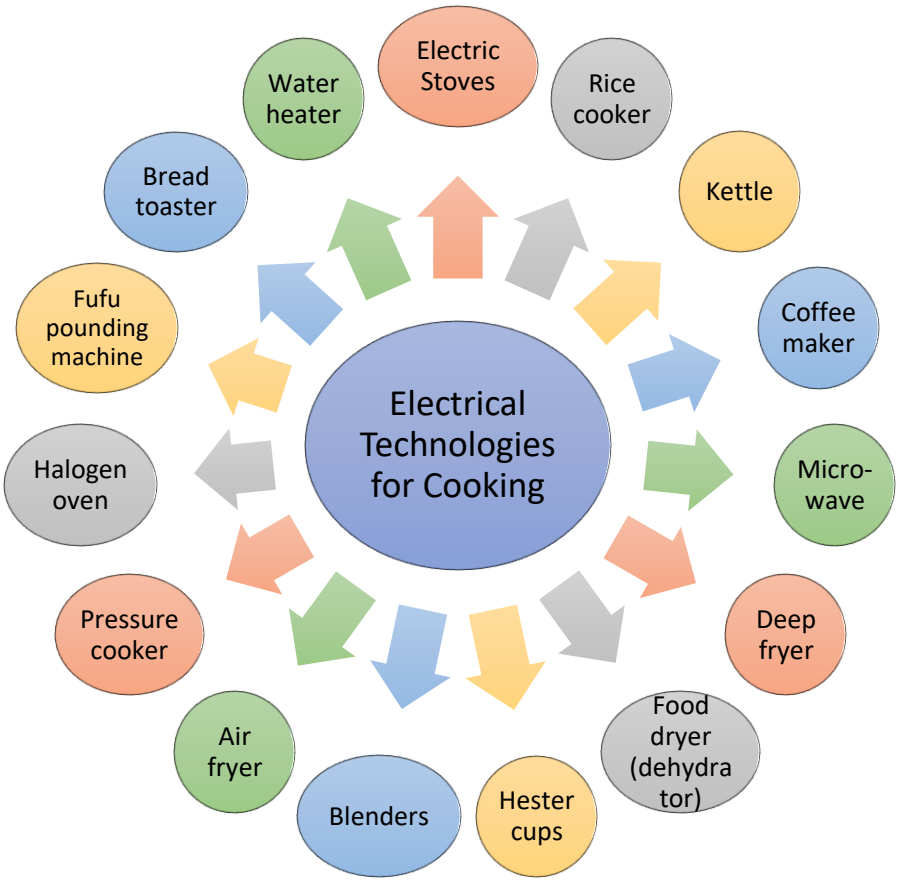
| POSSIBLE | POSSIBLE IF... | IMPOSSIBLE |
|---|---|---|
| • For secondary users since it is already being used<br>• Clean and can save pollution<br>• Electricity affordability is moderate<br>• Labour saving potential<br>• Ease of use<br>• Already happening and driven by technology. More can be done by promoting such technologies and demonstrating to households that it is cheaper and preserve health<br>• Tariffs and electrical appliancies are expensive*<br>• Dangerous, fast and unreliable* | • Research is done to change perceptions<br>• PURC reviews its tarrifs to encourage people to use electricity in cooking<br>• Systems are right<br>• Stability issues, tariffs and reliabilty of supply are reviewed<br>• Electricity becomes affordable and reliable<br>• Renewable energy is pushed<br>• Women alone are not targetted as end-users | • For primary use at the current state<br>• Forget it in Ghana with unrelaible electricity<br>• It is expensive in terms of both tarrifs and technology<br>• Should not be encouraged especially in rural areas |

Source: Authors' own construct

## 5.2 Technologies using Electricity for Cooking in Ghana

In regard to the technologies requiring electricity for cooking in Ghana, several electrical cooking appliances and technologies were identified by stakeholders. These include electric stoves, kettles, blenders, bread toasters and many others that have been developed purposefully for some Ghanaian delicacies, for example, the fufu pounding machine (see Figure 5.2). The varied appliances can be found in various shops and markets around the country. Also, there is a growing market for imported used appliances or 'second-hand' goods in the Ghanaian parlance that offer a wide range of electrical appliances at a much cheaper price than the brand-new products. The awareness creation of the benefits of e-cooking especially, regarding the use of electric stove for cooking in the Ghanaian households has a great potential of succeeding due to the presence of electric appliances and cookstoves in the market.

Figure 5. 2: Various e-cooking technologies/appliances in Ghana.




Source: Authors' own construct

## 5.3 Socio-economic and Environmental effects of cooking with electricity

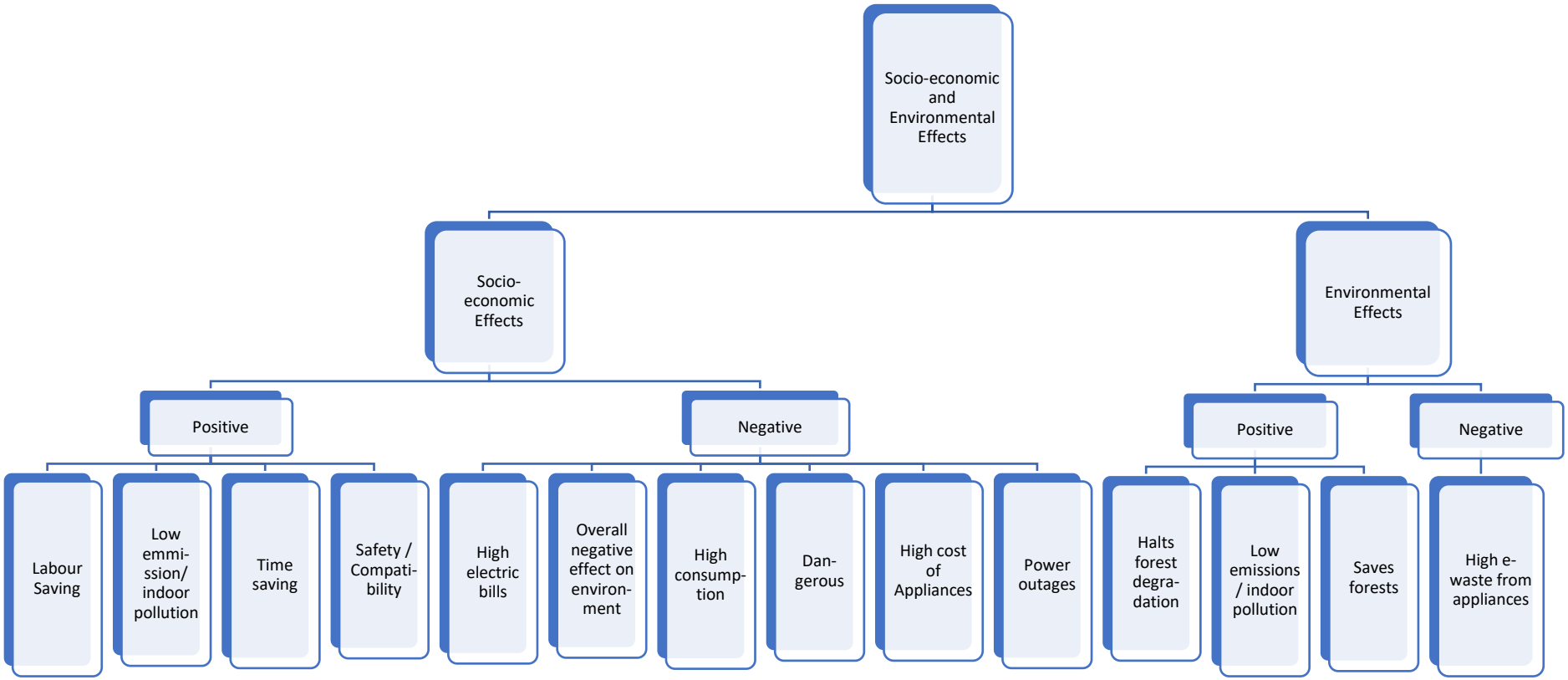
In order to ascertain the various social, economic and environmental factors that might enhance or constraint the utilisation of electricity for cooking in Ghana, the net-mapping exercise engaged stakeholders to identify these factors. Figure 5.3 embodies the aggregated positive and negative socio-economic as well as environmental effects that emerged out of the discussions in the four cluster stakeholder discussion tables.

The socio-economic effects (positive and negative) from the use of electricity were more than environmental effects. Cost and safety of the use of electricity for cooking were some of the major negative socio-economic effects, while conversely, time and labor saving were some of the positive effects.

Low indoor pollution and forest resilience through the reduction trees felling were cited as the dominant positive environmental effects connected with e-cooking. The low emissions/indoor pollution was identified as both a social and an environmental benefit of e-cooking. The stakeholders argued that the levels of pollution through the use of solid fuels or biomass for cooking and it associated health effects on individuals can be tackled or drastically reduced by prioritising e-cooking in Ghana and putting in place all the necessary measures to ensure maximum adoption.

On the other hand, the phenomenon of e-waste production from electrical cooking appliances was cited by stakeholders as a major environmental externality in Ghana due to the lack of appropriate infrastructure for the management e-waste in the country. This challenge, however, is surmountable through strong political will and investment, the stakeholders pointed out.

Figure 5. 3: Socio-economic and Environmental effects associated with cooking electricity

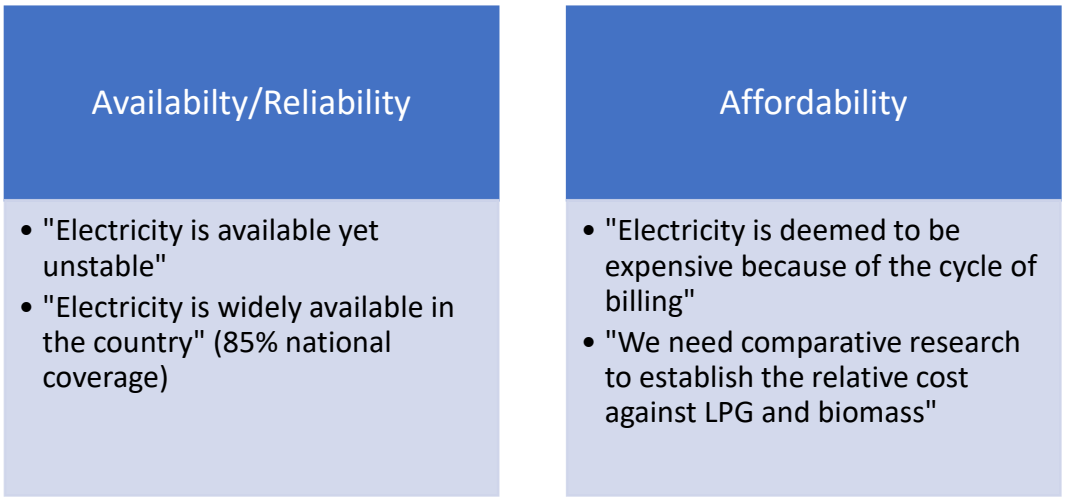



Source: Authors' own construct

## 5.4 Availability and Affordability of Electricity for Cooking

The availability, affordability and reliability of electricity supply are key factors that determine the adoption or non-adoption of electricity as a fuel for cooking. The synthesis of stakeholders' submissions during the net-mapping reveals that various consensus emerged among stakeholders in respect of this thematic issue (Figure 5.4). First and foremost, there was the understanding that most households in Ghana are either connected to the national grid or have access (availability) to electricity given the 85 percent national electricity access. Secondly, it also emerged strongly among stakeholders that the supply of electricity is unreliable and unstable despite it being available. Finally, the cost or monthly tariff was generally deemed expensive for the average household.

Figure 5. 4: Availability and Affordability of electricity for cooking in Ghana




Source: Authors' own construct

## 5.5 The extent to which current electricity supply and pricing system favor cooking with electricity

Once the availability, affordability and reliability perspectives on electricity in Ghana were established, stakeholders were asked to assess the current electricity supply and pricing systems in the country and render accounts as to the extent to which they enhance cooking with electricity. Overwhelmingly and unanimously, stakeholders agreed that the current electricity supply system in the country favors cooking with electricity. However, in a similar fashion, there was a unanimous rejection of the notion that the current pricing system favors cooking with electricity in Ghana. Accordingly, while the supply of electricity has been very high with excess supply in the country in recent years; the pricing system is a cause for concern since most households believe electricity is expensive to be used for domestic cooking. A favourable adjustment of electricity tariffs for consumers and the guarantee of reliable electricity supply to households could foster the advancement of e-cooking agenda in Ghana.

# 6 Policy Environment Concerning Electricity for Cooking

This section focuses on the policy environment concerning electricity for cooking in Ghana. Similar to other themes, the views of stakeholders during the net-mapping exercise were solicited on the following issues: their knowledge on policies/plans that exist in Ghana for the promotion of modern energy cooking services; the main targets in the identified policies that aid in the promotion of modern energy cooking services (fuels and technologies favored in Ghana) and finally; their assessment of whether the identified policies have achieved their intended targets so far or not and why.

## 6.1 Existing Policies and Plans Promoting MECS in Ghana

Figure 6.1 encapsulates the identified policies and plans by stakeholders, which they consider as to be supportive and promote modern cooking fuels such as LPG and biofuels in Ghana. A brief description of the policies in relation to MECS are provided below

Figure 6. 1: Stakeholders' identification of Policies and Plans that Promote MECS in Ghana


Source: Authors' own construct

**National Energy Policy (2010):** The 2010 National Energy Policy targets the promotion of alternative fuels such as LPG as a substitute for biomass by addressing the institutional and market constraints that hamper increasing access to LPG in Ghana. This policy has birthed several programmes and projects on LPG use, such as the introduction of subsidies on LPG. The policy also addresses issues around biomass by promoting the use of improved and efficient biomass utilization technologies.

**Ghana Country Action Plan for Clean Cooking:** The Country Action Plan for Clean Cooking is intended to act in support of the achievement of the global goal of 100 million households adopting clean cooking solutions by 2020. Major strategies, interventions and opportunities for clean cooking in Ghana are proposed with a few highlighted. Actions are divided into two separate groups:

- Phase I Actions: actions that will help urban, low and middle income families move from charcoal dependence to clean fuels such as LPG and/or from moderate efficiency, high emissions cookstoves to high efficiency, low emissions cookstoves.
- Phase II Actions: actions that will build upon the work done in Phase I to set the stage for actions in reaching rural, low-income families who are currently dependent on collected fuel wood for cooking and transitioning this population to increased efficiency wood cookstoves and, dependent on the success of Phase I, moving this population towards the adoption of cleaner fuels (Energy Commission & Global Alliance for Clean Cookstoves, n.d.).

**Cylinder Recirculation Model of Distribution (CRM):** The CRM is the implementation model of the National LPG policy aimed at providing direction for marketing and distribution of LPG in a safe and efficient manner, so as to facilitate an increase in LPG nationwide. The target of the CRM is to ensure that at least 50% of Ghanaians have access to safe, clean and environmentally friendly LPG by 2030. The CRM will also ensure safety in the use of LPG by households by producing cylinders based on the established standards by Ghana Standard Authority (GSA) in order to aid adoption and boost confidence in usage.

**SE4All Action Plan (2012):** This is a global initiative that advocates for the provision of universal access to modern energy services. The Ghana SE4ALL Action Plan targets LPG and improved cookstoves use in the country. Specifically, the goal of the plan towards clean cooking is to ensure that all households using biomass for cooking will use improved energy saving cookstoves for cooking and with an efficiency of 30% in Ghana.

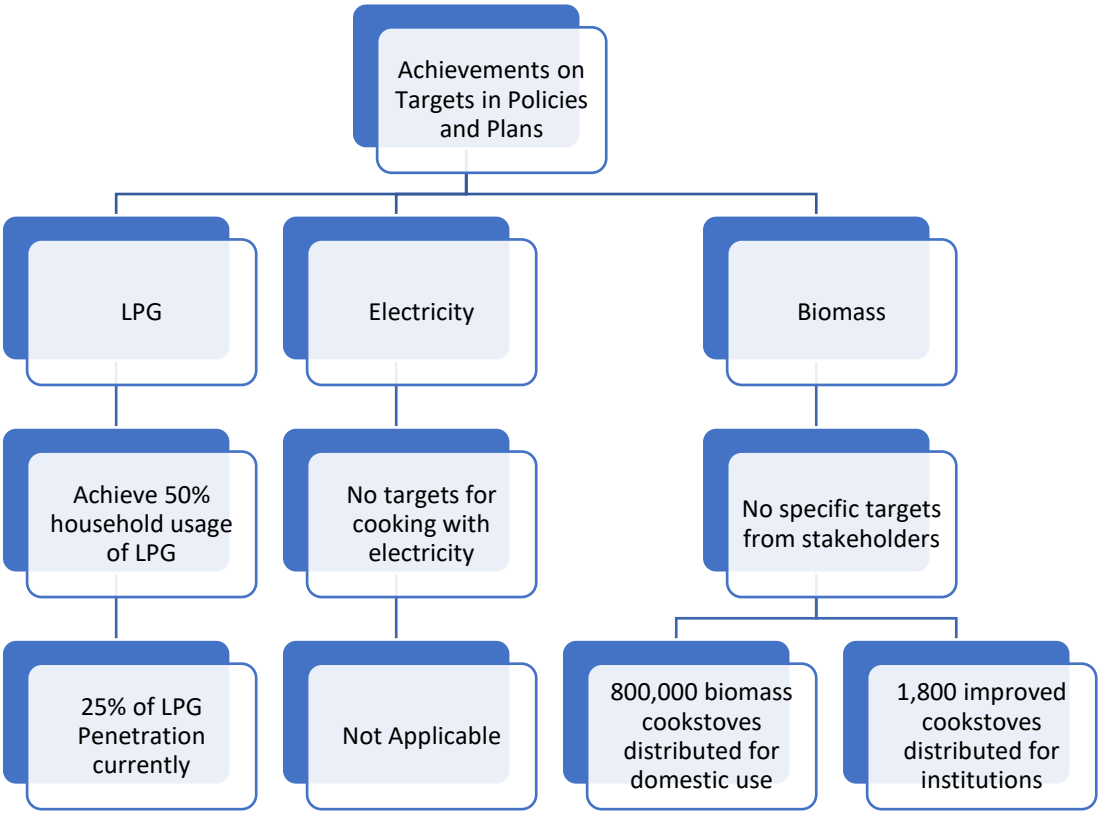
**Renewable Energy Master Plan (2019):** The implementation of the Renewable Energy Master Plan was started in 2020 and is planned to run till 2030. In terms of cooking, it aims at reducing the dependence on biomass as the main fuel for thermal energy applications. One of the strategies that would lead to the achievement of the goals of the plan is making use of the abundance of biomass in Ghana by developing knowledge through research and development of biomass technologies for the production of solid fuels such as sustainable charcoal, pellets and briquettes. Some of the proposed interventions also include energy efficient conversion (improved kilns, pelleting and briquetting equipment, etc.) and end-use devices (improved cookstoves, efficient boilers, etc.).

The stakeholders agreed generally that, none of the policies and plans specifically target the use of electricity in the country for cooking. This is therefore a manifestation that there is a great neglect in the existing policies and plans as far as the promotion of cooking with electricity is concerned.

## 6.2 Targets and Achievement of Policies/Plans on MECS

The energy policies and plans in Ghana have sections that concern cooking with set targets, goals and strategies laid out to be followed. Most of the targets revolving around modern energy fuels, however, are directed at the use of LPG. No target has been set for cooking with electricity as the policies and plans do not explicitly promote the use of electricity for cooking. According to the participants at the net-mapping workshop and per national statistics, the national LPG strategy has been able to achieve 25% of household access and usage out of the 50% target that was set. Figure 6.2 captures the aggregate ratings on the achievement of set targets in various energy policies and plans for specific modern cooking fuels and services in Ghana by stakeholders. With the promotion of MECS in Ghana, it is imperative that there is a formulation of specific policies to support the promotion of e-cooking.

Figure 6. 2: Achievement of set targets in Policies/Plans for specific modern fuels and services




Source: Authors' own construct

# 7 Drivers and Constraints of MECS in the Ghanaian Household

This section addresses the drivers of adoption of MECS in the Ghanaian households. Specifically, the section focuses on the factors that motivate or demotivate the use of electricity and other modern cooking fuels such as LPG in various households. The discussion also embodies the extent of the strength of the driving factors using a Likert scale of 1 to 10.

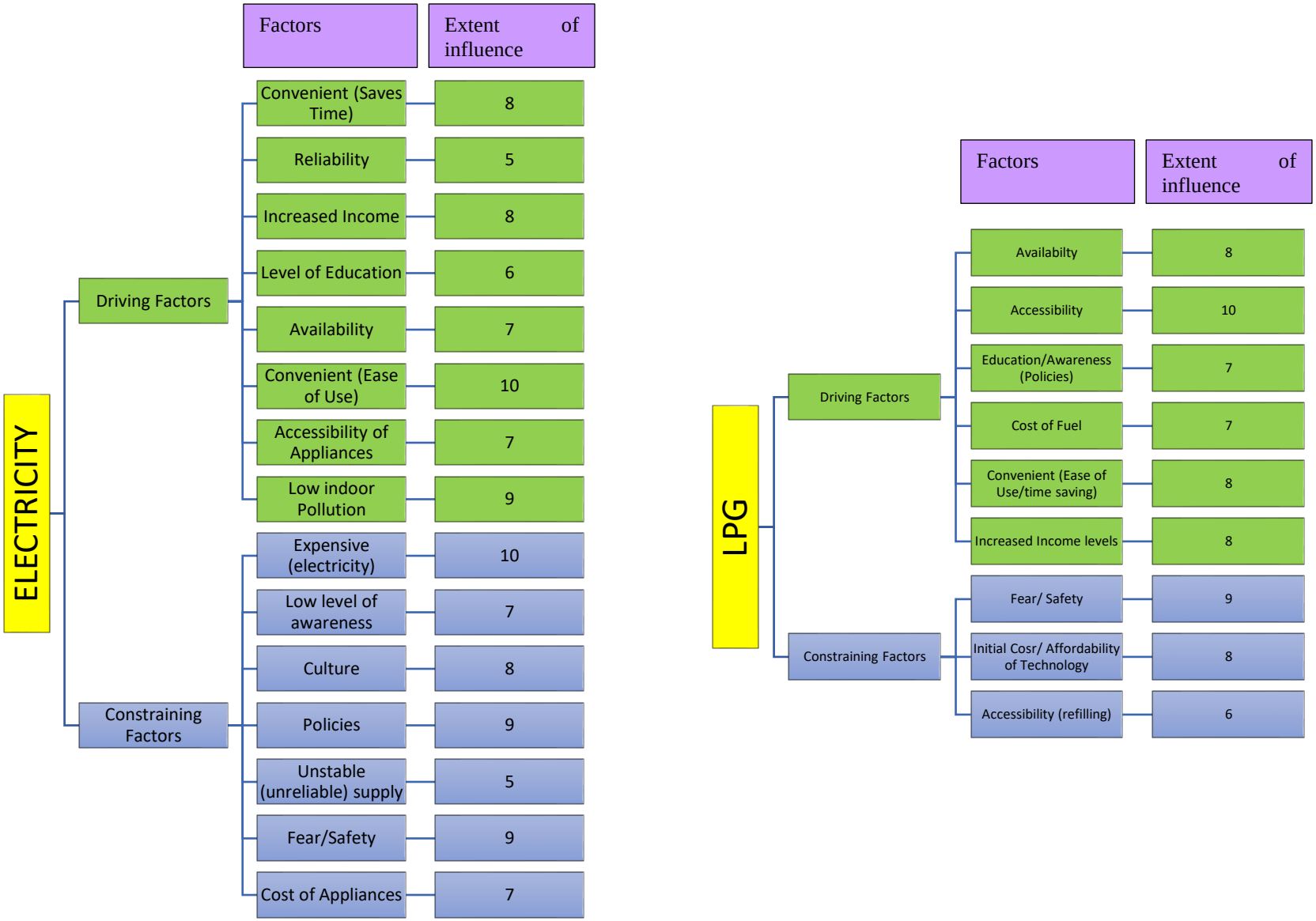
## 7.1 Factors driving and constraining the use of electricity for cooking and the extent of influence factors

Several factors were identified by the stakeholders during the net-mapping exercise as the driving forces for the use or non-use of electricity to cook various meals in Ghana as captured in Figure 7.1. These included one's level of education, increased income, accessibility to electrical appliances and so on. A review of the numerous drivers identified revealed that, convenience in term of ease of use of electricity for cooking is rated as the highest driver for e-cooking. The constraining factors to the utilisation of electricity for cooking on the other hand included unreliable supply of electricity, lack of policies backing e-cooking, cost of electricity and appliance (expensive) and fear and safety in use. Cost as a constraint was ranked the highest by stakeholders as obstructing households from adopting e-cooking.

## 7.2 Factors driving and constraining the use of LPG for cooking and the extent of influence factors.

In terms of the LPG, accessibility, availability, low cost compared to other fuels and increase in income levels were enumerated by the stakeholders as some of the key factors driving the use of LPG (Figure 7.1). Accessibility was ranked as the leading factor that influences the adoption of LPG. Whereas the constraints identified were the initial cost and affordability of LPG appliances and cookstoves, fear and safety of use and difficulty in refilling fuel were the key factors that deter households form adopting LPG. The barrier to the adoption of LPG for cooking that had the highest ranking is fear and safety in use. This has come about due to the numerous reported incidents of fire outbreaks in homes as a result of faulty valves and deficient cylinders for cooking.

Figure 7. 1: Factors driving and constraining the use of electricity and LPG for cooking and the extent of influence of the factors

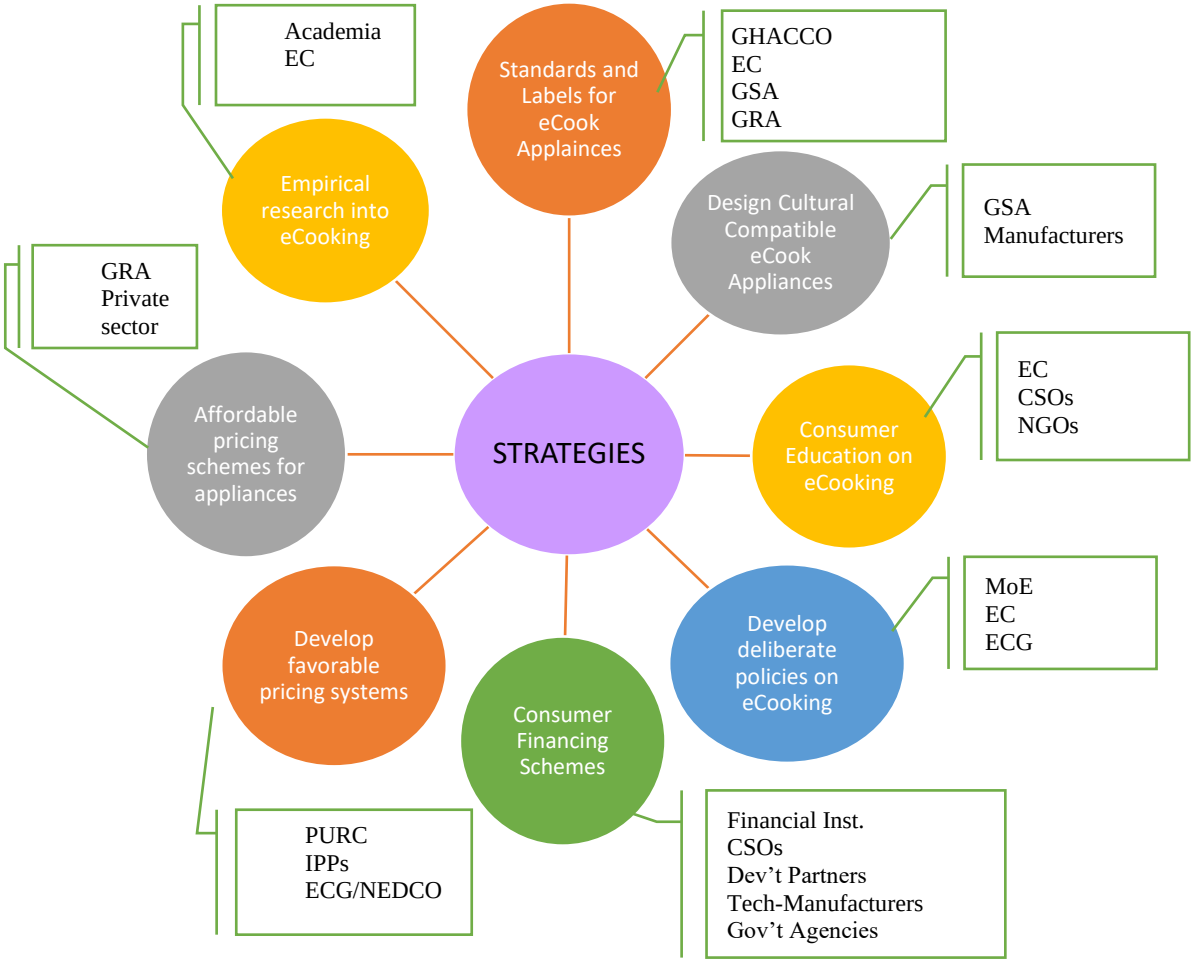



Source: Authors' own construct

# 8 Strategies in relation to electricity for cooking (e-Cooking)

The final section of the report focuses on the strategies that stakeholders proposed to enhance the adoption of e-cooking and the identified responsible agencies to push the agenda in Ghana. The various responses from stakeholders are depicted in Figure 8.1.

Figure 8. 1: Strategies to be adopted in promoting e-Cooking and responsible agencies in Ghana




Source: Authors' own construct

**Standards and Labels for e-cook appliances** – Energy efficient appliances are important for the promotion of e-cooking since they boost consumer confidence in the types of appliances that are in circulation. According to the stakeholders, energy-efficient standards, schemes and labeling programmes for all appliances imported and manufactured in the country are therefore critical for the acceleration of the MECS programme. The stakeholders finally recommended that GHACCO, EC, GSA and GRA should championthis strategy in order for success to prevail.

**Design culturally compatible e-cook appliances** – Cultural processes in the preparation of staple foods by households are factors that need to be considered in the MECS agenda. The appliances used in e-cooking should cater for and incorporate the traditional ways of preparing food. The stakeholders noted that compatible innovations are essential for the enhancement of MECS since culturally, households are usually accustomed to certain ways of cooking and usually find it difficult to adopt new technologies that are incompatible. GSA and manufacturers were recommended as the key champions of this strategy.

**Consumer education on e-cooking** – Education and advocacy are critical to disseminating the message on e-cooking to households and getting them to understand and get onboard the agenda. Most households are misinformed about the use of electricity for cooking, holding on to incorrect messages and speculations which can be clarified through advocacy and educational programmes. The stakeholders recommended the EC, CSOs and NGOs to lead in advancing this strategy.

**Develop deliberate policies on e-cooking and favourable pricing** – The lack of policies on e-cooking is a major problem in the promotion of e-cooking services in the country. The right and appropriate policies aimed at energy efficiency, cost saving initiatives that are beneficial to households were some of the major steps the stakeholders proposed for e-cooking advancement in Ghana. PURC, IPPs, EC/NEDCO, GRA and the private sector players were proposed by stakeholders to promote this strategy.

**Consumer financing schemes** – Financing schemes on e-cook technologies specifically, on appliances including, loans, credit buying, subsidies, hire purchases and short-term repayment modes are strategies that can boost the achievement of e-cook targets in the country, the stakeholders recounted. They equally proposed the following institutions to steer the success of this strategy: financial institutions, CSOs, development partners, technology manufacturers and government agencies.

**Empirical research into e-cooking** – Research is an area that cannot be overlooked for the success of any project. It is important to understand the cooking economy of households in relation to their livelihoods in order to provide the possible best solutions. The academia and EC were identified by the stakeholders, to promote this agenda for MECS in Ghana.

# 9 Conclusion

The net-mapping exercise was able to identify the players in the cooking space and those promoting MECS in Ghana generally. Despite all the contributions that these players make towards the MECS agenda, they can be identified based on their specific mandate and responsibilities and are categorised into five distinct groupings. For example, players responsible for the formulation of policy, implementation and setting the enabling environment for MECS such as the MoE and PURC were categorised under Government agencies. The other categorisations of players were the CSOs/NGOs, Private Sector Players, Development Partners and Research and Development Organisations.

However, it was realized that despite the importance of players working together to promote MECS, there are very weak linkages and coordination among some of the players and even within the same group of players. Although some players such as Development Partners and Research and Development Organisations were rated as showing strong linkages in advancing MECS agenda, there is the need for the players to work together effectively in achieving the general goals and objectives of MECS.

Pursuance of e-cooking in Ghana is a viable option in the MECS initiative. There is an already existing market for electric appliances in Ghana with households already using varying appliances such as blenders, microwave ovens, rice cookers, water heaters and many more on a daily basis for cooking process. Also, the availability of electricity supply in the country is another leveraging factor in the promotion of e-cooking in Ghana. However, despite the availability of electricity in the country, there is an unstable supply to households. The high cost of appliances and fuels, unstable power supply, etc., are issues that can be resolved with strategic initiatives such as affordable pricing schemes, consumer education on e-cooking, instituting standards and labels for e-cook appliance and several other strategies. The lack of policies targeted at e-cooking is one of the important factors that needs to be addressed by all the relevant players especially the government agencies. Successful implementation of the MECS programme requires the joint coordination of all the key players in the MECS spaces in addressing the issues raised as well as amplifying the driving factors to the reach of the users of MECS.

# 10 Recommendations

A number of recommendations were offered by stakeholders during the net-mapping exercise in respect of how the implementation of the MECS programme in Ghana especially, the e-cooking initiative can succeed.

1. **Strengthen the linkages and coordination among key players in the MECS space**

There were quite a number of players that were identified to be involved in the promotion of MECS in Ghana. Each of these players have specific and specialised roles they perform in the dissemination of

messages on MECS. Thus, MECS Ghana programme should organise periodic programmes to reinforce the coordination between these stakeholders apropos of MECS agenda. In addition, practical initiatives and projects that allow the various players to give their inputs and work together should be undertaken to strengthen the coordination among them.

2. **Develop and Implement a Policy focused on e-cooking in the country**

Ghana has a National Energy policy, that has leveraged the development of several other policies, action plans, strategies and programmes targeted at cooking fuels for households. Among such policies and plans are the Ghana Liquefied Petroleum Gas Promotion Programme and Ghana Country Action Plan for Clean Cooking, which have targeted biomass, LPG, and biogas. It is, therefore imperative that the government develops a policy that would target the promotion of e-cooking in Ghana. There are a host of stakeholders from different sections of the cooking space with viable propositions that can be harnessed in the development of these policies. Research Institution, CSOs and NGOs have worked on MECS and e-cooking and have churned out useful reports and information as well as practical examples of areas/countries that have been able to successfully implement e-cooking programmes. These practical examples can serve as sources of reference for the development of workable e-cooking policy and strategy for Ghana.

3. **Enhance affordability of electricity and e-cooking appliances**

The cost of electricity and electrical appliances is one of the cardinal factors that was noted as deterring households from adopting e-cooking practices and technologies in Ghana. The economic situation in most development countries is a cause of concern as it strongly influences the purchase of goods and services. Key players in the MECS space such as government agencies and officials have a duty of providing favorable environment that promotes e-cooking by addressing the documented financial barriers. A measure such as subsidy on electricity supply to households is one of the many solutions that can be considered. Offering affordable and relatively cheaper electricity to households compared to other relatively high polluting cooking fuels and technologies will spur on the adoption of e-cooking practice. The electrical appliances are also usually somewhat expensive since they are mainly imported into the country either as brand new or used (‘second hand’) ones. There are wide range of appliances that can be used by households and purchasing these at high prices is not favorable. Measures such as tax exemptions, lower import duties and subsidies on imported appliances will also boost the adoption of such appliances. Another measure that should be considered is the investment in local manufacturing of electrical appliances so as to eliminate the cost of importation, which will in turn lower the cost.

# 11 References

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# 12 Appendices

**Appendix 12.1: List of Participating Organisations at the Net-mapping exercise**

| | | |
|---|---|---|
| ACEP | ECONEXUS | Adenta Municipal Assembly |
| VRA | Energy Commission | USAID |
| PURC | ECG | Power Africa |
| ISSER | ABANTU | Ministry of Energy |
| GHACCO | GSA | Biogas Technologies |
| KITE | COPEC | ECOBANK |

**Appendix 12.2: Thematic Areas and Questions Guide**

The MECS-Ghana team has identified five (5) different themes around which the net mapping activity will be undertaken. Below are the themes and the possible questions that will guide the discussion

***The understanding of MECS***

- In the Ghanaian context, what do we mean by cooking (probing whether cooking goes beyond the application of heat to include other processes like blending)?
- What is your general perspective/view on modern or clean cooking discourse?
- What modern energy cooking services (fuels and technologies) are there in general?
- Which modern energy cooking technologies are available in the Ghanaian households?

***Players in MECS Space***

- Who are the key players in the cooking space generally in Ghana in relation to fuels and technologies?
- How strongly, moderately, or weakly are they connected?
- Specifically, who are the key stakeholders promoting modern energy cooking services in Ghana?
- What are their key mandates in connection to promoting modern energy cooking services in Ghana?
- How aligned are their priorities to MECS agenda (Weak, Medium, Strong)?
- How much do these stakeholders influence policy regarding modern energy cooking services? (Using a Likert scale of 1 to 5, where 1 is lowest and 5 is strongest)
- **What are the reasons for that much level of influence?
- What is the level of coordination among these stakeholders and why? (weak, medium, strong)
- How are their alliances/linkages between the stakeholders promoting the use of the following?
    - electricity
    - other modern cooking fuels e.g. LPG

***The market potential of cooking with electricity in Ghana***

- What are your candid opinions on cooking with electricity in Ghana (a possible or impossible action and why)?
- What technologies and/or appliances are used with electricity for cooking in Ghana?
- What are the socio-economic and environmental effects of electricity for cooking in Ghana?
- What is your assessment on the availability and affordability of electricity in Ghana?
- To what extent do the current electricity supply and pricing systems favor cooking with electricity in Ghana? (Using a Likert scale of 1 to 5, where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree)
    - The current electricity supply favors cooking with electricity in Ghana
    - The current electricity pricing systems favor cooking with electricity in Ghana.

***Policy Environment concerning electricity for cooking***

- What policies exist in Ghana for the promotion of modern energy cooking services (to policy makers)?
- What are their main targets in the promotion of modern energy cooking services (fuels and technologies favored)?
- Have these policies achieved their intended targets so far or not and why?

***Drivers of MECS in the Ghanaian households***

- What factors drive or motivate the use of the following?
    - electricity
    - other modern cooking fuels e.g. LPG

    - **electrical cooking appliances
- **On the scale of 1 to 10, rate the strength of these limiting factors.
- What factors limit the use of the following?
    - electricity
    - other modern cooking fuels e.g. LPG
    - **electrical cooking appliances
- **On the scale of 1 to 10, rate the strength of these limiting factors.

***Strategies in relation to eCooking***

- In your view, what strategies should be adopted/pursued and by who to promote e-cooking in Ghana?

# 12 Appendices

**Appendix 12.3: Discussion session in one cluster**

**Appendix 12.4: Group picture of net-mapping exercise participants**

**Appendix 12.5: Plenary session – posting of answers on flip chart in the center of workshop venue**

**Appendix 12.6: Pictures of synthesis session of stakeholders' responses by MECS Ghana team**