

Modern Energy Cooking Services: Partnering with India



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Version: Final

October 2020

This material has been funded by UKAid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies.

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1 Executive Summary

This document sets out basis for the Modern Energy Cooking Services (MECS) programme working with India on the development and implementation of cooking with electricity.

The Modern Energy Cooking Services (MECS) Programme is funded by UK Aid through the Foreign, Commonwealth and Development Office (FCDO) UK. It is a five-year programme to transition from the Biomass/firewood cooking to clean cooking in South East Asia and Africa. This has the potential to save millions of lives in the MECS target countries in Sub Saharan Africa & South East Asia and extending further across the world. It would make a huge difference to health and the environment in these countries and drive the transition to modern cooking energy.

Reducing deaths from Household Air Pollution (HAP) is a key domestic agenda for the Government of India. In addition, India has a world class manufacturing, technology and research base and substantial trade relationships with African and Asian countries. All these factors make India an ideal partner for MECS as it is in a unique position to make a substantial contribution to the development and implementation of clean cooking solutions for DFID target countries. As a result, India stands to benefit economically from the foreign and domestic need for clean cooking solutions, and position itself as global clean cooking manufacturing hub.

While much has been done in India to attempt to reduce deaths from HAP by developing a range of improved biomass stoves or LPG access, we see a major new opportunity to radically change the approach as a result of the huge investments going into electricity access. For the first time, there is a real possibility of “eCooking” being financially viable and for cooking devices and systems to be developed that can work in weak grid or off-grid contexts. The fact that this then generates a much-needed additional load and potential revenue stream for energy providers, as well as the potential to demonstrate and release funds as a result of the substantial carbon emission reductions, means that the barriers to households securing eCooking devices can also be massively reduced.

During our engagement in India, we were focussed on identifying and mapping the agencies as potential partners and the aspects on which they can partner, device manufacturers, analysing the current state of clean cooking sector in India, the market opportunity and current available solutions. Following over 30 dedicated meetings and round tables, we have developed a strategic approach to engaging with India. The aims are to focus on the following ways India can benefit MECS and its agenda:

- Develop evidence to support the use of electric cooking devices for Indian cooking.
- Mapping Indian cooking cultures and needs to those in MECS target countries
- Support established Indian manufacturers in entering our target markets and scaling up availability of suitable devices
- Harness the Indian Innovation capability to grow the range of clean cooking solutions available.
- Piloting to gain real-world evidence of take-up, impact and value of different solutions.
- Sharing learning and connecting with work in target countries.

Fundamentally, our approach will be to identify initiatives in India with which we can engage and collaborate, where MECS will be a contributor, but not the primary/main initiator/financer, and where our input will add significant value to the initiatives and return valuable addition to the MECS programme impact, both in terms of our priority countries and the wider global change agenda.

The specific partnerships and programmes that we believe will deliver considerable value are:

- **In-Country Partner:** Finovista – To enable work to proceed

- **Innovation Stimulation:** BIRAC/Social Alpha/SIN India/Indian Technology Institutions/GITA/TCoE India/Invest India/AGNIi– To harness the Indian innovation ecosystem to drive the development of new clean cooking solutions
- **Mapping clean cooking needs and impacts:** GIZ India/DFID India/Social Alpha – To build an understanding of the variety of clean cooking requirements across India and the impact of meeting these, which can be related to those in FCDO target countries
- **Pilots:** CLEAN/BIRAC/Social Alpha/GIZ India/Rockefeller Foundation/NSEFI/TERI – To increase the range of real world trials of clean cooking solutions and enhance our collective understanding of what works
- **Support for business expansion and export:** MSME/SIDBI/EXIM Bank/Social Alpha/FIEO/High Commissions – To enable businesses with promising clean cooking solutions to scale up and take their solutions to the FCDO target markets so that households have access to them
- **Demand Side measures:** ISA/MFI – To make clean cooking solutions more affordable in India and in FCDO target countries
- **Sharing learning between India and FCDO target countries:** GDC/RIS for Developing Countries – To establish a strong flow in both directions of learning and insights regarding clean cooking needs and solutions

We have set out a comprehensive group of KPIs that will enable us to demonstrate the progress and impact we have made.

2 The Modern Energy Cooking Services (MECS) programme

Modern Energy Cooking Services (MECS) Programme is funded by UK Aid through the Department of International Development (FCDO). It is a partnership between researchers, innovators, policy makers, and the Energy Sector Management Assistance Program (ESMAP) of the World Bank. The programme draws on a broad range of expertise and relevant work from around the world to co-construct new knowledge with practitioners and the private sector. It is led by Loughborough University, UK. Globally, partners include the UN, WHO, World Food Programme and national Governments along with major financial institutions.¹

Globally, 3 billion people still cook with biomass, yet 2 billion of these now have access to electricity². The increasing investment in energy access and the gains made in electrification combined with energy efficient cooking appliances open considerable new opportunities for genuine clean cooking.

Existing strategies are struggling to solve the problem of unsustainable, unhealthy but enduring cooking practices which place a particular burden on women. After decades of investments in improving biomass cooking, focused largely on increasing the efficiency of biomass use in domestic stoves, the technologies developed have had limited impact on development outcomes. The multiple problems caused by biomass based cooking, which affect 3 billion people in low income countries, result in 4 million premature deaths annually (which is more than the combined deaths by Malaria, HIV and TB, WHO 2018³), contribute to climate change and cause loss of economic opportunity.

According to the World Bank a ‘business-as-usual’ approach will not deliver on SDG Global Goal 7 and will result in more people using biomass for cooking in 2030 than is the case now⁴. A different strategy that supports the transition of low-income economies to the use of modern energy cooking services, creating access to genuinely clean cooking is needed to change this situation. **Using emerging innovations and technologies could potentially leapfrog existing harmful practices in cooking with significant development benefit.**

This programme, Modern Energy Cooking Services (MECS) aims to break out of this “business-as-usual” cycle by investigating how to rapidly accelerate a transition from biomass to genuinely ‘clean’ cooking (i.e. with electricity or gas). A key driver is the trajectory of costs that show cooking with (clean, renewable) electricity has the potential to reach a price point of affordability with associated reliability and sustainability within a few years, which will open completely new possibilities and markets.

Whilst the overall MECS programme will focus on cooking with genuinely clean modern fuels - including gas (both LPG and Biogas), the main technology of focus is Electric Cooking Appliances and their acceptance both to users and to those managing loads and delivery of grid and off-grid electricity.⁵

¹ [S. Batchelor, E. Brown, N. Scott, and J. Leary, “Two Birds, One Stone—Reframing Cooking Energy Policies in Africa and Asia,” *Energies*, vol. 12, no. 9, p. 1591, 2019.](#)

² Sustainable Energy for All, “SEforAll.org,” 2019. [Online]. Available: <https://www.seforall.org/>.

³ WHO, “Household air pollution and health,” 2018. [Online]. Available: <https://www.who.int/en/news-room/fact-sheets/detail/household-air-pollution-and-health>. [Accessed: 25-Mar-2019].

⁴ World Bank (2015); [Atur, Varadarajan; Jammi, Ramachandra. 2015. World Bank Group support to electricity access, FY2000-2014: an independent evaluation. Washington, D.C. : World Bank Group.](#)

⁵ [Brown, E.; Leary, J.; Davies, G.; Batchelor, S.; Scott, N. eCook: What behavioural challenges await this potentially transformative concept? *Sustain. Energy Technol. Assess.* 2017, 22, 106–115.](#)

3 Indian scenario and MECS Programme

India has a clear focus on clean cooking and is at a transformation stage, where it has taken active initial steps of providing **80 million** (as on 22nd Sep 2019) **Free LPG based Gas Connections** to the poor households, under the **Prime Minister Ujjawala Yojana**⁶. Also, multiple Indian agencies are promoting clean cooking through **Improved cook stoves (ICS)**, however these ICS are still using Biomass/Firewood at the cooking gas. PSA Office, NITI Aayog and relevant government ministries have had some initial discussions about **electric cooking** and potential of **electricity to be used as prominent cooking fuel** considering India is moving towards an electricity surplus scenario.

“While the world is working towards electric cars, in India, in addition to electric cars, electric stoves would go a long way in meeting the needs of the people. This innovation would, in one stroke, significantly impact the nation’s dependence on imported fuel.”

Hon’ble Prime Minister Shri Narendra Modi

Further, households using LPG for cooking has significantly increased from 62% in May 2016 to 94% in March 2019. However, the average annual refill consumption for PMUY beneficiaries has remained low at 3 refills per year, compared to non-PMUY consumers at 6.7 refills per year. This points to a lack of sustained usage of LPG by the beneficiaries under the scheme⁷.

India has also realised that clean cooking through LPG alone may not be viable proposition hence several agencies are exploring other options based around electric (possibly PV) cooking. In particular, the National Mission on Clean Cooking by NITI Aayog⁸, discussions on a National Mission of Solar PV Cooking by the Office of Principal Scientific Advisor (PSA), Govt of India. Electric cooking in India is starting to become popular, not necessarily as a main cooking fuel but including it within a basket of solutions^{9 10}. The Minister of Power recently stated an intention to shift mobility and cooking to electric energy, starting with a communication campaign¹¹.

As well as the Government of India focus on reducing deaths from Household Air Pollution (HAP), India has a world class manufacturing, technology and research base and substantial trade relationships with African and Asian markets. All these factors make India an ideal partner for MECS as it is in a unique position to make a substantial contribution to the development and implementation of clean cooking solutions for DFID target countries. As a result, India stands to benefit economically from the foreign and domestic need for clean cooking solutions, and position itself as global clean cooking manufacturing hub

While there is considerable experience both within India and elsewhere of gas-based cooking with its strengths and challenges, MECS sees value in a focus on the potential for cooking using electricity given:

- the wider range of devices that exist and could be developed offering highly energy efficient cooking options; and
- the opportunity to build electric cooking into electrification/mini-grid programmes with the

⁶ <https://www.financialexpress.com/economy/pmuy-success-pradhan-mantri-ujjawala-yojana-modi-government-beats-8-crore-pmuy-connections-deadline/1698448/>

⁷ <https://www.prsindia.org/report-summaries/pradhan-mantri-ujjawala-yojana>

⁸ [https://niti.gov.in/sites/default/files/2019-11/CEEW-Roadmap for Access to Clean Cooking Energy in India-Report.pdf](https://niti.gov.in/sites/default/files/2019-11/CEEW-Roadmap%20for%20Access%20to%20Clean%20Cooking%20Energy%20in%20India-Report.pdf)

⁹ https://niti.gov.in/writereaddata/files/document_publication/NITIBlog28_VC-AnilJain.pdf

¹⁰ <https://www.iea.org/reports/india-2020>

¹¹ <https://www.livemint.com/industry/energy/new-package-soon-for-easing-power-retailers-losses-r-k-singh-11583155610594.html>

benefit of creating a substantial base load that creates increased revenue generation opportunities and improved return on investment prospects.

MECS is not just looking for cooking appliances but whole solutions for the integration of cooking with electricity into the overall energy system, which give very promising energy efficiencies. Electric Pressure Cookers (EPC) are probably the most advanced and have a proven track record of energy efficiency for long cook foods. There are opportunities for adapting them to off-grid situations. Additionally, looking at a broader range of potential cooking solutions is possible, some of which are already in market and others that don't yet exist or are at development stage.

India has huge opportunity in this space and can become global hub for clean cooking device supplier, as MECS programme is aiming for transitioning from biomass to clean cooking in South East Asia and Africa. We have identified and ready to move into new ways of cooking, but clearly there are challenges in all of these as every country is unique and has very different conditions in terms of the energy mix for cooking, the availability of other resources and geography.

We believe that a broad, systemic approach is needed to achieve change on the scale that is envisaged. This will require work across a wide range of partners, with multiple strands being taken forward and a broad roadmap in place¹².

4 What solutions are we focused on?

Essentially, we are demonstrating that a focus on cooking powered by electricity (however generated and delivered) is both feasible for specific markets and offers huge benefits due to its ability to benefit from and leverage the massive investments going into energy access. Our research has identified that a range of eCooking devices have potential in different contexts but that Electric Pressure Cookers are particularly well-suited, when cooking certain foods. These are devices that have achieved very substantial take-up in Western markets and these markets are becoming saturated. The markets offering the best prospects of growth are now in Africa and Asia.

There is then the prospect of integration between the three modes of electrification – stand-alone systems, mini-grids and grid – which unlocks latent community demand for sustainable electricity.

A transition to and uptake of electric cooking depends not only on the affordability to the household per se, but to the mechanisms by which a household may spread payments. Utilities and those offering off-grid solutions, with excess generating capacity and wanting to encourage more demand, could offer the initial cost of an EPC on a lease basis, or a pay as you go through perhaps on bill financing.

By introducing a 'single investment strategy', incorporating clean cooking into the growth of renewable energy technology for grid and off-grid development, the various financial instruments currently in play to encourage renewable technologies come to the foreground. Within this context load management for cooking needs to be deeply embedded in all planning of electrification.

If we are to encourage cooking with electricity, there need to be devices that make this possible, for different cooking cultures. Our research has enabled us to develop a detailed understanding of what drives cooks' behaviours and choices. Devices need to support a range of types of dish, result in the expected flavours and textures and keep the price of cooking as low as possible.

The Electric Pressure Cooker (EPC, or multicooker) combines energy efficiency from the use of pressurisation and insulation with versatility. While commonly available Electric Pressure Cookers are highly energy efficient, being generally rated at 1kw, they do potentially place an excessive load on a

¹² [S. Batchelor, E. Brown, N. Scott, and J. Leary, "Two Birds, One Stone—Reframing Cooking Energy Policies in Africa and Asia," *Energies*, vol. 12, no. 9, p. 1591, 2019.](#)

minigrid if everyone in a village or town were to cook with them at the same time. There are a range of potential solutions to managing energy demand and some could be built into cooking devices or into control/feedback systems at the minigrid level.

We are not tied to electric pressure cookers. However, we believe that they are an efficient appliance because they combine automatic control of the heating with a highly insulated environment. Slow cookers and rice cookers also do the same. The added value of the EPC is its ability to cook under pressure which for long cook 'heavy' meals can save time and energy.

The benefits of EPCs that we have seen in our studies mirror those that are reported in the US, where these appliances are extremely wide-spread as a result of their versatility and ability to enable householders to very rapidly prepare meals from raw ingredients.

Rice cookers and slow cookers also have potential. The attempts to drive eCooking using induction stoves and hotplates are constrained by their high energy requirements and power ratings. Our research has identified that certain modifications and enhancements will be key to achieving large scale acceptance and ensuring their suitability in weak and off-grid contexts.

We acknowledge that in some markets and some specific cultural cooking task specific appliances may be an appropriate step in the transition to modern energy like the kettle or bread making machine. For instance, lighting a charcoal stove just to boil water for tea is much more expensive than boiling the water in an electric kettle. As such, kettles could be a first step in a transition.

Also, we believe there could well be a range of types of solution to meeting the needs of cooks working in weak grid and off-grid settings and aim to stimulate the development of a variety so that the best option can be available in all cases.

The recent policy report: Electric Cooking: Needs, Challenges and Ways Forward¹³ provides further evidence of the relevance of electric cooking to India with recent research and policy recommendations.

5 Synergies with British High Commission in India business plan

There are a range of areas of the British High Commission existing work with which MECS aligns very well:

- Energy and Green Growth are key themes of DFID work with India¹⁴, working with the Ministry of Power and promoting clean energy opportunities as part of the India UK Tech Partnership¹⁵ – within which eCooking could be incorporated
- There are developing partnership programmes with a number of African countries focused on development and innovation collaboration¹⁶.
- The programme with DBT on “Women & Healthy Children”¹⁷ – this could easily include a focus on clean cooking

¹³ https://mecs.org.uk/wp-content/uploads/2020/07/77550-MECS-Briefing-Paper-Electric-Cooking_p4.pdf

¹⁴

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723160/India-July-2018.pdf

¹⁵ <https://www.gov.uk/government/news/uk-and-india-agree-ambitious-new-tech-partnership>

¹⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723160/India-July-2018.pdf

¹⁷ <https://mrc.ukri.org/funding/browse/grp/global-research-programme-addressing-the-health-needs-of-women-and-children-in-disadvantaged-populations-globally/>

- The Powered programme with the Shell Foundation¹⁸ promoting women as entrepreneurs in clean energy and includes a strand on business opportunities linked to cooking
- The Innovating for Clean Air (IfCA) programme¹⁹ aims to support UK and Indian firms to tackle pollution at source in Bengaluru, by introducing innovations that improve air quality with clean cooking included in the areas of focus.

The new British High Commissioner has set out his priorities for UK-India collaboration in a recent article in the Hindustan Times²⁰:

- Cooperation on health – given the COVID19 pandemic. Given its impact on respiratory system improving air quality is especially important.
- Deepening the trade relationship in the context of leaving the European Union.
- Building a partnership on climate change, especially as the UK is currently COP-26 president. Reducing the burning of fossil fuel/biomass and replacing with sustainably generated electricity or gas would make a substantial contribution to this.

Further, the focus of FCDO, going forward, in its work with India will increasingly be on how UK and India can work as partners to support economic development and achievement of the SDGs in developing nations.

6 Towards a Programme in India

The MECS Programme is creating a wide range of resources that could be of considerable use to those in India working on developing and implementing clean cooking solutions for domestic and overseas markets:

- Our fundamental insights into the benefits of bringing together the clean cooking and energy access agendas can release the investment required, and grow the potential of electric cooking as other fuel prices increase.
- Our research into cooking requirements in different cultures and countries and the implications of different cooking devices/solutions – highlighting those showing greatest promise
- Our modelling work on energy systems and the impact of introducing electric cooking and how this can be managed
- Our market analysis and access to potential partners and national Governments
- Frameworks for releasing Carbon Credits and other Results Based Financing models to bring additional grants into the market to increase affordability.
- Our contacts within global organisations and wider networks.

We have held extensive discussions to understand the landscape and players in India that relate to clean cooking and explore where there could be good alignment of interests as well as practical resources that could be made available.

As well as individual meetings, we have participated in or led three round table discussions:

- Solar PV Cooking potential for India (Ministry of New & Renewable Energy (MNRE), Government of India and Office of the Principal Scientific Advisor (PSA) to the Government of India, facilitated by GIZ India) – 5 December 2019 - as part of India Clean Cooking Forum - Appendix 2

¹⁸ <https://shellfoundation.org/learning/powered-enterprise-bringing-clean-tech-to-indian-agriculture/>

¹⁹ <https://es.catapult.org.uk/impact/projects/international-innovating-for-clean-air-india/>

²⁰ <https://www.hindustantimes.com/analysis/the-deepening-bonds-between-india-and-the-uk/story-scufMrBk2BfZIMVE5NKFNl.html>

- Nexus of Electricity and Cooking (facilitated by MECS and CLEAN & IRADe) – 5 February 2020 – as part of India Energy for All Summit (IEAS) 2020 - Appendix 4
- Workshop on Promotion of Clean Cooking and launch of MECS in India (facilitated by Finovista and MECS) – 26 February 2020 - Appendix 6

We visited two cooking device manufacturers and had fruitful discussions. We have also researched and identified over 150 established companies (already in market /looking for export market) and over 190 startup/Innovators (need support for their enterprise journey through innovation, funding, mentoring, market access, etc.) in the sector and established a mailing list. Over 100 have expressed interested, nominated devices to the Global LEAP Award for EPCs or attended our workshop/round table.

Our discussions to date show that there are many potential partners in India that can see the value of what could be achieved and are happy to contribute. By acting as an independent convener, we have been able to draw in a very wide range of interested parties. However, this will bring its own challenges and require an overall governance framework that can identify the strands of activity, who will be responsible for each and how the overall programme is coordinated and resourced.

Considering our Theory of Change and the drivers towards clean cooking within India, we can see the key areas of activity including:

- Identifying key research areas, commissioning, funding and carrying out research to understand the landscape of needs and challenges
- Identifying policy options across a range of areas/Ministries that will create the conducive environment and incentives for the programme
- Working with businesses and academia (in India and overseas) to stimulate the development of solutions that could work – potentially creating a coordinated and supported network of businesses and other organisations that can form an ecosystem
- Mapping, planning, financing, running and evaluating pilots at different scales, including the work of engaging with the relevant communities at the early stage to identify their cooking needs and secure their buy-in
- Promotion of the programme across multiple stakeholder groups – from consumers to businesses to energy providers and other enablers
- Providing finance and support for businesses from R&D to skill development to scaling up to foreign market access
- Management, oversight, leadership, monitoring of the programme including communication amongst all interested stakeholders of new findings or insights into what is needed

6.1 Our assessment of the options

Our consultation has identified different opportunities for synergy with the MECS programme and its focus on SSA and SE Asia. We have reviewed the above to identify where there are the best prospects for synergies and additionality.

Strand	MECS	India	What collaboration, if any?
Programme Management	Manage the MECS programme and its partnerships	Manage the Indian clean cooking transition	Largely separate
Research	Studying cooking Modelling cooking/ energy systems Conditions for change	Mapping Indian energy and eCooking landscape Mapping where people pay for biomass	Sharing methodologies and insights from research
Policy	Influence target country policies	Indian energy policy Indian clean cooking policy Want evidence	Keep in touch. Share findings.

Promotion	Develop eCookbooks and promote in target countries.	Develop eCookbooks and promote in India	Work together on promotion for pilots in India.
Implementation	Help companies to understand and distribute in MECS target markets. Enable user support.	Help companies to understand and distribute in India Enable user support in India.	Enable Indian companies understand and distribute and support in our target markets
Scale up	Help companies with good solutions to get support to manufacture and distribute at scale across our target countries	Help Indian companies to get support to manufacture at scale across India and export in wider markets	Work closely for Indian companies.

Innovation stimulation and solution development	Enabling the conception of new technologies, business models and systems that work in different contexts	Enabling the conception of new technologies, business models and systems that work in different contexts	A joint programme?
Solution assessment	Helping target countries to assess options	Assessing options for India	Share criteria and process
Prototype development	Support the development of prototypes	Support the development of prototypes	A joint programme?
Pilots and evaluation	Carry out trials to understand what solutions work in reality, at scale.	Carry out trials to understand what solutions work in reality, at scale.	A joint programme?

6.2 Our resulting approach

Fundamentally, our basis for selecting opportunities in India with which we can engage and collaborate will be based on the following criteria:

- **MECS can be a contributor, but not the primary/main initiator/financer;**
- **Our input will add significant value to the initiatives;**
- **The initiative, with our input, will return valuable addition to the MECS programme impact, both in terms of our priority countries and the wider global change agenda.**

In order to be effective, particularly with the travel restrictions resulting from the COVID19 pandemic, we needed to secure an effective in-country partner. Following an approach to a number of potential candidate organisations, we have selected Finovista to take on this role and are now working closely with the team there to develop this strategy and the subsequent implementation plan.

At the point of writing this Strategy, we can identify a significant number of strands of activity and the partners and potential outcomes we envisage. We will build the Implementation Plan during the second half of 2020, while we start to build practical action on the ground and early collaborations.

The key areas of activity are set out below:

Aims	Key strands
Develop evidence to support the use of electric cooking devices for Indian cooking.	This is not expected to be a major strand of this work but the MECS methodologies will be made available for others to gather evidence and build eCookBooks, etc.
Mapping Indian cooking cultures and needs to those in MECS target countries	Alongside the work to classify and segment different markets for cooking solutions in our MECS target markets, we will investigate the different cooking cultures and energy access scenarios in India and identify the similarities and differences. Disseminate this and use to inform transfer of solutions.
Support established Indian manufacturers in entering our target markets and scaling up availability of suitable devices	Developing an understanding of Indian manufacturers in the eCooking sector and associated sectors that can contribute to complete eCooking solutions. Engage with sector members and disseminate information about data, reports, calls, services that would be relevant – newsletters, events, visits. Work with financial institutions and High Commissions to secure support for export of eCooking solutions to our target markets.
Harness the Indian Innovation capability to grow the range of clean cooking solutions available.	Contribute our knowledge and finance to relevant innovation programmes in India. Support on-going development and market entry of the best solutions. Potential Hackathon/collaborative workshop with UK companies.
Piloting to gain real-world evidence of take-up, impact and value of different solutions.	Develop piloting opportunities and partnerships. Support the piloting and evaluation methodologies. Maintain links and support to pilots.
Sharing learning and connecting with work in target countries.	Report on progress and learning in India through MECS communications channels. Events to bring together insights from India and other locations.

7 Specific Collaborations and initiatives

7.1 In-Country Partner: Finovista

We have secured the support of Finovista as our in-country partner for work in India. They have been very effective in supporting our engagement with India from the outset, facilitating three highly productive visits to India and a mixture of meetings and events.

The results of these can be seen in the Appendices to this document.

Our in-country partner, will play an active role in all the strands set out in this Strategy and will be key to ensuring delivery of the key collaborations and outcomes we are seeking. In the context of the current and potentially on-going travel restrictions, having an effective in-country partner will be particularly critical to the success of this programme.

7.2 Innovation Stimulation: BIRAC/Social Alpha/SIN India/Indian Technology Institutions/GITA / TCoE India/Invest India / AGNIi/TERI

7.2.1 Partners

- Biotechnology Industry Research Assistance Council (BIRAC) is a not-for-profit Public Sector Enterprise, set up by Department of Biotechnology (DBT), Government of India as an Interface Agency to strengthen and empower the emerging Biotech enterprise to undertake strategic research and innovation, addressing nationally relevant product development needs.
- Social Alpha is a not-for-profit platform created by Foundation for Innovation and Social Entrepreneurship (FISE), sponsored and supported by the Tata Trust and Government of India to promote socially relevant innovations and entrepreneurship with a mission to create largely scale sustainable social impact. We have had multiple meetings and they were active participants in our Round Table. They have concrete plans and we are exploring how we could collaborate. They have expressed strong interest in our expert input
- CSIR is a network of public funded research institutions having 38 labs across India, working on various cutting-edge technologies across all sectors. CSIR institutions and other technology institutions across India could be a good partner in India as a number have been actively working in multiple clean cooking technology areas and can provide support in technology development, testing, piloting etc. to the Indian startup, companies and others.
- GITA (Global Innovation & Technology Alliance) / TCoE India (Telecom Centre of Excellence) / Invest India / AGNIi (Accelerating Growth of New India's Innovations) – Are project management agencies, promoted under the PPP mode to professionally manage large scale innovation funding programme for Government of India, Bilateral/ multilateral and other agencies across India.

“Would like take forward our conversation on the partnership forward together to build on the work that you are doing and potentially support some of the challenge fund award winners into a larger programme deployment that Tata trust and social alpha will support going forward. Happy to anchor lead support for joint programme to support the ecosystem through financial / non-financial support for pilots, innovation, running challenge fund secretariat, learning each other experiences.”

Smita Rakesh, Social Alpha

“CSIR can provide support, Technology, Development, Transfer, Testing, Piloting etc. Some of the labs are suitable the clean cooking covering material, design, material, new material, ceramic coating, modern energy, , energy storage, emission studies, health and nutritional aspect etc,”

Dr Meenakshi Singh, CSIR

We have established a good relationship with BIRAC and Social Alpha, both of which are keen to see and support the growth of a sector developing and taking to market new clean cooking solutions for India.

We have had positive discussions with the Science and Innovation Network Regional Director and with the India lead in BEIS. We have prepared proposals for them regarding how they could support the MECS work in India.

We have established good relations with CSIR and it is keen to provide support.

GITA/AGNIi/TCoE/Invest India have been sensitized about the MECS Programme and have shown initial interest in opportunities of fund management. We can contact these agencies if the need arises for large scale fund management in India.

Indian companies and researchers will be eligible to bid for funds under the MECS Challenge Fund programme and Finovista will actively promote all our calls within India, using its growing network there. The specific timing and focus of future calls will be determined in the coming months.

In addition, BIRAC has launched the “BIRAC-Innovation Challenge Award-SoCH (Solution for Community Health) 2020-21” and is supported by Bio-NEST Incubator Clean Energy International Incubation Centre (CEIIC) and Social Alpha. The SoCH 2020-21 calls for Clean Cooking Solutions that will consist of a multi-stage programme offering support for companies with promising solutions:

BIRAC-SoCH is an Innovation Challenge Award envisioned for Start-ups/Entrepreneurs working in the community health sector. The focus of the Challenge is to facilitate a promising technology idea that can be translated into an efficient technology which addresses the issues of community health in a defined time limit.

Through the programme, BIRAC intend to facilitate Indian innovators to offer solutions for clean cooking based challenges having national and global relevance

Theme for SoCH 2020-21

Innovative, Efficient and Affordable solutions for Clean Cooking in Rural and Community settings, sub-themes are:

- Biomass
- Electricity
- LPG
- Solar
- Biogas

Scope of the Challenge

SoCH is aimed to facilitate Indian innovators by offering **recognition, mentoring and financial support** to them towards combating the challenges of community health. Potential applicants will be shortlisted for Hackathon spanning across one and a half years.

Award Remuneration

- 10 shortlisted applicants to receive **INR 0.5m/£5,555** each and incubation/ mentorship support for development of Minimal Viable Prototypes (MVP) in 3 months.
- 5 finalists to receive additional **INR 1m/£11,100** each and incubation/ mentorship support for product development, design & fabrication to deliver final products in 3.5 months.
- 2 winners of the theme selected after the 3 months of user acceptance field trials to receive **INR 5m/£55,555** each and a continued incubation support (if required) for ensuring effective after sales of the product post the deployment.

Further opportunities to work with BEIS/SIN include:

- Include clean cooking as an agenda item for the next UK-India Science and Innovation Commission/dialogue to raise the profile of this area of work and explore the potential for it to become the basis for a tangible joint programme
- Consider including clean cooking within the UK-India Tech Partnership
- A trade mission to India including an exploratory workshops/hackathons to set out the challenges and requirements and seed partnerships between UK and Indian teams.
- If this proves successful, extend our collaboration with BIRAC in the future through a Newton-Bhabha funded initiative that matches GoI support with BEIS finance to enable UK companies to form collaborations.

Should MECS need a partner to support running specific innovation calls, we could explore how GITA/ TCoE India / Invest India / AGNIi could assist.

Some of the Technology institutions are also suitable for clean cooking and can cover design, material, ceramic coating, modern energy, energy storage, emission studies, health and nutritional aspect etc.. It could be possible to involve the relevant laboratories to provide technical support, research facilities and incubation resources for participating companies. This could represent a cost-effective approach to building in some MECS support that makes less demands on the core MECS team.

7.2.3 MECS role and contribution

The MECS programme will partner with this programme, providing a financial contribution to enable the programme to support a larger number of companies and knowledge input. In addition, we will support the programme participants in a number of ways, being finalised:

Before the start of the programme

- Provide technical/research expertise on electric cooking and other areas of expertise of the MECS team to contribute to the Program's knowledge base and engage in discussions with stakeholders
- Support the Social Alpha and BIRAC teams in the assessment process as experts, along with the other experts.

During the programme (after the shortlisting of 15 companies to the declaration of final 5 winners)

- Integrate with the incubation/acceleration programme designed and led by Social Alpha, including:
 - o Webinars where speakers from the MECS team brief on relevant findings and context in our target countries.
 - o Align relevant start-ups with MECS aims and identify information resources, strands, target countries of greatest relevance for the MECS program and assist them in accessing these.
- Support in the assessment process for selecting the 8 finalists from the shortlisted 15; and up to 5 winners from amongst the finalists.
- Joint publications by MECS with Social Alpha/BIRAC teams during and after the programme.

After the programme / post-announcement of winners

- The companies that fit MECS aims and are the final winners may be offered a more in-depth assessment of their needs involving others in the MECS team and of the support and opportunities that MECS can offer them beyond the programme
- MECS may offer seed investment to any of the companies, subject to them fitting MECS programme aims.
- Where the companies are looking for in-country partners or investors, MECS may share details of those known to them and provide introductions wherever possible.
- In addition, MECS may also offer any additional support to the companies who haven't made it to the winners list, but were a part of the Top 15, if they meet MECS' criteria and thesis.

If we identify that the some of the Indian research/technology institutions could make a real difference, we would need to identify a set of partners to co-finance the support package. MECS could provide a financial contribution and provide some mentorship or support to the institutes.

7.2.4 Status and timescale

The plans for this collaboration are well advanced and we are at the stage of finalising the details and contracting. The BIRAC-SoCH will run over 18 months to end 2021.

Involving the technology institutes could be explored in the autumn of 2020 and potentially a support programme developed and implemented in early 2021.

Securing additional support from BEIS/SIN will be dependent on a UK-India policy dialogue on science and innovation collaboration and a resulting mission and Newton-Bhabha call during 2021-2022.

7.2.5 Potential outcomes and we will evidence these

This programme is already very well aligned with MECS' aims and even without our input should result in a number of companies being identified with strong clean cooking solutions and getting practical support to enable them to scale up and have real impact in driving the transition towards greater take up of clean cooking in India.

As a result of our involvement, however:

A larger number of companies can be included within the programme. We have agreed on the following increases:

- Shortlisted applicants – from 10 to 15
- Finalists – from 5 to 8
- Winners – from 2 to 5

In addition, through sharing our research findings into cooking requirements and energy contexts, we would hope that all companies will develop better solutions that are more targeted at real needs, both within India and within the FCDO target countries.

Finally, through our support for companies with relevant solutions and an ambition to take these to the FCDO target markets, we hope to see new solutions being made available within these countries.

Key impact measures will therefore be:

- Number of programme participants
- Participation in Webinars and use of MECS reports, etc. – and references to these in reports and proposals
- Number of participating companies that actively seek opportunities in FCDO target markets.
- Number of innovative early stage Indian companies exporting to the FCDO target countries in long run

Involving Indian technology institutions, especially if we can find an Indian co-funder, would provide a cost-effective way to extend the research capacity being devoted to clean cooking research and solution development.

7.3 Mapping clean cooking needs and impacts: GIZ India/DFID India/Social Alpha

7.3.1 Partners

In addition to Social Alpha, other partners are:

GIZ India has had a substantial programme in India for many years, working closely with the Ministry for New & Renewable Energy (MNRE) and Ministry of Power (MoP) to improve energy access. They are now developing a programme focused on clean cooking and have determined that the most effective focus should be on enabling cooking with electricity.

FCDO India has engaged positively with the MECS programme and the Senior Advisor responsible for Energy policy has attended and

“DFID India will stay engaged in MECS and we will continue to support it not just with this programme but through our work on the ground with the Shell Foundation.”

Udit Mathur, Senior Energy Advisor, DFID India

spoken at our workshop, indicating his desire to support our work in a range of ways.

7.3.2 Specific Collaboration opportunity

There are a number of initiatives that have the potential to help build understanding by working collectively.

GIZ India: Having initially explored the potential for cooking using solutions that are directly powered by solar PV, GIZ India believes this is probably not financially viable. They are now focused on the broader concept of cooking with electricity (primarily on the grid) and are scoping an 18 month project with three strands:

- Market study – what is currently available in India, and how do they compare to cooking devices using alternative fuels – what finance options are available
- Impact on the grid – in urban and peri-urban areas what would be the resulting power demand, voltage requirements – aim to provide recommendations for companies and Ministry. They are working with Min of Renewable Energy
- Pilots – discussed in the next section

DFID India: One of their key activities is work on the Power Sector Reform programme working with Ministry of Power and electricity companies on loss reduction and sustainability. Bringing in behavioural insights to improve revenue collection, demand side management and storage options. They are also supporting research and entrepreneurship mentoring, with the Shell Foundation, aimed at women to drive improvements in health and economic activity. They have invested in research into the theme of Women and Children’s health.

Social Alpha: In addition to the collaboration with BIRAC, they plan to undertake a mapping of the requirements that cooking solutions must meet across India to understand the barriers and factors affecting uptake

7.3.3 MECS role and contribution

Our work on market segments and the different requirements associated with different cooking types will help to provide frameworks for these mapping exercises.

We have submitted a proposal document to BEIS/SIN and hope to work with them to develop concrete projects in India that extend our impact further and enable UK academic and commercial engagement and value.

7.3.4 Status and Timescale

We are in discussions to map out the best way we can work together by sharing information, contacts and resources to both effectively grow clean cooking within India, further increasing the impact of the MECS programme without directly targeting India with substantial resources, and supporting the increased understanding of what solutions work in different contexts that will enable more targeted and better informed solutions to be put in place within our target countries.

7.3.5 Potential Outcomes and how we will evidence these

The contribution from MECS should be visible in the methodologies developed and the emphasis. We will look for parallels between the cooking contexts across India and those of the FCDO target countries - producing a report setting out these parallels and their implications. We will use these to inform the work with innovators and manufacturers as they seek to identify the most promising markets.

Should BEIS/SIN agree to our proposals, that will lead to UK academic and business involvement and potentially partnerships in innovation and in the commercial exploitation of the resulting solutions.

7.4 Pilots: CLEAN/BIRAC/Social Alpha/GIZ India/Rockefeller Foundation/Smart Power India/NSEFI

7.4.1 Partners

In addition to the above mentioned, other partners are:

CLEAN is a business chamber and network of Clean Energy professionals/enterprise. It organizes several large-scale multi-stakeholder events. MECS has jointly conducted a workshop and roundtable with CLEAN and can join/sponsor their event and workshop in future too, to promote the MECS Programme. It could also assist us in piloting with energy companies.

Additionally, other business chambers like CII, FICCI, FIEO, IESA can also be engaged for MECS Programme Promotion across India.

Rockefeller Foundation has an energy programme - Smart Power India. Under this initiative it promotes rural electrification through mini and micro grids. We have had initial discussions for conducting pilots given their surplus grid capacities.

There are a number of research/evaluation institutes that could be highly effective at setting up and evaluating pilots – TERI, iRADE, Priyadarshani /Samuchit/CEEW.

TERI is a large research organization, and a prominent voice on the issues of Energy and Environment in India. They are managing a large programme; “Lighting a billion Lives”, it is a global initiative to facilitate Clean energy access and delivery of last mile energy services. We had advance level of discussion for large scale piloting, research and demonstration and exploring opportunities.

National Solar Energy Federation of India (NSEFI), is one the largest Industry Chamber for Solar Energy, they are working with PSA office on Mission on Solar Cooking. We are in discussion with NSEFI, for conducting pilots through their members and better utilisation of their grids.

7.4.2 Specific Collaboration Opportunities

Essentially there are many different opportunities for piloting clean cooking solutions in different contexts in India. There is a real appetite for this amongst the minigrid company community and the Smart Power India programme has offered their minigrids to be used.

GIZ India is also planning to run some– maybe 50 households – controlled so can develop a good understanding of user behaviour aspects.

Finally, the BIRAC SoCH programme will include field trials of the shortlisted solutions.

7.4.3 MECS role and contribution

The MECS role in this will largely to be assist with methodology and insights from our own piloting and research. We have established some useful approaches to working with communities to select the most promising cooking devices and to collect data in structured ways that support interpretation and generation of useful insights for innovation.

Essentially, we would be acting in an advisory capacity. Where pilots align well with MECS own target scenarios and would provide valuable additional evidence to support our aims we may consider providing financial support or more hands-on engagement.

The BIRAC SoCH field trials will be in 2021 and GIZ India has not yet started scoping its pilots as yet but they expect to run in 2021 also.

We will hold wider discussions about piloting opportunities in early 2021.

7.4.5 Potential outcomes and how we will evidence these

The outcomes from our involvement will be more useful pilots and we would expect to see our work cited in the reports. We will also obtain early access to the findings that can inform our own investigations.

If MECS becomes a contributing partner to any pilots, we will contribute to the resulting reports and they will be available through our own channels.

7.5 Support for business expansion and export: MSME/SIDBI/EXIM Bank/Social Alpha/FIEO/High Commissions

7.5.1 Partners

In addition to Social Alpha, other partners are:

The Ministry of Medium and Small Enterprises (MSME) has a policy of providing support to the establishment of clusters of SMEs and this then enables them to access different services to support business growth. Product and Process Development Centre Agra (PPDC), is a MSME technology development centre.

Small Industries Development Bank of India (SIDBI) and Export-Import (EXIM) Bank were both established by Acts of Indian Parliament.

EXIM Bank provide Indian businesses with a range of products and services. This includes import of technology and export product development, export production, export marketing, pre-shipment and post-shipment and overseas investment. They aim to act as a catalyst and key player in the promotion of cross border trade and investment.

Small Industries Development Bank of India (SIDBI) acts as the Principal Financial Institution for Promotion, Financing and Development of the Micro, Small and Medium Enterprise (MSME) sector as well as for co-ordination of functions of institutions engaged in similar activities.

Federation of Indian Export Organisations (FIEO) is an apex trade promotion agency.

Most of the FCDO target countries have High Commissions in Delhi that are set up to support trade and wider relations with India. These can have programmes and funding for missions and collaborative programmes to support business-business partnerships.

7.5.2 Specific Collaboration Opportunities

The MECS programme is funding CLASP to run a Global LEAP Award for Electric Pressure Cookers²¹ and this has been promoted to Indian companies by Finovista. As a result, two companies have nominated EPCs and these are being tested. The Buyers Guide listing successful products will be launched in autumn 2020 and should lead to substantial orders and commercial opportunities. Any future LEAP Awards will also be promoted to Indian companies.

²¹ <https://globalleapawards.org/electric-pressure-cookers>

In addition, PPDC / MSME can fund Cluster (grouping) development in India for Clean Cooking. PPDC Agra is working towards establishing a Clean Cooking Clusters under their Cluster Development Programme/SFURTI Programme. Under this programme, PPDC would be inviting applications from Indian agencies for setting up the MSME Clusters. The establishment cost of these clusters would be borne by MSME, government of India and MECS will be providing expertise, research and protocol.

Together the SIDBI and EXIM Bank are putting in place the Ubharte Sitaare Programme that offers funding to Indian companies grant, debt and equity, capacity building, technical assistance, manufacturing, marketing, handholding support for technology upgradations, R&D, business strategy planning to the Indian SMEs for exploring the International market

A scheme of ₹ 1,000 crore/£111m will be anchored by Exim Bank together with SIDBI, who would contribute ₹ 50 crore/£ 5.5m each. This ₹ 100 crore/£11m would be used to provide equity and technical assistance. In addition, debt funding of ₹ 900 crore /£100m from banks would be made available.

The FEIO can offer a range of services to support businesses seeking to export, funded by the Government of India. We are currently discussing the possibility of a major exhibition and trade fair to take place in 2021 that could be invaluable in bringing together potential partners in the FCDO target countries and companies with clean cooking solutions. It would be funded by the Government of India under the Reverse Buyers Scheme, providing small grants to cover the costs of those coming from overseas.

We have not identified any specific initiatives being run by the High Commissions but they will be valuable partners in promoting the Trade Fair and other programmes.

7.5.3 MECS role and contribution

The MECS programme would be expected to contribute Technical Assistance for companies on the PPDC clean cooking cluster programme and the Ubharte Sitaare programme to support their growth and entry into the markets. This would be essentially the same as we already seek to provide to other companies.

For the Trade Fair/exhibition, we will need to assist with promoting it and encouraging participation amongst our partners in the FCDO target countries.

7.5.4 Status and timescale

We have had meetings with PPDC team and they also partnered in MECS India launch workshop. PPDC is working towards finalization of their cluster development Programme and we are having regular interactions and waiting next call (RFP) where Indian partners will become primary implementation agency. We have had meetings with EXIM Bank officials who also attended our Round Table, and discussions with SIDBI. Finovista attended a consultation event to discuss potential sectors to be targeted for the Ubharte Sitaare Programme. We are working with these institutions to promote case that the clean cooking sector is included in this programme.

We have had meetings and discussions with FEIO. They have indicated their interest in organising a large Exhibition in India on eCooking and inviting the buyers from programme countries.

We visited two High Commissions (Rwanda and Ethiopia) and they participated in our workshop. We have also met the High Commissioner of Ghana.

The benefit from these activities will be from companies with strong cooking solutions securing support that will enable them to grow into successful enterprises and enter the FCDO target markets. We will maintain contact with as many of these as possible and monitor their progress so that we can see what support they have had and what success they achieve in the markets. This will be covered in the Quarterly Report of the In-Country Partner, Finovista.

7.6 Demand Side measures: ISA/MFI

7.6.1 Partners

ISA's main mandate is to scale up solar clean cooking stoves/equipment through organising a competitive cost financing, aggregating the capacities across countries and scaling up different solar activities in its member countries.

Microfinance Initiatives (MFI) are private sector bodies that offer a range of products and services on the basis of payment ...

"ISA is very happy to take part in these practices of Clean Cooking and to take such initiatives forward. We look forward to the deliberations in this workshop and the recommendations which can really help in expanding on this idea. ISA is able to float a large scale tender for cost optimisation to achieved economy of scale by aggregating of demand through the marketplace model for its member countries."

Mr PC Sharma, International Solar Alliance

7.6.2 Specific Collaboration Opportunities

ISA does not any specific programme on clean cooking, however it can work together with MECS for promotion of solar cooking and optimising the price of cooking systems through the large scale procurement based on aggregation model. ISA is planning to integrate the cooking system into their overall energy solutions, provided to the households.

MFIs could be encouraged to add cooking devices/solutions to the range they support.

7.6.3 MECS role and contribution

MECS programme can work with the ISA to promote the solar cooking our programme countries, as many of these are ISA's member countries.

MECS would need to demonstrate the potential market for these devices, or to work with partners in India to do that. We would aim to assist in establishing other means of subsidising costs through carbon credits or RBF schemes.

7.6.4 Status and timescale

This is at an early stage but there is a strong level of interest. The challenge will be in working with the FCDO target countries to identify opportunities for bulk procurement that can be quantified and aggregated across the countries.

We have had some exploratory discussions with a number of MFIs.

We envisage this being something to work on in early 2021.

7.6.5 Potential outcomes and how we will evidence these

The main outcome would be collective procurement exercise that secures a bulk order for clean cooking solutions and drives down the unit price of these through economies of scale and ability to work with major manufacturers. This would be covered in the documented process of the procurement and its outcomes.

The involvement of MFIs will make a substantial difference to the ability of poorer households to cover the up-front costs of clean cooking devices and we would hope that a large number of sales would

occur through this channel. We will keep in touch with the MFIs we identify to obtain details of these that can be reported back by the In-Country Partner.

7.7 Sharing learning between India and FCDO target countries: GDC/RIS for Developing Countries

7.7.1 Partners

Global Development Centre (GDC), aims to contribute to the evolving alternative development paradigm that promote the virtues of inclusiveness and sustainability. It is one of the initiatives of Research and Information System for Developing Countries (RIS) and it is funded by the DFID India..

“GDC would like to collaborate with like-minded institutions who fit into the overall development narrative that GDC has in mind”

Dr Priyadarshi Dash, GDC

7.7.2 Specific Collaboration Opportunities

We can explore the possibilities for working together with the GDC/RIS and using their platform for Sharing of Knowledge and experience and connecting with South East Asia and Africa. This could be a combination of participation in existing activities and events and organising specific ones focused on clean cooking.

7.7.3 MECS role and contribution

This would need to be assessed but may require a financial contribution towards specific activities.

7.7.4 Status and timescale

This is at an early stage but there is a good level of interest.

7.7.5 Potential outcomes and how we will evidence these

Events and reports of sharing of findings will be recorded.

8 Key Performance Measures for the delivery of this Strategy

The following table sets out the KPIs and milestones for achieving them.

Aims	Key strands	Milestone (or KPI) May 2021	Interim outcome hoped for	Milestone (or KPI) Dec 2021	Interim outcome hoped for	Milestone (or KPI) Sept 2022	Interim outcome hoped for
Develop evidence to support the use of electric cooking devices for Indian cooking.	This is not expected to be a major strand of this work but the MECS methodologies will be made available for others to gather evidence and build eCookBooks, etc. Could link to work by Social Alpha mapping Indian dishes.	Basic cookbook illustrating value of EPC for common Indian dishes (self-published by Finovista).		A published cookbook branded with an Indian institution*.		Distribution records for the cookbook and ancillary documented evidence.	Reaching to 300 relevant stakeholders. (individuals or institutions within India)
Mapping Indian cooking cultures and needs to those in MECS target countries	Alongside the work to classify and segment different markets for cooking solutions in our MECS target markets, we will support the investigation of the different cooking cultures and energy access scenarios in India and identify the similarities and differences. Could link to work by Social Alpha mapping Indian dishes. Disseminate this and use to inform transfer of solutions.	Documented evidence of dialogue and advice and contributions to study and report.*	Report published by Indian institution on the different Indian markets matching cooking culture with electrical appliances.	Documented evidence of us working with Indian organization to establish a study of electric cooking, contributing financially if necessary.*	Study of households exploring electrical cooking in 5 cultures across India	Presentation of case notes and report at 3 clean energy events held in India with higher level stakeholders (ie not academic conferences for students)	
Support established Indian manufacturers in entering our target markets and scaling up availability of suitable devices	Developing an understanding of Indian manufacturers in the eCooking sector and associated sectors that can contribute to complete eCooking solutions. Engage with sector members and disseminate information about data, reports, calls, services that	Documented agreed plan of action with 1 manufacturer on intention to export products to Africa or SE Asia. Documented support for export	At least 1 manufacturer develops concrete plans to export clean cooking products to target markets.	Documented agreed plan of action with 3 (cumulative) manufacturers on intention to export products to Africa or SE Asia.	At least 3 manufacturer develops concrete plans to export clean cooking products to target markets.	Evidence of exports made – sales ledger or export licence data. Evidence of support given – named manufacturers plus finance or TA given, plus evidence of take	Significant volumes of exports and sales achieved to multiple target markets.

Aims	Key strands	Milestone (or KPI) May 2021	Interim outcome hoped for	Milestone (or KPI) Dec 2021	Interim outcome hoped for	Milestone (or KPI) Sept 2022	Interim outcome hoped for
	would be relevant – newsletters, events, visits. Work with financial institutions and High Commissions to secure support for export of eCooking solutions to our target markets.	of eCooking solution to Africa or SE Asia. (Financial institution or High Commission)		Documented support for export of eCooking solution to Africa or SE Asia. (Financial institution or High Commission)		up by 3 manufacturers.	
Harness the Indian Innovation capability to grow the range of clean cooking solutions available.	Contribute our knowledge and finance to relevant innovation programmes in India. Support on-going development and market entry of the best solutions. Potential Hackathon/collaborative workshop with UK companies.	Documented evidence of us making a real contribution to one innovation challenge fund.	As a result of our engagement, greater number of innovations supported.	Documented evidence of 5 cumulative entrepreneurs supported in innovation.	As a result of our engagement entrepreneurs are better informed about user needs, etc.	Documented evidence of us identifying opportunities for engaging with innovation calls relating to clean cooking and actively seek to partner with the organizing bodies.	One other innovation fund engaged and 10 cumulative entrepreneurs supported in innovation.
Piloting to gain real-world evidence of take-up, impact and value of different solutions.	Develop piloting opportunities and partnerships. Support the piloting and evaluation methodologies. Maintain links and support to pilots.	Documented evidence of working with GIZ India and others to set up effective pilots with our contribution helping to shape them.	50 household engaged in piloting on grid.	Documented evidence of us develop partnerships to create mini grid pilot projects and contribute to help shaping them.	50 households engaged in pilot on mini grid*	Report on pilot data and analysis. 3 institutions proposing new pilots.	
Sharing learning and connecting with work in target countries.	Report on progress and learning in India through MECS communications channels. Events to bring together insights from India and other locations.	1 event presenting MECS collaboration hosted by key Indian stakeholder		2 event (cumulative) presenting MECS collaboration hosted by key Indian stakeholder		4 event (cumulative) presenting MECS collaboration hosted by key Indian stakeholder	

*: Financial contribution to be agreed towards the achievement of these – will be identified and mapped in the Strategy Implementation Plan.

9 Summary and next steps

In conclusion, we believe that there are enormous opportunities for the MECS programme to increase its reach and impact through work with India and to support positive developments in India in relation to reducing deaths from household air pollution and supporting economic growth through trade and exports with the FCDO target countries.

Specific outcomes that support the MECS mandate that we expect to result from this work include:

- Expansion of the number of businesses developing new clean cooking solutions, harnessing the support available within India and potentially in collaboration with UK businesses and specialists
- A better understanding is built of the needs and impacts of clean cooking and how the Indian context relates those of the FCDO target countries.
- Those innovators looking at this area have access to and benefit from MECS research findings in developing their solutions.
- Pilots of promising solutions take place in India, benefitting from the MECS experiences and methodologies, generating additional insights and data
- Businesses with promising clean cooking solutions are supported to grow and enter the FCDO target markets, leading to greater availability of suitable products
- The cost of clean cooking solutions is reduced through a combination of aggregation of demand driving economies of scale in production and spreading of the costs for the end-user
- Research findings and insights are shared between India and FCDO target countries.

All these opportunities require further work to be realised and we recommend that this strategy is approved and followed by the development of a comprehensive and evolving Implementation Plan.

10 Appendices

Appendix.1. MECS India Visits Report 2-6 Dec 2019

This was a first scoping visit by the MECS Team in India on December 2 – 6, 2019 to New Delhi and Chennai which was facilitated by Finovista. Productive introductory meetings and visits were conducted with individuals across the Indian and UK Government, industry bodies, research centres and cooking device companies.

Appendix.2. Notes of Roundtable Discussion Solar PV for Cooking 5 Dec 2019

MECS team attended and presented at the **India Clean Cooking Forum (ICCF)** 2019 on December 5, 2019 in New Delhi, enabling multiple meetings with other Clean Cooking Stakeholders. A roundtable discussion on Solar PV cooking in India was facilitated by GIZ India with senior representatives from Government of India - Ministry of New and Renewable Energy and the Office of Chief Scientific Advisor.

Appendix.3. MECS India Visits Report 4-6 Feb 2020

The MECS Programme team had a second visit to India in early February to allow participation in the India Energy for All Summit (IEAS) and for further meetings.

Appendix.4. Nexus of Electricity and Clean Cooking updates 5 Feb 2020

The MECS Programme participated in the IEAS through:

- **Exhibition** – High Footfall and Engagement at the **MECS Exhibition Stall**. Finovista team spoke to a large number of visitors on Electric Cooking and the MECS Programme including giving live demonstration of cooking on **Electric Pressure Cooker** and showing its electricity consumption readings with an **energy meter**.
- **“Nexus of Electricity and Clean Cooking” Round Table in association with IRADe** – Finovista team ensured a good level of participation in the Round Table. Finovista compiled a detailed report of the discussions which further helped as input in developing the MECS Programme India Strategy.

Appendix.5. MECS India Visit Reports 24-27 Feb 2020

During late February 2020 a further visit of MECS team members to India, developed new relationship with potential partners such as International Solar Alliance (ISA), Shakti Foundation, EXIM Bank, IIT Delhi, TCOE India, High Commission of Ghana, High Commission of Rwanda etc and further strengthen the relationship with the Social Alpha, UKSIN/BHC etc.

Appendix.6. Workshop Report on Promotion of Clean Cooking and launch of MECS in India Full

As part of the visit in late February, Finovista arranged for the Modern Energy Cooking Services Programme (MECS) Launch Workshop and Round Table that together attracted over **80** participants.

- Businesses, were briefed on the market opportunities, support available from MECS and leading Indian institutions and the kinds of devices and innovation opportunities across India Africa and South East Asia
- At the **Round Table**, we discussed the opportunities for the MECS programme to work with Indian partners, with a particular focus on supporting innovation, pilots of promising technologies for clean cooking and collaboration to enable businesses to scale up production and enter the relevant markets
- ***It was agreed that there are excellent opportunities for win-win collaboration and to work together towards concrete action in each area***

Appendix.7. Mapping of potential MECS partners in India

We have identified the various potential partners for the MECS Programme in India, consolidated the list of all such organisations in tabular format, highlighted the current engagement level and best suitability as partner for the programme.

Appendix.8. Clean Cooking Background Paper Final

During the Roundtable in late February, we have shared a detailed Background paper to all attendees of the Roundtable to understand the Programme, latest development, our expectation, what we are looking for etc.

Appendix.10. Key Stakeholders for MECS Programme in India

List of potential partners, with the engagement level in mindmap chart

Appendix.11. Copy of Presentation on India Strategy in March 2020, by Nick Rousseau, Matt Leach & Malcolm Bicknell

Copy of presentation, presented to senior management on the MECS Programme with potential, opportunity, way-forward for the MECS programme in India.

