

Landscape Analysis of Modern Energy Cooking in Displacement Settings



Electric cooking in an Internally Displaced People (IDPs) camp in Myanmar, Photo Pesitho 2020

Modern Energy Cooking Services (MECS) Programme

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"Clean Cooking is...Life!"

Julie Gichuru, Clean Cooking Forum 2019 Emcee

Executive Summary

Cooking safely and sustainably in forced displacement settings is an enduring energy challenge in the humanitarian sector. There were an estimated 79.5 million forcibly displaced people globally at the end of 2019, with approximately 26 million refugees, 46 million internally displaced people (IDPs), 4.2 million stateless people, and 4 million asylum seekers¹ living in urban, peri-urban, rural and camp areas. Exact proportions in each category are not clear but in 2019 an estimated 2 out of 3 IDPs and 60% of refugees were in urban or semi-urban areas^{2,3}. Facilitating transitions to modern energy cooking (i.e. cooking with electricity or gas) for all displacement settings is complex and requires multi-pronged and multi-sectoral approaches.

The landscape report identifies a diversity of settings – rural areas and camps, and urban and peri-urban, acknowledging that the distinction between rural and peri-urban is often blurred and that this is not a binary cluster but a spectrum of settings and experiences. We note that data on energy in urban and peri-urban displacement settings is a neglected area.

For rural and camp areas it has been shown that 85% still primarily rely on solid fuels, such as charcoal and wood, and open fires or traditional stoves for cooking⁴. To the humanitarian institutions seeking to support the care and wellbeing of displaced people in rural and camp settings, clean cooking, and indeed energy, is too often relegated as a second-tier priority despite the negative health and environmental impacts associated with biomass cooking. This challenge is compounded by the lack of sustained investment in energy, little local capacity, high turnover of humanitarian staff, the sheer number of displaced people, sensitivity for the deep cultural connection people have with food, the arbitrary separation of electrification and cooking agendas in humanitarian strategies, and gender inequalities.

We define displacement settings (or situations) as inclusive of displaced and host populations with both household and community-level energy needs and call for this holistic approach to be reflected in the design of clean, modern energy cooking solutions. Rural area and camp displacement settings themselves are complex environments where the issues at stake do not only concern the displaced but also the host communities, who frequently face similar challenges, leading to potential tensions and competition over already scarce resources.

In contrast, those displaced into urban and peri-urban settings often have the local infrastructure to draw on but can be isolated by an absence of social inclusion, illegitimacy or informal land occupation that prevents access to formal energy services (such as signing on to a utility for electricity), a lack of awareness of the options and limited household budgets for upfront capital expenditure that results in poor energy access.

Data on the displaced in urban and peri-urban areas is scant. While the headline data is that over 50% of displaced people live in these areas, suggesting over 40 million (and likely significantly more), there are a very limited number of studies that provide insight into their energy situation and context.

¹ (Muggah & Abdenur, 2018) Refugees and the City the Twenty-first-century Front Line

² Ibid.

³ (Lahn & Grafham, 2015) Heat, Light and Power for Refugees. Saving Lives, Reducing Costs

⁴ (ESMAP & MECS, 2020) Analysis of the Drivers and Barriers for Transition to Modern Energy Cooking Services

This reflects the absence of data on urban cooking generally, including in the MECS priority countries. A systematic review conducted by MECS⁵ found that there were few studies on cooking in an urban context, prompting a recommendation that given the growing trend of rapid urbanization, particularly amongst the young, whom the evidence suggests are more likely to adopt modern technologies, this is worthy of future study.

Most urban contexts offer at least some level of infrastructure access and therefore opportunities that the rural areas and camps do not. However, the marginalised, including the displaced, in urban areas may be vulnerable to issues such as exploitation, arrest or detention, and competition over limited resources and jobs⁶. A lack of social capital and inclusion in the society only exacerbates existing vulnerabilities.

The purpose of this report is to analyse the landscape of modern energy cooking in a diversity of displacement settings. It seeks to identify the drivers and constraints for the transition from traditional biomass fuels to modern energy cooking. The study focuses on displacement settings in 15 countries in Sub-Saharan Africa (Ethiopia, Ghana, Kenya, Malawi, Rwanda, Tanzania, Uganda, Zambia, Cameroon, the Gambia and Nigeria) and South, South-East Asia (Bangladesh, Cambodia, Myanmar and Nepal)⁷. Relevant examples from other displacement settings are also drawn upon where appropriate, in light of the limited evidence on energy in displacement settings across the 15 priority countries. The study is based on a desktop literature review of academic and grey literature. The focus of the study centres on three main themes:

- Technological requirements
- Role of different stakeholders
- Policy and finance

The landscape study will inform the Modern Energy Cooking Services (MECS) programme strategy and open up wider discussion within the humanitarian sector to shift the narrative on clean cooking in situations of displacement. For rural areas and camps, this might mean moving away from fuel distribution and direct combustion of biomass to the provision of modern, sustainable and affordable cooking services with the people in displacement settings and their host communities at the heart of their design. For urban and peri-urban areas, for which we again note there is a lack of data and is a neglected constituency of displaced persons, the priority is to fill a data gap and open up the narrative on how displaced persons might access local infrastructure. This is less about designing new infrastructure programmes and more about awareness raising for local officials, mechanisms for inclusion, and changes in law and status for energy access such as utility connections and upfront capital lending.

By mapping out modern energy cooking projects and interventions in displacement settings to date, the report has identified several critical gaps, including lack of understanding of cooking in urban and peri-urban displacement settings, and community-scale cooking (e.g. in schools, clinics, businesses etc.); limited application of innovative financing and business models for energy solutions across all displacement settings; short-term approaches to what proves to be a long-term challenge, and an overall scarcity of data on energy access (electricity and cooking).

⁵ (ESMAP, n/d) Analysis of the Drivers and Barriers to for Transition to Modern Energy Cooking Services (MECS)

⁶ (GPA, 2018) The Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement Framework for Action

⁷ The 15 countries are the MECS programme's priority countries.

TECHNOLOGICAL TRENDS AND OPPORTUNITIES

For rural areas and camps, energy for cooking has predominantly been based on traditional biomass fuels such as firewood and charcoal used over a three stone fire and other basic devices. In addition to limited local capacity building and market system development, the investment of international donor funding has focused on technologically basic improved biomass cookstove (ICS) interventions with little evidence of improvement to the health and safety of displaced people. Only more recently have the cooking transition efforts focused on truly clean, modern energy cooking based on liquid or gas fuel, or electricity (including solar), though few projects have managed to reach scale. For example, in response to humanitarian emergencies, **cooking primarily with LPG has shown to be successfully scaled as a viable short to medium term “transitional” solution in refugee camps** in Bangladesh and across the Middle East⁸. The drivers for these interventions were protection needs (i.e. security and safety from potential violent events when leaving settlements or camps, including significant risk of sexual and gender based violence (SGBV) due to firewood collection) with a sudden significant influx of refugees from a conflict situation, major environmental degradation due to shelter building and firewood fuel usage, and lack of locally available firewood fuel.

For protracted humanitarian crises, the major long-term constraints for widespread LPG adoption in displacement settings are the significant on-going economic burden, lack of established distribution networks and the challenges of setting them up in displacement settings, and the increased risk of supply-chain disruptions during times of global crisis.

As prices of photovoltaic (PV) systems have been falling, decentralised solar solutions such as solar lanterns, solar home systems and mini-grids have been playing an important role in rural electrification efforts, as well as in displacement settings as of recent. These developments in Sub-Saharan Africa (SSA) and parts of Asia offer an opportunity to explore electricity as a viable cooking solution for these contexts, especially if paired up with innovative business models deployed in the off-grid solar sector. Even though issues such as sufficiency and reliability of power supply through such solutions can be a barrier to cooking with electricity they are increasingly being overcome with the emergence of high-efficiency electrical cooking technologies such as electric pressure cookers (EPCs), rice cookers, slow cookers and induction stoves. Other barriers include technical and economic barriers such as the costs per kWh and low levels of rural electrification where rural displaced are located (e.g. majority of refugee camps)^{9,10}, social barriers such as perceived reliability of power generation and distribution, as well as cooking habits and traditions; and political and legal barriers such as the legal rights of refugees to work, restricted freedom of movement and land tenure arrangements, which limit their ability to participate in local markets and perpetuate the reliance on free fuel distribution and collection.

A particular opportunity rests with institutional responses within rural and camp displacement. Within camps there are often feeding centres, schools and clinics each of which have a need for large scale cooking. Provision of new infrastructure to tackle this addresses a need while avoiding the social barriers often found in household cooking. In some instances, host communities do not have robust health clinics and schools, and where the displaced communities are integrated there are opportunities to upgrade the host communities' institutional infrastructure for the benefit of all.

⁸ (UNHCR, 2020) Rohingya Refugee Response – Bangladesh.

⁹ (HEC, 2019) Humanitarian Energy Conference 2019 Conference Report

¹⁰ (Batchelor, Brown, Scott, & Leary, 2019) Two birds, one stone-reframing cooking energy policies in Africa and Asia

In urban and peri-urban settings, new opportunities for the host communities are constantly being explored. For instance, over the past 5 years, the availability of commercial, highly energy efficient electric household appliances, including cookers, has gained traction in the argument for **electric cooking as a primary cooking method as access to electricity stands at a high rate in urban settings.**^{11,12} This is important for the 60% of refugees and two-thirds of IDPs who live in urban and peri-urban settings.¹³

In addition to the issues brought up by their settlement status, the displaced have many of the other barriers that have been identified for the transition of biomass cooking to modern energy cooking in urban and peri-urban areas. These include a lack of awareness, the perception that electricity costs more than other fuels, perceived (un)reliability of power generation and distribution, as well as cooking habits and traditions.

ROLE OF DIFFERENT STAKEHOLDERS

The modern energy cooking eco-system in displacement settings involves a multitude of stakeholders from UN organisations, humanitarian agencies, local and national governments, to non-government organisations (NGOs), donors, businesses, research organisations and the displaced people themselves. Their concerns vary from human protection, poverty alleviation, climate change, environmental conservation, health, education, energy, and gender inequality. Not all organisations that implement MECS interventions identify SDG 7 (energy access for all) within their organisational goals, even if there are clear linkages between energy access and their priority areas which fall under SDGs 1 (no poverty), 2 (zero hunger), 5 (gender equality), 8 (decent work and economic growth), 13 (climate action), 15 (life on land) and 17 (partnerships to achieve the Goal). This can be a source of strength in ensuring that modern energy cooking services contribute to broader development goals.

Individual strategic partnerships between humanitarian actors, private sector actors, academia and governments exist at the project level, but have been historically ad hoc with poor coordination. Since 2018, the high-level, international coordination of these stakeholders has been facilitated by the UN-led Global Plan of Action for Sustainable Energy in Situations of Displacement (GPA), a non-binding framework for inter-agency collaboration of 200+ organisations to ensure that all refugees and displaced people enjoy safe access to affordable, reliable, sustainable, and modern energy services by 2030. The GPA together with the UN High Commissioner for Refugees (UNHCR) under the Clean Energy Challenge (CEC) launched in 2019 to boost multi-sectoral cooperation and coordination. Additionally, improvements have been made in sharing lessons learnt, for example through the Energypedia webinar series on Sustainable Energy in Humanitarian Settings, though there are still barriers for transparent and systematic reporting on energy projects and programmes, clean cooking energy indicators, fragmented data collection and its limited availability. Greater involvement of people in displacement settings in the dialogue could help to accelerate the roll out of and increase the impact of energy services in these challenging contexts. This will involve shifting the narrative to recognise the skills and knowledge of people in displacement situations and moving towards people-centred design.

¹¹ (Batchelor, Leary, Leach, & Brown, 2018) eCook Global Market Assessment. Where will the transition take place first?

¹² (Muggah & Abdenur, 2018) Refugees and the City The Twenty-first-century Front Line

¹³ (UNHCR, 2020c) Global Trends Forced Displacement in 2019

As said above, data for urban and peri-urban settings are in short supply, including the role of stakeholders and the political economy between humanitarian organisations and government and developmental actors. Collection of such data should be deeply integrated with local planning – for instance municipalities are often aware of informal or semi-formal settlements and take them into account for their long-term planning. They rely on data collection across many agencies, all of which could also benefit stakeholders in the humanitarian sector.

POLICY AND FINANCE

Governments of areas hosting large numbers of displaced people have an important role in the success of energy interventions. Enabling policies and mandates that build alliances between governments, humanitarian organisations, NGOs, research organisations and businesses are critical to safeguarding and providing support for the access to modern energy cooking for people in the entire range of displacement settings. National and local electrification and cooking strategies should be inclusive of all people affected by the lack of access to clean, modern energy. Such approaches can ensure that no-one is left behind.

Enabling policies that empower and build resilience among refugees, asylum seekers and stateless persons **include the right to work, freedom of movement and land tenure arrangements.** International humanitarian organisations also have a significant role to play in long-term energy cooking solutions. The enactment of the UNHCR Global Compact for Refugees in 2017, places a mandate to support both refugees as well as host communities. This major shift from humanitarian response to long-term community development policies enables long-term planning of infrastructure that supports the development of all people affected by displacement. This translates into both host and displaced populations gaining access to critical infrastructure, which can diffuse potential conflicts and tensions between them, whether that be a camp setting surrounded by a host community, or where it is the displaced integrated into an urban community but perceived as being outsiders.

The current policies of free distribution of cooking fuel to displaced people in camps have distorted energy markets and reduced the willingness of displaced people to pay for cooking energy. The piloting of local market systems in rural areas and camp displacement settings for clean cooking provision is a new strategic approach to move towards resilience, the ability to choose solutions and having a sense of ownership over energy services. Enabling the narrative change to modern energy cooking will require a whole systems approach encompassing innovative implementation models, progressive funding mechanisms and collaborative private-public partnerships developed with a long-term view, and capacity building within humanitarian, energy, donor and business sectors as well as with people in displacement settings who will benefit from access to modern energy cooking.

Importantly, a narrative shift will be required in the way energy interventions are designed in displacement settings. Humanitarian agencies which are responsible for the majority of the displaced globally, have a short-term focus due to the nature of their mandate to act quickly and effectively in crisis situations. This approach, however, is not aligned with the needs of the displaced in protracted crises situations, including access to energy and infrastructure, which call for much longer time frames. According to UNHCR¹⁴, there were 15.7 million refugees in protracted situations (5 years or longer as a refugee) at the end of 2019. Protracted internal displacement has also been on the rise as a result of conflict and disasters¹⁵. The inadequacy of traditional humanitarian approaches hinders the much-

¹⁴ (UNHCR, 2020c) Global Trends Forced Displacement in 2019

¹⁵ Ibid.

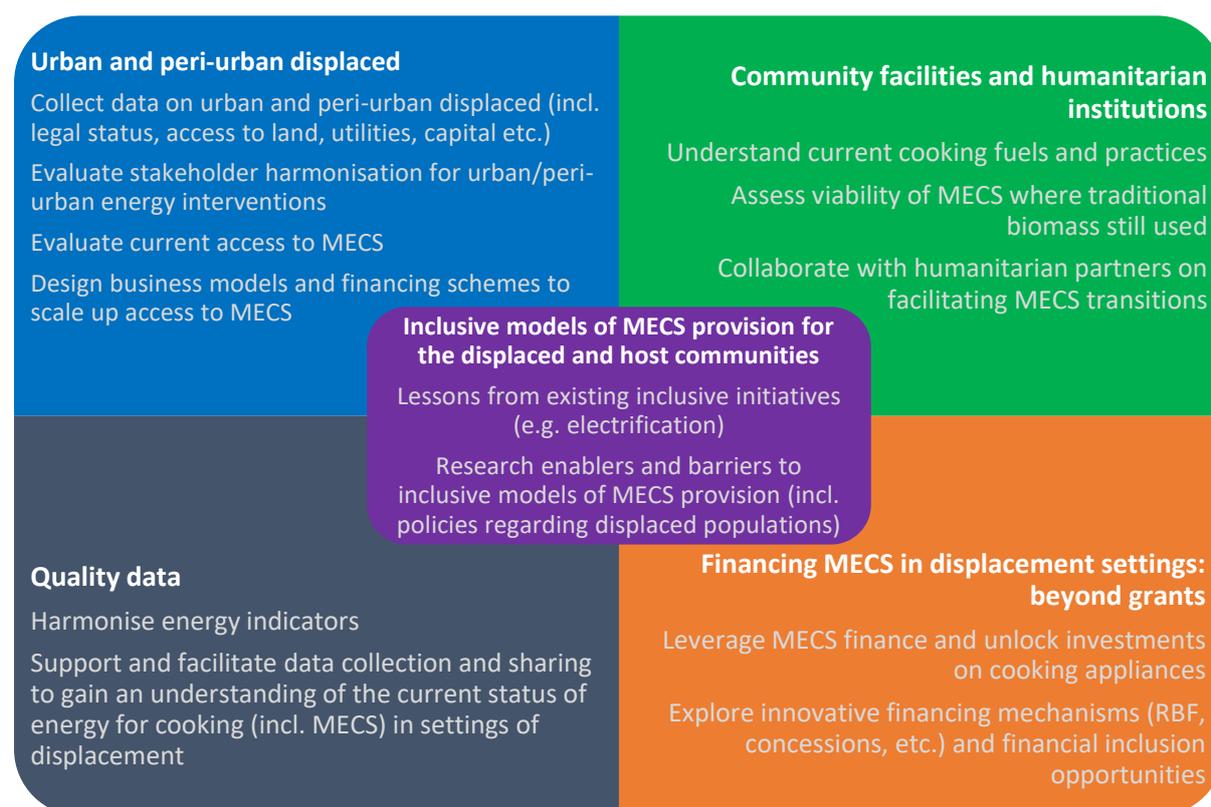
needed long-term intervention planning and is among the top factors needing change if universal energy access in displacement settings is to be achieved in the next decade.

A matrix of enabling policies relating to refugees', asylum seekers' and stateless persons' right to work, freedom of movement and right to land ownership identified **Gambia (the), Ghana, Uganda, Cameroon and Ethiopia** as the most progressive countries in term of displaced populations policies for self-reliant livelihoods. This provides an opportunity for the displaced to increase their purchasing power for MECS solutions of their choosing, creating a sense of dignity and empowerment.

A more nuanced question lies over the role of humanitarian stakeholders working with the urban and peri-urban displaced. Previous research by the MECS programme has shown that MECS interventions are more likely to succeed in urban and peri-urban settings in which electricity and gas infrastructure are already established alongside high prices for firewood and charcoal¹⁶. Considering these factors, MECS interventions in displacement settings are more likely to succeed in countries with significant number of displaced people in peri-urban and urban settings such as **Uganda, Kenya, Ethiopia, Nigeria, Myanmar and Cameroon**.

KEY RESEARCH PRIORITIES

This landscape report has identified five priority research areas which would make the biggest impact for modern energy cooking services in displacement settings (see Figure 1). We call for inclusive models to be at the core of energy interventions, including for modern energy cooking services, which meet the energy needs of all people in situations of displacement.



Research needs for modern energy cooking services in situations of displacement.

Firstly, cooking with electricity can be a reliable, scalable, and an economically viable long-term solution for if the right enabling eco-system is in place. Political commitments and innovative funding

¹⁶ (ESMAP & MECS, 2020) Analysis of the Drivers and Barriers for Transition to Modern Energy Cooking Services

mechanisms have facilitated successful electrification efforts in refugee camps and many urban centres in SSA and South, South-east Asia. Including electric cooking as part of electrification programmes to tackle the most pressing energy challenge for all, including people affected by displacement, has now become a feasible next step in many regions of the world. MECS could leverage existing country and local municipality strategies to *include displacement settings*, particularly urban and peri-urban settings, in which electricity access and LPG supply chains are available to transition the many who still cook with biomass to MECS. However, there is a scarcity of data on urban and peri-urban displacement settings which has to be addressed first in order to understand the needs in those contexts and to design appropriate business models and financing mechanisms.

Secondly, rolling out clean, modern cooking services in institutional settings, including schools and health clinics, community marketplaces, businesses, welcome reception centres and UN kitchens for staff, may be more successful than at the household level as those facilities have greater access to resources, including funding mechanisms, with the potential to be the first cooking innovators in displacement contexts. In addition, MECS in institutional settings can help to build awareness and capacity for household-scale and communal cooking interventions in situations of displacement.

Thirdly, although energy access in displacement settings has seen more interest from different stakeholders, including governments, NGOs, donors, private sector actors, and humanitarian organisations themselves, most of the support towards this area has been through grant funding, which is often limited in scope and has a relatively short lifespan as compared to the long-term nature of the energy challenge. To provide sustainable MECS, a more diverse range of funding mechanisms is urgently needed. These could include concessions, Results Based Financing (RBF) schemes, crowdfunding and more, with lessons learnt from energy access financing in the development sector and the wider MECS programme used to guide their design. The programme could also leverage existing innovations in energy financing and investments in electric appliances to support their applications, and potential adaptations needed to tailor them to displacement settings.

Fourthly, significant data gaps exist on displacement settings within urban and peri-urban areas. As energy access has fallen outside of humanitarian organisations' mandates, data on the subject in displacement settings has not been collected in a systematic way or at all. To support MECS transitions, greater effort is required to collect quality data and harmonise energy access indicators to understand the needs of populations affected by displacement and the impacts of modern energy cooking interventions. With the existing expertise in evidence building and the ongoing collaborations with partners involved in pushing the agenda for improved data collection (e.g. the Global Plan for Action and UNHCR under the Clean Energy Challenge), there is an opportunity for the MECS programme to help facilitate suitable data collection and knowledge building mechanisms for displacement settings.

Finally, a commitment should be made to work with people in displacement settings towards a long-term programme sustainability as a central feature at the conception of clean cooking programme design. Those affected by displacement should be recognised as not just passive receivers of aid, but as self-organising, active leaders of their own solutions. There should also be recognition of emerging power relations among the range of stakeholders involved in the transition to MECS, who shape decision-making on what solutions should be deployed, by whom and under what models. At the centre of MECS interventions must be the **voices of people in displacement settings and the ability to choose solutions that meet their self-identified needs, to enable them not only to survive but to thrive.**

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Acronyms and abbreviations

CBT	Cash-Based Transfers
CCA	Clean Cooking Alliance
CRRF	Comprehensive Refugee Response Framework
DfID	Department of International Development (UK)
DP	Displaced person/population
EnDev	Dutch-German Energy Partnership - Energising Development programme
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign, Commonwealth & Development Office (UK) (formerly DfID)
GCR	Global Compact on Refugees
GIZ	German Development Agency
GPA	Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement
HEDON	Household Energy Network
ICS	Improved biomass cookstove
ICRW	International Centre for Research on Women
IDP	Internally displaced person/people/population
IOM	International Organization for Migration
IUCN	International Union for Conservation of Nature and Natural Resources
LPG	Liquefied petroleum gas
MECS	Modern Energy Cooking Services
MEI	Moving Energy Initiative
MFI	Microfinance Institution
MNSA	Multi- Sector Needs Assessment
NFI	Non-Food Items
NRC	Norwegian Refugee Council
OCHA	Office for the Coordination of Humanitarian Affairs
SDG	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SGBV	Sexual and Gender Based Violence
SSA	Sub-Saharan Africa
SSEA	South, and South-East Asia
UNHCR	United Nations High Commissioner for Refugees
UNITAR	United Nations Institute for Training and Research
UNRWA	United Nations Relief and Works Agency for Palestine Refugees
WFP	World Food Programme

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Cooking with LPG in Nyarugusu refugee camp, Tanzania, Photo: UNHCR/Agnes Mwangoka.

1 Introduction

Achieving universal access to modern energy cooking involves the inclusion of all people in displacement settings, ensuring that no-one is left behind. An estimated 79.5 million people are forcibly displaced which is equivalent to 1% of the world's population.¹⁷ Of these, 46 million are internally displaced people, 20.4 million are refugees living under the UNHCR's mandate, 5.6 million are refugees under UNRWA's mandate and 4.2 million are asylum-seekers.¹⁸ Estimates by the Moving Energy Initiative (MEI) show that 85% of refugees living in UNHCR camps use biomass fuels for cooking and 97% have limited or no access to electricity.¹⁹

Modern energy cooking in displacement settings is complex due to the sheer number of people concerned, the arbitrary division between electrification and cooking sectors²⁰, and the multi-dimensional challenges of humanitarian and community development responses²¹. The challenge of clean cooking is one that is exacerbated along gender lines as the everyday chore typically falls on women (and children) to carry the burden with negative impacts on health and well-being due to air pollution and increased risk of sexual and gender-based violence (SGBV) while collecting firewood.²² In addition, the displaced live in a range of settings from urban, peri-urban, to rural and camp areas. Exact proportions in each category are not clear but in 2019 an estimated 2 out of 3 IDPs and 60% of refugees were in urban or semi-urban areas.²³ Facilitating transitions to modern energy cooking (i.e. cooking with electricity or gas) for all displacement settings therefore requires multi-pronged and multi-sectoral approaches.

The purpose of this report is to analyse the landscape of modern energy cooking in displacement settings to address the research question,

'What are the key drivers and constraints for modern energy cooking services in displacement settings?'

The study aims to evaluate existing cooking services and the level of readiness for the widespread adoption of modern energy cooking in Sub-Saharan Africa (SSA) and South, South-east Asia, in a diversity of displacement settings including rural areas and camps, and urban and peri-urban settings. It also aims to support the development of a strategic, evidence-based action plan for the transition from biomass to modern energy cooking in displacement settings. While the study focuses on displacement settings in SSA and South, and South-East Asia (SSEA) contexts, relevant examples from other regions are drawn upon when appropriate.

First, the report outlines the aims, definitions and methodology (Section 1), then reviews the roles of different stakeholders (Section 2), technology (Section 3) and, policies and financial models (Section

¹⁷ (UNHCR, 2020c) Global Trends Forced Displacement in 2019

¹⁸ (UNHCR, 2018a) Global Trends Forced Displacement in 2018

¹⁹ (GPA, 2018) Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement

²⁰ (Grafham & Lahn, 2018) The Cost of Fuelling Humanitarian Aid

²¹ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

²² (Grafham, 2019) Energy Access and Forced Migration

4) in modern energy cooking in displacement settings. Section 5 draws conclusions on the role modern energy cooking services can play in displacement settings to accelerate progress towards achieving the global goal of sustainable development goal (SDG) 7 (energy access for all).

1.1 Definitions

Before we begin, clarification of key terms is required to develop a shared understanding of the complex topic of modern energy cooking in displacement settings. Drawing on the definitions offered in *Energy Access and Forced Migration*²³ edited by Owen Grafham, we define modern energy cooking services in displacement settings as:

Institutions, organisations, businesses, policies, programmes, global initiatives, actions, and activities which use modern energy cooking sources (i.e. liquid or gas fuel or electricity) in contexts of displacement, to meet the energy needs of people in camps, peri-urban and urban settings, self-settled refugees, asylum seekers, host communities and internally displaced people.

1.1.1 “Displaced person/population/people”

The displaced person of concern is defined as a refugee, asylum seeker or internally displaced person, which is dependent on if they have crossed international border or not, to seek safety.

A **refugee** is defined by the United Nations High Commissioner for Refugees (UNHCR) as “someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion.”²⁴ Implicit in this definition is that refugees have crossed international borders to seek safety and are no longer living in their country of origin. Refugees legal rights are protected by international law ratified by 145 State parties at the 1951 Refugee Convention. The most important protection being **non-refoulement**, meaning that refugees have the right to be protected by the country in which they seek asylum and cannot be forced to return home. The 1951 Refugee Convention and its 1967 Protocol accords other rights including the freedom of movement, rights to healthcare education and employment. It is worth noting that not all nations have signed up to the 1951 Convention and/or its 1967 Protocol and do not recognise refugees’ status.²⁵

An **asylum seeker** is defined as someone who is seeking international protection but whose claim for refugee status has not yet been determined.

An **internally displaced person (IDP)** on the other hand has been forced to flee their home and finds refuge within the boundaries of his or her country. IDPs stay within their own country and remain under the protection of their government, even if that government is the reason for their displacement. IDPs could have also been forced to leave their home due to natural disasters and climate change. Displaced persons still have rights, including the right to receive humanitarian assistance, protection from violence and freedom of movement. However, under national sovereignty laws, some governments are unable or unwilling to provide that protection. While IDPs are one of the largest populations of displaced people, they are also one of the most vulnerable.

In addition, the displacement landscape involves a **host community** which has been defined in this context as districts, neighbourhoods, public spaces as well as the local, regional and national

²³ (Grafham, 2019) Energy Access and Forced Migration

²⁴ (UNHCR, 2015b) States Parties to the 1951 Convention relating to the Status of Refugees and the 1967 Protocol

²⁵ (UNHCR, 2011) The 1951 Convention relating to the Status of Refugees and its 1967 Protocol

governmental, social and economic structures within which refugees live.²⁶ The concept of 'host community' accounts for local populations experiencing significant inflows of refugees, which can put additional strain on services and the availability of goods. **We define displacement settings as settings (or situations) that are inclusive of both displaced and host populations, as well as both household and community energy needs.**

1.1.2 “Modern Energy Cooking” and “Clean Cooking”

In the literature, the use of “clean cooking” has traditionally been applied to improve biomass cookstove (ICS).^{27,28} In the UNHCR’s Global Strategy for Sustainable Energy 2019-2024²⁹, “*clean modern cooking energy over firewood or other traditional solid fuels*” applies to Tier 2 biomass cooking. However, these biomass stoves have limited impact on health outcomes, for example, the literature found **no evidence** that an intervention comprising of **cleaner burning biomass-fuelled cookstoves reduced the risk of pneumonia** in a cluster randomised controlled trial.³⁰ Hence, effective strategies and a new narrative is needed to reduce the adverse health effects of household air pollution in terms of cooking.³¹

In this report, the term “modern energy cooking” or “clean cooking” refers only to ESMAP’s Tier 4 and 5 of the multi-tier framework (where Tier 0 is no access and Tier 5 is highest level of access) **“BLEENS” category made up of biogas, LPG, ethanol, electricity, natural gas and solar**, namely based on non-biomass technology.³²

Significant focus will be applied to electricity and LPG in this study for displacement settings as they provide modern convenient cooking solutions that meet the highest level of the multi-tier criteria matrix of 1) indoor air quality, 2) cookstove efficiency, 3) convenience, 4) safety of primary cookstove, 5) affordability, 6) quality of primary fuel and 7) availability of primary fuel (see Figure 1). There is also a recognition that fuel stacking (mixing a range of fuels) occurs to meet the transitional cooking needs of displaced people and that a **“cleaner stack”** refers to the mix of Tier 4 or Tier 5 **with** traditional biomass cooking and a **“clean stack”** is one in which **only** Tier 4 and/or Tier 5 cooking occurs the majority of the time (no regular use of biomass fuels except for the occasional barbeque) – an aspirational target.

²⁶ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp NGO Toolkit for Practical Cooperation on Resettlement. Community Outreach - Outreach to Host Communities: Definitions and FAQs

²⁷ (Batchelor et al., 2019) Two Birds, One Stone. Reframing Cooking Energy Policies in Africa and Asia

²⁸ (ESMAP, 2015) Beyond Connections: Energy Access Redefined

²⁹ (UNHCR, 2019k) UNHCR Global Strategy for Sustainable Energy

³⁰ (Mortimer et al., 2017) A Cleaner Burning Biomass-Fuelled Cookstove Intervention to Prevent Pneumonia in Children Under 5 Years Old in Rural Malawi (the Cooking and Pneumonia Study): a Cluster Randomised Controlled Trial

³¹ (Batchelor et al., 2019) Two Birds, One Stone. Reframing Cooking Energy Policies in Africa and Asia

³² (ESMAP, 2015) Beyond Connections: Energy Access Redefined



Electric cooking in Bidibidi Refugee Settlement in Uganda, Photo: Pesitho 2020

Figure 1: ESMAP multi-tier matrix for cooking solutions.³³

Multi-tier Matrix for Measuring Access to Cooking Solutions

		LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	
ATTRIBUTES	1. Indoor Air Quality	PM _{2.5, 3} (µg/m ³)	[To be specified by a competent agency, such as WHO, based on health risks]	[To be specified by a competent agency, such as WHO, based on health risks]	[To be specified by a competent agency, such as WHO, based on health risks]	< 35 (WHO IT-1)	< 10 (WHO guideline)	
		CO (mg/m ³)				< 7 (WHO guideline)		
	2. Cookstove Efficiency (not to be applied if cooking solution is also used for space heating)		Primary solution meets Tier 1 efficiency requirements [to be specified by a competent agency consistent with local cooking conditions]	Primary solution meets Tier 2 efficiency requirements [to be specified by a competent agency consistent with local cooking conditions]	Primary solution meets Tier 3 efficiency requirements [to be specified by a competent agency consistent with local cooking conditions]	Primary solution meets Tier 4 efficiency requirements [to be specified by a competent agency consistent with local cooking conditions]		
	3. Convenience: Fuel acquisition and preparation time (hrs/week) Stove preparation time (min/meal)				< 7 < 15	< 3 < 10	< 1.5 < 5	< 0.5 < 2
	4. Safety of Primary Cookstove	IWA safety tiers	Primary solution meets (provisional) IWA Tier 1 for Safety		Primary solution meets (provisional) IWA Tier 2	Primary solution meets (provisional) IWA Tier 3	Primary solution meets (provisional) IWA Tier 4	
		OR Past accidents (burns and unintended fires)					No accidents over the past year that required professional medical attention	
	5. Affordability						Levelized cost of cooking solution (inc. cookstove and fuel) < 5% of household income	
6. Quality of Primary Fuel: variations in heat rate due to fuel quality that affects ease of cooking						No major effect		
7. Availability of Primary Fuel						Primary fuel is readily available for at least 80% of the year	Primary fuel is readily available throughout the year	

1.2 Unique Barriers and Enablers for MECS in Displacement Settings

Displacement settings have unique barriers and enablers that differentiate humanitarian responses of cooking interventions to stable developing markets. The rapid onset of a conflict or disaster can lead to large influxes of displaced people into areas that are typically remote with limited

³³ (ESMAP, 2015) Beyond Connections: Energy Access Redefined

infrastructure, often rural and made into camps. Displaced people arriving at these locations rely on the free collection of fuel to cook their food or on humanitarian agencies and host governments to provide handouts. Conflict over scarce resources with host communities, environmental degradation and health and safety risks from fuel collection, primarily by women and children, are all negative impacts of the lack of or unsustainable cooking fuel provisions. The work of the DfID funded MEI programme identified key features of cooking interventions in displaced settings which have been adapted to focus on MECS transitions (see *Table 1*).³⁴ In contrast, those displaced into urban and peri-urban settings have the local infrastructure to draw on, but can be isolated by an absence of social inclusion, illegitimacy or informal land occupation that prevents access to formal energy deliveries (such as signing on to a utility for electricity), a lack of awareness of the options and limited household budgets for upfront capital expenditure that results in poor energy practices.

As humanitarian emergencies transition into protracted crisis situations, a rethink is required in terms of the unsustainable provision or collection of cooking fuel. Displaced people are particularly vulnerable yet also extremely resilient and possess ingenuity to survive traumatic and difficult situations. Do no harm is the central tenet of humanitarianism and hence, long-term sustainability must be a central feature at the conception of clean cooking programme design. If not, the failure or cessation of essential needs and services such as the ability to cook food to survive may lead to further inequalities. A commitment should be made to work with displaced people-led groups and organisations, where they are not just passive receivers or dependent, but self-organising, active leaders of their own solutions. There should also be recognition of emerging power relations in the transition to MECS. At the centre of MECS interventions must be the voices of displaced people and the ability to choose solutions that meet their self-identified needs, to enable them not only to survive but thrive.

Cooking solutions also require an understanding of the cultural context in displacement settings. Recent eCook projects in Bidibidi refugee camp in Uganda by Pesitho showed that users preferred at least two heating elements after complaints were received of the extra time required to cooking dishes in serial instead of parallel with only one heating element of the ECOCA.³⁵ The ethanol project in Ethiopia demonstrated high acceptance of the modern energy cooking technology with Somali refugees. However Sudanese refugees in the same region only used the ethanol stoves for half of their cooking needs as their traditional way of cooking flat bread did not fit onto the ethanol cooking stove design. Additional fuel stacking biomass cooking options were required to meet all their culturally important cooking needs.³⁶

³⁴ (Vianello, 2016) Toolkit for the Moving Energy Initiative. A Review of Cooking Systems for Humanitarian Settings

³⁵ (Zarazua de Rubens & Probert, 2020) MECS-TRIID Project Report (public version) Cleaning the Air Through Cooking: Providing Alternative Energy Solutions for Cooking Practices in the Bidibidi Refugee Settlement in Yumbe District in Uganda

³⁶ (Benka-Coker, Tadele, Milano, Getaneh, & Stokes, 2018) A Case Study of the Ethanol CleanCook Stove Intervention and Potential Scale-up in Ethiopia

Table 1: Unique barriers and enablers of MECS interventions in displacement settings modified from MEI Toolkit.³⁷

Category	Barriers	Enablers
Policy	Displaced people may be restricted from accessing energy sources by host communities or governments (e.g. In the analysis of MECS alternative fuels for Rohingya refugees, the Bangladesh government did not permit solar PV solutions as most host communities did not have this technology) ³⁸	Cooking interventions to include both refugees and host communities
	Resentment from host communities and governments towards displaced people who receive better cooking services than hosts	Cooking interventions to include both refugees and host communities
	Encampment policies restrict movement of displaced people to access local markets to procure materials or sell products, reducing opportunities for productive activities and self-reliance	High level dialogues with host and donor governments that encourage self-reliance policies through freedom of movement policies (e.g. CRRF)
	Low prioritization of modern energy cooking in humanitarian responses	Support the integration of cooking services into food and fuel strategies, with matching budgets
Finance	Displaced people have limited access to finance and hence, spending power because they do not have the right to work, cannot find employment or are paid less	High level dialogues with host and donor governments that encourage self-reliance policies through right to work policies (e.g. CRRF) Provision of innovative finance i.e. pay-go-mechanisms or smart subsidies to increase ability to pay
	Free handouts lead to dependency of displaced people on humanitarian aid (including cooking fuels and services)	Cooking interventions that enable displaced people to choose their cooking solutions (e.g. cash or vouchers are used to purchase products/fuels in an open market) or reduce the cost of modern cooking solutions (e.g. subsidies or concessions, bulk purchasing of cooking products, carbon financing to reduce cooking services cost).
	Restricted provision of cooking products/services through market-based approaches by both humanitarian agencies and governments, reluctant to indicate permanency of displaced population for political sensitive messaging	High level dialogues with host and donor governments that encourage the view that displaced people are an asset and promote self-reliance policies (e.g. CRRF)

³⁷ (Vianello, 2016) Toolkit for the Moving Energy Initiative A Review of Cooking Systems for Humanitarian Settings

³⁸ Response of UNHCR staff at the Clean Cooking Forum in Kenya, 2019 to the question “Was electric-solar PV cooking solutions considered as an option as an alternative cooking fuel in Bangladesh?”

Coordination	Multi-agency involvement in displaced settings (particularly during the emergency phase), without clear coordination or consistency of approach and often outside government structures	Support coordination of humanitarian actors, community development, private businesses with all level of governments to encourage long-term energy and cooking services in displaced settings
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1.3 Displacement settings profiles

Displacement settings can be profiled using three main characteristics: 1) geographical locations (camps, peri-urban and urban), 2) scales (households and community) and 3) spatial timeframes (humanitarian emergencies vs protracted crisis). These profiles affect the type of responses a cooking intervention is likely to require.

1.3.1 Geographical setting

The landscape report identifies that there is a diversity of settings, including rural areas and camps, and urban and peri urban, acknowledging that the distinction between rural and peri urban is often blurred and that this is not a binary cluster but a spectrum of settings and therefore experiences.

Refugee or IDPs rural camps are ‘temporary’ facilities built to receive refugees and people in refugee-like situations to provide immediate protection and assistance to people who have been forced to flee due to conflict, violence or persecution. These camps are typically located in rural areas. Many of these camps have existed for decades and are known as "protracted refugee situations", defined as situations where at least 25,000 people from a particular country are refugees in another particular country for 5 or more years.³⁹

Urban (city) displacement settings are locations in which a refugee, asylum seeker or IDP has decided to or was obligated to settle in an urban area rather than a refugee camp. In 2018, the World Refugee Council report shows that 60% of all refugees and 80% of all internally displaced persons are living in urban areas.⁴⁰

Peri-urban, slum settlements and informal settlements where many refugees, asylum seekers and IDPs reside, is defined as residential areas where a group of housing units has been constructed on land to which the occupants have no legal claim, or which they occupy illegally or unplanned settlements and areas where housing is not in compliance with current planning and building regulation.⁴¹ We note that data on the urban and peri-urban settings is lacking and is a neglected area.

1.3.2 Scale

Household scale cooking refers to cooking within individual dwellings for a family unit typically feeding up to 20 people. **Community scale** cooking refers to the feeding of large numbers of people (e.g. school feeding, reception centres in which arrival refugees are provided food).

1.3.3 Spatial timeframe

Humanitarian emergencies are displacement situations that are less than 5 years old, whereas **protracted crises** endure for periods greater than 5 years. According to UNHCR, an estimated 15.7 million people are affected by protracted crisis by the end of 2019 in 32 host countries accounting

³⁹ (UNHCR, 2018a) Global Trends Forced Displacement in 2018 (If report is 2018, ref UNHCR, 2019?)

⁴⁰ (Muggah & Abdenur, 2018) Refugees and the City The Twenty-first-century Front Line

⁴¹ (Satterthwaite et al., 2020) Building Resilience to Climate Change in Informal Settlements

for 51 protracted situations. These figures however exclude Palestine refugees under UNRWA's mandate and IDPs.⁴²

1.4 Methodology

This report is a landscape study on “modern energy cooking in displacement settings” rather than a systematic review as there are very few peer-reviewed publications on the humanitarian modern energy cooking topic to constitute a systematic review. A desktop study was undertaken to capture a wide range of evidence using a purposive and iterative approach. The following electronic databases were searched: SCOPUS, Web of Science and Google Scholar. In addition to formal literature, grey literature sources were also extensively reviewed to capture the wealth of material published by humanitarian practitioners, non-academic research organisations and UN bodies. These searches included Google and websites of UN organisations (e.g. UNHCR, WFP, UNITAR, IOM, FAO, World Bank).

Further evidence was obtained through citations and reference searches of the retrieved studies. The study focused on evidence relating to MECS countries of interest⁴³ and FCDO priority countries which are from Low- to Middle-Income Countries (LMICs), are written in English, and published between January 2000 to July 2020. Other countries relevant to displacement context have also been included as case studies. Several engagement meetings were held with key stakeholders to understand further details. A detailed description of the methodology is presented in Appendix A.

1.4.1 Limitation of the study

The main limitation of the study was the lack of data in the literature based on rigorous evidence-based research and methodologies on modern energy cooking in displacement settings. Data on the displaced people's energy for cooking in urban and peri-urban areas has been found particularly scarce.

A significant portion of the literature review was based on grey literature. The information obtained includes qualitative and quantitative data on numbers of households provided with cooking solutions. However, there was a distinct lack of critical analysis of what worked and what did not work to enable shared lessons learning. A reason for this is that donors and implementers are sensitive to the perception that “tax-payers” money is spent on “unsuccessful” projects and hence, are reluctant to put in writing issues regarding failures, corruption and geo-political influences that are not to the benefits of the people that the projects are serving.

Researchers partnering with implementing partners provide a more impartial analysis of the projects and hence, the academic literature provides greater insight into the lived experience of displaced people. However, these studies were mainly based on camp settings which were easier to study due to the narrow geographical focus and time constraints in collecting data. Research on urban displaced populations and internally displaced people is significantly under-represented. Even when data existed, they were based on estimates and inferred proxy indicators (e.g. using data related to housing destruction).⁴⁴

⁴² (UNHCR, 2020c) Global Trends Forced Displacement in 2019

⁴³ (MECS, 2018) <https://meecs.org.uk/countries-of-interest/> Accessed: 18 July 2020 Bangladesh, Cambodia, Cameroon, Ethiopia, Gambia (the), Ghana, Kenya, Malawi, Myanmar, Nepal, Nigeria, Rwanda, Tanzania, Uganda, Zambia

⁴⁴ (Lahn & Grafham, 2015) Heat, Light and Power for Refugees. Saving Lives, Reducing Costs

2 Technological requirements for foods cooked in displacement settings

The lessons learnt from past cooking interventions provides an understanding of lived experiences of displaced populations, which is critical in the designing of cooking interventions that are socially and culturally acceptable. This section covers the types of food provided to beneficiaries in displacement settings, types of food cooked, and technology available. Additionally, it suggests how MECS can support the transition towards cleaner-cooking stacks in displacement settings. It should be noted that displaced people living in urban areas generally do not receive food assistance from humanitarian organisations and hence, there is a lack of literature on their eating habits.⁴⁵

2.1 What foods are typically cooked in displacement settings?

As cooking is a deeply cultural activity, the food typically cooked in displacement settings is diverse. An understanding of what and how cooks cook is critical in developing appropriate MECS interventions. User-centric research methodologies like the Cooking Diaries Protocols developed by MECS have enabled a user’s perspective to be considered in cooking interventions.⁴⁶

Table 2: Examples of meals and food items in displaced settings.

Country	Location; Ethnic origins residents	Meals/food items
Ethiopia ⁴⁷	Addis Ababa; Ethiopian (host community)	Pot cooking: meats, pulses, sauces, stews, boiling water, re-heating food, and preparation of coffee and tea. Baking: injera up to 60 cm in diameter (similar to a large flatbread or pancake)
	Shimelba refugee camp; Eritrean	Pot cooking: sauces and stews Baking: injera up to 60 cm in diameter
	Kebribeyah, Sheder, Awbare refugee camps; Somalian	Pot cooking: Rice, sauces, spaghetti, stew Baking: small injera up to 10 cm in diameter
	Bonga, Tsore, Sherkole, Bambasi, Tongo, Gure Shembola refugee camps; South Sudanese	Pot cooking: Corn porridge
Rwanda ⁴⁸	Kigeme refugee camps; Congolese DRC	Porridge, rice, beans, ugali, potatoes
Bangladesh ⁴⁹	Cox’s Bazar refugee camp and Teknaf area; Myanmar’s Rohingya	Most collected food stuff from vouchers (ranked from most important to least important): eggs, onion, dry red chilli, potato, salt, dry fish, garlic, turmeric powder, sugar, green chilli, brinjal (egg plant), gram, pumpkin, chilli powder.

⁴⁵ (WFP, 2015) Protracted Relief and Recovery Operations – Kenya 200737

⁴⁶ (Leary, Batchelor, & Scott, 2019) Cooking Diaries 3.0 Protocols

⁴⁷ (Benka-Coker et al., 2018) A Case Study of the Ethanol CleanCook Stove Intervention and Potential Scale-up in Ethiopia

⁴⁸ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

⁴⁹ (ICCO, 2019) What do the Rohingya eat in the refugee camps of Bangladesh?

The types of food vary depending on the region and culture though staples such as porridge, rice, beans, potatoes and ugali (type of maize flour porridge) are typical in East Africa.⁵⁰ Other accompanying dishes includes soups and vegetables depending on the season and local context (see *Table 3*). Milk or tea requiring water boiling is also common for breakfast.

In Kigeme refugee camp in Rwanda, the results of a study on the cooking time for porridge, rice, beans, ugali and potatoes using the traditional three stone fire system, revealed that most foods averaged under 40 minutes cooking time except for beans which took over 2.5 hours to cook.⁵¹ Soaking beans overnight has been suggested as an approach to reduce cooking times significant risk of sexual and gender-based violence (SGBV) due to firewood collection. However, some refugees have complained the watery taste and soggy texture of the bean is not to their liking.⁵² Some nutrients are also lost in the soaking water unless it is used to cook with also. It is therefore critical to understand the lived experiences of refugees and take into consideration taste and nutrients, as well as preparation and cooking times when considering cooking solutions for displaced populations. Recent research in eCooking may provide a potential solution. Beans have been classified as “heavy foods” and significant savings in time and money have been shown with the use of electric pressure cookers in Kenyan households in 2018 against the purchase price of charcoal.⁵³ The beans are cooked with minimal water and are not required to be soaked overnight to produce reductions in cooking times due to the pressurised and insulated properties of the cooking appliance.

Table 3: Types of food and cooking times for host communities in Tanzania.⁵⁴

Summary of cooking habits in Kidegembye with corresponding timings and induction cooker power ranges (LP: low power; MP: medium power; HP: high power).

	Timing [min]	Power range
Breakfast		
Milk/tea	4–6	HP
Chapati	4–6	MP
Lunch/dinner		
Ugali	20–30	LP
Rice	20–30	LP
Soup	20–40	LP
Vegetables/potatoes/meat/fish	5–10	MP
Water boiling	15–25	HP

Summary of cooking habits in Mama Kevina with corresponding timings and induction cooker power ranges (LP: low power; MP: medium power; HP: high power).

	Timing [min]	Power range
Breakfast		
Water boiling	18–25	HP
Porridge	15–20	LP
Lunch/Dinner		
Ugali	20–30	LP
Rice	20–30	LP
Soup	20–40	LP
Vegetables/potatoes/meat/fish	5–10	MP
Water boiling	18–25	HP

⁵⁰ (Lombardi, Riva, Sacchi, & Colombo, 2019) Enabling Combined Access to Electricity and Clean Cooking with PV-microgrids: New Evidences from a High-resolution Model of Cooking Loads

⁵¹ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

⁵² Ibid.

⁵³ (Leary & Todd, 2019) The Kenya eCookbook Beans & Cereals Edition

⁵⁴ (Lombardi et al., 2019) Enabling Combined Access to Electricity and Clean Cooking with PV-microgrids: New Evidences from a High-resolution Model of Cooking Loads

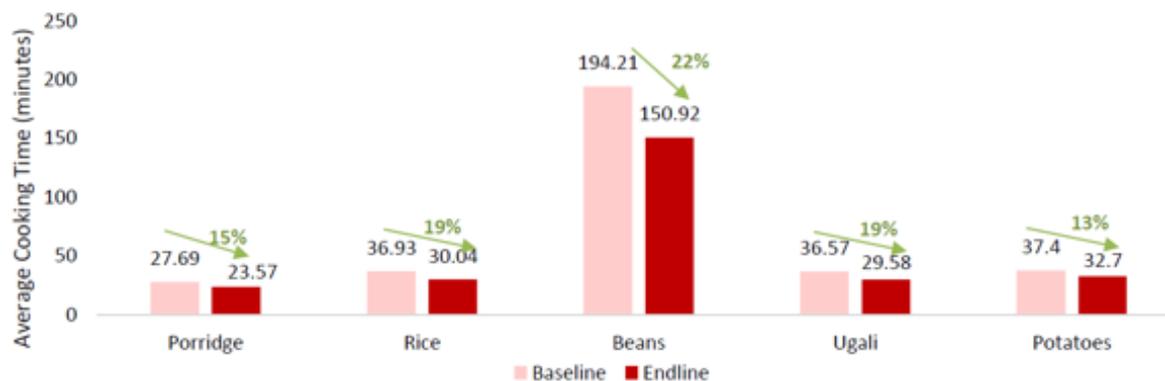


Figure 2: Types of food and cooking times for refugees in Rwanda refugee camp.⁵⁵

Household sizes

The number and size of cooking equipment required is dependent on the number of people and the types of food required in a typical meal. Household sizes average approximately 5 people in Bangladesh refugee camps⁵⁶ and Rwandan refugee camps.⁵⁷ Households typically have one large pot and a smaller pot to cook at a minimum.⁵⁸

⁵⁵ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

⁵⁶ (UNHCR, 2018c) Rohingya refugee camps in Bangladesh switch to Environmentally Friendly LPG

⁵⁷ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

⁵⁸ Ibid.

BOX 1: COOKING AND GENDER IN DISPLACEMENT SETTINGS

Sexual and gender-based violence (SGBV) linked with firewood collection has often been cited as the reason why many cooking interventions need alternative fuel sources to ensure protection.⁵⁹ Firewood is typically distributed free of charge at refugee camps for a month at great cost to humanitarian organisations, but it is never enough to cover the entire month of cooking. Situated in rural settings, many women and girls venture out of the camps in search of firewood, often illegally. Girls and women are almost always responsible for firewood collection and cooking, particularly in rural and camp settings, exposing them to the additional risk of physical and sexual violence when travelling long distances for fuel (see Figure 6). For example, in the Farchana refugee camp in Chad, 90% of confirmed rapes occurred when women left the camps in search of firewood. In 2014 in Uganda’s Nakivale refugee settlement, 41% of households reported incidences of violence during firewood collection. In Doro, South Sudan in 2014, 54% of refugee respondents reported incidents of violence against women in firewood collection places. In emergency and crisis situations, access to fuel-efficient stoves can decrease the protection risks faced by vulnerable populations, particularly women and girls.⁶⁰ However, it is noted that energy access is not the only solution for SGBV as it is a complex issue of culturally embedded norms.⁶¹

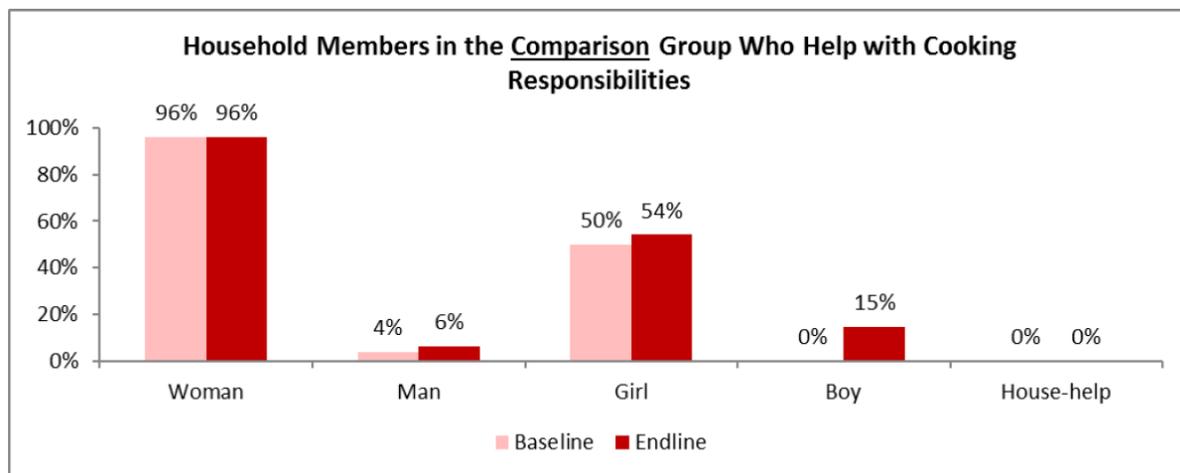


Figure 2: Cooking task by gender and age in Kigeme refugee camp, Rwanda.⁶²

⁵⁹ (Patrick, 2007) Sexual Violence and Firewood Collection in Darfur

⁶⁰ (Listo, 2018) Preventing Violence Against Women and Girls in Refugee and Displaced Person camps: Is Energy Access the Solution?

⁶¹ (Thompson, 2015) Cooking With Gas: How Children in the Developing World Benefit From Switching to LPG. Report Developed for the World LPG Association

⁶² (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

2.2 Review of technology

This section reviews the current technology landscape of cooking in displacement settings. Biomass fuels and cooking systems will be discussed to provide a baseline for comparison to the BLEENS (biogas, LPG, electricity, ethanol, natural gas and solar) modern energy cooking systems.

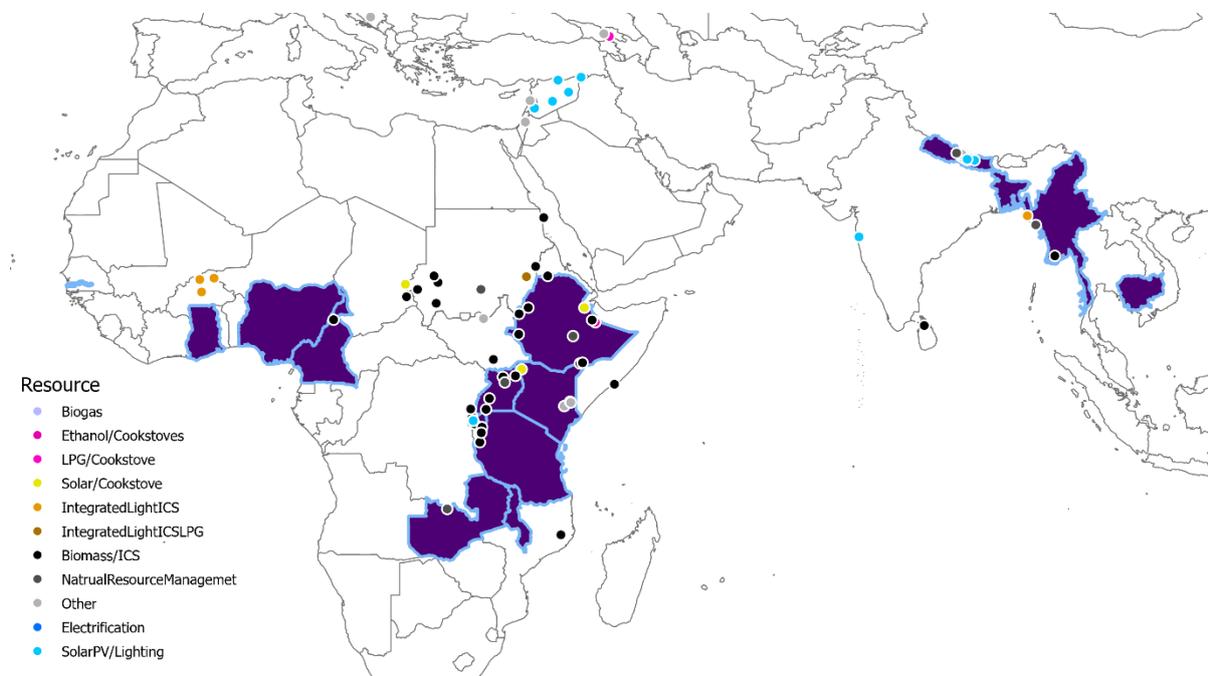


Figure 3: Energy Projects in Humanitarian Settings 1983 to 2015 recorded in GACC dataset. 59 of 133 projects were in, or within 10km of the MECS's programme focus country borders. Only 1 project involved modern energy cooking (ethanol project in Ethiopia) – Map by Dr Andrew Pascale

The literature review revealed that between 1983 to 2015, there were 133 energy projects identified by the Global Alliance of Clean Cookstove ((GACC) known now as the Clean Cooking Alliance (CCA)) in humanitarian settings.⁶³ Of these 133 projects, 59 projects are situated in or within 10 kms of the 15 MECS countries of focus (see Figure 4). Cooking interventions have predominately focused on improving biomass combustion and, notably, only one project involved the use of modern energy cooking: the Gaia Foundation ethanol project in three refugee camps in Jijiga, Ethiopia. However, since 2015 there has been significant shift in humanitarian responses to the cooking crisis with five LPG and electric cooking (eCook) projects in displacement settings in MECS focus countries and another proposal pending (see *Table 4*).

Table 4: LPG and eCook projects in displacement settings MECS focus countries.

Year	Country	Displacement	Cooking source	Details
2005-2017	Ethiopia	Rural. Three refugee camps in Jijiga	Ethanol	Gaia Association (local Ethiopian NGO), UNHCR. n=8731 stoves freely distributed ⁶⁴

⁶³ (GACC, 2016) Energy Projects in Humanitarian Settings 1983 to 2015 - Humanitarian Data Exchange

⁶⁴ (Benka-Coker et al., 2018) A Case Study of the Ethanol CleanCook Stove Intervention and Potential Scale-up in Ethiopia

2016-2017	Tanzania	Rural. Nyarugusu refugee camp	LPG	UNHCR project. Pilot n=3000 HHs received free LPG kits and two refills of 6kg LPG per month over a 3-month period ⁶⁵
2018-ongoing	Bangladesh	Kutupalong and the other refugee settlements Cox's Bazar district	LPG	UNHCR, IOM, FAO, Government. Project scaled to entire camp n=99,103 HHs (88,385 refugee HHs and 10,718 host communities HHs) ⁶⁶
2019	Uganda	Bidibidi refugee camp	eCook (ECOCA)	Pesitho, Caritas Denmark. n=50 HHs (38 refugees HHs & 12 host community HHs) ⁶⁷
2019	Myanmar	IDPs in Kapen and Kapaungpin	eCook (ECOCA)	Pesitho, Caritas Denmark. n=50 IDPs HHs ⁶⁸
2020	Myanmar	Two IDP camps in Karin State	LPG	Spectrum (NGO) n=60 IDPs HHs (up to 100 by Dec 2020) ⁶⁹
Proposed	Kenya	Kakuma refugee camp	LPG	MEI, KNOX, proposed pilot n=5400 refugees HHs over 24 months using concessions ⁷⁰

2.2.1 Biomass cooking

Firewood is the predominant biomass fuel used in situations of displacement in rural and camp settings.⁷¹ An allocation is provided to refugees in camps however it is not enough fuel to cook for the entire duration between allocations. Negative coping mechanisms such as selling food that was distributed or exploitative labour were used by refugees to survive. While there are no direct studies linking the procurement of additional fuel using the negative coping mechanism of transactional sex, a SGBV baseline survey in Malawi in 2019 showed that women and girls engaged in survival and transactional sex in exchange for monetary and in-kind assistance.⁷² In 2014, the estimated cost of providing fuel for cooking and heating in displaced settings amounted to approximately \$2.1 billion per year which is paid predominately by displaced people and supplemented by humanitarian organisations and hosting governments.⁷³ Other alternative biomass fuels include charcoal, dung, briquettes, pellets and agricultural waste. The cooking system ranges from three stone fires to improved cookstoves with gasifiers to improve combustion.⁷⁴ The proportion of the population in MECS focus countries with primary reliance on non-clean fuels and technology (%) in 2017 is shown in *Figure 4* from modified data from SDG indicator 7.2.1.⁷⁵ A significant proportion of the population

⁶⁵ (Patel & Gross, 2019) Cooking in Displacement Settings

⁶⁶ (UNHCR, 2020e) UNHCR Bangladesh - LPG Distribution Tracking Dashboard. (as of 30 June 2020)

⁶⁷ (Ladefoged et al., 2019) Pesitho ECOCA Pilot Testing Uganda and Myanmar

⁶⁸ Ibid.

⁶⁹ (Spectrum, 2020a) Overview of Key Findings from Baseline Survey for the IDP Fuel Transition Project

⁷⁰ (Patel & Gross, 2019) Cooking in Displacement Settings

⁷¹ (Lahn & Grafham, 2015) Heat, Light and Power for Refugees: Saving Lives, Reducing Costs

⁷² (WFP, 2019) Food situation worsens for refugees in Malawi, urgent support required

⁷³ (WFP, 2015) Protracted Relief and Recovery Operations – Kenya 200737

⁷⁴ (Barbieri, Riva, & Colombo, 2017) Cooking in Refugee Camps and Informal settlements: A Review of Available Technologies and Impacts on the Socio-Economic and Environmental Perspective

⁷⁵ (UN Stats, 2020) Indicator 7.1.2: Proportion of Population with Primary Reliance on Clean Fuels and Technology (in percentage) | UN Stats Open SDG Data Hub

still cook with biomass fuels in Sub-Saharan Africa and South, South-east Asia, even though numbers have been falling since 2010.

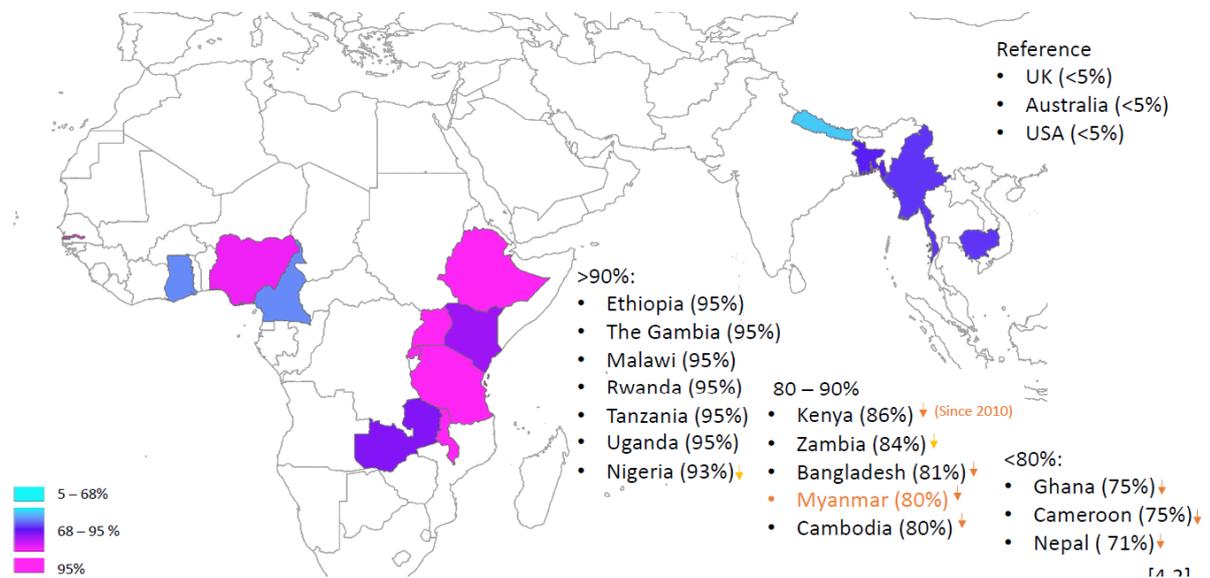


Figure 4: Proportion of population in MECS focus countries with primary reliance on non-clean fuels and technology (%) in 2017 – modified from SDG indicator 7.2.1.⁷⁶ Map by Dr Andrew Pascale

2.2.2 Ethanol

Ethanol is a liquid fuel with a slow, steady and only slightly visible flame used for cooking and heating. This fuel can be derived from feedstocks such as corn, sugar cane and sugar beets. Significant work has been undertaken by Gaia Foundation in refugee camps in Ethiopia.⁷⁷ Many lessons can be learnt by studying the 13-year implementation of ethanol in displaced settings. The project moved from in-kind donations towards a market-based approach through cooperatives. There have been issues with reliable supply chains of ethanol from sugar cane producers. Stoves came from South Africa, resulting in issues with procurement, clearance through customs, long lead time to restock and sales tax for commercial market (where as UNHCR good is sales tax-exempt). Different economic profiles of refugees were identified in the camps. Those new to camps with no resettlement schemes are less likely to benefit from remittance payments.

BOX 2: ETHANOL PROJECT IN ETHIOPIA⁷⁸

Ethiopia has traditionally been a host to large refugee populations from South Sudan, Somalia, Eritrea, Sudan and Yemen with 766,563 registered refugees and asylum seekers as of 30 June 2020. Cooking fuels for camps come almost entirely from firewood gathered from the surrounding community resulting in depleted woodlands, hostile tensions between refugees and host communities and inadequate amount of cooking fuels for refugees. In 2005, the Gaia Foundation and UNHCR established the ethanol project in three refugee camps in Jijiga, Ethiopia. A driver of the project included buy-in from private business in which the Ethiopian Sugar Corporation opened an invitation for ethanol cookstove trials. In 2005, 150 CleanCook ethanol stoves were

⁷⁶ (UN Stats, 2020) Indicator 7.1.2: Proportion of Population with Primary Reliance on Clean Fuels and Technology (percentage) | UN Stats Open SDG Data Hub

⁷⁷ (Benka-Coker et al., 2018) A Case Study of the Ethanol CleanCook Stove Intervention and Potential Scale-up in Ethiopia

⁷⁸ (Hassen, 2006) Impact Evaluation of the Use of Ethanol with the CleanCook Stove in the Kebribeyah Refugee Camp

provided to Eritrean refugees' households in Shimelba Camp in Northern Ethiopia. In 2006, 150 stoves were provided to Sudanese refugee households in Bonga Camp and 150 stoves to Somali refugees in Kebribeyah Camp. The initial CleanCook ethanol stove was manufactured in Sweden and Slovakia though from 2015, the newer model was manufactured in Durban, South Africa and can be shipped fully assembled or in parts, to be assembled locally. The CleanStove comes in either a single or double burner with a 1.2L fuel canister with a burn time of 4-5 hours at maximum heat and 7-8 hours at low heat. From lab tests, it is estimated that the ethanol stove uses approximately 22 kg of fuel per month. 13 years later, the Gaia Association (the incarnation of the Gaia Foundation) has given away 8731 ethanol stoves to refugees through a donor driven model. 46 jobs were created for refugees and host communities. The project is now run as a community enterprise. Some significant lessons learnt include the difficulty of competing with cookstoves that are not subject to VAT (56% of VAT is applied to ethanol cookstoves) and numerous issues with the reliability of ethanol supply that had to be shipped into the country. Differences in cooking cultural practices were observed in different ethnic groups in the camps. Somali refugees in Kebribeyah Camp found the CleanStove to be suitable for all cooking needs as they used traditional smaller mirite to cook injera. However, Eritrean refugees fuel stack with firewood to use the full-sized injera stoves and South Sudanese refugees were unable to cook porridge in large pots.

2.2.3 Biogas

Biogas is a gaseous clean cooking fuel that can be generated from organic waste materials within a digester. The feedstocks are typically sourced from animal waste products, food waste products and human waste products. The biogas production process requires regular input of feedstock and management of the system to maintain it in optimal condition. The by-product of the process is organic fertiliser. In Kakuma refugee camp in Kenya, Sanivation - a social-enterprise company - produces biogas as their third revenue stream after waste management and charcoal production from the waste product.⁷⁹

BOX 3: COMMUNITY ENERGY RESILIENCE WITH BIOGAS IN NEPAL

The Gorkha earthquakes in Nepal was the single largest displacement event globally in 2015, forcing 2.6 million people to flee their homes. Most displaced people initially stayed in makeshift shelters near their homes, but many of the poorest households moved from rural areas to collective urban sites in Kathmandu to seek shelter.⁸⁰ The Government of Nepal's Alternative Energy Promotion Centre (AEPCC) reported that 30-50% of biogas digesters serving 79,000 households in the worst affected districts were damaged, and there was also damage to improved cookstoves.⁸¹ Many households moved to using firewood to meet their cooking needs following the earthquake and during the blockade of the Indian border in the following months.⁸²

A study conducted in Nepal in 2016 in four earthquake affected districts found that communities deployed their own resilience strategies to access energy services using renewable energy by leveraged local resources, local technical expertise, and informal networks.⁸³ This included extending biogas pipelines and constructing improved mud cookstoves to service temporary

⁷⁹ (Foote, Woods, Fredes, & Leon, 2017) Rendering Faecal Waste Safe for Reuse Via a cost-effective Solar Concentrator

⁸⁰ (Bilak et al., 2016) Global Report on Internal Displacement 2016

⁸¹ (To & Subedi, 2019) Towards Community Energy Resilience

⁸² (Herington & Malakar, 2016) Who is Energy Poor? Revisiting Energy (In)security in the Case of Nepal

⁸³ (To, Subedi, Campbell, Carrero, & Mulugetta, 2016) Enhancing Community Resilience Using Renewable Energy in Nepal: Preliminary Results. Presented at the Smart Villages and Low Carbon Energy and Development Network (LCEDN) Webinar Series

shelters. However, damage to biogas domes required external engineering expertise to repair and were more challenging to organise. Informal networks were mobilised by communities in the aftermath of the earthquake to maintain access to services, including energy services.⁸⁴

2.2.4 LPG

LPG is a non-renewable, clean-burning liquid fuel that is stored in containers. It has been successfully introduced as a viable short to medium term “transitional” solution in displacement contexts to reduce the reliance on biomass fuels for cooking⁸⁵, including in refugee camps in Bangladesh and across the Middle East. The significant on-going cost of supply makes this fuel a challenging solution for the long-term in rural areas and camp settings. In urban and peri-urban settings, in which LPG supply chains are more established and readily available, these barriers could be overcome to transition the many who still cook with biomass to MECS. However, there is a scarcity of data on urban and peri-urban displacement settings which has to be addressed first in order to understand the needs of the displaced in those contexts and to design appropriate business models and financing mechanisms.



Figure 5: Promotion of LPG as an alternative fuel for the refugees in Nyarugusu Camp, Tanzania Photo: Emmanuel Biririza/UNHCR

BOX 4: LPG IN IDP CAMPS IN MYANMAR

Since 2011, conflict in Myanmar has seen the internal displacement of people in the Karin State. There are 169 IDPs sites with a total of 105,192 IDPs as of 30 June 2020.⁸⁶ Spectrum is a national non-governmental organization in Myanmar. They are implementing the project “Facilitating LPG fuel transitioning in crises: Development of Myanmar for public private partnership on LPG supply logistics to camps and resettlement sites” to replace firewood and charcoal with LPG as an improved cooking fuel for people in IDP camps in the Kachin State. This project is funded with UK aid from the UK government via the Humanitarian Assistance and Resilience Programme Facility (HARP-F). Drivers for switching to alternative cooking fuel sources include conflict with host communities and land mine concerns while collecting firewood.⁸⁷

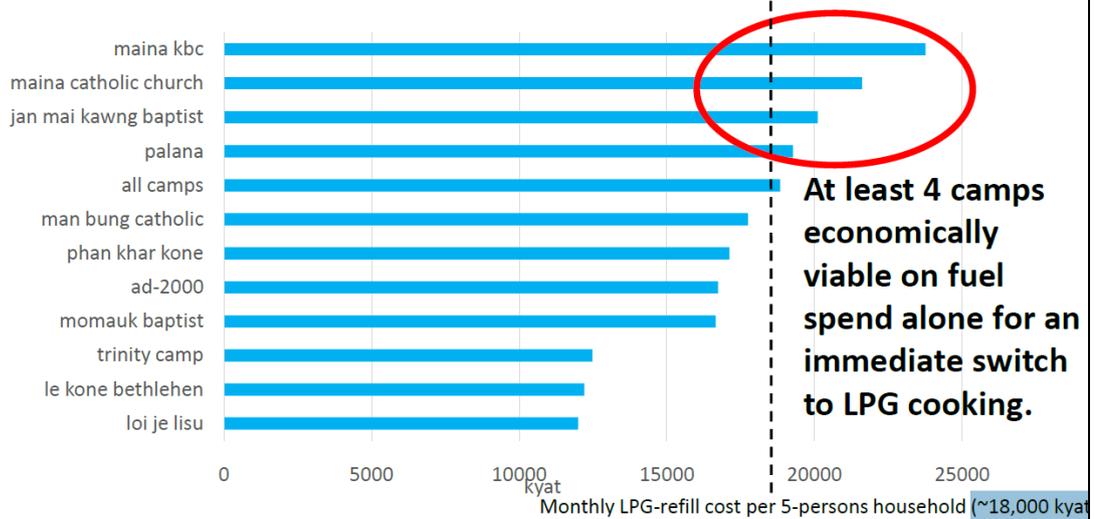
⁸⁴ (Carrero et al., 2019) Tacit Networks, Crucial Care: Informal Networks and Disaster Response in Nepal’s 2015 Gorkha Earthquake

⁸⁵ (UNHCR, 2020e) LPG Distribution Tracking Dashboard (as of 30 June 2020)

⁸⁶ (OCHA, 2020) Myanmar: IDP sites in Kachin and Northern Shan states (as of 30 June 2020)

⁸⁷ (Spectrum, 2020b) Tender for the Supply of Liquefied Petroleum Gas and Associated Household Cooking Settings in Waing Maw IDP Camps

Average spending on cooking fuel adjusted per 5-persons household



- 15 kg of LPG is known to be sufficient for a 5-persons household per month according to the UNHCR Bangladesh's Clean Cooking Project in Cox's Bazar. Local price for 15-kg of LPG refill ranged around 18000 kyats as of late last year (LPG price is now more declining as of April, 2020 due to declining global oil price).
- Spending does not take into account opportunity costs of time spent on firewood collection & fire-start time, so underestimates.

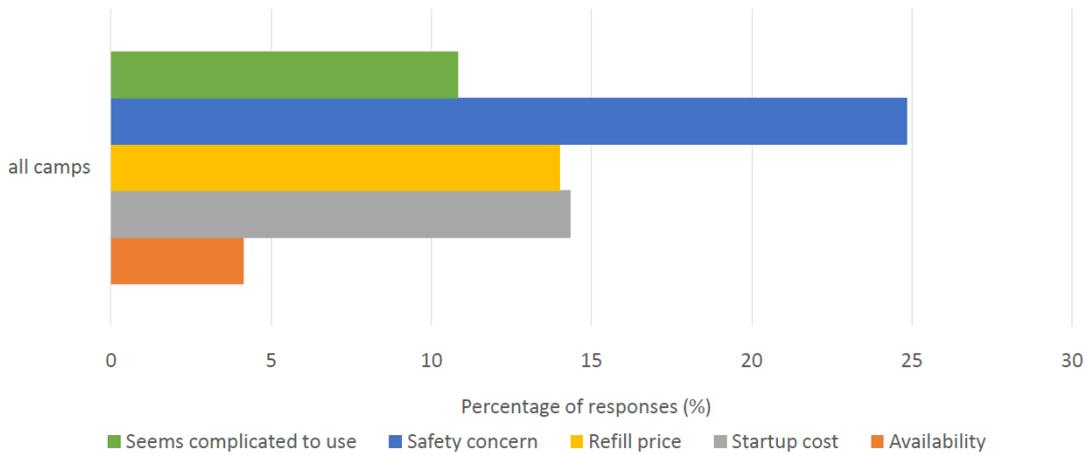


Figure 6: Average spending on cooking fuel (Source: Spectrum 2020)⁸⁸.

The site selection was based on the baseline survey carried out in 11 camps with 315 survey respondents. The two camps that spent the most on cooking fuel were selected as the site location for the pilot project: Maina KBC and Maina Catholic Church were “urban” camps in the Waing Maw Township, Kachin State (see Figure 6). The proximity of these two camps to LPG suppliers reduces supply-chain disruptions, safety risk and transportation cost. From the survey, “cooking fast” (33%) and “clean air” (21%) were identified as the two top advantages of using LPG for cooking. However, there was still 14% of respondent unable to identify any advantages of LPG for cooking demonstrating a lack of awareness of this new technology. Barriers to the uptake of this new technology focused on safety concerns such as explosions (25%), while start-up cost (14%) and refill cost (13%) were also identified as barriers.

⁸⁸ (Spectrum, 2020b) Tender for the Supply of Liquefied Petroleum Gas and Associated Household Cooking Settings in Waing Maw IDP Camps for the period

LPG knowledge and barrier assessment



LPG knowledge and advantage assessment

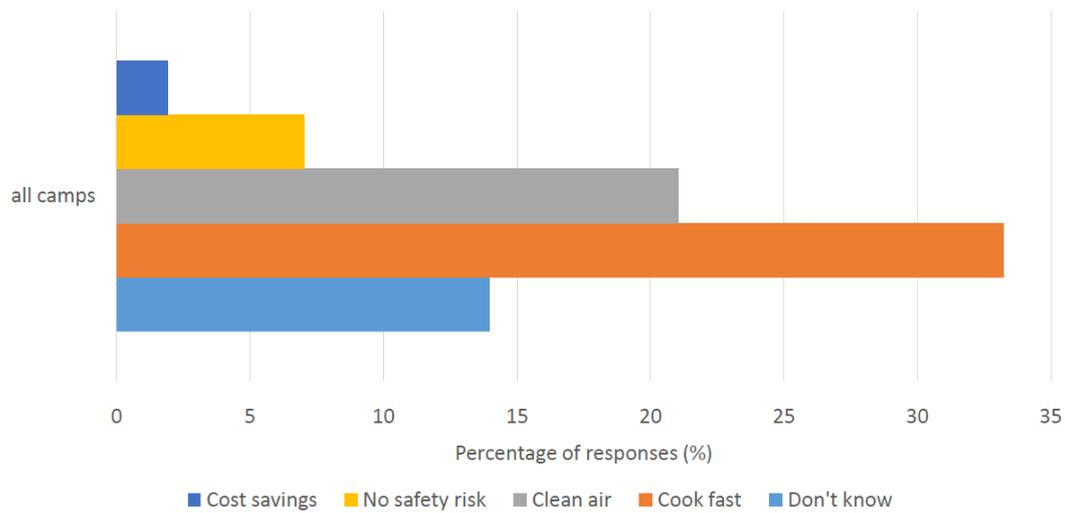


Figure 7: LPG knowledge and advantage/barrier assessment in two urban refugee camps in Kachin State, Myanmar⁸⁹

At the start of the pilot in mid-2020, 60HHs in the two IDP camps were supplied with 15kg LPG gas bottles, 1.5m hose, regulator and single burner. This will increase to 100 households in total by October 2020 for this pilot. The HHs are given one free refill per month till December 2020 when the project funding concludes. Each refill is approximately 18,000 kyat (US \$13.53 as of September 2020). As LPG technology is new for these populations, safety training was conducted by the LPG supplier.

Spectrum were hoping to target persons with disabilities (PwDs) however, no PwD HHs were selected by the local selection committees. Gender sensitivities were taken into consideration with 2 out of the 3 Spectrum field staff were women. There will be a gradual phase-out of the subsidies for the LPG refill cost. A follow up survey should identify how many HHs continue to use LPG after the pilot is completed.

⁸⁹ (Spectrum, 2020b) Tender for the Supply of Liquefied Petroleum Gas and Associated Household Cooking Settings in Waing Maw IDP Camps for the period

BOX 5: ROAD NETWORKS SUPPORT LPG SUPPLY CHAINS IN PALESTINE

LPG cans are widely used in the household primarily for cooking and water heating, which are made available in rural areas through a good road network. This is now curbing the use of inefficient biomass stoves, which have negative health effects primarily on housewives and children.

Enabler: Supply chain supported by good transport infrastructure in rural areas enable effective and reliable access to MECS.

BOX 6: SOCIAL COST–BENEFIT ANALYSIS FOR LPG IN NYARUGUSU CAMP, TANZANIA

Cost–benefit analysis and evidence of impacts could be used to attract donor funding to modern energy cooking interventions. UNEP DTU Partnership found that by switching all refugee households in the Nyarugusu camp to LPG, a \$45 million in net benefits would be achieved after 10 years (assuming a 3 per cent discount rate) that would result in a benefit-cost ratio of 1.76.

Enabler: Rigorous methodologies that look beyond economic value of MECS by quantifying social, environmental and health impacts, can provide evidence to funders who are willing to also invest in social good.

BOX 7: LPG IN ZAATARI CAMP, JORDAN

The Norwegian Refugee Council study showed how LPG beneficiaries (n=102) managed to secure gas cylinders, obtain refills and preference of cooking sites. 75% reported cooking in their tents/caravan using gas cylinders with an average between re-filling of 18 days for average household of 5 people. Of those that do not own/cannot afford gas, they cooked in communal kitchen, relative or friend’s shelter, used small portable kerosene stove or only consuming food that doesn’t need cooking as they have no money. Gas was refilled at camp markets (50%), exchanging NRC vouchers at malls (34%) or roving gas cars.⁹⁰

BOX 8: UNSUSTAINABLE LPG DISTRIBUTION IN COX’S BAZAR, BANGLADESH

In Bangladesh, there were 200,000 Rohingya refugees from Myanmar from influxes between 1978 to 2016.⁹¹ Since August 2017, over 745,000 more refugees have sought protection in Bangladesh, overwhelming the existing camps. As of June 2020, there are 860,356 Rohingya people from 187,423 families with an average family size of 4.6. 51% are children and 1% are people with disabilities.⁹² Intervention by UNHCR provided a source of cooking fuel involving the free monthly distribution of compressed rice husk pellets to 95,000 refugee families as cooking fuel, however it was still insufficient for all their cooking requirements. Free firewood collection supplemented the needed cooking fuel however, 700 metric tons of wood were needed every day for cooking.⁹³ The

⁹⁰ (NRC, 2015a) Post Distribution Monitoring Report Gas and Cooking in Zaatari Camp Background Information

⁹¹ (Enamul Haque, Bari, Khan, & Mian Ashraf Uddin, 2019) Impact of LPG Distribution Among the Rohingya and Host Communities of Cox's Bazar South Forest Division on Forest Resources

⁹² (Government of Bangladesh & UNHCR, 2020) Population Factsheet (as of 30 June 2020)

⁹³ (UNHCR, 2018c) Rohingya Refugee Camps in Bangladesh Switch to Environmentally Friendly LPG

drivers of LPG in Cox’s Bazar were severe environmental degradation and conflict with host communities. An assessment was carried out and identified that LPG was the best solution. 12kg LPG cylinders last for up to one month, depending on the family size. As the camps were not connected to the grid, electric cooking and solar electric was not considered as the local host population did not have these technologies. Significant work was done on training users on the proper use of gas cylinders and follow up home visits were carried out to identify potential. In addition, pressure cookers have been trialled at the start of 2020 to encourage energy-efficient pots use. The current model of free distribution of LPG in displacement settings is not a sustainable long-term solution. Despite the high adoption rate of this new cooking technology among both refugees and host communities, a UNHCR/IUCN survey (n=1,208) found that only 13% of the Rohingya families reported they would continue to use LPG if free refills were discontinued. Of the 87% who said that they would stop using LPG, almost all respondents (99%) cited financial barriers of not being able to afford the refills cost.⁹⁴ The underlying reason for this inability to pay is that refugees and Rohingya families are considered stateless and do not have the right to work, freedom of movement, land or to own livestock. The only income is through work or volunteering schemes run within the camp.

The LPG programme cost humanitarian agencies US\$1.15 million/month⁹⁵ and continued funding relies on year-long extensions from international donors. Chronic underfunding leaves cooking interventions at the mercy of donors. The real impact of funding cuts is felt tragically on the ground with cases of refugees killed and injured in protests after reductions in aid such as those that occurred in Rwanda.⁹⁶

The few recommendations stemming from this intervention would be to scale-up the distribution of LPG as an alternative cooking fuel and cooking sets to refugees, in a way that can support the local economy in the long run. Training should also be provided on the safe and correct use of the gas and cooking equipment to avoid incidents posing safety threats and potentially discouraging others from adopting LPG for cooking as a result.

Table 5: Provision of cooking LPG in non-MECS focus countries in displacement settings.

Location	Date	Energy Access	Description
Palestine		LPG	Other energy forms (i.e., LPG cans) are also widely used in the household sector primarily for cooking and water heating, which are made available in rural areas through a good road network. This is now curbing the use of inefficient biomass stoves, which have negative health effects primarily on housewives and children. ⁹⁷
Zaatari camp, Jordan	February 2015	Monitoring report of LPG usage (n=102)	The Norwegian Refugee Council study shows how beneficiaries managed to secure gas cylinders, obtain refills and preference of cooking sites. 75% reported cooking in their tents/caravan using gas cylinders with an

⁹⁴ (Enamul Haque et al., 2019) Impact of LPG distribution among the Rohingya and Host communities of Cox's Bazar South Forest Division on Forest Resources

⁹⁵ (Rahman, 2019) UNHCR Bangladesh in Sustainable Energy for Household Cooking Needs in Humanitarian Settings Webinar

⁹⁶ (Uwiringiyimana, 2018) Five refugees killed, 20 Injured, in Rwanda Camp Food Protest: Police (Reuters)

⁹⁷ (Karaki et al., 2005) Electric Energy Access in Jordan, Lebanon and Syria

			average between re-filling of 18 days for average household of 5 people. Of those that do not own/cannot afford gas, they cooked in communal kitchen, relative or friend's shelter, used small portable kerosene stove or only consuming food that doesn't need cooking as they have no money. Gas was refilled at camp markets (50%), exchanging NRC vouchers at malls (34%) or roving gas cars. ⁹⁸
Zaatari camp, Jordan	Reported on September 2019	Cash for cooking gas for entire camp (n=76,108)	UNHCR provides "cash for cooking gas" to the entire camp population regularly throughout the year and cash for heating gas is provided during winter. ⁹⁹ The amount of cash depends on the family size. UNHCR also provides core relief items (CRIs) such as cooking utensils. NRC supported UNHCR with 3.3 million Jordanian Dinars in total (about USD 4.6 million) to provide each family's heating gas needs for the five months of winter. This is the biggest cash distribution in the seven-year history of Zaatari camp. ¹⁰⁰

2.2.5 Solar cookers

BOX 9: SOLAR COOKERS FOR SUDANESE REFUGEES IN CHAD

Since the beginning of the war in Darfur in 2003, over 200,000 Sudanese have sought refuge in Chad. Many have stayed in refugee camps close to the border for over 15 years. Firewood has been the most common fuel used for cooking, but its collection has proven very challenging. In addition to the area where the camps are located being very dry, the need for cooking fuel has created conflicts with the host communities, resulting in harassment and assaults of the refugees, particularly women and children. To address these challenges, the [CookKit Solar Cooker](#) was launched in 2005 in six camps hosting Sudanese refugees. The project has been supported by the FairClimateFund since 2019. By Gold Standard certifying the CO2 savings stemming from the reduction in wood consumption, they have obtained carbon credits which are used to continue the distribution of the solar cookers.¹⁰¹

BOX 10: SOLAR COOKERS IN GOUDOUBO REFUGEE CAMP, BURKINA FASO

In 2013, under a 3-year SAFE strategy programme, the UNHCR introduced two solar cookers into the camp: the Devos and the Blazing Tube (BT). The former was rejected by the mostly Malian refugees, while the BT was met with relatively high acceptance rates in the first year of distribution. The key reason was that it was distributed for free. Even then, adoption rates and usage were low. On average, the number of uses of the cooker fell in the range between 15 and 20 times. A year after the BTs had been distributed, only 2% of recipients in the Goudoubo refugee camp were still using them, mostly as a secondary cooking solution. None reported

⁹⁸ (NRC, 2015a) Post Distribution Monitoring Report Gas and Cooking in Zaatari Camp Background Information

⁹⁹ (UNHCR, 2019b) Fact Sheet Jordan – Zaatari Refugee Camp September 2019

¹⁰⁰ (Qashu', 2019) Refugees Prepare for Winter with Zaatari's Largest Ever Distribution

¹⁰¹ (Fair Climate Fund, n.d.-a) Chad - Solar Cookers for Refugee

Families <https://www.fairclimatefund.nl/en/projects/chad-solar-cookers-for-refugee-families> Accessed: 22 October 2020

choosing to use them as the primary option. The main identified barriers to adoption and usage were: misleading size (despite being bigger than traditional stoves, they would not allow for cooking bigger portions); reliability and fuel expenses (on cloudy days, the cookers would not perform as well which meant that households still had to purchase other fuels to be able to cook for their families); continued contribution to deforestation (as a result of having to resort to collecting or purchasing firewood due to the cookers not providing sufficient energy for all cooking needs); food taste and preparation time (there was a preference for foods cooked over fire and it would also take a long time to cook using the solar cookers); and intra-household conflicts (due to the spouses preferring foods prepared in a traditional way which would prevent women from using the cookers).¹⁰²

2.2.6 Cooking with electricity

The technology behind generating electricity from mini-grids is well-established and understood, however there is scope for innovation in distribution algorithms and cooking appliances. For example, new induction stoves have been designed to operate using 24V low voltage DC directly connected to DC solar power instead of the typical AC electricity which requires an expensive inverter. However, these new stoves still require high power (e.g. hundreds of Watts) so will require up-front capital financing solutions to be affordable to most displaced persons (DPs).¹⁰³

While mini-grid based power generation deployed mostly in rural and camp settings poses a set of challenges for eCooking, in urban and peri-urban areas where grid electrification is already available, barriers to eCooking are fewer. Urban settings, for example, have an overall higher rate of electricity access and can be well-placed to explore electricity for cooking. They are also places where majority of the displaced reside. However, urban displaced might be isolated by an absence of social inclusion, illegitimacy or informal land occupation that prevents access to formal energy deliveries (such as signing on to a utility for electricity), a lack of awareness of the options, and limited household budgets for upfront capital expenditure that results in poor energy practices. With the scarcity of data on energy access among the displaced in urban contexts, these and other issues will have to be better understood in order to remove barriers to the uptake of MECS.

BOX 11: GENDER PERSPECTIVE IN SOLAR-POWERED ELECTRIC COOKING IN REFUGEE CAMPS

Pesitho Aps and Caritas Denmark funded by FCDO's Modern Energy Cooking Services (MECS) programme conducted a pilot electric cooking project at the Bidibidi Refugee Settlement in Northern Uganda. The study involved 20 households, 10 households in which an ECOCA solar-powered electric cookstove with battery storage were installed and 10 non-ECOCA households. A gender perspective was explored by asking the research question, "How does solar-powered electric cooking impact traditional gender roles?"

The study found women reported a greater sense of food and personal security with electric cooking. They and their children reduced their need to collect firewood outside the camps and this improved mental health as it reduced the stress of where to acquire firewood every day. While overall CO₂ emissions were reduced for ECOCA households, second-hand smoke from neighbouring households demonstrated a need for community-wide electric cooking programmes to reduce air pollution across the entire camp and host communities.

¹⁰² (Troconis, 2018) The Broken Promise of Solar Cooking? The Case of Goudoubo Refugee Camp

¹⁰³ (Puzzolo et al., 2019) Supply Considerations for Scaling Up Clean Cooking Fuels for Household Energy in Low- and Middle-Income Countries

Socio-cultural factors around cooking still places the cooking burden predominantly on women and children though all family members benefitted through improved food taste and nutrition where there is no longer the bitter taste of ash from fires. While the men also discuss similar advantages for females in their household, the new electric cookstove did not translate into men participating in the burdensome task of cooking.¹⁰⁴

2.2.7 Electrification in refugee camps

Box 12: E-COOKING AN OPPORTUNITY IN JORDAN?

One of the main goals of the newly developed electrical infrastructure in Jordan is to provide all refugees with cooking and lighting needs in a safe and sustainable manner.¹⁰⁵ However, the current strategic goals of UNHCR places electrification and cooking in two different categories.

Modern energy cooking predominantly focuses on a gas solution (e.g. LPG cylinders). In the past, ethanol and solar have been trialled with little success in scale up. Electrification focuses on lighting, refrigeration, cooling, productive uses of energy and solar pumping of water. Even though electrification is promoted as improving daily task such as cooking¹⁰⁶, this improvement applies to being able to store food in refrigerators and cooking at night due to lighting.

UNHCR has partnered with Schneider Electric to pilot to a phase 1 trial of 24 “[Energy Dispenser](#)” smart devices to monitor household energy consumption in village 6 in Azraq refugee camp from September 2018.¹⁰⁷ In Phase 2 trials, 200 shops will be monitored for energy consumption within the camp.

There is currently no evidence in which electricity is being promoted with modern cooking appliances (e.g. high-efficient electric pressure cookers) that could reduce the reliance on fossil fuel derived LPG.

Table 6: Examples of electrification projects in UNHCR refugee camps.

Location	Date	Project stage	Description
Palestine		On-grid Electricity	Many of the poor in refugee camps are not paying for their electricity bills thus presenting a burden on the already difficult financial status of EDL which the government seeks to privatize. At the household level the burden is due to a large use of energy hungry appliances making electricity consumption in the residential sector around 38.5% of total electric energy supplied. The analysis of the electricity structure and consumption for both residential and commercial sectors is based on a study completed in 1998 for Lebanon [UNDP, 19]. From this analysis 80% of the total electricity consumption in these sectors is due to electric space heating 31%, electric domestic hot water systems 22%,

¹⁰⁴ (UNHCR, 2019a) Fact Sheet Innovation Jordan February 2019

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

			air conditioning A/C 13%, lighting 8.5% and refrigeration 6%. (NOTE: no cooking with electricity) The electricity tariff is constructed to present a low cost to the poor as shown by the tariff of the first block for low income costumers, which is at about half of the cost of production. The range stretches from 4.5 cents to 11.2 cents/ kWh. ¹⁰⁸
Azraq camp, Jordan	May 2017	Solar power plant (n=20,000 in 5,000 shelters)	The first renewable energy solar powered refugee camp in the world funded by IKEA Foundation. Phase 1 was the installation of 2MW solar photovoltaic (PV). The solar plant cost 8.75 million euros. Savings of US\$1.5M/yr and it will reduce CO ₂ emissions by 2,370 tons/yr. ¹⁰⁹ Another estimate has savings of \$1.17M/yr with a payback period of 7.4 years. ¹¹⁰ 50 refugees have been trained and employed to construct the solar farm, some of which will provide on-going maintenance of the system. ¹¹¹
	Sep 2018	Extension of Solar Plant (n=36,766 in 8,668 shelters)	New extension of 1.5MW power making it a total of 3.5MW with the support of the Jordanian company EDCO (Electrical Distribution Company) and funded by the Saudi Fund for Development. ¹¹² The energy covers 55% of shelter electricity needs. ¹¹³
	Aug 2019	Extension of Solar Plant (n=40,000 10,000 shelter)	Further construction of a 1.5 MW power extension to the solar plant which bring the camp to a total of 5MW solar power plant, which covers 70% of the total energy required for the whole camp. ¹¹⁴ Overall savings of up to US\$2.75M/yr in electricity consumption costs and environmental reduction of 6300 tons of CO ₂ emissions/yr. 100% of the camp shelters are connected (10,000 refugee shelters) with an additional 234 formal and informal businesses, offices and utilities, providing year-round electricity of up to 16 hours daily. Average shelter consumption is 2.7-3.5 kWh/day depending on the season to operate lights, a refrigerator, television, a fan and charge phones. The system covers 70% of the camp electricity needs. Notably, electrical cooking was not considered a viable solution at the time of assessment. ¹¹⁵ Cooking is reliant on the free provision of LPG.
Zaatari Camp, Jordan		On-grid electricity access	On-grid electricity was provided to refugee households for 6 to 8 hours a day after sunset. The access was rationed due to high cost of powering the camp. ¹¹⁶
	Nov 2017	Solar power plant.	Largest solar power plant ever built in a refugee camp. 12.9MW peak Solar PV plant increase access of electricity to

¹⁰⁸ (Karaki et al., 2005) Electric Energy Access in Jordan, Lebanon and Syria

¹⁰⁹ (UNHCR, 2017a) Azraq, the World's First Refugee Camp Powered by Renewable Energy

¹¹⁰ (Cohen & Patel, 2019) Innovative Financing for Humanitarian Energy Interventions

¹¹¹ (UNHCR, 2017a) Azraq, the World's First Refugee Camp Powered by Renewable Energy

¹¹² (UNHCR, 2019c) Fact Sheet Jordan November 2019

¹¹³ (UNHCR, 2019a) Fact Sheet Innovation Jordan February 2019

¹¹⁴ Ibid.

¹¹⁵ (UNHCR, 2020b) Fact Sheet Jordan - Azraq Refugee Camp May 2020

¹¹⁶ (UNHCR, 2017b) Jordan's Zaatari Camp Goes Green with New Solar Plant

		(n=80,000 refugees and host community)	refugees' homes. Save US\$ 5M/yr in electricity bills. ¹¹⁷ Funded by German government at a cost of 15 million euros (US\$17.5 million). Provides HHs with 12-14 hours electricity each day ¹¹⁸ typical from 17:00pm to 5:00am. The plant connects 100% of shelters in the camp with low and medium voltage power network supported by the Government of the Czech Republic. In addition, capacity building of 109 refugees with internationally recognised accreditations as electricians by the Japan International Cooperation Agency (JICA) provide construction and on-going maintenance for the entire electrical system. ¹¹⁹
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Addressing clean energy transitions will require holistic thinking about both electricity and energy for cooking in order to maximise the co-benefits and provide truly modern energy services. There are opportunities to apply learnings from the global electrification efforts to the clean cooking sector, and to combine the ongoing electrification projects and interventions with energy for cooking, which could also see greater potential for leveraging the funds going towards electrification for the provision of MECS¹²⁰.

Box 13: COOKING AS A SERVICE

Even though modern, clean cooking solutions are often thought of as a sum total of the physical components that make them up, i.e. the stoves, the stove equipment, and the fuel that is used (incl. the way it is packaged/contained in instances such as LPG, ethanol or biogas), the service aspect of modern cooking should be emphasised as it is a critical factor in supporting clean cooking transitions, including in displacement settings. For example, the provision of LPG for cooking in IDP camps in the Kachin State, Myanmar (see Box 5), heavily depends on the service that the customers receive, including LPG refills and training on the safe installation and use. In the case of PAYG LPG, explored as an option for the transition to clean cooking in the Nyarugusu camp, Tanzania¹²¹ (see Box 7), the service also includes the processing of payments and the remote enabling and disabling of LPG flow (when a customer runs out of credit, the flow is disabled, once the payment is made- the flow resumes). At-home refill services and system maintenance can also alleviate the burden otherwise placed on the user. In the case of eCooking, the user depends on the electricity supply and services and it is also critical that maintenance of the electrical appliances is provided in case of any faults which the user might not be able to address her/himself. Without the service component, the offered solutions run the risk of going into disuse as soon as they stop working or experience failures.

2.3 What foods provisions are being provided to beneficiaries in displacement settings?

For humanitarian organisations, there are three distinct transfer modalities for food distribution:

- In-kind (i.e. giving out specific food items for free)

¹¹⁷ (UNHCR, 2019a) Fact Sheet Zaatari Camp, Jordan January 2020

¹¹⁸ (UNHCR, 2017b) Jordan's Zaatari Camp Goes Green with New Solar Plant

¹¹⁹ (UNHCR, 2019a) Fact Sheet Innovation Jordan February 2019

¹²⁰ (Batchelor et al., 2019) Two Birds, One Stone - Reframing Cooking Energy Policies in Africa and Asia.

¹²¹ (Rivoal & Haselip, 2018) Delivering Market-based Access to Clean Cooking Fuel for Displaced Populations the Kigoma Region, Tanzania: a Business Plan

- Cash-based transfers (i.e. cash transfers of which some might be used to buy food items)
- Voucher (giving beneficiaries an amount that can be used to buy a range of food items).

The difference between commodity and value vouchers are that commodity vouchers are in terms of fixed quantities of goods (e.g. one kg of rice and one kg of beans) whereas value vouchers are in monetary terms (e.g. \$10 to be spent at specific kiosks). The decision on which scheme to implement is context-dependent and is determined by:

- The objective: relief, recovery, or development
- Considering length and scale of the project
- Local availability of infrastructure (market, technology, financial, network)
- The setup costs of the scheme.

The advantages and disadvantages of each modality are discussed in detailed below.

It should be noted that food assistance by humanitarian organisations (e.g. WFP) is predominately focussed on displacement in camp settings. Those living in urban areas are typically not entitled to food assistance.¹²²

2.3.1 In-kind food distribution

The WFP provides a free “food basket” for emergencies or refugee situations when beneficiaries are completely reliant on food provisions.¹²³ These in-kind food baskets typically contain:

- a staple, such as wheat flour or rice
- lentils, chickpeas or other pulses
- vegetable oil (fortified with vitamin A and D)
- sugar
- iodized salt.

Table 7: In-kind food distribution to displaced populations.

Country	Food Supplied	Situation
The Gambia	Rice, oil, sugar	Senegalese authorities have delivered and distributed several metric tons of food to the displaced and host families – including rice, oil and sugar. Forty tons of rice arrived in Ziguinchor region in the last week and distribution has started in several villages hosting displaced people (UNHCR 24/01/2017).
Malawi	In-kind donations – rice, beans, oil	Approximately 90% of the 44,000 refugees in the Dzaleka refugee camp in Malawi rely on food assistance. ¹²⁴ A full ration is defined as 15 kilograms (33 pounds) of food a month, composed of a daily ration of 440 grams of rice, 90 grams of varied beans and 25 grams of vegetable oil. ¹²⁵ Limited funding has meant that the food situation has worsened with only half rations being distributed. ¹²⁶

¹²² (WFP, 2015) Protracted Relief and Recovery Operations – Kenya 200737

¹²³ (WFP, n.d.) The WFP Food Basket <https://www.wfp.org/wfp-food-basket> Accessed: 2 December 2020

¹²⁴ (UNHCR, 2019f) Malawi Fact Sheet

¹²⁵ (Godin & Martin, n.d.) A Forgotten Refugee Crisis <https://thegroundtruthproject.org/a-forgotten-refugee-crisis/> Accessed: 20 October 2020

¹²⁶ (WFP, 2019) Food Situation Worsens for refugees in Malawi, Urgent Support Required

Kenya	Cereals, SuperCereals, pulses, vegetable oil, salt, dates, plus vouchers. Porridge and sugar for school meals.	WFP provides general food distribution fortnightly as a combination of food and vouchers (resources permitting), complementary feeding for pregnant and lactating women during the first 1000 days after conception, treatment of acute and chronic malnutrition, nutrition support to people living with chronic diseases, institutional feeding in hospitals, school meals and food for training for young people. ¹²⁷
Bangladesh	20 food items purchased using e-vouchers	WFP is providing general food assistance (and LPG for cooking) to around 855,000 refugees in the world's largest refugee camp, in Cox's Bazar. The target is to provide this support to all refugees through e-vouchers by the end of the year. Through these e-vouchers, refugees can choose from a list of 20 food items at outlets in the camp and pay using their WFP SCOPE card. ¹²⁸
Jordan	Ready to eat meals and bread for newly arrived refugees	For newly arrived refugees, WFP provided ready to eat meals and bread on arrival. In addition, WFP provides students with meals through their school feeding programme based in refugee camps and within host communities. The daily meals during the school semester for approximately 10,000 children in formal education in the camp include fresh baked snacks consisting of a savoury pastry, a cucumber, and a piece of fruit. 150 refugee workers prepare the meals in two kitchens located inside the camp with 50% workers being female ¹²⁹ . The feeding programme halted as schools closed due to the impact of COVID-19 and has resumed in early October, 2020 ¹³⁰ . More information on types of foods cooked in school feeding programmes and UN kitchens can be found in the report on the Landscape Analysis of Modern Energy Institutional Cooking. ¹³¹

2.3.2 Cash-Based Transfers (CBT)

UNHCR has brought about a strategic global shift from distribution of in-kind relief items, to **providing humanitarian cash transfers** for refugees to support the purchase of vital and essential needs items. The ability to purchase essential items supports empowerment and increased dignity to refugees. In Jordan, the World Food Programme (WFP) supports refugees living in camps with US\$32/person per month through cash transfers. Refugees can use this money to purchase a variety of food and items from two WFP contracted supermarkets and four bread shops in the camp. 30,000 vulnerable refugees in Jordan outside the camp are given cash transfers. The winter cash transfer covers the four coldest months, and the average amount of cash varies from USD 260 for a single person (\$66 per month) to USD 440 for a family of 7 (\$110 per month).¹³² At the WFP, CBT started in 2005.

¹²⁷ (WFP, 2015) Protracted Relief and Recovery Operations – Kenya 200737

¹²⁸ Correspondence with WFP Staff Energy for Food Security Advisor Maarten Kleijn

¹²⁹ (UNHCR, 2020b) Fact Sheet Jordan - Azraq Refugee Camp May 2020

¹³⁰ (UN, 2020) WFP Resumes School Feeding for Jordanian and Refugee Children

¹³¹ (MARGE, 2020) Landscape Analysis of Modern Energy Institutional Cooking

¹³² (UNHCR, 2019c) Fact Sheet Jordan November 2019

2.3.3 Vouchers

Vouchers can be conditional or unconditional. Conditional vouchers are when people must earn the voucher by doing something (work, attend training, etc) and unconditional requires no activity to be done to earn the voucher.

Paper Voucher/E-voucher: Physical voucher systems come as paper voucher/coupon or scratch card while E-voucher consist of either barcode, magnetic band, microchip of a plastic card or used through a cell phone. The plastic card can come as a personal pre-paid card, SMART Card, SCOPE Card. Cell phone systems use SMS or USSD. Smart Card/SCOPE Card standouts using biometric ID checks and offline functionality.

The voucher scheme is appropriate when the products can be quickly supplied in the local market, it does not lead to inflation and the local market is competitive. The potential disadvantages of the voucher scheme are:

- **Selection of beneficiaries** can be challenging
- It could lead to **inflation** that would especially affect the people in the area who do not benefit from the voucher scheme
- **Limited capacity** among implementers and partners to implement such a scheme
- **Restricts mobility** to areas covered by the scheme, and digitised voucher schemes introduce a traceability and formality to refugee life that may be unwelcome or disruptive
- **Gender issues:** women might not be allowed to control vouchers distributed as they are perceived to control cooking fuel, cookstoves and basic electrification.

Although the spread of digital technologies and the inclusion of the displaced in their use has been advantageous in helping with issues such as resource distribution and more broadly financial inclusion (e.g. through the use of smart cards or mobile money), there are concerns that those digital technologies do not always foster integration of the displaced but instead increase their vulnerability by being subjected to digital governance¹³³. Digital connectivity and inclusion are often disjoined from legal recognition and refugee protection and does not foster their right to stay, work, and access citizens' benefits. For example, the temporariness that characterises Cash Assistance Programmes and refugees' access to digital technologies contributes to increased precariousness. Those who temporarily benefit from prepaid debit cards recharged by the UNHCR and who are in connection with NGOs via mobile applications can be easily 'illegalised' when denied international protection.

2.3.4 Kitchen sets

In addition to food distributions, refugees are also given kitchen sets to enable the preparation and consumption of meals. One "Type B" Kitchen Set includes the following cooking and serving utensils suitable for a family of 5 people to support African and Western gastronomy.¹³⁴

¹³³ (Garelli & Tazzioli, 2018) Migrant Digitalities and the Politics of Dispersal: An Introduction

¹³⁴ (IHRPP, n.d.) Kitchen Sets <https://ihrpp.com/ad-category/emergency-relief/kitchen-sets/> Accessed: 1 October 2020



Figure 8: UNHCR Kitchen set (Source: <https://ihrpp.com/ads/kitchen-sets/>)

- Each kitchen set includes the following items:
- 1 x 7 litres, stainless steel cooking pot
 - 1 x 2.5 litres, stainless steel frying pan (used as lid for 7L cooking pot)
 - 1 x 5 litres, stainless steel cooking pot with lid
 - 5 x 1 litre, stainless steel bowl
 - 5 x stainless steel plates
 - 5 x stainless steel cups
 - 5 x stainless steel tablespoons
 - 5 x stainless steel table-forks
 - 5 x stainless steel table-knives
 - 1 x kitchen knife with stainless steel blade
 - 1 x wooden serving spoon
 - 2 x stainless steel serving spoon
 - 1 x stainless steel scouring pad

Packing and Marking:

1 carton box, outer dimensions 0.3 x 0.3 x 0.25m.

Box Strength - withstands 6m-high stacking for more than 48h, and 10 handlings.

Seal - tape on every joint of the carton, plus 4 plastic 10mm straps.



Figure 9: Example of shelter kits and kitchen sets. In Bangladesh, these items are provided materials for Rohingya refugees in Cox's Bazar. The kits include core relief items, plastic sheeting, ropes, blankets, a fire extinguisher, solar panel, mosquito nets, pots and pans, cutlery and dishes.¹³⁵ Photo: UNHCR Facebook 1 November 2019

¹³⁵ (UNHCR, 2019h) Shelter Kits and Kitchen Sets in Bangladesh

2.4 In which displacement settings will the MECS transition take place first?

The literature has been used to predict early adopters of eCooking in various displacement settings and host communities from an assessment matrix¹³⁶ based on electricity access and current cooking appliances (see *Table 8*). The following categories in displacement settings were identified from the most likely to transition to the least likely.

2.4.1 Likely to transition

Cooking for large groups within camps for schools, community kitchens, police stations and UN staff kitchens are low hanging fruits due to their centralised authority of an international humanitarian organisation, location within camps with electricity access from powering other humanitarian operations and access to significant international funding sources.

Cooking for large groups in peri-urban, urban centres (e.g. schools or marketplaces) supporting IDPs, host communities and urban refugees' schools and businesses could be another opportunity for MECS in displacement settings.

Displaced populations and host communities in **urban areas also have the potential to transition to electricity for household cooking**. MECS could leverage the considerable research, technical and business innovations of existing MECS programme for mini-grids, weak on-grid and on-grid eCook solutions. The challenges within these settings are that urban displaced populations are interspersed with host communities and hence, national and local authority engagement is critical in promoting enabling infrastructure. In addition, the ability to afford eCook solutions will depend on the legal rights to work, rights of movement and access to digital payment methods¹³⁷ that is in the jurisdiction of hosting counties. Similar factors will impact on the adoption of fuels such as LPG which have an existing infrastructure in place and can benefit the urban displaced who might still predominantly rely on charcoal for cooking.

Another potential setting could be camps with LPG cooking solutions and solar PV installations connected to grid (e.g. Zaatar or Azraq refugee camps in Jordan), piloting eCook studies to encourage a transition towards a **clean modern energy fuel stack**. It is noted however, that Jordan is not listed as a MECS' country of focus but that it offers a valuable case study.

Working with the World Food Programme schools feeding programmes in displacement settings and for initial feeding of arrivals at "reception centres" in refugees camps could also be an area to explore.

2.4.2 Less likely to transition

The matrix also identifies settings in which there are considerable challenges to be overcome before eCook is affordable, sustainable and available at scale. Most refugees in rural camps currently have no access to electricity and/or gas and cook with traditional biomass fuels collected free and/or provided as aid handout. This setting is the most challenging scenario for the transition to MECS in the next decade as refugees will tend to be limited in their ability to pay for a cleaner alternative fuel source, and humanitarian donor organisations do not have the budgets to sustain long-term provision of cooking fuels for protracted displacement situations. However, household interventions with standalone solar electric powered cooking appliances (e.g. Pesitho ECOCA) could be conducted

¹³⁶ (Brown & Sumanik-Leary, 2015) A Review of the Behavioural Change Challenges Facing a Proposed Solar and Battery Electric Cooking Concept

¹³⁷ Ethiopia and Uganda have progressive refugee integration policies which include freedom of movements and rights to work.

at pilot-scale to develop an understanding of refugee lived experience with e-Cooking. Scale up of eCook will follow on from when an electrification programme reaches these camps.

Table 8: Likelihood of eCook adoption in various displacement settings.¹³⁸

	<i>Current access to electricity</i>			
	<i>None</i>	<i>Off-grid/isolated systems e.g. Solar Home Systems (SHS)</i>	<i>Unreliable national grid or mini-/micro-/nano-grid</i>	<i>Reliable national grid supply</i>
<i>3 stone fire or traditional stove Solid fuel collectors</i>	Majority of refugees in rural camps in SSA – Least likely to transition as technical, financial and cultural barrier the greatest.			
<i>3 stone fire or traditional stove Solid fuel purchasers</i>	Peri-urban or slum settlements, IDPs, refugees, host communities. Transition to PV-eCook possible if TT, IF, AR & DM offered. WFP run reception centres at refugee camps to feed initial influx of refugees at the start of a humanitarian crisis.	Some rural host communities. Likely transition to PV-eCook with DM, AR & IF as fuel payments can offset cost	Urban IDPs, refugees, host communities. Likely transition to PV-eCook with DM, AR & IF as fuel payments can offset cost	Urban IDPs, refugees, host communities. Likely transition to eCook with DM, AR & IF as fuel payments can offset cost
<i>Improved Cookstove Solid fuel collectors</i>	Host community institutional cooking in schools – student collects firewood			
<i>Improved Cookstove Solid fuel purchasers</i>	Majority of “institutional cooking” in refugee camp schools		“Institutional cooking” in health clinics, UN Kitchens (find reference) (e.g. for feeding staff)	“Institutional cooking” in health clinics, UN Kitchens (find reference) (e.g. for feeding staff).

¹³⁸ Table 8 Adapted to Displacement Settings From Brown et al. (2017) eCook: What Behavioural Challenges Await This Potentially Transformative Concept?

	(supported by WFP/UNHCR). Street vendors in informal urban settlements (Nairobi, Kenya). ¹³⁹			No battery is required.
LPG/Biogas	Refugees & IDP in camps in Bangladesh, Jordan, Niger, Myanmar already have access to freely distributed LPG. Potential for e-Cook stack to reduce cost to UNHCR.	Potential for super energy-efficient electric cookers where Tier 3 and beyond access exists to complement LPG use.	Potential for super energy-efficient electric cookers where Tier 3 and beyond access exists to complement LPG use.	Potential for any electric cookers to complement LPG use.
Electricity		Only pilot stage eCook interventions have been carried out in rural refugee & IDP camps in Uganda and Myanmar. Likely transition to PV-eCook with TT, DM, AR & IF as <u>fuel cash voucher can offset cost though not a long-term solution</u>	Very little data of urban/peri-urban displaced person in cooking habits.	Very little data of urban/peri-urban displaced person in cooking habits.

Key barriers to transition: TT = technical training on PV systems, IF = innovative financing, AR = Awareness raising showing health benefits, DM = locally appropriate delivery model

2.5 What role can MECS play in the transition towards a cleaner cooking stack in displacement settings?

The following suggestions are provided to the MECS programme to leverage their work in technology and research:

- Conduct and support others to undertake user-centric research to understand the lived experience of displaced populations in rural, camp and peri-urban and urban areas using

¹³⁹ (IIED, 2016) Informal Food Systems and Food Security in Rural and Urban East Africa

evidence-based methodologies such as the Cooking Diaries Protocols developed by the MECS programme.

- Study LPG transitional fuel usage and advantages of energy efficient appliances (e.g. pressure cookers), particularly, but not exclusively, in urban and peri-urban areas which offer an environment more conducive to the adoption of MECS.
- Demonstrate the technical feasibility of electrical cooking (e-cook) at large scale for institutional cooking (e.g. school feeding programme, reception centres at refugee camps, UN kitchens for staff, police stations and administration kitchens).

Support other actors that are traditional implementers in displacement settings with technical assistance to trial e-cooking interventions, e.g. WFP School feeding programme, working with humanitarian organisations to transform operation cooking systems through “greening the blue” initiatives.

3 Roles of stakeholders

This section reviews the current stakeholders’ landscape and identifies the differences in drivers and constraints of cooking in displacement settings from the perspective of four major stakeholder categories:

Household scale cooking (< 20 people¹⁴⁰, usually below 10):

- 1) **displaced people without legal rights** to work, restrictions on movement and no rights to own land (e.g. refugees¹⁴¹ and asylum seekers)
- 2) **internally displaced people (IDPs) and refugees with legal rights** to work, freedom of movement and the rights to purchase land
- 3) **host communities with legal rights** to work, freedom of movement and the rights to purchase land

Community scale cooking (typically > 20 people):

- 4) **host governments and humanitarian organisations** (e.g. government ministries and local authorities working in the field, UNHCR, WFP, IOM) that have the mandate to provide large scale cooking for the masses of displaced populations, host communities and for their own staff (e.g. “welcome reception centres” for newly arrived displaced populations, school feeding programmes, staff kitchens, police stations providing protection in camps).

These distinctions are important as long-term, sustainable transition from biomass to modern energy cooking in displacement settings centres on **self-reliance and the ability to choose solutions** that best meet individual household and organisations’ cooking needs.¹⁴² The drivers of switching to more modern technologies that have been identified in the literature have been discussed in relations to the four groups. Table 9 describes the motivation for each stakeholder category in relations to these drivers.

¹⁴⁰ Special cases e.g. larger households with more than one wife

¹⁴¹ There are exceptions to these restricted rights (e.g. countries like Ethiopia and Rwanda that have granted rights to refugees to work, move and own land).

¹⁴² (Crawford & O’Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and Self-reliance in East Africa

Table 9: Key drivers of different stakeholder group to transition to modern energy cooking in displacement settings.

	Refugees, IDPs, Host community members	For Governments/ Humanitarian Organisations
Cooking scale	Household	Large community scale
Environmental	Deforestation leads to greater distance required to collect fuelwood/charcoal ¹⁴³	<ul style="list-style-type: none"> Deforestation from excessive fuelwood collection leading to local environmental degradation (e.g. landslides from flooding) negatively affecting camp management¹⁴⁴ Awareness of global impacts of the climate crisis prompting reduction strategies for carbon emissions and air pollution levels through the role of intact and functioning forest ecosystems as carbon sinks for climate change mitigation, implementing strategies for forest protection, rehabilitation or reforestation^{145, 146} Deforestation or forest degradation from excessive fuelwood collection leading to negative impacts on core, interlinked ecosystem services such as freshwater provision, soil fertility maintenance, and biodiversity¹⁴⁷
Safety and protection	<ul style="list-style-type: none"> Safety from sexual and gender-based violence (SGBV) from fuelwood collection outside camps^{148, 149} Less dangerous than paraffin/kerosene Reduce burns from open fires 	Physical protection of refugees from fuelwood collection related SGBV ¹⁵⁰
Health	Health benefits from reduced indoor air pollution	Reduction in air pollution levels and respiratory related illness ¹⁵¹
Gender equity	Reduces time burden of cooking to dedicate to other activities such as child-minding, income generation or leisure ¹⁵²	Increase opportunities for woman and girls for other education and income activities

¹⁴³ (FAO, 2018) Managing Forests in Displacement Settings

¹⁴⁴ (WFP & UNHCR, 2014) WFP UNHCR Joint Assessment Mission Rwanda

¹⁴⁵ (Watson et al., 2018) The Exceptional Value of Intact Forest Ecosystems

¹⁴⁶ (FAO, 2018) Managing Forests in Displacements Settings

¹⁴⁷ (FAO, 2015) Forests, Trees and Disasters

¹⁴⁸ (Patrick, 2007) Sexual Violence and Firewood Collection in Darfur

¹⁴⁹ (Listo, 2018) Preventing Violence Against Women and Girls in Refugee and Displaced Person Camps: Is Energy Access the Solution?

¹⁵⁰ (Patrick, 2007) Sexual Violence and Firewood Collection in Darfur

¹⁵¹ (UNHCR, 2020d) Jordan Operational Update May 2020

¹⁵² (IDRC, 2017) Pre-Cooked Beans for Improving Food and Nutrition Security and Income Generation in Kenya and Uganda

Cost	Free distribution of firewood but not enough for allocated time. Reduce negative coping mechanism related to previous fuelwood restriction (e.g. sell food to buy additional charcoal to cook). Charcoal production leading to rising consumer prices of fuelwood/charcoal Reduction in cost of alternative fuel stacking sources	Negative driver (however mandate to reduce host communities' conflict due to competition of fuelwood resource overrides cost) Social-cost analysis can demonstrate and quantify positive impact beyond cost ¹⁵³
Users cooking experience	Faster cooking both in terms of preparation of heat source and cooking duration. Highly flexible – faster cooking and able to adapt to a range of utensils and meet highly variable demand patterns ¹⁵⁴	Not directly cooking. Hire or volunteer cooks with rigid timeframes for food to be ready for meals
Economic dependency	Reliant on humanitarian organisations to provide free distributions of fuel or cash for fuel schemes ¹⁵⁵ Others are self-reliant ¹⁵⁶	Reliant on international and country-level donors which can be highly politicised based on self-serving interest of LPG/electricity suppliers
Livelihoods, Employment	Time saving translated to more time to earn a living (if displaced person has right to work) or dedicate to education, earn a living ¹⁵⁷	Creation of a cleaner energy economy (if displaced person has legal rights to work) ¹⁵⁸

The literature shows that the displacement landscape is complex and dependent on the stakeholder perspective to understand which drivers will motivate which groups to transition towards modern energy cooking. The drivers are both top-down and bottom-up and will require multi-pronged and multi-sectoral approaches to enable successful cooking interventions in displacement settings.

3.1 Who is doing what in displacement settings in the cooking sector and how are the programmes being delivered?

Modern energy cooking is a multi-dimensional, multi-stakeholder challenge. For the case of electrical cooking, it cuts across both electrification and cooking agendas which have traditionally been seen as separate energy access issues. In terms of displacement settings, the political sensitivities, long-term chronic under-funding and protracted crisis situations involve significant

¹⁵³ (ICRW, 2018) Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

¹⁵⁴ (Rivoal & Haselip, 2018) Delivering Market-based Access to Clean Cooking Fuel for Displaced Populations the Kigoma Region, Tanzania: a Business Plan

¹⁵⁵ (Crawford & O'Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and Self-reliance in East Africa

¹⁵⁶ (UNHCR, 2020d) Jordan Operational Update May 2020

¹⁵⁷ (Crawford & O'Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and self-reliance in East Africa

¹⁵⁸ (Cohen & Patel, 2019) Innovative Financing for Humanitarian Energy Interventions

political will to enable a narrative change.¹⁵⁹ The main actors of modern energy cooking in displacement settings, their self-described roles, priorities, and agendas are discussed in this section to enable a broader understanding of this complex landscape.

3.1.1 Hosting Governments

Fundamental to any cooking intervention in displacement settings is the governance landscape. Geographical proximity to areas of conflict or natural disasters is a significant determinant of refugee and IDPs hosting responsibility. 80% of refugees live in countries neighbouring their countries of origin, typically in developing countries. Only 16% of the world's refugees have been resettled in developed countries.¹⁶⁰

Hosting governments play a crucial role in allowing displaced populations to cross international borders, providing the required land for humanitarian organisations to set up operations, balancing expectations of their own constituents against the perceived favouritism of refugees, legislation of refugee's right to work, freedom of movement, tenure of land and ownership of livestock. The complexity of displacement contexts sits in the backdrop of hosting governments' own socio-economic challenges.

In September 2016, to stem the tide of the 'European refugee crisis' of 2015, the United Nations General Assembly (UNGA) adopted the New York Declaration for Refugees and Migrants which produced the Comprehensive Refugee Response Framework (CRRF) and the Global Compact on Refugees (GCR). The response aims to:

1. Ease pressure on countries that welcome and host refugees
2. Build self-reliance of refugees
3. Expand access to resettlement in third countries and other complementary pathways
4. Foster conditions that enable refugees voluntarily to return to their home countries

If successful, the local integration of refugees in host countries will reduce the movement of refugees to developed countries, which was a central motivation behind this "global solidarity".¹⁶¹

Table 10 shows the number of people of concern under the protection of UNHCR and estimated number of IDPs by the Internal Displacement Monitoring Centre (IDMC) in the 15 MECS countries of focus. The publicly available population figures from UNHCR are extensive, with some gender, age and disability disaggregation of the data in different locations (e.g. camps and urban areas) and country overviews. The IDMC data on the other hand is sparse and are estimated from a range of sources including local and national governments, civil society, international organisations, news reports and social media. In 2019, the data was collated in 50 countries and territories from 140 disasters that were associated with displacement. With limited humanitarian access in areas of conflict or disasters, displacement estimates are sometimes estimated from the destruction of homes using satellite imagery.¹⁶²

Significant numbers of displaced people reside in these countries. Therefore, to leave no-one behind in the transition towards modern energy cooking, it is imperative that displacement contexts are

¹⁵⁹ (Crawford & O'Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and self-reliance in East Africa

¹⁶⁰ (UNHCR, 2018d) UNHCR Submission on Cambodia: 32nd UPR session

¹⁶¹ (Crawford & O'Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and self-reliance in East Africa

¹⁶² (IDMC, n.d.) How We Monitor Internal Displacement

part of national government strategies on clean cooking. Further analysis of displacement and energy policies in each of the MECS priority countries is presented in Chapter 4.

Table 10: Number of displaced persons in MECS priority countries.

Region	Country	UNHCR Population of Concern ¹⁶³	Internal displacement person (disasters; conflict and violence) ¹⁶⁴	Total displaced persons	Populatio n (millions) (World bank 2018)	% of DPs to Total populatio n																																																																																																										
East Africa	Ethiopia	702,145	390,000	2,506,145	109.2	2.30%																																																																																																										
			1,414,000					Kenya	476,695	1,400	640,095	51.39	1.25%	162,000		Tanzania	278,767	1,300	280,067	56.32	0.50%	0		Uganda	1,347,360	1,100	1,380,460	42.72	3.23%	32,000		Rwanda	149,212	5,500	154,712	12.3	1.26%	0	Souther n Africa	Malawi	42,246	54,000	96,396	18.14	0.53%	150		Zambia	76,027	100	76,127	17.35	0.44%	0	West Africa	Ghana	11,981	15,000	27,211	29.77	0.09%	230		The Gambia	4,239	4,000	8,239	2.28	0.36%	0		Nigeria	46,591	143,000	2,772,591	195.9	1.42%	2,583,000		Cameroon	1,567,543	28,000	2,564,543	25.22	10.17%	969,000	South Asia	Nepal	21,406	29,000	50,406	28.09	0.18%	0		Banglades h	914,998	88,000	1,429,998	161.4	0.89%	427,000	South- east Asia	Myanmar	845,000	41,000	1,343,000	53.71	2.50%	457,000		Cambodia
	Kenya	476,695	1,400	640,095	51.39	1.25%																																																																																																										
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¹⁶³ (UNHCR, 2020g) Country Data from UNHCR Refugee Statistics 2019

¹⁶⁴ (IDMC, 2019) Disasters From 1 January – 31 December 2019, Conflict and Violence as of 31 December 2019

¹⁶⁵ (UNHCR, 2018d) Submission on Cambodia: 32nd UPR session

3.1.2 International organisations in Energy in Displacement Settings

In 2005, the Inter-Agency Standing Committee (IASC) Cluster System was adopted to increase the effectiveness of emergency humanitarian response and coordination with an over-arching goal for linking up a range of intervention and technology areas (see Figure 10). A lead agency is responsible for the coordination and delivery of humanitarian assistance across the sector, within each cluster. Notably, there is currently no official cluster for energy and cooking which poses significant challenges for the implementation of MECS interventions as no single agency takes responsibility for energy access and with other competing priorities, services such as cooking or electricity are often side lined. The interlinkages of MECS within this cluster system reveals the complexity of MECS interventions within the humanitarian system. A mapping approach to energy and cooking can be linked strongly to food security, nutrition, water, protection, health and shelter however, food security led by WFP and FAO appears to be the most appropriate fit.

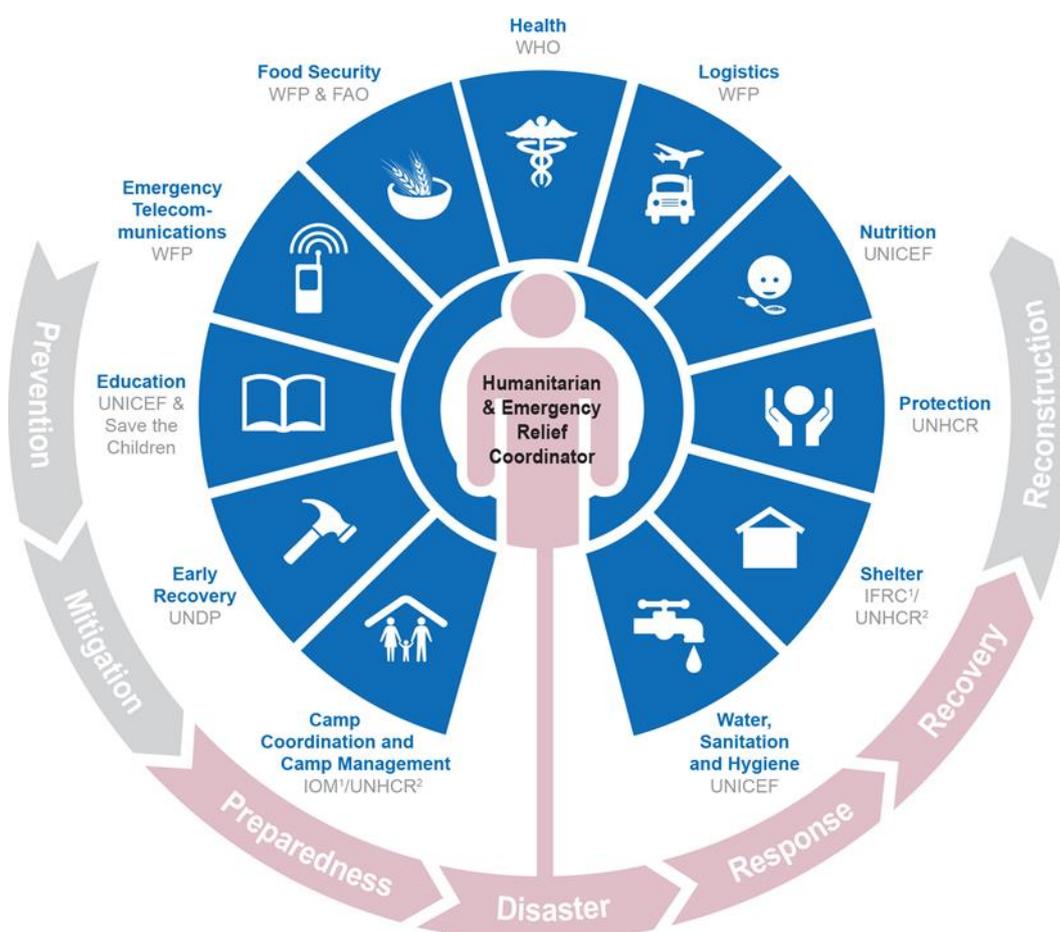


Figure 10: Humanitarian Cluster System where modern energy cooking and energy in general has no specific cluster focus.¹⁶⁶

Since January 2018, the UN-led Global Plan of Action (GPA) for Sustainable Energy Solutions in Situations of Displacement has been coordinating an inter-agency collaborative agenda with the vision that "Every person affected by conflict or natural disaster has access to affordable, reliable, sustainable and modern energy services by 2030". Hosted by the [United Nations Institute for](#)

¹⁶⁶ (OCHA, n.d.) What is the Cluster Approach? Humanitarian Response

[Training and Research \(UNITAR\)](#) with a steering committee made up of representatives from the following organisations: [UNITAR](#), [UNHCR](#), [International Organization for Migration](#), [GIZ](#), [World Food Programme](#), [Food and Agriculture Organization of the United Nations](#), the [Moving Energy Initiative](#), [Practical Action](#), [UNEP-DTU](#), [UNDP](#), the [Clean Cooking Alliance](#), [MercyCorps](#), the [UN Foundation](#), and [Sustainable Energy for All](#). More than 200 organisations with an interest in energy in displacement settings come together in five thematic working areas:

- **Thematic Area 1:** Planning and Coordination
- **Thematic Area 2:** Policy, Advocacy and Host Community Resilience
- **Thematic Area 3:** Innovative Finance and Funding
- **Thematic Area 4:** Technical Expertise and Capacity Building
- **Thematic Area 5:** Data, Evidence, Monitoring and Reporting

MECS have been involved with the GPA in *Thematic Area 4: Technical Expertise and Capacity Building*, to build capacity of practitioners, donor and end-users in their understanding of modern energy cooking and *Thematic Area 5: Data, Evidence, Monitoring and Reporting*, to develop and update relevant indicators and data collection methods and tools for energy access in the humanitarian sector, with a focus on clean cooking.

3.1.3 Implementors

[UNHCR](#), the UN Refugee Agency, is a global organization dedicated to saving lives, protecting rights and building a better future for refugees, forcibly displaced communities and stateless people. UNHCR is the facilitator of the implementation of the [Global Compact on Refugees](#) (GCR) and the [Comprehensive Refugee Response Framework](#) (CRRF) in selected refugee contexts and sectors. “At the heart of the CRRF and the GCR is the idea that refugees should be included in the communities from the very beginning. When refugees gain access to education and labour markets, they can build their skills and become self-reliant, contributing to local economies and fuelling the development of the communities hosting them. Allowing refugees to benefit from national services and integrating them into national development plans is essential for both refugees and the communities hosting them, and is consistent with the pledge to “leave no-one behind” in the 2030 Agenda for Sustainable Development.” Following on the back of the GCR, the [UNHCR's Clean Energy Challenge](#) and [Sustainable Energy Strategy](#), promotes four strategic action areas on energy:

1. Addressing refugee households’ energy needs from the onset of an emergency
2. Improving access to sustainable, safe and affordable household cooking energy
3. Expanding sustainable household electrification
4. Expanding sustainable electrification of community and support facilities while limiting overall consumption.

While laudable in the approach, the strategic targets set out in these initiatives for 2030 fall short of truly modern energy for cooking. Cooking targets focus on Tier 2 biomass cooking over firewood or other traditional solid fuels” and Tier 2 electrification targets for refugees to have access to 200 Wh/household/day, allowing for basic lighting and connectivity and not electrical cooking.¹⁶⁷

[IOM](#) is the UN leading international organization for migration (IOM) and was tasked primarily with ensuring “the orderly flow of migration movements throughout the world”, as its 1953

¹⁶⁷ (UNHCR, 2019j) UNHCR Engagement with The Sustainable Development Goals

constitution.¹⁶⁸ IOM and UNHCR have worked closely together to develop the **LPG cooking intervention** in Cox Bazar, Bangladesh (see Box 7 for more details).

The World Food Programme ([WFP](#)) is the leading humanitarian organization with a motto “*saving lives and changing lives*”, delivering food assistance in emergencies and working with communities to improve nutrition and build resilience. There are 36 WFP Country Offices, implementing 106 energy programmes. WFP champions the Safe Access to Firewood and alternative Energy ([SAFE](#)) initiative, and has developed the “[Energising School Feeding](#)” programme. This programme aims to bring transformative economic and social change to local communities through combining energy initiatives into school feeding programmes using **solar electricity in schools for cooking**, lighting and digital learning, it can also power fridges and machines that process agricultural output.

[FAO](#)’s work on energy involves enhancing knowledge and supporting member countries to move towards using energy-smart agrifood systems through five areas of work. FAO’s [Energy-Smart Food](#) (ESF) Programme, refers to methods and technologies that optimize the use of efficient and sustainable energy in different settings. Energy is needed at every stage of this chain. Energy-smart agrifood systems can also be used to produce energy and therefore offer a way to take better advantage of the dual relationship between energy and food. The programme covers emergencies, including protracted crises.

With the lines of humanitarian and community development being blurred with protracted displacement crisis, [UNDP Energy Access](#) play an increasing prominent role supporting countries to meet energy needs from the perspective of affordability, reliability and sustainability – particularly for host communities and IDPs in developing countries.

The GIZ [ENDEV](#) and Energy Supply in Displacement Settings ([ESDS](#)) programme support extends to MEMD, UNHCR and OPM to improve framework conditions for the implementation of sustainable, market-oriented approaches for improved access to sustainable energy for refugees and hosting communities. This includes cooking energy and quality solar products for households and social institutions as evidence for broader scale-up. UNHCR will receive support for greening their base camp operations by replacing diesel generators with solar systems. While the cooking energy solutions promoted under these programmes were not modern energy, there is scope for MECS to influence their cooking agenda.

[Sustainable Energy for All](#) (SEforALL) is an international organization working with leaders in government, the private sector and civil society to drive further, faster action toward the achievement of Sustainable Development Goal 7 (SDG7), which calls for universal access to sustainable energy by 2030.

The [Danish Refugee Council](#) assists refugees and internally displaced persons in 40 countries across the globe: providing emergency aid, fighting for their rights, and strengthening their opportunity for a brighter future. The DRC works in conflict-affected areas, along the displacement routes, and in the countries where refugees settle. In cooperation with local communities, the DRC strives for responsible and sustainable solutions. The DRC works toward successful integration and – whenever possible – for the fulfilment of the wish to return home.

The [Norwegian Refugee Council](#) is an independent humanitarian organisation helping people forced to flee. NORCAP works in crises across more than 30 countries, helping to save lives and rebuild

¹⁶⁸ (World Bank, 2019b) World Bank Announces \$2.2 Billion Scale-up in Support for Refugees and Host Communities at First Global Refugee Forum

futures. NORCAP strengthens partners' capacity to provide clean energy services to vulnerable populations and humanitarian operations. NORCAP experts work with the Ministry of Home Affairs, the Department of Refugee Services and other stakeholders in Tanzania, to implement alternative energy options for cooking and reduce total dependence of firewood. This aims to benefit refugees and host communities in Nyarugusu refugee camp, by providing them with clean and sustainable cooking solutions with LPG.

3.1.4 Donor Governments

Canada – IDRC - International Development Research Centre (IDRC)

Germany - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Japan - Japan International Cooperation Agency (JICA)

Norwegian Agency for Development Cooperation (NORAD)

United Kingdom – Foreign, Commonwealth & Development Office (FCDO) (formerly Department for International Development)

United States - United States Agency for International Development (USAID)

3.1.5 Donors and funders

[IKEA Foundation](#) works with strong strategic partners applying innovative approaches to achieve large-scale results.¹⁶⁹ Since 2010, IKEA Foundation has committed more than USD 198 million dollars in both cash and in-kind donations to UNHCR's programmes in 16 countries. This strategic partnership shows how global companies can provide solutions that really work, helping us to respond in emergencies, identify and scale new ideas, and create more opportunities for refugees to lead dignified lives.¹⁷⁰

[Schneider Electric Foundation](#) supports innovative and forward-looking initiatives to give as many people as possible the energy they need to succeed. Ever optimistic, the Schneider Electric Foundation aims to help build a fairer, lower-carbon society to give future generations the keys to transform our world.¹⁷¹ Schneider Electric is an active member of the GPA and works with UNHCR to develop technical solutions in humanitarian settings.

[Shell Foundation](#) and Shell's energy access business is focused on finding commercial ways to help tackle energy poverty. Their ambition is to provide a reliable electricity supply to 100 million people, primarily in Africa and Asia, by 2030.

The [World Bank](#) (WB) supports large scale-up support for refugees and host communities through funding packages such as the 19th replenishment of the International Development Association (IDA19) for \$2.2 Billion that will run from July 2020 to June 2023.¹⁷² The WB has also established a \$500 million Clean Cooking Fund to accelerate progress toward universal access to clean cooking by 2030.¹⁷³

¹⁶⁹ (IKEA, n.d.) About <https://ikeafoundation.org/about/> Accessed: 5 August 2020

¹⁷⁰ (UNHCR, n.d.) UNHCR - IKEA Foundation <https://www.unhcr.org/en-au/ikea-foundation.html> Accessed: 2 December 2020

¹⁷¹ (Schneider Electric, n.d.) The Foundation and Sustainability - Schneider Electric Global <https://www.se.com/ww/en/about-us/sustainability/foundation/> Accessed: 2 December 2020

¹⁷² (World Bank, 2019b) World Bank Announces \$2.2 Billion Scale-up in Support for Refugees and Host Communities at First Global Refugee Forum

¹⁷³ (World Bank, 2019a) Clean Cooking: Why it Matters

3.1.6 NGOs

[Clean Cooking Alliance](#) (CCA), formally the Global Alliance for Clean Cookstoves, is a significant non-government stakeholder of cooking in displacement settings. Under the Humanitarian Clean Cooking Fund, they have funded ethanol cooking projects in refugee camps in Ethiopia, supported IDPs to switch to LPG in North Darfur, funded? biogas digester projects in Gaza and solar cooking in Burkina Faso refugee camps. CCA has developed the [Spark Fund](#) for clean cooking which aims to support the specific capital and capacity development needs of enterprises across the value chain that have passed the start-up/proof-of-concept stage. While not directly related to displacement settings, CCA supports clean cooking businesses in any settings. CCA is also a partner of the MECS programme.

[Practical Action](#) is a UK-based NGO and partner of the Moving Energy Initiative. They have also coordinated the Renewable Energy for Refugees (RE4R) project working in partnership with UNHCR, the UN Refugee Agency and supported by the IKEA Foundation in Jordan and Rwanda.

[Mercy Corps](#) is a global humanitarian organization empowering people to recover from crisis, build better lives and transform their communities for good. With over 130 program offices in more than 42 countries, over 87% of Mercy Corps' over 5,000 team members are local to the places where they work, with deep linkages to local markets, and strong, long-term relationships with key government actors, private sector entities, and other influencers. They have done work on gender in humanitarian settings.

[Energy 4 Impact](#) (E4I) is a non-profit organisation working with local businesses to extend access to energy in Africa, impacting the quality of life for millions of people. Growing sustainable clean energy markets improves livelihoods and accelerates economic growth. They were partners in the Moving Energy Initiative.

[Energypedia](#) UG Nonprofit is an independent organization established in 2007 within the Dutch-German Energy Partnership "Energising Development" (EnDev) implemented by GIZ (Gesellschaft für Internationale Zusammenarbeit GmbH). In 2019, Energypedia launched a series of online seminars on different topics such as the Sustainable Energy in Humanitarian Settings in collaboration with the ICRC and the UNITAR enabling lessons learnt within the humanitarian energy space.

[SNV](#) is a not-for-profit international development organisation focusing on three sectors: agriculture, energy and water, sanitation and hygiene (WASH). From 2019-2019, SNV Kenya implemented the Market Based Energy Access (MBEA) for cooking and lighting in Kakuma Refugee Camp and Kalobeyei Integrated Settlement under the EnDev programme.

3.1.7 Companies

[Bboxx](#) is a leading next generation utility and an Imperial College London spinout launched in 2010, delivering pay-as-you-go solar PV systems. They operate in 12 African and Asian countries and have provided more than one million people with electricity and utilities worldwide. Since 2018, they have been operating in displacement settings, including in the Kakuma refugee camp (Kenya) and three refugee camps in Rwanda (Nyabiheke, Gihembe and Kigeme). In July 2019, Bboxx Cook was launched which provided clean cooking services for both urban and rural areas through LPG and biogas solutions in Rwanda (now discontinued)¹⁷⁴ and has since been replicated in Kenya and DRC where adapted business models are serving rural and urban populations.

¹⁷⁴ (Bboxx, 2019) Bboxx Unveils Bboxx Cook <https://www.bboxx.com/news/bboxx-unveils-bboxx-cook/>
Accessed: 2 December 2020

[Pesitho](#) is a Danish company committed to providing off-grid power solutions for the world's poor. Founded in 2017, it developed the ECOCA - a compact, self-contained, multi-purpose home unit consisting of an electric power base, that includes a battery pack and a solar panel array. Pesitho has trialled 50 ECOCA in Bidibidi Refugee Camp in Uganda with MECS funding an air quality and gender focused research study.¹⁷⁵

[SolarKiosk](#) is an off-grid solar services provider combining quality solar products with turnkey solutions and provide services to create sustainable businesses in off-grid frontier markets worldwide. The company has provided energy services to both households and community facilities, including schools in the Zaatari refugee camp in Jordan.

[OffGridBox](#) provide an all-in-one system using solar energy to purify water and distribute energy. Through their village kiosks, they look to provide rural electrification and clean water at an affordable price, empower women entrepreneurs to run Pay-As-You-Go boxes, and build more resilient and sustainable communities through renewable energy.

[d.light](#) is a provider of distributed solar energy solutions, including solar lanterns and solar home systems. Through four hubs in Africa, China, South Asia and the US, they have provided cash based and PAYG solar solutions to households and businesses in 70 countries. They partner with distributors of such solutions and have also provided their solar lanterns to refugees, e.g. in South Sudan and Uganda.

[SolarNow](#) is a Uganda-based company selling and financing solar home systems. They won a 145,000\$ USAID grant. This is under the USAID's DE-RISKING PAY-AS-YOU-GO SOLAR HOME SYSTEMS IN UGANDA REFUGEE SETTLEMENTS program which aims at accelerating off-grid investment and energy access by incentivizing private sector solar companies to enter Kiryadongo and Rwamwanja refugee settlements and host communities.

[Azuri Technologies](#) is a commercial provider of PayGo solar home systems to rural off-grid communities. Azuri is leveraging solar and mobile technology to allow users in 11 different countries to access power on a pay-as-you-go basis. Azuri have worked in the Kakuma and Kalobeyei refugee camps in Kenya upon receiving a grant from SNV.

3.1.8 Research Organisations

[Chatham House](#), a research think tank in the UK, coordinated the Moving Energy Initiative, a groundbreaking international partnership which examines the provision of sustainable energy for refugees and displaced people, giving particular consideration to the context of the displaced communities, such as their cultural traditions, collective capacities, needs, and technology available to them.

[UNEP DTU Partnership](#) provide research-based advisory services to assist developing countries deliver on the Paris Agreement and Sustainable Development Goals. They are part of the Technical University of Denmark and work to implement UN Environment's Climate Change Strategy and Energy Programme. Significant work has been undertaken in Tanzania on attitudes to LPG supply in refugee camps.

[Coventry University](#) is a UK university and led the Humanitarian Engineering and Energy for Displacement (HEED) research project in Rwanda and Nepal. This project explored energy needs and identified solutions for Congolese refugee communities living at 3 camps in Rwanda and IDPs in

¹⁷⁵ (Ladefoged et al., 2019) Pesitho ECOCA Pilot Testing Uganda and Myanmar

Nepal to produce socio-technical systems that encourage community resilience and capacity building.

[Alianza Shire](#), based out of the Technology and Innovation Centre for Development at the University Polytechnic of Madrid, has tackled energy access challenges through a public-private partnership and with the active participation of the refugee communities. The project was completed in the Adi-Harush refugee camp and has since been operating in four refugee camps and their respective host communities in the north of Ethiopia.

[SET4Food](#) (Sustainable energy technologies for food security in humanitarian contexts) was a project designed to respond to the shortage suffered by humanitarian actors of appropriate and organized tools and guidelines to assess the conditions in camps or settlements, identify appropriate technologies and deliver efficient solutions responding to specific needs. The second phase of SET4food was co-funded by the European Union Directorate General for Humanitarian Aid and Civil Protection (ECHO) with the aim of enhancing efficient collaboration and synergies among humanitarian actors in the energy sector.

3.1.9 Displaced persons groups

Critical to the transition to modern energy cooking is the socio-demographic profile of the end-users themselves for the cases of household cooking. Understanding lived realities of both men and women refugees, asylum seekers, IDPs and host communities in consuming energy services such as cooking and lighting is important. Recognition of the diverse groups and their needs within displacement settings including, for example, people with a range of disabilities, should also be part of the programme in order to leave no one behind. Co-designing solutions with displaced groups should be considered to encourage empowerment and enhance resilience.¹⁷⁶

Cooking is a deeply cultural experience. A key instrument that has enabled the voices of cooks to be understood are through the Cooking Diaries Protocols developed by MECS.¹⁷⁷ This proven research methodology provides key insights into 'how' a cook cooks and how their cooking practices change when they transition to a different fuel or appliance. This protocol aims to understand qualitatively the food people cook and the practices they use to prepare them and quantitative data of fuel use and/or electricity data measurements.

This mixed methods approach gathers data from various sources:

- Cooking diaries – data on foods cooked, appliances used, cooking processes and times
- Energy measurements – manual measurements of fuel use and/or electricity data monitor files
- Participatory cooking sessions – establishing which appliances should be trialled
- Registration and exit surveys - demographic data and qualitative feedback from participants

3.1.10 Data, metrics and indicators

While there has been an uptake in the number of studies and energy assessments providing data sources for the humanitarian sector in the last 5 years, many of them are either outdated, not comparable or do not provide a sufficient level of detail for decision-makers. Similarly, many existing reports and summaries fail to provide accurate information on the current country-level state of play, including in the energy access space. Overall, there is a dearth of data and quality evidence on the

¹⁷⁶ (Ockwell et al., 2019) Transformative Innovations Start with the Social and Political, Not Technology Hardware and Finance: Lessons from Lighting Africa and MECS

¹⁷⁷ (Leary et al., 2019) Cooking Diaries 3.0 Protocols

status quo of energy access in settings of displacement. This has been a result of a combination of factors, among them: organisations and institutions such as UN agencies (e.g. UNHCR, WFP, IOM, FAO), NGOs and private energy providers collect some data on energy access mostly for the purposes of designing projects or monitoring and evaluating existing ones, or to support specific investments. Much of this data is not shared externally and is not collected regularly. It is also often unclear how data is collected, and the various methodologies and diverse indicators used result in datasets which, even if they can be accessed, are not comparable. As there is no one agency currently responsible for energy access data in displacement settings, existing data is very fragmented. Additionally, as has been mentioned before, there is a scarcity of data on energy access among the displaced in urban and peri-urban areas. This reflects the absence of data on urban cooking generally, including in the MECS priority countries. A systematic review conducted by MECS found that there were few studies on cooking in an urban context, prompting a recommendation that given the growing trend of rapid urbanization, particularly amongst the young, whom the evidence suggests are more likely to adopt modern technologies, this is worthy of future study.

Both Sustainable Development Goal (SDG) 7 on access to affordable, reliable, sustainable and modern energy for all and ESMAP's Multi-Tier Framework (MTF) for assessing energy make no mention of key metrics or indicators for displacement settings for either energy or cooking. The GPA is supporting the work of the data and evidence Working Group V to address this gap in order to complement data platforms such as UNHCR's Energy Information System (EIS) and OCHA's Humanitarian Data Exchange (HDX).¹⁷⁸

3.2 How are different stakeholders in the displacement cooking sector articulating their contribution to the SDG goals?

Both UNHCR and WFP have identified SDG 7 – energy access for all - as one of their goals. UNHCR Global strategy for clean energy and Clean Energy Challenge states as its aims:

The international community has acknowledged the key role of energy through the Sustainable Development Goals (2030 Agenda), which include SDG 7 – Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All. In addition to universal access, SDG 7 aims to achieve a significant increase in renewable energy and to double the global rate of improvement in energy efficiency. UNHCR believes that access to sustainable, clean energy is closely linked to protection and a key factor in ensuring that basic needs are met, as well as in creating more sustainable and inclusive communities and building resilience to climate change. (UNHCR Global Strategy 2019)

However, it is interesting to note that **not all** UN humanitarian organisations involved in cooking in displacement have identified SDG 7 as one of their goals (e.g. IOM, FAO) (see Table 11). This demonstrates that **energy access is seen as an enabler** to other priority goals for many organisations. MECS will require a broad engagement strategy to identify and work with a range of stakeholders in cooking in displacement area.

¹⁷⁸ (GPA, 2020) From Assessment to Investment: the Role of Research, Data and Evidence to Deliver the UNHCR Energy Strategy

Table 11: Reporting on SDGs by selected implementers of modern energy cooking in displacement settings.

Implementer	SDG Documentation	Specific mentions of SDG goals
UNHCR	UNHCR engagement with the Sustainable Development Goals ¹⁷⁹	Focus on “leaving no-one behind”. SDG 1 No Poverty, 2 No hunger, 3 Health, 4 Education, 5 Gender equality, 6 Clean water and sanitation, 7 Affordable and clean energy, 8 Decent work & economic growth, 10 Reduced inequalities, 11 Sustainable cities & communities, 16 Peace, justice and strong institutions, 17 Partnership for the goals
WFP	WFP’s contribution to the SDGs ¹⁸⁰	Focus on SDG 2: Zero hunger and SDG 17: Partnerships. All other SDG are mentioned.
IOM	SDG seen through the lens of Migration ¹⁸¹	Focus on SDG 10: Reduce inequalities with SGD 3 - health, 4 - education, 5 – gender equality, 8 – decent work, 11 – sustainable cities, 13 – climate action, 16 – peaceful societies, 17 – partnership are also mentioned.
FAO	FAO and the SDGs ¹⁸²	FAO is proposed ‘custodian’ UN agency for 21 of the 230 SDG indicators identified by the UN Statistical Commission, across SDGs 2 – zero hunger, 5 – gender equality, 6 – clean water and sanitation, 12 – responsible consumption and production, 14 – life below water and 15 – life on land, and a contributing agency for six more.

3.3 What other development programmes are involved in the displacement cooking eco-system?

The Moving Energy Initiative (MEI) was a DfID funded programme that broke ground in humanitarian energy by taking the first systematic approach to quantifying energy in humanitarian settings. The ground-breaking report “Heat, light and power for refugees: saving lives, reducing costs”¹⁸³ in 2015 presented data on energy and provided recommendations on how humanitarian organisations could transition to clean energy solutions in displacement contexts.

A major UK Aid initiative is under development that addresses the sustainable energy and the Leave No One Behind agenda (which explicitly includes the displaced) through the £1 Billion Ayrton initiative.¹⁸⁴

3.4 Conclusion

This chapter provided an overview of the stakeholders involved in MECS interventions in displacement settings. Stakeholders can be broadly categorised into the following actor groups: displaced people, humanitarian or displacement settings experts; technical experts; researchers; project developers; and policy, advocacy and governance workers. Clean cooking cuts across numerous sector clusters - food security, nutrition, protection, health, education, water, shelter, logistics and telecommunications. Notably, not all UN humanitarian organisations involved in

¹⁷⁹ (UNHCR, 2019j) UNHCR Engagement with The Sustainable Development Goals

¹⁸⁰ (WFP, 2018) WFP and SDG

¹⁸¹ (IOM, 2016) The Sustainable Development Goals Seen Through the Lens of Migration

¹⁸² (FAO, 2017) FAO and the SDGs

¹⁸³ (Lahn & Grafham, 2015) Heat, Light and Power for Refugees: Saving Lives, Reducing Costs

¹⁸⁴ (UK Government, 2019) British Scientists to Help Tackle Climate Change Through New £1 billion fund

cooking in displacement have identified SDG 7 as one of their goals demonstrating that energy access is seen as an enabler to other priority goals for many organisations.

Despite the number and complexity of stakeholders involved, no coordinating body exists for the delivery of cooking services in displacement settings. At present, the funding and implementation of MECS interventions in displacement settings are largely carried out by different individual agencies with limited sharing of lessons learnt. Larger scale-up projects (e.g. LPG in Bangladesh) have seen greater collaborative effort in planning and coordination however this is the exception and not the rule. The GPA and Energypedia webinars have spearheaded sharing of lessons learnt over the past two years and continued transparency and collaboration should be encouraged.

3.5 What are the opportunities for MECS to fit into the overall displacement cooking eco-system?

The MECS programme will require a broad engagement strategy to identify and work with a range of stakeholders in cooking in displacement settings. The following are potential suggestions for the MECS programme to engage in the displacement settings eco-system:

- Stakeholder awareness raising and communication: actively participate in efforts to promote MECS for the humanitarian energy access agenda by engaging with relevant stakeholders listed out in this report and by participating in MECS advocacy activities and initiatives led by those stakeholders
- Dissemination of evidence-based research on MECS interventions in stable developing markets that can apply to displacement settings. Target could be donors and financiers who might benefit from MECS' research and evidence on innovative funding mechanisms for access to modern cooking in non-displacement settings
- Collaboration with the GPA on the efforts to coordinate and engage a wide range of stakeholders to enable landscaping changes particularly in the data and capacity building working groups. In addition to the ongoing initiatives, activities could include data harmonisation of key indicators of modern energy cooking within ESMAP multi-tier framework and developing learning modules and training opportunities for humanitarian practitioners on modern energy cooking
- Partner with humanitarian organisations and local stakeholders (such as local governments, municipalities, local NGO's, refugee groups etc.) to conduct research which could help address the existing data gaps, e.g. on urban and peri-urban displaced and their cooking habits, practices, challenges etc.
- Promotion of academic research coming out of research institutions such as Coventry University and Imperial College London to raise awareness among academics and practitioners, as well as the donor community who rely on research for decision-making.

4 Policies and financial models

“Cooking is a silent tsunami. Failure to address the problem does not reflect inadequate technology or even insufficient resources, but a lack of political will.”

– Dr. Kandeh Yumkella, Former United Nations Under-Secretary-General and Special Representative of the Secretary-General for Sustainable Energy for All, and Former two-term Director-General of the United Nations Industrial Development Organization

This section provides an overview of the political and financial drivers and barriers to modern energy cooking in displacement settings. Even though this is the last section, it is most important as without supportive policies, long-term sustainable market-based cooking solutions will not be possible in displacement settings.

4.1 Current policies in relation to displaced populations and energy access in displacement settings

The history of humanitarian organisations mandate to protect and support refugees at the international level was borne from the aftermath of World War Two. In 1950, the office of the **United Nations High Commissioner for Refugees (UNHCR)** was created to support millions of Europeans who had fled or lost their homes and was to be disbanded after 3 years. In the following year, the **1951 Refugee Convention** which was ratified by 145 State parties, was adopted as the legal document to guide the principles of UNHCR’s work, defined the rights of refugees and the legal obligations of States to protect refugees.¹⁸⁵

Complementary work is also carried out by the **United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)** to provide services to registered Palestine refugees in the Middle East which number 5.4 million. Palestine refugees are the longest protracted refugee situation lasting over 72 years and political solutions are difficult.¹⁸⁶ Crucially, the Palestinian context provides us with a way to understand how displacement transitions from a temporary event to a variety of protracted and permanent contexts. This way of thinking provides impetus into an approach that is sensitive to these contextual differences, for instance exploring urban-based solutions and policy recommendations that are inclusive of refugee and host communities.

In 2016, the United Nations General Assembly (UNGA) led to a significant shift of the mandate of humanitarian organisations. The CRRF aims to:

1. Ease pressure on host countries
2. Enhance refugee self-reliance
3. Expand access to third-country solutions
4. Support conditions in countries of origin for return in safety and dignity

Key to this framework is the mandate for humanitarian organisations to work not only with refugees but host communities. This has ramifications of modern energy cooking solutions is that refugee crisis is an international issue and requires the cooperation key actors.

¹⁸⁵ (UNHCR, 2015a) History of UNHCR

¹⁸⁶ (El Masri, 2020) 72 Years of Homemaking in Waiting Zones: Lebanon’s “Permanently Temporary” Palestinian Refugee Camps

The GCR key indicators¹⁸⁷ that have been used to support the analysis of the transition to MECS in displacement settings include 1) the number of supporting partners in energy sector as identified by UNHCR, 2) rights to work, 3) freedom of movement and 4) proportion of refugee and host community populations living below the national poverty line of the host country (see *Table*). The computation method, disaggregation of data and data sources are also listed.

Limitations of the analysis include data sets that predominately focus on camp or settlement-based data and not on self-settled urban or peri-urban refugees and IDPs. Actors other than large international humanitarian organisation include a wide range of actors from municipalities, businesses and local NGOs which are often uncoordinated and the data difficult to obtain. Even with encouraging policy providing rights to work for refugees, legal and practical barriers such as limited freedom of movement, issues with obtaining work permits, restrictions of working above a certain pay grade, land and property ownership, and limited awareness of urban refugee’s rights to work policies still exist. Also, while some nations have complete freedom of movement policies for refugees, the reality is that real mobility is deterred as humanitarian assistance are nearly completely tied to camp or settlement residency.¹⁸⁸

Table 12: Global Compact on Refugee Key Indicators¹⁸⁹ used for MECS transition analysis.

Indicator	Computation Method	Disaggregation	Data Sources
1.2.2: Number of partners supporting national arrangements in the refugee-hosting country that are linked to energy initiatives	The sum of partners supporting national arrangements, as recorded by the relevant nationally led coordination entity.	Number of government entities, UN system members, civil society, international financial institutions, bilateral development partners, private sector, academia, refugee and host communities and traditional/customary leaders.	Official records by the designated government entity, at national, regional and local level, in charge of coordinating/facilitating comprehensive responses in the host country.
2.1.1: Proportion of refugees who have access to decent work	Analyse the host country’s labour and related law pertaining to refugees.	This indicator is required to be disaggregated by country of origin.	The International Labour Organization (ILO) maintains a database of national labour, social security, and related human rights legislation for each country. ¹⁹⁰
2.1.2: Proportion of refugees who are able	Analyse access to freedom of movement and the	This indicator is required to be	The data to estimate the proportion of refugees is

¹⁸⁷ (UNHCR, 2019e) Indicator Framework - Global Refugee Forum

¹⁸⁸ (Crawford & O’Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and Self-reliance in East Africa

¹⁸⁹ (UNHCR, 2019e) Indicator Framework - Global Refugee Forum

¹⁹⁰ (ILO, n.d.) NATLEX https://www.ilo.org/dyn/natlex/natlex4.home?p_lang=en Accessed: 2 December 2020

to move freely within the host country	right to choose the place of residence of refugees in the host country and relevant laws applicable to refugees.	disaggregated by country of origin.	published in UNHCR's Population Statistics Reference Database. ¹⁹¹
2.2.2: Proportion of refugee and host community populations living below the national poverty line of the host country	The proportion of the total, urban and rural population living below the national poverty line.	At a minimum, this indicator is required to be disaggregated by age and sex.	Based on the existing Sustainable Development Goal indicator 1.2.1: Proportion of population living below the national poverty line, by sex and age. ¹⁹²

UNHCR's Global Strategy on Sustainable Energy¹⁹³

In October 2019, UNHCR outlined the organisation's **Global Strategy on Sustainable Energy 2019-2024** that focussed on four strategic action areas:

1. addressing refugee household energy needs from the onset of an emergency
2. improving access to sustainable, safe and affordable household cooking energy
3. expanding sustainable household electrification
4. expanding sustainable electrification of community and support facilities while limiting overall consumption

Outcome 2: Refugees and host communities have sufficient access to safe, sustainable energy to cook three daily meals.

Outcome 3: Refugees have access to 200Wh/ household/day allowing for basic lighting and connectivity.

Action area and outcome two focuses on sustainable, safe cooking energy at the household level (see *Figure 11*). The UNHCR definition of "modern energy" is only at the Tier 2 level – improved biomass cooking stoves, which is not the definition applied by the MECS programme which focuses on Tier 4 and 5 cooking solutions. These modest targets reflect the realities of typical camp situations in which most refugees are reliant on aid handouts or collecting free firewood. Significant strains on donor humanitarian budgets and without the means to generate income, refugees have limited purchasing power to cleaner cooking services. Action area and outcome three focuses on electricity access at 200Wh/household/day. This is insufficient to power eCooking solutions which FAO estimated at 8000Wh/day (using inefficient stoves).¹⁹⁴ UNHCR recognises the limitation of the current realities, however, still aspire to transition to higher tier cooking and energy solutions. These quotes below demonstrate an awareness and aspiration to transition to MECS.

¹⁹¹ (UNHCR, 2020g) UNHCR - Refugee Statistics

¹⁹² (World Bank, 2017) Institutional information Proportion of Population Living Below the National Poverty Line, by Sex and Age

¹⁹³ (UNHCR, 2019k) UNHCR Global Strategy for Sustainable Energy

¹⁹⁴ (AFREA, 2014) Clean and Improved Cooking in Sub-Saharan Africa A Landscape Report

This Strategy acknowledges that current energy generation and consumption habits are not sustainable and need to change: renewable energy sources need to be integrated and overall energy consumption reduced. In this sense, interventions such as provision of LPG, to reduce environmental degradation during emergencies, have to be seen as a transitional approach pending the development of complete renewable energy solutions. - UNHCR Global Strategy

While LPG intervention in Bangladesh example represents a significant success, UNHCR's goal globally is to move towards low-carbon energy cooking solutions, when technological advances allow. - UNHCR Global Strategy

LPG is significantly cleaner than 'polluting fuels' and has an important role to play as a transition fuel, however it does not offer a truly sustainable long-term pathway to clean cooking. It can easily be compressed, facilitating distribution, allowing it reach far beyond the limits of the piped networks in which natural gas is distributed. However, as a fossil fuel, it is a finite resource and still contributes to climate change.¹⁹⁵

¹⁹⁵ (Solar Electric Cooking, 2019) Is LPG Cheaper and Reliable?

Outcome #2 Refugees and host communities have access to sufficient safe, sustainable energy to cook three daily meals.		
Global Initiatives	Global Milestones	Milestone Indicators
<ul style="list-style-type: none"> Global data collection and analysis on refugee cooking energy needs in urban and camp or settlement settings Global data collection and analysis on appropriate cooking energy and stove technologies for a range of refugee settings Development of guidelines, standards and monitoring tools for cooking energy and stove technologies in displacement settings Develop guidelines, standards and monitoring tools for the use, and phaseout, of local biomass as cooking energy in displacement settings Disseminate data, guidelines, standards and monitoring tools for cooking energy in displacement settings and advocate for partnerships and resources to meet the standards In 10 priority countries, identify partners to establish markets-based cooking energy access programmes. In 10 priority countries, identify partners to establish cooking energy-based livelihoods initiatives for refugees and host communities. 	<ul style="list-style-type: none"> A global, up-to-date public database on cooking energy needs and cooking energy and stove technologies for displacement settings is launched, maintained and made accessible to all stakeholders. Guidelines on cooking energy, stove technologies and the use of local biomass in cooking are published and accessible to all stakeholders. Resources are mobilized to enable UNHCR and partners to meet the cooking related standards. 10 priority countries have active market-based cooking energy access projects. 10 priority countries have active livelihoods projects related to cooking energy. 	<ul style="list-style-type: none"> Monthly number of user visits to the global energy in displacement settings database Number of country operations reporting on households' ability to cook three meals per day without resorting to negative coping mechanisms Number of new partners engaged in delivering cooking energy services to refugees and host communities % of partners reporting progress in meeting the cooking energy and biomass standards Number of country operations reporting on households' ability to cook three meals per day without collecting local biomass for cooking energy % of cooking energy related projects using market-based approaches % of livelihoods projects that are related to cooking energy

Figure 11: UNHCR cooking energy target outcomes, initiatives, milestones and indicators.

[The Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement \(GPA\)](#)¹⁹⁶

GPA is a non-binding framework that provides concrete actions for accelerated progress towards the vision that

Every person affected by conflict or natural disaster has access to affordable, reliable, sustainable and modern energy services by 2030.

¹⁹⁶ (UNITAR, 2018) The Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement. Framework for Action.

The framework consists of five Working Areas which include: Planning and Coordination; Policy, Advocacy and Host-Country Resilience; Innovative Finance; Technical Expertise, Capacity Building and Training; and Data, Evidence, Monitoring and Reporting. The challenges and recommendations contained under each one of the Working Areas are presented in Table 12.

Table 13: Major challenges and recommendations under the GPA Working Areas.¹⁹⁷

Challenge	Priority Recommendation
Working Area I: Planning and Coordination	
Energy is not a formal priority in humanitarian assistance	<ul style="list-style-type: none"> I. Formally recognize sustainable energy access as a priority within the humanitarian system. II. Foster ‘bottom-up’ collaborations and engagement on energy and environment interventions between displaced people, host community members, local experts and energy product/ service providers. III. Build energy activities into other humanitarian assistance priorities.
Working Area II: Policy, Advocacy and Host-Country Resilience	
Displaced people are often not included in national or international energy access agendas	<ul style="list-style-type: none"> I. Bring displaced people into the SDG 7 agenda and the Global Tracking Framework with a clear link to the response and resilience agenda II. Encourage and support the design and implementation of response and resilience plans, including attention to energy priorities and energy linkages with other priorities such as housing, water supply, environment, food security and health III. Foster national-level dialogue to enable successful sustainable energy-access interventions at the country level. Provide examples of how clean energy investment and self-reliance create a virtuous circle of beneficial change
Working Area III: Innovative Finance	
Energy in displacement settings is under-funded	<ul style="list-style-type: none"> I. Conduct further data, mapping and research on the different types of projects or parts of the value chain that require financing, the instruments that would be best suited to each, and how they can be developed through discussions with different stakeholders II. Hold discussions with donors to identify potential sources of funding to test out

¹⁹⁷ (UNITAR, 2018) The Global Plan of Action for Sustainable Energy Solutions in Situations of Displacement. Framework for Action.

	<p>new financing instruments, with an emphasis of coordinating investment approaches and exploring more innovative financing options</p> <p>III. Design a financing facility or financial instruments that could be used to support energy investments in displacement settings</p>
Working Area IV: Technical Expertise, Capacity Building and Training	
Expertise and capacity to implement humanitarian energy solutions is limited	<p>I. Build in-house capacity of staff at the field and international level to plan for multi-year interventions and energy strategies and to implement projects</p> <p>II. Develop tailored training packages according to stakeholders' capacity needs</p> <p>III. Create or adopt a common repository to exchange knowledge, discuss issues and receive support from peers and experts</p>
Working Area V: Data, Evidence, Monitoring and Reporting	
Data on humanitarian energy needs and solutions is limited and not widely shared	<p>I. Integrate energy indicators into planning and assessment tools for the humanitarian sector, in collaboration with Working Area I</p> <p>II. Harmonize and standardize the types and forms of data collected to enable comparison and to facilitate effective monitoring and evaluation</p> <p>III. Design and deliver of holistic monitoring, evaluation and learning tools for humanitarian energy programmes, with ways to share data and best practices between the humanitarian, development and private sectors</p>

4.2 Country policies in relation to displaced populations

As discussed previously, displaced populations are formally categorised into two groups: 1) refugees, asylum seekers and stateless persons, and 2) IDPs. Refugees, asylum seekers and stateless persons fall under the protection of humanitarian organisations, however it is the host countries policies that determine refugees' access to legal identity, right to work, mobility rights and ownership of land.¹⁹⁸ The existence (or not) of pro-migration policies impact the transition to MECS because without the ability to work and earn a livelihood, refugees are reliant on in-kind donations and handouts - which have suffered long-term underfunding¹⁹⁹ - or forced to seek opportunities in the informal economy. IDPs on the other hand remain under the protection of their own government and generally retain

¹⁹⁸ (Crawford & O'Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and Self-reliance in East Africa

¹⁹⁹ (UNHCR, 2020a) Consequences of Underfunding In 2020

the rights to work and freedom of movement. *Table 14* summarises the refugee policy context of the 15 MECS countries of focus.

Table 14: Summary of refugee rights to work, freedom of movement and land ownership in MECS countries of focus.

Country	Rights to work	Freedom of movement	Land ownership	Score	Summary
Bangladesh	0	1	0	1	Registered refugees (most registered before 1992) and undocumented Rohingyas officially are denied the right to work, however unofficial employment is tolerated. Registered refugee movement is confined to camps and require permission to leave camp. ²⁰⁰
Cambodia	1	2	0	3	Domestic laws on refugees and asylum-seekers states that refugees have the rights to a residence card, the right to work and operate a business, the right to sponsor a family member to immigrate to Cambodia, and the right to travel documents however in reality, refugees are given “refugee cards” that outside law enforcement, are not recognised. Freedom of movement is also limited to urban centres with the lack of travel documents. ²⁰¹
Cameroon	4	4	0	8	Refugees in Cameroon have the right to work and to free movement. 70% of refugees are self-settled outside of camps. ²⁰²
Ethiopia*	4	2	2	8	Since 2010, Ethiopia introduced an out-of-camp policy which Eritrean refugees can reside outside camps in urban centres under certain restrictions. In 2016, the CRRF pledge was made which could see freedom of movement policies opening. ²⁰³ Refugees have the right to work. In 2019, the government pass new laws through the Ethiopian Jobs Compact to enable 30% of 100,000 new jobs created in industrial parks to be allocated to refugees. ²⁰⁴ Irrigable land would also be made available to refugee and host communities to engage in crop production. ²⁰⁵
Gambia (the),	4	4	4	12	The Gambia recognises refugees’ rights to engage in wage-earning employment or self-employment, freedom of movement and access to social amenities such as provision of aid, healthcare, education, water wells and communal gardens. Refugees are also given a plot of land to live on and

²⁰⁰ (Zetter & Ruadel, 2016) Refugees' Right to Work and Access to Labor Markets-An Assessment KNOMAD STUDY Part II

²⁰¹ (UNHCR, 2019d) Ghana | Global Focus

²⁰² (Barbelet, 2017) Supporting Central African Refugees in Cameroon Policy and Practice in Response to Protracted Displacement

²⁰³ (Nigusie & Carver, 2019) The Comprehensive Refugee Response Framework Progress in Ethiopia

²⁰⁴ Ibid.

²⁰⁵ (ARRA, 2017) Ethiopia CRRF Roadmap

					to farm, and the transferral of ownership is currently on-going. ²⁰⁶
Ghana	4	4	4	12	Refugees have the same legal rights as ordinary Ghanaian citizens. They can live, work, own businesses and properties, ²⁰⁷ and are able to access basic services such as health, education and security. ²⁰⁸
Kenya*	2	2	0	4	Official refugee documents (a process that can take up to 3-24 months) do not confer the rights to work. Another process is required to obtain a “Class M” permit, which is issued free of charge and needs recommendation from a prospective employer and letter confirming refugee status. Since 2014, an encampment order was issued, and freedom of movement was significantly restricted due to anti-terrorism measures. ²⁰⁹
Malawi	1	0	0	1	Refugees are unable to seek employment or conduct businesses outside of the camp. An encampment policy is enforced. ²¹⁰ Refugees have limited access to arable land. ²¹¹
Myanmar	1	1	0	2	People of concern in Myanmar are stateless persons, IDPs, IDP and refugee returnees and local communities mostly in Kachin and Rakhine States. Their freedom of movement, access to services, and a pathway to citizenship remained unfulfilled. ²¹²
Nepal	1	1	0	2	Camps are officially restricted, though refugees generally move in and out of them freely. ²¹³ Bhutanese refugees in Nepal are not allowed to work and are considered to be in the country only temporarily and are unable to own land. ²¹⁴
Nigeria	1	0	0	1	90% of Cameroon refugees in Nigeria are within 10km of their border. ²¹⁵ Many refugees are unwilling to relocate to settlements away from the border due to schools and ties with community. Frameworks for freedom of movement and access to services are currently being supported by UNHCR however, there are difficulties accessing the displacement location safely.

²⁰⁶ (Zanker, 2018) The Gambia: a Haven for Refugees?

²⁰⁷ (Kuewor, 2018) What Ghana can Teach Us About Integrating Refugees

²⁰⁸ (UNHCR, 2019d) Ghana | Global Focus

²⁰⁹ (Zetter & Ruaudel, 2016) Refugees' Right to Work and Access to Labor Markets-An Assessment KNOMAD STUDY Part II

²¹⁰ (UNHCR, 2019f) Malawi Fact Sheet

²¹¹ (WFP, 2019) Food Situation Worsens for Refugees in Malawi, Urgent Support Required

²¹² (UNHCR, 2019g) Myanmar | Global Focus

²¹³ (Nepalese Government, 2001) Nepal: Information on the Issuance of Refugee Travel Documents by the Nepalese Government

²¹⁴ (Reuters, 2009) U.N. Resumes Full Food Aid to Bhutan Refugees in Nepal

²¹⁵ (UNHCR, 2019l) UNHCR Nigeria: Protection Strategy CRS May 2018

Rwanda*	4	2	0	6	Refugees have unlimited freedom of movement however humanitarian assistance is tied to camp residency and absence from camp for more than 3 months results in elimination of humanitarian assistance. Since 2018, government ID cards have been issued to provide access to jobs and services. ²¹⁶
Tanzania	2	1	0	3	Tanzania has a strict encampment policy. Since Tanzania has withdrawn from the CRRF in 2018, refugees within the camps have had restrictions to income-generating activities by closing markets.
Uganda*	4	3	4	11	Uganda is a global leader for refugee rights and inclusion policies. A Jobs and Livelihoods plan expands refugee opportunities beyond agriculture. Refugees live on settlements (instead of camps) and are provided with land to cultivate. ²¹⁷
Zambia*	4	1	0	5	Refugees have the right to work though they must apply for a work permit. Freedom of movement is restricted to designated “refugee settlements”. Written permission is required for urban residency which is valid for 1-3 years. ²¹⁸

Key: * Countries voluntarily signed up for the CRRF. **Rights to work is:** 0 = Denied, even informally within camps, 1 = Denied but informal work is possible in practice, 2 = Granted but discrimination is common, 3 = Granted but expensive permits are required and/or lengthy processing procedures, 4 = Granted, no obvious restrictions. **Freedom of movement:** 0 = Strict encampment policy, movement outside camps is almost impossible, 1 = Almost all DPs live in camps, movement outside camps is restricted arbitrarily, 2 = Most DPs live in camps, movement outside is possible with permits or no encampment, but IDs can be required arbitrarily, 3 = No encampment, restrictions on settlement province or discrimination is common, 4 = (Almost) no encampment, no province restrictions. **Access to land:** 0 = no land provided, 2 = land provided, 4=land provided with ownership possible

Of the 15 MECS countries, all have policies that recognise refugee legal rights of protection and 5 out of 15 MECS countries have signed up to the progressive self-reliance policies espoused by the CRRF. The countries with the most pro-refugee policies focusing on a self-reliant livelihood models are **Gambia (the), Ghana, Uganda, Cameroon and Ethiopia**. In terms of scale, Gambia (the) and Ghana have relatively small displaced populations (refugees and IDPs), approximately 8,000 and 27,000 which is 0.36% and 0.09% of DPs in comparison to their total population, respectively. In contrast, significantly larger number of DPs are situated in Uganda, Cameroon and Ethiopia which have 1.3 million, 2.6 million and 2.5 million, making up 3.2%, 10.2% and 2.3% of DPs in comparison to their total population, respectively.

Table15: Countries signed up for the Comprehensive Refugee Response Framework (CRRF).

Countries signed up to the Comprehensive Refugee Response Framework (CRRF) as of September 2018²¹⁹

Countries that have withdrawn from CRRF

²¹⁶ (Crawford, Holloway, & Lowe, 2019) The Comprehensive Refugee Response Framework Progress in Rwanda

²¹⁷ (UNHCR, 2019i) Uganda Country Refugee Response Plan

²¹⁸ (Zetter & Ruaudel, 2016) Refugees' Right to Work and Access to Labor Markets-An Assessment KNOMAD STUDY Part II

²¹⁹ (UNHCR, 2018b) Global Update on the Comprehensive Refugee Response Framework

Chad, Djibouti, Ethiopia, Kenya, Rwanda, Uganda, Zambia, Somalia, Costa Rica, Guatemala, Honduras, Mexico, Panama	Historically, Tanzania has a generous record of providing shelter to refugees and asylum seekers. However, Tanzania has pulled out of the CRRF on the 23 January 2018 as the government would not take a <i>loan</i> from the World Bank IDA 18 window for ‘financing refugees’ since supporting refugees is an international obligation, not one to be borne by the host country alone. ²²⁰ Significant underfunding of aid to refugees has resulted from the withdrawal with only 27% of the funds needed to assist refugees in 2018 were obtained. ²²¹ There have been cuts in food rations between August 2017 and October 2018, a ban on refugees leaving the camps including to find work or firewood, and violence against some refugees who left the camps, as well as generalised insecurity. ²²²
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4.3 Country energy access policies in relation to displaced populations

Previous research by the MECS programme has shown that MECS interventions are more likely to occur in urban and peri-urban settings in which electricity and LPG infrastructures are already established alongside high prices for firewood and charcoal²²³. Countries such as Uganda and Tanzania have emerging energy and environment policies supporting MECS interventions. Considering these factors, it is predicted that MECS interventions for displaced people are more likely to succeed in countries with significant number of displaced people in peri-urban and urban settings such as **Uganda, Kenya, Ethiopia, Nigeria, Myanmar and Cameroon**. However, significant data gaps exist for refugees and IDPs in urban and peri-urban areas. To support these transitions, greater effort is required to collect more **quality data and harmonise these indicators to understand impacts of modern energy cooking interventions**.

Table 16: Energy and environment update for displacement settings in Uganda and Tanzania.

Energy and Environment Update	
Uganda	The National Action Plan for GCR implementation (2018-2020) includes “Energy”. However, briquettes and charcoal standard are mentioned.
Tanzania	UNHCR and partners are implementing a comprehensive energy and environment strategy, which includes the fabrication of fuel-efficient stoves, and community-based biomass briquette production. Alternative cooking fuels currently being explored include LPG, biomass briquettes and sustainably sourced firewood. Afforestation, reforestation, community-based forest management, and enhanced environmental conservation and management through environmental education in the three refugee camps, constitute other efforts to mitigate the impact of refugee presence on the environment in the Kigoma region.

Table 17 outlines policies regarding energy access for the displaced in selected countries where such policies are in place. Only few countries among the 15 MECS priority countries have implemented

²²⁰ (Felleson, 2019) From Roll-Out to Reverse: Understanding Tanzania's Withdrawal from the Comprehensive Refugee Response Framework (CRRF)

²²¹ (NRC, 2019) 6 Things to Know About Refugees in Tanzania

²²² (Human Rights Watch, 2019) Tanzania: Asylum Seekers Coerced into Going Home

²²³ (ESMAP & MECS, 2020) Analysis of Drivers and Barriers for Transition to Modern Energy Cooking Services (MECS)

such policies. In many cases, refugees are seen as the responsibility of UNHCR and hence national policies do not include them.

Table 17: Summary of selected country energy, cooking and displacement policies.

Countries	Energy policies	Cooking policies	Humanitarian Policies
Kenya	National Climate Change Action Plan (2018-2022) – CCA country profiles to ‘promote the transition to clean cooking with alternative clean fuels in urban areas and clean biomass cookstoves and alternatives in rural areas’ but no reference to refugees. ²²⁴	The Kenyan government committed to achieving universal access to clean cooking by 2028, two years ahead of schedule. Nairobi-based Equity Bank pledged to invest \$100 million in the clean energy sector over the next two years, with the majority going to clean cooking. ²²⁵	The health impacts of transition to clean cooking tracked (linked to Climate Action 7): Promotion of clean cooking), with the aim of reducing the number of household deaths related to biomass energy use from 21,560 annually (49% of total deaths) to 20%. ⁵¹
Malawi	National Cookstove Taskforce set up with government input. Then President launched the 2 million cleaner cookstoves for Malawi by 2020. ²²⁶		UNHCR and the Government of Malawi through the Ministry of Homeland Security pledged commitment for a Roadmap for the implementation of the CRRF. ²²⁷
Tanzania	Tanzanian parliamentarians have engaged and made requests for more discussion and evidence on the role electricity might play in cooking both on grid and off-grid. Parliamentarians are also coming together through the Climate Parliament.		

²²⁴ (Government of Kenya, 2018) National Climate Change Act - Kenya - Climate Change Laws of the World

²²⁵ (CCA, 2019) Clean Cooking Forum 2019 Recap

²²⁶ (MARGE, 2020) Landscape Analysis of Modern Energy Institutional Cooking

²²⁷ (UNHCR, 2019f) Malawi Fact Sheet

4.4 What role can the MECS programme play in integrating modern energy cooking into policies?

The MECS programme can leverage their experience of working with all levels of governments and international partners from municipalities, national and international actors to advocate for the transition to modern energy cooking services using rigorous evidence-based research. Significant learnings can be transferred from stable developed markets. Coordination between the many stakeholders is a key enabler of successful projects. The barriers include policies that inhibit right to work and freedom of movement.

Policy engagement suggestions for the MECS programme:

- Engage in high-level political strategies (e.g. UNHCR Clean Energy Challenge)
- Advocate integration of clean cooking for displacement settings with national country policies to ensure that no-one is left behind
- Support policy development with robust research and through strategic partnerships

4.5 What are the current funding models for cooking and fuel access in displacement settings?

“We have to do things differently, disrupt our way of thinking, as business-as-usual will not enable us to achieve our global and national aspirations.” – **Hon. Simon Kachapin, Chief Administrative Secretary, Kenya Ministry of Energy**

Energy and indeed other services in displacement settings have historically relied heavily on grant-based funding. However, grants are limited in time and scope and usually cannot support interventions beyond their agreed timeframe. They also frequently fail to support development of financially sustainable solutions. New ways of funding energy access in displacement settings is urgently needed to address the scale of the challenge and do so fast. A comprehensive report by the MEI has been published on Innovative Financing for Humanitarian Energy Interventions.²²⁸

Innovative financing schemes can help create incentives for public and private providers of energy services to access settings such as refugee camps, which can be more challenging than other contexts, as well as help lower the price of the products and/or services for the target populations. A range of finance options which have been applied in displacement settings, including grants, are summarised in Table 18.

Table 18: Selected funding options for MECS solutions.

Model	Details	Examples of MECS in displacement settings
Grants and awards	Non-repayable funds or products disbursed or given by one party (grant makers), often a government department, foundation, trust or any other donor organisation, to a recipient (e.g. organisation, business or an individual).	Focus countries: 1. Ethanol in 3 refugee camps and host communities in

²²⁸ (Cohen & Patel, 2019) Innovative Financing for Humanitarian Energy Interventions

Results-based finance (RBF)	Development assistance provided in response to verified results, e.g. households provided with an electricity connection, rather than providing funding up-front for inputs, e.g. electricity meters, wires and poles. It can include funding provided from donors or development organisations to governments or funding for the delivery of basic services, such as energy, by private sector companies, community organisations, and public providers (“results-based financing”) ²³⁹ .	Jijiga, Ethiopia ²²⁹ (UNHCR, 2020c) 2. LPG in Cox’s Bazaar refugee camps and host communities, Bangladesh ²³⁰ 3. LPG in Nyarugusu refugee camp, Tanzania ²³¹ 4. LPG in IDPs camps in Myanmar ²³² 5. LPG in refugee camps and host communities in Kakuma, Kenya ²³³ 6. E-Cook in Bidibidi refugee camp, Uganda ²³⁴
Concessions	Any arrangement in which a firm obtains from the government the right to provide a particular service under conditions of significant market power. A concession is thus a device that can be used to ‘create competition’ for a market, when competition in the market is not operating. ²⁴⁰ Concessions provide incentives for the private sector to operate, maintain, and even expand upon infrastructure investments that remain publicly owned.	7. E-cook with IDPs in Myanmar ²³⁵ Other examples: 8. LPG in refugee and IDP camps and host communities in Diffa region, Niger ²³⁶ 9. LPG in Azraq and Zaatari camp, Jordan ^{237,238}

The International Finance Corporation (IFC)²⁴¹ found that there are three primary sources and structures of funding available to private sector companies willing to establish operations in displacement settings: grants and awards from foundations, humanitarian organisations, or individual donors (the more traditional route); procurement and contracting for the delivery of programmes and services as implementation partners for humanitarian organisations; and development finance and impact investing in the form of equity or debt contributions.

²³⁹ (ESMAP, 2020) Results-Based Funding for Energy Sector Development

²²⁹ (Patel & Gross, 2019) Cooking in Displacement Settings Engaging the Private Sector in Non-wood-based Fuel Supply

²³⁰ (Enamul Haque et al., 2019) Impact of LPG distribution among the Rohingya and Host communities of Cox's Bazar South Forest Division on Forest Resources

²³¹ (Rivoal & Haselip, 2017) The True Cost of Using Traditional Fuels in a Humanitarian Setting. Case Study of the Nyarugusu Refugee Camp, Kigoma Region, Tanzania

²³² (Spectrum, 2020a) Overview of Key Findings from Baseline Survey for the IDP Fuel Transition Project

²³³ Ibid.

²³⁴ (Ladefoged et al., 2019) Pesitho ECOCA Pilot Testing Uganda and Myanmar

²³⁵ Ibid.

²³⁶ (Patel & Gross, 2019) Cooking in Displacement Settings Engaging the Private Sector in Non-wood-based Fuel Supply

²³⁷ (NRC, 2015b) NRC Zaatari Gas Cooking PDM report

²³⁸ (NRC, 2015a) Post Distribution Monitoring Report Gas and Cooking in Zaatari Camp Background Information

²⁴⁰ (Kerf, 1998) Concessions for Infrastructure: A Guide to Their Design and Award

²⁴¹ (IFC, 2019) Private Sector & Refugees Pathways to Scale

From the literature, all examples of the initial setup of MECS interventions in displacement settings fall within the grants or concession models which is reliant on donor funding and at risk of underfunding, a chronic challenge in humanitarian operations.²⁴² UNHCR Representative in Jordan Stefano Severe which was the first refugee hosting country to install solar PV plant, describes the needs for energy interventions to have long-term strategic vision:

*“The plant will deliver huge savings in energy bills for UNHCR, which will be reinvested in other much-needed assistance. With the Syrian refugee crisis already into its seventh year, donor fatigue is setting in, making such savings essential for UNHCR to continue providing assistance to refugees in Zaatari camp and beyond,” Severe said.*²⁴³

There are opportunities for the humanitarian sector to move away from aid handouts and learn from market-based approaches to introduce innovative technology at scale. The ethanol project in Ethiopia is the only programme that has transitioned towards a market-based approach. With the support of Gaia Association (local Ethiopian NGO) and Ethiopian Administration for Refugee and Returnee Affairs (ARRA), host communities and refugees have been able to set up locally owned and operated social enterprises. **Enablers** to expand and support the sustainability of these operations include the **alleviation of VAT costs and access to business loans** for these cooperatives. Long-term success of these ventures lies in increasing the purchasing power of refugees to pay for the cooking interventions, instead of relying on aid handouts. High level political and business support in enabling self-reliance refugee policy such as refugees’ legal status that enable the **right to work** outside camps and ability to access finance would increase income-generating opportunities and hence, long term viability of new businesses within displaced settings.²⁴⁴

BOX 14: CONCESSIONS IN KAKUMA REFUGEE CAMP, KENYA

MEI through an open expressions of interest (EOIs) process funded local private-sector National Oil Corporation of Kenya (NOCK) with \$50,000 to supply liquefied petroleum gas (LPG) both to refugees in the Kakuma complex and to the surrounding host community. The proposal included income-generation opportunities, entrepreneurship training for women and youth inside and outside the complex and roles in the distribution and exchange of LPG cylinders through local retail shops.²⁴⁵

BOX 15: CASH FOR COOKING GAS AT SCALE

UNHCR provides “cash for cooking gas” to the entire camp population regularly throughout the year (n=76,108) and cash for heating gas is provided during winter. The amount of cash depends on the family size. UNHCR also provides core relief items (CRIs) such as cooking utensils. NRC supported UNHCR with 3.3 million Jordanian Dinars in total (about USD 4.6 million) to provide each family’s heating gas needs for the five months of winter. This is the biggest cash distribution in the seven-year history of Zaatari camp for the entire camp.²⁴⁶

²⁴² (Crawford & O’Callaghan, 2019) The Comprehensive Refugee Response Framework Responsibility-sharing and Self-reliance in East Africa

²⁴³ (UNHCR, 2017b) Jordan’s Zaatari Camp Goes Green with New Solar Plant

²⁴⁴ (Patel & Gross, 2019) Cooking in Displacement Settings Engaging the Private Sector in Non-wood-based Fuel Supply

²⁴⁵ Ibid.

²⁴⁶ (Qashu’, 2019) Refugees Prepare for Winter with Zaatari’s Largest Ever Distribution

4.5.1 Pay-as-you-go (PAYG) plans/ instalments

The PAYG model allows customers a similar level of flexibility offered by mobile operators meaning that they can use as much energy as they pay for and once their credit runs out, they have to make another payment. The daily, weekly or monthly amount can vary with some companies requiring a minimum amount in order to avoid mobile money (MoMo) transaction costs on small sums. Transaction costs can be high and difficult to scale where uptake of the offered solutions is low. PAYG model has benefitted from mobile services, using similar structures and principles and offering similar advantages, and has used them as an analogy for facilitating sales to different customer segments already familiar with the PAYG offering²⁴⁷. Whether for electricity or cooking solutions, the cost is spread over a series of instalments lowering upfront amount paid by the consumer. PAYG works best where there is an already established telecommunications infrastructure and at least early MoMo penetration. For example, in the Kakuma refugee camp in Kenya, Bboxx, who provide solar home systems on a PAYG basis, encountered difficulties with payment collections as not all refugees had access to MoMo. They would frequently use MoMo agents or other people's accounts to make their payments which would not register under the customers' accounts, causing delays in payment allocation and the switching back of the systems.

4.5.2 Carbon finance

Carbon financing is an innovative funding tool that places a financial value on carbon emissions and allows companies wishing to offset their own emissions to buy carbon credits earned from sustainable projects²⁴⁸. Carbon credits are claimed by the manufacturer to account for the CO₂ emissions over the lifetime of the energy solution, among which cooking solutions are common. This allows companies to finance projects and operations, partially lowers the cost of the solution and is effectively passed onto consumers as a subsidy. For instance, in 2014, UNHCR partnered with climate protection organisation *Atmosfair* to bring fuel-efficient stoves to refugees in Rwanda. It was UNHCR's first carbon financing agreement with the aim to increase refugee access to energy, decrease environmental degradation and reduce carbon emissions from cooking. Another example is the use of carbon credits in Chad where the CookIt Solar Cookers have been provided to the Sudanese refugees with the support from the FairClimateFund who have obtained carbon credit certificates on the basis of the reduction in firewood consumption by the refugees (see Box 9).

There is significant potential for solutions such as eCooking to be included in carbon credit schemes due to ease of data collection through consumption meters. Among the barriers is the instability of carbon credit markets which can impact on long-term planning of energy projects and the uncertainty of future available funding. Some initiatives, such as the FairClimateFund, offer therefore a fixed price for carbon off-setting that guarantees to cover the costs of the specific projects.²⁴⁹

4.5.3 Utility model using mobile technology

Utility-based models, otherwise known as energy as a service, operate on similar principles to those guiding a national energy utility. A standard practice is to collect a one-off installation fee after which service is offered on a pre-paid basis. Service fees paid by the customers are generally lower than those paid under a PAYG model as usually they cover the amount of power consumed (power

²⁴⁷ (Bisaga, 2020) Innovation for off-grid solar rural electrification

²⁴⁸ (UNHCR, 2014) Carbon Financing

²⁴⁹ (Fair Climate Fund, n.d.-b) Our Approach

units, similar as in the case of mini-grids or grid connections) rather than towards covering the full cost of the system. Similarly to PAYG, payments can be made via mobile solutions and the connection can be remotely enabled and disabled (when the credit runs out). This model is commonly used by solar mini-grid providers and could be extended to MECS, particularly for eCooking and LPG. With the available financing, the upfront cost of the cooking equipment could also be spread across a period of time, alleviating affordability issues.

4.5.4 Microfinance

Microfinance offers small loans for upfront purchases or investments which require lump sums typically exceeding the capacity of an individual. While traditional Microfinance Institutions (MFIs) have tended to avoid serving refugees and other displaced peoples because of the perceived cost and risk, some MFIs, such as [Kiva](#)²⁵⁰, have entered this space with crowdfunded, 0% and risk-tolerant loans operated by local, in the field partners. Due to the limited legal rights of refugees sometimes prohibiting access to finance, the schemes targeting those groups have taken an innovative approach with modified eligibility requirements including alternative ways of verifying personal identity. For cooking solutions, microfinance solutions can enable upfront payments for the cooking equipment.

4.5.5 Fuel amortization and cross-subsidy models

Cooking system offered free, at cost or with partial subsidy with funds collected from on-going energy source revenue stream.

4.5.6 Power Purchase Agreements and Leasing Agreements

Power Purchase Agreements (PPA) and Lease Agreements are typically bilateral agreements between an electricity provider and a power purchaser to secure a long-term electricity supply agreement de-risking both technical and financial aspects of renewable energy solutions. The agreement secures the revenue generation of the project by defining the terms and conditions of the selling of electricity generated by the power plant (most typically a solar PV system). A leasing agreement offers the option to lease the energy supply system, a fixed price for the lease, a specific duration of the leasing period and warranties for the leasing equipment. Similarities between PPAs and leasing agreement include the energy system owner's responsibility for the construction and maintenance of the system and a retention of system ownership throughout the contract duration. GIZ and GPA have supported the development of standard clauses of PPA and leasing agreements for energy provision in humanitarian settings²⁵¹.

UNHCR - Green Fund:

“Our hypothesis is that the optimal way to do this would be to procure clean energy via power purchase agreements from independent power producers. We are currently targeting implementation in an initial set of sites in Ethiopia, Kenya, and Uganda, where the green Fund would back solarization contracts with the private sector, to be selected in a competitive tender process. Beyond the initial set of sites, the goal will be to allow the Fund to grow through further investment and reach additional operations more quickly. “Green Fund” functioning under specific rules and

²⁵⁰ (Kiva, 2020) Kiva Labs - Supporting Refugees

²⁵¹ (Fouquet et al., 2020) Identification and Analysis Of Standard Clauses Of PPA And Leasing Agreements For Energy Provision In The Humanitarian Sector

procedures that would better support the upfront inputs needed to phase out fossil fuels and achieve sustainability.”²⁵²

4.6 How can these finance models be leveraged for the MECS programme?

The following suggestions in finance innovation are given to the MECS programme to explore and leverage the current work in displacement settings:

- Explore strategic market-based approaches with PPPs in line with current expertise at the national and local government levels
- Fund pilots for innovative business models and technology deployment with a foundation of evidence-based research
- Explore innovative financing tools and models which have been deployed in rural energy access and which could be applicable to displacement settings (such as has been the case with PAYG solutions). Where necessary, find alternative mechanisms that can enable access for the displaced in instances where their legal status/rights prohibit access (e.g. verification based on a national ID which majority of refugees do not possess)
- Partner with MFIs and other financial service providers willing to serve displaced populations and/or already collaborating with humanitarian organisations to jointly develop strategies which could be applicable in displacement settings, and which would be inclusive of risk mitigation, to facilitate access to MECS. Learn from existing case studies, e.g. Kiva

²⁵² (UNHCR, 2020f) UNHCR Green Fund Project Manager

5 Key Findings and Outlooks

The purpose of this report is to analyse the landscape of modern energy cooking in displacement settings by identifying the drivers and constraints for the transition from traditional biomass fuels to modern energy cooking services.

5.1 Key Findings

Technology

The literature has been used to predict early adopters of eCooking in various displacement settings from an assessment matrix²⁵³ based on electricity access and current cooking appliances (see *Table 8*). The following displacement settings were identified from the most likely to transition to the least likely:

- Most likely to transition: grid connected, typically in urban areas, displaced populations in countries with pro-refugee self-reliant models who are able to pay for their cooking energy.
- The least likely to transition: are refugees under encampment policies with no rights to work or freedom of movement who are reliant on aid distribution of firewood and free collection of firewood.

The former would be more likely to access and benefit from a sustainable market-based approach model whereas the latter would likely to struggle to take full advantage or access it at all, unless substantial cost reduction was facilitated alongside.

Stakeholder review

This chapter provided an overview of the stakeholders involved in MECS interventions in displacement settings. Stakeholders can be broadly categorised into the following actor groups: displaced people, humanitarian or displacement settings experts; technical experts; researcher; project developers; and policy, advocacy and governance workers. Clean cooking cuts across numerous sector clusters - food security, nutrition, protection, health, education, water, shelter, logistics and telecommunications. Notably, not all UN humanitarian organisations involved in cooking in displacement have identified SDG 7 as one of their goals demonstrating that energy access is seen as an enabler to other priority goals for many organisations.

Despite the number and complexity of stakeholders involved, there still exist no coordinating body for the delivery of cooking services in displacement settings. At present, the funding and implementation of modern energy cooking interventions in displacement settings are largely carried out by different individual agencies with limited sharing of lessons learnt. Larger scale-up projects (e.g. LPG in Bangladesh) have seen greater collaborative effort in planning and coordination however this is the exception and not the rule. The GPA and Energypedia webinars have spearheaded sharing of lessons learnt over the past two years and continued transparency and collaboration should be encouraged.

Policy and finance

Cooking policy frameworks in humanitarian organisations are generally non-existent, however when they do exist, they are incremental and perpetuate the use of biomass for cooking. The MECS programme can leverage its experience of working with all levels of governments and international partners from municipalities, national and international actors to advocate for the transition to

²⁵³ (Brown et al., 2017) A Review of the Behavioural Change Challenges Facing a Proposed Solar and Battery Electric Cooking Concept

modern energy cooking services using rigorous evidence-based research. Significant learnings can be transferred from stable developed markets. Coordination between the many stakeholders is a key enabler of successful projects. The barriers include policies that inhibit right to work and freedom of movement.

In addition to favourable policies regarding the displaced, there is a need for innovative financing of energy access in settings of displacement which goes beyond grants. There are lessons to be learnt from the development sector where various business models and financing mechanisms have already been applied, e.g. PAYG energy, carbon finance, microfinance, concessions and PPAs. There is an opportunity to adapt them to settings of displacement, where needed, and scale them up to serve both the urban and peri-urban displaced populations, and those living in rural or camp areas.

5.2 Outlooks

Based on the self-reliant approach of the CRRF, the criteria for the most likely refugee hosting countries to transition to MECS using a market-based approach includes the rights to work, freedom of movement and land ownership. The most likely countries to transition using market-based approaches instead of the traditional aid handouts are Gambia (the), Ghana, Uganda, Cameroon and Ethiopia. Rwanda, Zambia and Kenya fall into the next group due to their mainly encampment policies and lack of land for productive cultivation. Cambodia, Tanzania, Myanmar, Nepal, Bangladesh, Malawi and Nigeria are the least likely to transition as refugees have very limited opportunity to increase their purchasing power to afford MECS solutions.

Table 19. MECS priority countries' likelihood to transition to MECS using a market-based approach according to the CRRF self-reliant approach scoring criteria.

Country	Rights to work	Freedom of movement	Land ownership	Score
Gambia (the)	4	4	4	12
Ghana	4	4	4	12
Uganda	4	3	4	11
Cameroon	4	4	0	8
Ethiopia	4	2	4	8
Rwanda	4	2	0	6
Zambia	4	1	0	5
Kenya	2	2	0	4
Cambodia	1	2	0	3
Tanzania	2	1	0	3
Myanmar	1	1	0	2
Nepal	1	1	0	2
Bangladesh	0	1	0	1
Malawi	1	0	0	1
Nigeria	1	0	0	1

The situation for IDPs is different as they still can work within their own country. In these settings, the closer IDPs are to energy infrastructure typically in urban and peri-urban areas, the greater the likelihood of transition to MECS. Countries with significant proportion of DPs in urban and peri-urban cities are Uganda, Kenya, Ethiopia, Nigeria, Myanmar and Cameroon.

Table 20: Barriers and enablers of transitions to MECS.

Category	Barriers	Enablers
Policy	Displaced people may be restricted from accessing energy sources by host communities or governments (e.g. In the analysis of MECS alternative fuels for Rohingya refugees, the Bangladesh government did not permit solar PV solutions as most host communities did not have this technology) ²⁵⁴	Cooking interventions to include both refugees and host communities
	Resentment of host communities and governments towards displaced people who receive better cooking services than hosts	Cooking interventions to include both refugees and host communities
	Encampment policies restrict movement of displaced people to access local markets to procure materials or sell products, reducing opportunities for productive activities and self-reliance	High level dialogues with host and donor governments that encourage self-reliance policies through freedom of movement policies (e.g. CRRF)
	Low prioritization of modern energy cooking in humanitarian responses	Support the integration of cooking services into food and fuel strategies, with matching budgets
Finance	Displaced people have limited access to finance and hence, spending power because they do not have the right to work, cannot find employment or are paid less	High level dialogues with host and donor governments that encourage self-reliance policies through right to work policies (e.g. CRRF)
	Free handouts lead to dependency of displaced people on humanitarian aid (including cooking fuels and services)	Cooking interventions that enable displaced people to choose their cooking solutions (e.g. cash or vouchers are used to purchase products/fuels in an open market) or reduce the cost of modern cooking solutions (e.g. subsidies or concessions, bulk purchasing of cooking products, carbon financing to reduce cooking services cost).
	Restricted provision of cooking products/services through market-based approaches by both humanitarian agencies and governments, reluctant to indicate permanency of displaced population for political sensitive messaging	High level dialogues with host and donor governments that encourage the view that displaced people are an asset and promote self-reliance policies (e.g. CRRF)
Coordination	Multi-agency involvement in displaced settings (particularly during the	Support coordination of humanitarian actors, community development,

²⁵⁴ Response of UNHCR staff at the Clean Cooking Forum in Kenya, 2019 to the question “Was electric-solar PV cooking solutions considered as an option as an alternative cooking fuel in Bangladesh?”

	emergency phase), without clear coordination or consistency of approach and often outside government structures	private businesses with all level of governments to encourage long-term energy and cooking services in displaced settings
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5.2.1 Opportunities for the MECS programme to contribute

The MECS programme will require a broad engagement strategy to identify and work with a range of stakeholders in cooking in displacement settings. This section discusses the opportunities for the MECS programme to fit into the overall displacement cooking eco-system.

Through the partnership with GPA and its members, the MECS programme can help coordinate and engage a wide range of stakeholders to enable narrative changes that demonstrate MECS solutions in specific displacement settings. Activities could include data harmonisation of key indicators of modern energy cooking within ESMAP multi-tier framework and developing learning modules and training opportunities for humanitarian practitioners on modern energy cooking to support the work of the Technical Expertise and Capacity Building, and Data, Evidence, Monitoring and Reporting working groups. Additionally, the MECS programme could play a part in advocating clean cooking for displacement settings with national country policies to ensure that no-one is left behind. To that end, strategic market-based approaches with public-private partnerships in line with current expertise at the national and local government levels and innovative financing tools and models, will have to be explored to facilitate innovative business models and technologies (e.g., data-driven electricity metered carbon credit schemes) for the displaced in both urban and semi-urban areas, and camp and rural settings. There is also an opportunity to support actors that are traditional implementers in displacement settings with technical assistance to trial e-cooking interventions, for example, the WFP School feeding programme, working with humanitarian organisations to transform operation cooking systems through “greening the blue” initiatives.

The MECS programme could leverage its work with governments to address these issues in countries with progressive refugee and broader displacement policy frameworks and those who have signed up the GCR and/or the UNHCR Clean Energy Challenge. Bridging the traditional humanitarian approaches to serving the displaced and the broader development approaches, which typically have long term prospects and planning, could help facilitate more sustainable energy access interventions for the displaced.

5.2.2 Further research

The following are suggestions for the MECS programme research priorities to advance knowledge and shift the narrative about energy in displacement settings in order to facilitate faster transition to modern energy cooking for the millions of displaced in the MECS priority countries.

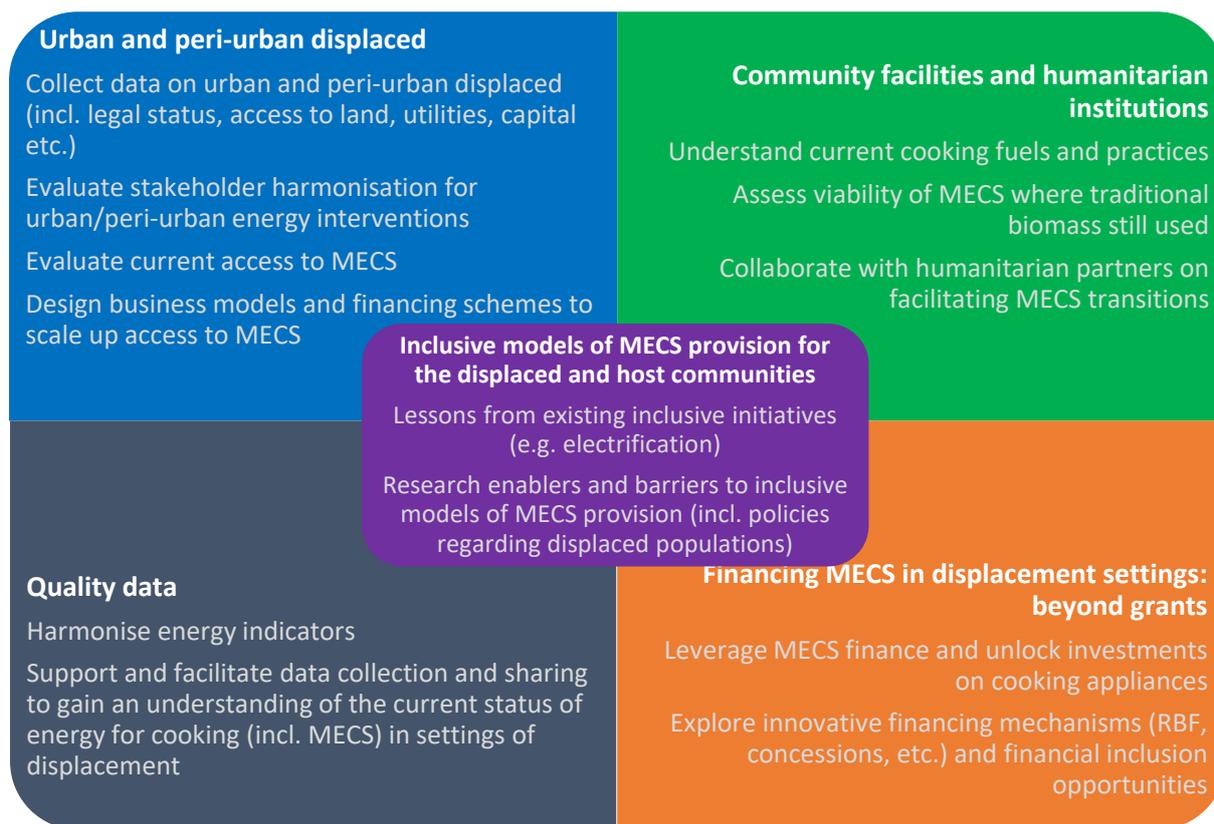


Figure 12: Research needs for modern energy cooking services in situations of displacement.

Firstly, cooking with electricity can be a reliable, scalable, and an economically viable long-term solution for if the right enabling eco-system is in place. Political commitments and innovative funding mechanisms have facilitated successful electrification efforts in refugee camps and many urban centres in SSA and South, South-east Asia. Including electric cooking as part of electrification programmes to tackle the most pressing energy challenge for all, including people affected by displacement, has now become a feasible next step in many regions of the world. MECS could leverage existing country and local municipality strategies to *include displacement settings*, particularly urban and peri-urban settings, in which electricity access and LPG supply chains are available to transition the many who still cook with biomass to MECS. However, there is a scarcity of data on urban and peri-urban displacement settings which has to be addressed first in order to understand the needs of the displaced in those contexts and to design appropriate business models and financing mechanisms.

Secondly, rolling out clean, modern cooking services in institutional settings, including schools and health clinics, community marketplaces, businesses, welcome reception centres and UN kitchens for staff, may be more successful than at the household level as those facilities have greater access to resources, including funding mechanisms, with the potential to be the first cooking innovators in displacement contexts. In addition, MECS in institutional settings can help to build awareness and capacity for household-scale and communal cooking interventions in situations of displacement.

Thirdly, although energy access in displacement settings has seen more interest from different stakeholders, including governments, NGOs, donors, private sector actors, and humanitarian organisations themselves, most of the support towards this area has been through grant funding, which is often limited in scope and has a relatively short lifespan as compared to the long-term nature of the energy challenge. To provide truly sustainable MECS, a more diverse range of funding

mechanisms is urgently needed. These could include concessions, Results Based Financing (RBF) schemes, crowdfunding and more, with lessons learnt from energy access financing in the development sector and the wider MECS programme used to guide their design. The programme could also leverage existing innovations in energy financing and investments in electric appliances to support their applications, and potential adaptations needed to tailor them to displacement settings.

Fourthly, significant data gaps exist on displacement settings within urban and peri-urban areas. As energy access has fallen outside of humanitarian organisations' mandates, data on the subject in displacement settings has not been collected in a systematic way or at all. To support MECS transitions, greater effort is required to collect quality data and harmonise energy access indicators to understand the needs of populations affected by displacement and the impacts of modern energy cooking interventions. With the existing expertise in evidence building and the ongoing collaborations with partners involved in pushing the agenda for improved data collection (e.g. the Global Plan for Action and UNHCR under the Clean Energy Challenge), there is an opportunity for the MECS programme to help facilitate suitable data collection and knowledge building mechanisms for displacement settings.

Finally, a commitment should be made to work with people in displacement settings towards a long-term programme sustainability as a central feature at the conception of clean cooking programme design. Those affected by displacement should be recognised as not just passive receivers of aid, but as self-organising, active leaders of their own solutions. There should also be recognition of emerging power relations among the range of stakeholders involved in the transition to MECS, who shape decision-making on what solutions should be deployed, by whom and under what models. At the centre of MECS interventions must be the **voices of people in displacement settings and the ability to choose solutions that meet their self-identified needs, to enable them not only to survive but to thrive.**

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Annex A: Methodology

The landscape study methodology followed a purposive and iterative approach that focused on the expected impacts of modern energy cooking in displacement settings. The purposive sampling involved search terms that fell into three broad groups: 1) setting and population description, 2) energy access, cooking, cooking technologies and energy source and 3) social-economic and environmental factors.

Search limits for academic literature:

Dates: January 2000 – July 2020

Fields: Title, abstracts, keywords

Publication types: All

Table 11: Search terms for literature review

Group 1: Setting and population description	Group 2: Energy access, cooking, cooking technologies and energy source	Group 3: Social-economic and environmental factors
Refugee;	Clean cooking, Cook*, cooking	Health
Internally displaced person, IDP, IDPs	Modern energy; Modern energy cooking, Modern energy services	Indoor air pollution
Asylum seeker*	Sustainable energy	Respiratory illness
Displaced person, displaced population, displaced people	Energy; energy access	Asthma
Urban refugees; Urban IDPs	Alternat* energy source	Burns
Slum dwellers	Cookstove, stove, cooker, induction stove, Improved cookstove, ICS	Protection, security
City refugee	Electricity, electrical	Gender, gender-based violence, GBV, gender disparity
refugee camps; displaced camps	Biomass, biomass energy, biomass cook*, fire, firewood, fire fuel, charcoal, pellets, kerosene	Disability
Informal settlements	Biogas, bio fuel, bio energy	Diversity, Equality
Humanitarian	Liquid petroleum gas, LPG, Liquefied gas, pressurised gas, gas	Income, livelihood
Migration	Ethanol, liquid fuel	Enterprise, small business
Bangladesh, Cambodia, Cameroon, Ethiopia, Gambia (the), Ghana, Kenya, Malawi, Myanmar, Nepal, Nigeria, Rwanda, Tanzania, Uganda, Zambia ²⁵⁵	Electricity, Electric, On-grid, Off-grid	Jobs, employment
	Natural gas, piped gas	Microcredit
	Photovoltaic, Solar PV, PV, Solar power*, solar energy, renewable energy, geothermal, hydro energy, wind energy	Remittance

²⁵⁵ (MECS 2018) <https://mecs.org.uk/countries-of-interest/> Access: 2020-07-18. MECS country of interests

	Solar thermal energy, solar ovens, concentrated solar,	Subsistence
	Electric cooking appliances, E-cook, Induction stove, Electric pressure cook*, EPCs, Rice cooker,	Rights, legal rights, freedom of movement
	Water heater, boiling, water pumping	Empowerment
	Energy policy	Private sector
	Diesel, genset, generators	

*Search root words

Electronic databases used included SCOPUS, Web of Science and Google Scholar. These included journals such as Renewable Sustainable Energy Review, Sustainable Development and Energy for Sustainable Development. Humanitarian journals not listed in the databases were searched separately and included Forced Migration Review, GIZ Boiling Point, Journal of Humanitarian Assistance, Humanitarian Exchange Magazine, Journal of Humanitarian Logistics and Supply Chain Management. A total of 35 academic articles were selected for inclusion in the study from the relevant searches. In addition to formal academic literature, grey literature sources were also extensively reviewed to capture the wealth of material published by humanitarian practitioners, non-academic research organisations and UN bodies. These searches included Google and websites of UN organisations (e.g. UNHCR, WFP, UNITAR, GPA, IOM, FAO, World Bank, WHO, Clean Cooking Alliance, MEI, Chatham House, Practical Action, Norwegian Refugee Council, Danish Refugee Council, Mercy Corps, UNRWA, MECS, HEDON, IEA, Ashden, Endev, GIZ, Irena, SE4All, Hivos etc). Also, Google search identified other local and international NGOs websites and articles working in this sector. News articles, webinar presentations, email correspondences and interviews with various stakeholders have also informed this study.

The study initial results were augmented by other techniques including snowballing, to find additional relevant articles.

After initial screening of the title, abstract and key words, a full paper review was conducted. The inclusion criteria for the literature involved the cross-linking of terms from at least two of the three categories, with most literature included involving terms from all three categories.

A significant number of articles linked cooking in displacement to impacts to social-economic and environmental benefits and constraints however, very little provided follow-up evidence to back up the anecdotal statements. Many tens of grey literature collated and reviewed were in response to a small number of modern energy cooking pilots and programmes in this sector. Many hundreds more involved traditional biomass cooking that either dismissed modern energy cooking or did not mentioned it at all as a viable alternative.