



## **MECS global experiences**

**Joint ECO Nepal Workshop**

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**Dr. Richard Sieff & Dr. Samir Thapa (Loughborough University)**





# MECS Programme Aims & Outcomes

- Eight year £40 million programme funded by UK Aid (Oct 2018 – March 2026)
- Aim: to ‘**break out of business-as-usual**’ approaches and rapidly accelerate the transition from polluting fuels to genuinely clean cooking (electric/gas) on a global scale.
- Intended outcomes
  - Market-ready range of innovations (technology and business models) which lead to improved choices of affordable, reliable and sustainable modern energy cooking services for consumers.
  - MECS principles adopted in the SDG 7.1 global tracking framework
  - Modern energy cooking services incorporated in energy policies and planning.
- Global engagement – a range of countries in Africa and Asia (including Nepal).



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## MECS outputs

1. **Transition pathways.** Evidence and research into the factors driving transitions to modern energy cooking services (including in institutions and humanitarian situations)
2. **Technology and business Innovation** that make electricity and gas more efficient, practical, more desirable and affordable for poor households (consumer preferences).  
Innovation in business models, financing & private sector delivery of mecs  
**Challenge funds** for simulating innovation (e.g. ECO)
3. **Global tracking** modern energy cooking services. Attributes of modern energy cooking services defined and incorporated into SDG7.
4. **Finance work:** Operational models for scaling developed and tested, feasibility of finance mechanisms for scaling tested, understanding the factors for effective supply chains
5. **Changed the narrative on cooking** – pushing MECS results into practice for those involved in wider energy access policy and programming.



# Transition pathways

**Enabling transitions to modern energy cooking services in places such as schools, clinics, and humanitarian response**

- Rapid Institutional cooking baseline research in Indonesia, Malaysia and Cambodia
- Fuel-efficient menus in the school feeding programme in Rwanda – with World Food Programme
- Large EPC testing (33l – 65l) in Schools – Lesotho.

**Investigation of transitions in domestic situations**

Example research (Modern Eating workstream) – ASEAN countries

- Understanding how people learn to cook
- Use of informal food vendors, their practices, habits and beliefs
- Eg Cookpad research: Correlate country averages for access to clean cooking from the WHO Household Energy Database with quality-of-life indices from the Gallup World Poll data to investigate if “access to clean cooking improves quality of life”.





# Technology and Business Innovation

**Case studies developed on technology and business innovations previously funded by MECS that show promise of maturing and market uptake**

**Infrastructure adaptability to eCooking:** Grid connected solar, load balancing and business models on mini-grids (solar, hydro, hybrid) & SHS

**Alternative Fuels:** Biogas bottling, new LPG business models, new LPG delivery mechanisms, Hydrogen.

**Appliance adoption:** Low voltage appliances, modified EPCs for specific markets

**Energy Storage:** Phase Change batteries, Recycled Lithium, Batteries with different Chemistries,

**Business innovation:** delivery models, market-testing, bottom of the pyramid, situational analysis, social media campaigns, employment implications

**Social Inclusion:** human-centred design, humanitarian, institutional and industrial cooking, **inc. consumer behaviour and preferences**



**Kachione – Malawi.** An eWant DC 5L electric pressure cooker (EPC) connected to two 280W solar panels - An Off-grid Solar Photovoltaic Electric Pressure Cooker system that costs only \$200 in Malawi.



**MECS Challenge Fund.** PEEDA: Assessing electric cooking potential in micro hydropower microgrids in Nepal. <https://mecs.org.uk/download-category/mecs-triid-report/>

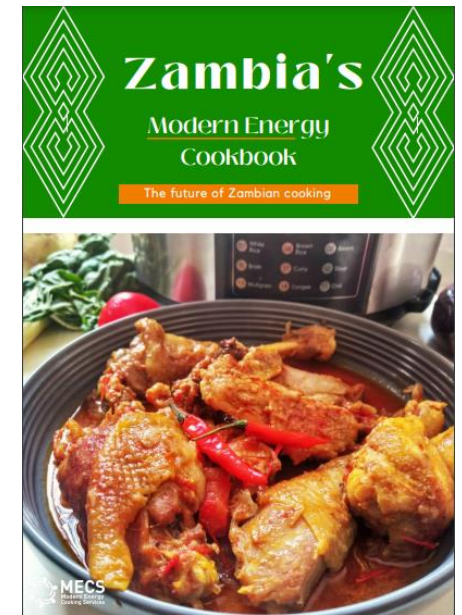
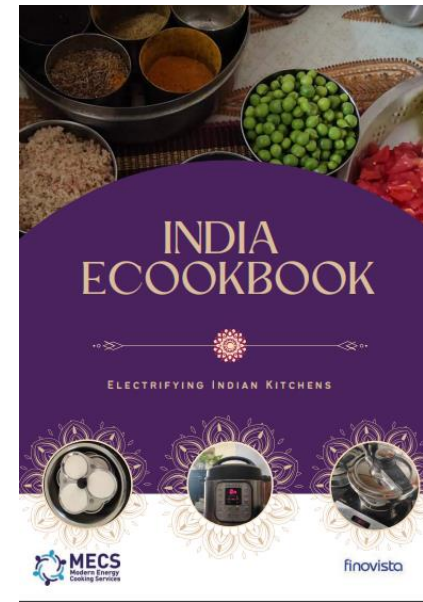




# Understanding consumer preferences - eCookbooks

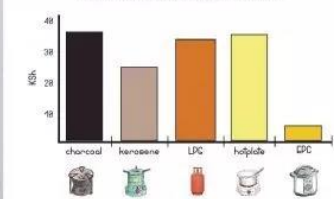
Key Achievement: eCookbooks for multiple countries developed:  
Capture unique opportunities for transitioning to modern energy in each country context

- India eCookBook highlights value of EPCs and induction stoves for cooks further electrifying their kitchens.
- Zambia cookbook focuses on reducing loads on the grid.
- Uganda eCookBook focuses on the huge cost and time savings of eCooking in comparison with charcoal
- Nepal eCookbook raises awareness of health, social and particularly cost saving benefits of eCooking compared to LPG and firewood



## WHAT IS THE CHEAPEST WAY TO COOK HEAVY FOODS?

We wanted to know if anything could beat an **Electric Pressure Cooker (EPC)** on cost, so we looked 500kg of yellow beans as carefully as we could on charcoal, kerosene, LPG, an electric hotplate and an EPC. We did it side-by-side & just pre-cooked them so that we could directly compare between them.



We used all the tricks in the book - lids on the surfaces, turning down to a simmer, just enough water etc. However, we still couldn't get close to an EPC.

Not only was it seven times cheaper than charcoal, but it cooked in half the time without any stirring or topping up of water or fuel!





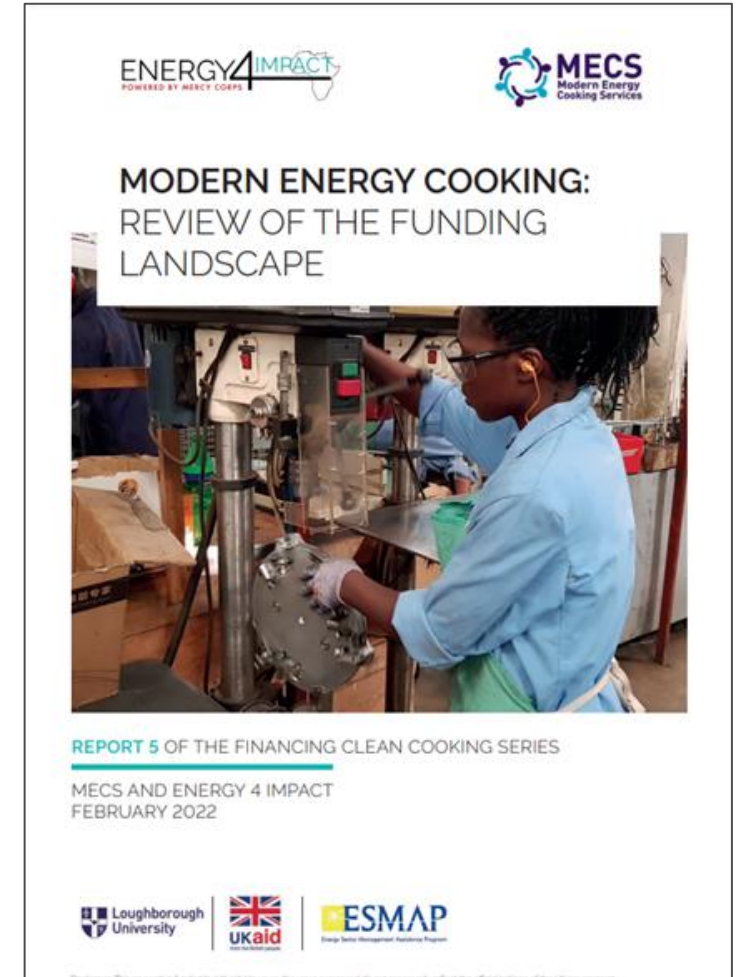
# Understanding finance for modern energy cooking

Series of multiple reports on different types of financing and financing strategies for clean cooking - with Energy4Impact.

- crowd-funding, appliance-finance, financing cooking in humanitarian settings, results based financing (RBF), and a [review](#) of the funding landscape for clean cooking.
- Lots of potential to leverage funding from electrification sector for e-cooking (integrated planning)

[NEFCO](#) launched major new RBF initiative for clean cooking (€27.8 million initially)

- focused on higher-tier solutions including electric cooking.
- Design based on detailed advice provided by the MECS/Open Capital Advisors (OCA) collaboration on designing clean cooking RBFs.







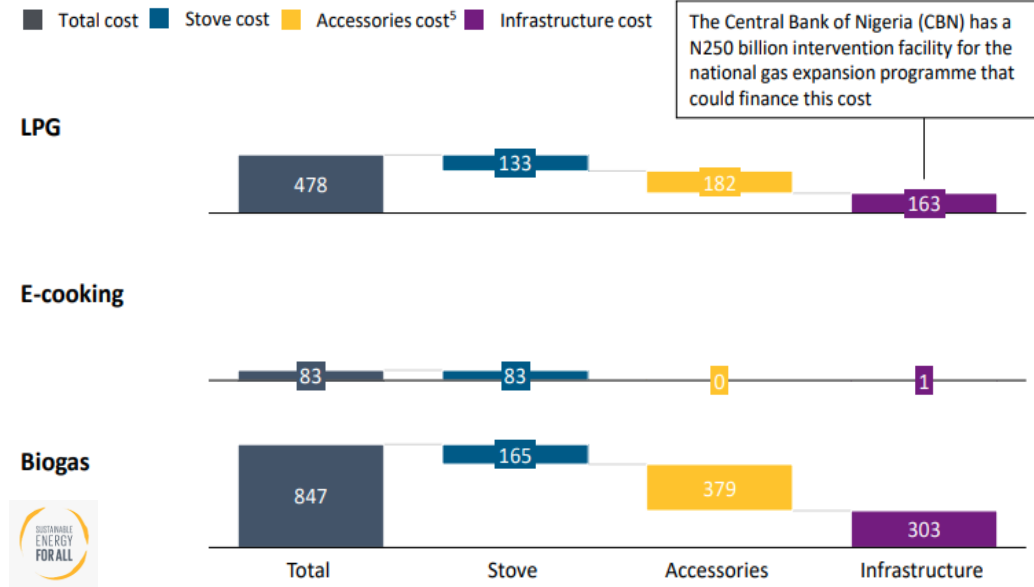


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# Grids, off-grid and Tariff plans

- Working with SE4All on integrated Energy Planning tool. [Shows least cost option for Govt eg Nigeria. \(see extract right\)](#)
- Tariff changes – Uganda introduced an ecooking tariff. [Kenya introduced just last week a ‘category 2’ tariff designed for ecooking. See extract below right.](#)
- Integrating Solar PV at the edges of the grid to strengthen the grid
- Working with mini grids to explore profitable business models with ecooking (Phase 1 of COSMO challenge fund currently under way.)
- Exploring Solar PV home systems strong enough to cook – often requires heat battery storage, and/or total system design alongside solar pumping to create income for households that do not normally monetise their fuel collection.

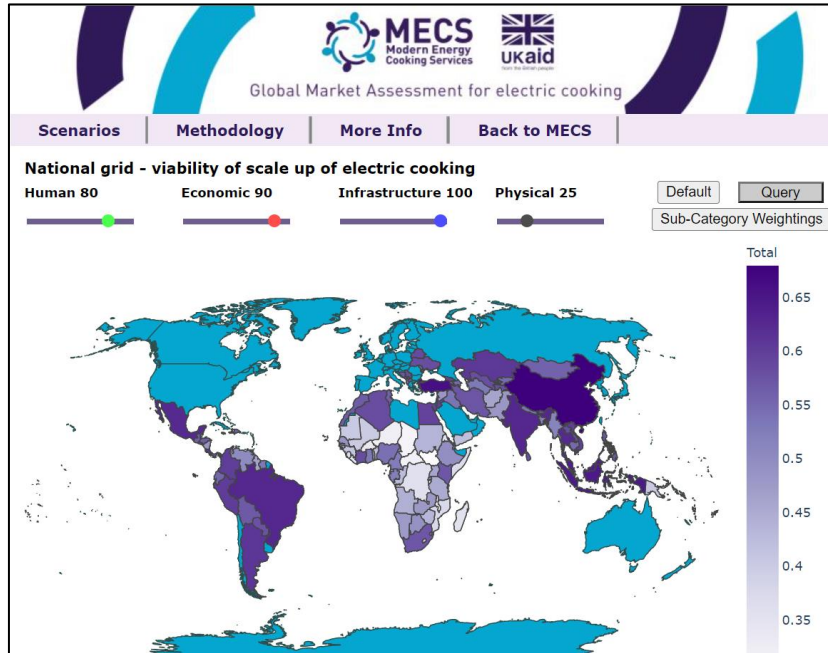
Investment required to realise clean cooking opportunity in Nigeria in 2030<sup>1</sup>, USD Mn



27. In order to promote electric/clean cooking and energy transition in support of climate change mitigation and related initiatives, the Authority has introduced a new customer category (Domestic Customer Category 2) for those consuming between 31-100kWh. Research and cooking experiments in cleaning cooking by the Modern Energy Cooking Services (MECs) in Kenya has shown that, only 41kWh/units on average are used in electric cooking by families who have adopted this mode of cooking.



# MECS Global Market Assessment



- Provides score on the viability of electric cooking scale up from 37 indicators
- 130 countries in the Global South.
- Provides a score for national grid, mini-grid and off-grid (standalone) supported electric cooking.
- Online tool allows users to change individual indicator weightings, and explore all data sets (<https://gma.mecs.org.uk/>)

## Global Market Assessment for electric cooking (GMA): Factsheet (July 2021)

### Nepal 2nd

out of 130 countries in the Global South (overall GMA score for all scenarios)

**Viability of scale up of electric cooking**

By constructing a weighted score from 37 indicators across 130 countries the Global Market Assessment for electric cooking (GMA) shows where in the Global South a scale up of electric cooking is most viable. [Find out more](#)

Nepal has the second highest all round GMA score (behind India) owing to an expected surplus in grid electricity capacity, strong mini-grid infrastructure, and consistent human development indicators, business environment and sustainable energy policy. Electricity access is high (urban: 96%, rural: 93%) via an entirely renewable national grid and the country's numerous mini-grids, many of which are hydro-powered.

Nepal is ranked 7th for the mini-grids scenario, and is a particular area of opportunity for electric cooking in the country (represented by high scores for number of people connected to mini-grids, mini-grid developers and high off-grid renewables capacity). The use of clean cooking fuels is growing throughout (LPG primary fuel: 28% (LB 9%, UB 44%); electricity primary fuel: 0% (LB 0%, UB 17%)), but most households still use biomass (primary fuel: 70% (LB 55%, UB 84%)). There is also a relatively high number of household air pollution attributable deaths, meaning that action is needed but ability to pay is likely to be a challenge for those transitioning onto modern fuels.

**Background**

Nepal has a population of 28.6m and transitioned to a lower-middle income country in 2020. It has a strong services sector, accompanied by many employed in agriculture and manufacturing [1]. There is close to universal access to electricity, with two thirds being able to use medium-power devices and above (MTF tier 3 equivalent to ability to use for example, a TV, fridge and/or rice cooker) [2]. However grid electricity reliability is an issue particularly in urban areas, exacerbated by the reliance on hydroelectric generation which is vulnerable to seasonal fluctuations and requires boosting via imports from India [2]. Most households depend on firewood for cooking but modern cooking fuels are becoming more prevalent, with a quarter now adopting LPG although this is far more common in urban areas compared to rural areas [2].

**Key statistics**

- 94% electricity access
- 21st/139 highest deaths attributable to HAP
- 100% (on-grid) renewable generation
- 98% (on-grid) generation hydro-electric
- 2nd/114 highest number of mini-grid developers
- 5th/49 Clean cooking policy (RISE)

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**Policies, partners and projects [5-8]**

In the short-medium term policies focus on improving the efficiency of cooking with biomass, with long term vision to transition to electricity. Government of Nepal has the following plans/targets:

- ten-year plan to increase generation capacity (inc solar and hydro) and improve transmission and distribution [3]
- universal electricity access + smokeless kitchens by 2032; "one electric stove in every home" - utilise surplus generation [4]
- reduce reliance on LPG
- install 80,000 biogas systems, initial 20,500 target met by 2017 through Alternative Energy Promotion Centre (APEC)

Key partners include: NEA, APEC, National Association of Community Electricity Users-Nepal (NAECUN), Kathmandu Alternative Power and Energy Group (KAPGE), ENERGA, CCA, Practical Action

**Challenges**

Grid supply and reliability issues (blackouts, low voltage)

Lack of awareness of clean cooking options

Constrained financial resources among households using traditional stoves

**Opportunities**

Favourable policy environment

Expected surplus generation capacity

Most mini-grid systems hydro powered - more appropriate than solar for electric cooking

Large body of past/ongoing research

**Cooking fuel mix**

All fuels \* R type

% population using fuel (WHO upper bound to represent stacking)

**GMA scores in the region**

MECS Modern Energy Cooking Services UKaid



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# Supply chains

- Understanding the factors for an effective supply chain
- Working with different companies allows us to learn from their experiences
- Knowledge from in-country partners is invaluable to secure data about device availability and market conditions
- Looking to initiate conversations with retailers to offer solutions more pro-actively and put in orders for more stock.
- ECO projects – key role in stimulating the beginnings of a supply chain, but currently waiting for outputs from a series of SC2 challenge fund winners.
- Piloting with utility companies as suppliers and promoters of ecooking – win win as it pivots existing expenditure on other fuels into the utility.





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# Delivering on intended outcomes

Outcome. MECS principles adopted in the SDG 7.1 global tracking framework

- [Data sets](#) and data collection guidelines developed by ESMAP

Outcome. Modern energy cooking services incorporated in energy policies and planning.

- Kenya's Ministry of Energy national eCooking Strategy
- Uganda 2020 Development Plan and Energy Policy.
- PEEDA's MECS research and Nepal NDC's implementation plan

Outcome. Market-ready range of innovations which lead to improved choices of affordable, reliable and sustainable modern energy cooking services for consumers.

- Range of innovations already available through collaborations with in-country partners
- Next steps – taking to scale

