



# Workshop Report Promotion of Clean Cooking & launch of MECS Programme in India



Organized By  
Loughborough University through Finovista (MECS Partner)



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## Workshop Agenda

09:30 - 10:00

Registration



10:00 - 10:30

**Inaugural and MECS in India Programme**

- Prof. Matthew Leach, MECS Programme
- Mr. Udit Mathur, Department for International Development (DFID) India
- Ms. Smita Rakesh, Social Alpha
- Mr. Rakesh Kumar, International Solar Alliance (ISA)
- Dr. Priyadarshi Dash, Research and Information System for Developing Countries for Developing Countries (RIS)



10:30 - 11:30

**Market opportunities for cooking device manufacturers in India, Africa and South East Asia**

Session Moderator:

- Prof Matthew Leach, MECS Programme

Panelist:

- Ms. Jessie Press-Williams, BURN Mfg
- Mr. Joseph Kabakeja, High Commission of the Republic of Rwanda
- Dr. Jyoti Parikh, Integrated Research and Action for Development (IRADE)



11:30 - 11:45

Tea / Coffee Break

11:45 - 12:45

**Support eco-system for Clean Cooking sector**

Session Moderator:

- Mr. Malcolm Bricknell, MECS Programme

Panelist:

- Ms. Smita Rakesh, Social Alpha
- Mr. Vimal Kumar, Finovista (MECS Partner)
- Mr. Mayank Joshi, Cashinvoice
- Mr. Subrahmanyam Pulipaka, National Solar Energy Federation of India



12:45 - 13:30

**Clean Cooking Devices – Current range and innovation challenges**

Session Moderator:

- Dr. Nick Rousseau, MECS Programme

Panelist:

- Mr. Manish Kumar Pandey, The Energy and Resources Institute (TERI)
- Ms. Sasmita Patnaik, Council on Energy, Environment and Water (CEEW)
- Dr. Nitin Labhassetwar, CSIR - NEERI
- Mr. Nitin Akhade, The Clean Network

13:30-14:30

Lunch



16:30 - 16:45

**Wrap-up and Way Forward**

Dr. Nick Rousseau, MECS Programme & Mr. Vimal Kumar, Finovista (MECS Partner)

14:30 - 16:30

**Round Table**

Objective: To explore the potential for collaboration between the MECS Programme and Indian institutions to support clean cooking in India & wider, and develop concrete project proposals



16:45

High Tea



# 1. Inaugural Session & MECS Programme Launch

Cooking practices are based on biomass burning which is having a very adverse impact on climate and more particularly human health. Earlier they were more focus on climate and environment under this segment of course it remains so but of late I would say in few years the health factor have become very important

We sense that the opportunity for the shift to the electric cooking is quite large already and its growing.

**- Udit Mathur, DFID India**

Any type of development solutions that we are visualising for people of this country should be affordable, should not discriminate in terms of affordability part of that, and most important should not dislocate, hamper the local industry and businesses

**- Rakesh Sharma, ISA**

**- Priyadarshi Dash, GDC**

Energy access has for a long time been interpreted to be about lighting, other low power uses in the home, and small-scale productive use. MECS is seeking to change the way we approach this so that access to modern energy for cooking is given similar priority

**- Mathew Leach, MECS**

User centricity, affordability, accessibility and product's user experience should be factored in from day zero when designing the product

**- Smita Rakesh, Social Alpha**



## KEY TAKEAWAYS

Eliminating the use of biomass, combustion cooking would require a multi fuel, multi-pronged, multi-stakeholder approach by taking into considerations the regional requirements, appropriateness of technology and household incomes

Right products and business models are the key to actually grow the market. Electric cooking solutions have to be affordable and deliver similar expectations on the output

In Clean cooking, behaviour change is an important aspect w.r.t the adoption of modern energy. Communication with the end users/potential customers plays a vital role in influencing their choice

Choice of energy for rural households and specially women is currently restricted. Thus, clean cooking not only addresses the health issues but empowers them with dignity especially rural women

## 2. Session on Market Opportunities for Device Manufactures in India, Africa & SE Asia



(L-R): Prof. Matthew Leach, MECS Programme ; Dr. Jyoti Parikh, Integrated Research and Action for Development (IRADe); Mr. Joseph Kabakeja, High Commission of Rwanda; Ms. Jessie Press-Williams, Burn Mfg

*Objective: Discuss the opportunities that the MECS programme is identifying for India and other nations and why enabling a shift to clean cooking will save lives. Explain why previously challenging customer groups could now be viable*

### KEY TAKEAWAYS

- Estimated size of the market in terms of the expenditure on cooking fuels is 47 billion pounds, of which 34 billion pounds are spent on wood charcoal and kerosene with only 13 billion spent on what we regard as truly Clean Fuels
- The cost of traditional fuel is high and rising and falling costs of batteries, PV and efficient cooking devices which opens up the opportunity for kickstarting an electric cooking revolution
- Electric Cooking brings huge benefits both for consumers in terms of cost savings, aspirational cooking experience with zero household emissions, as well as broader economic and environmental implications of switching people from spending money and burning dirty fuels to a better cooking future
- Products need to be constantly tested with users, in both urban and rural areas. Challenges associated with behavioural change need to be factored in. Gender component of behaviour change needs to be addressed by closely working with women and understanding their role in purchase decisions.
- Innovative small financing models e.g. through self help groups or village clinics would strengthen distribution and reach. It could be a great way to empower women entrepreneurship especially in rural areas.

### 3. Session on Support Eco-System for Clean Cooking Sector



Mr. Malcolm Bricknell, MECS Programme; Ms. Smita Rakesh, Social Alpha; Mr. Vimal Kumar, Finovista (MECS Partner); Mr. Mayank Joshi, Cashinvoice; Mr. Subrahmanyam Pulipaka, National Solar Energy Federation of India (NSEFI)

*To set out the funds, awards and other support available for companies that want to take advantage of these opportunities, and the further support and initiatives that we hope will be put in place*

#### KEY TAKEAWAYS

- MECS has an active collaboration with institutions like the World Bank Group through ESMAP, and other large multilaterals like African Development Bank, Asian Development Bank, Bilateral agencies like CDC FMO. Aside to this there are local collaborations in respective countries with financial institutions like commercial banks, micro finance institutions and other consumer finance organizations
- MECS Programme, in partnership with Indian Institutions would support for R&D, Innovation, Prototyping, testing, Piloting, commercialization and scale-up to the Clean Cooking Device Manufacturers and complete ecosystem
- A three-prong approach for promotion of Clean Cooking in India is: -
  - ◆ User trials and Deployment through grants and investments
  - ◆ Technology support for clean cooking solution
  - ◆ User adoption by supporting actual research, enabling technologies to measure usage and adoption, behaviour change communication, on -ground research on adoption and building in feedbacks
- Credit underwriting for supply chain finance borrower, specially the small distributor and retailer should not be based on empirical data and financial strength but on relationship between distributor and manufacturer, transaction pattern
- In micro grid model, integration is the missing link and would be the real innovation. We need to look at it as a micro grid model, where solar cooking becomes an inevitable part of the entire micro grid design.

## 4. Session on Clean Cooking Devices – Current Range and Innovation Challenges



(L-R): Mr. Manish Kumar Pandey, The Energy and Resources Institute (TERI) ; Dr. Nick Rousseau, MECS Programme; Ms. Sasmita Patnaik, Council on Energy, Environment and Water (CEEW); Dr. Nitin Labhasetwar, Council of Scientific and Industrial Research – National Environmental Engineering Research, (CSIR – NEERI); Mr. Nitin Akhade, The Clean Network;

*Objective: overview of the types of devices available and the innovations required to meet the needs of the intended customers*

### KEY TAKEAWAYS

- Traditional cooking fuels in villages are free of cost and readily available. In case there is any issue with clean cook stoves whether it is technical, financial or behavioral, there is an immediate switch back to traditional fuel usage. Thus, the adoption to the new and modern cooking technologies, has been really slow in rural areas
- There is no one solution, while accessing the right cooking solution factors like efficiency, financial control to user, durability, type of available energy, safety and emission have to be taken into account
- Innovations in product, distribution and financing models are critical to success. To increase penetration in rural markets, self-help groups (SHGs), livelihood promotion societies etc. can play a vital role. Blended finance support can be provided to SHG to bring down the cost.
- Efficient clean cooking solutions should be tested in both urban and rural markets. There is an aspirational quotient linked between urban and rural, and if something is picked up in urban areas there is a greater likelihood of its success in rural households
- Integration with existing social protection programs would help in adoption as would give purchasing power to consumers to afford these solutions

## 5. Leaders Speak



“

There is tremendous opportunity for electric pressure cookers and other electric cooking and modern energy cooking devices in Kenya and other countries in Africa.

-Jessie Press-Williams,  
Burn Manufacturing



Clean Cooking solutions should be tested on criteria like affordability, adoption and recurring cost and even aspects like sustainability and durability

-Nitin Labhateshwar, CSIR-NEERI



There is a huge potential for electric pressure cookers. Because, this can operate in the rural areas with the support from households solar panels. Also, through the grid electricity, it can leapfrog because it doesn't have any recurring costs

-Manish Kumar Pandey, TERI



Energy is just one of the many things that the household considers. There are a gamut of needs that the house has and cooking energy is just one of them

-Sasmita Patnaik, CEEW



For electric cooking devices, we have fantastic opportunities to really fast track and reduce the cost of getting certification for carbon credits

-Malcolm Bricknell, MECS Programme



User trials is not a one time activity, It is not a yes or no, it is not a go no go exercise but an iterative process. It requires anchoring agencies to be constantly engaged on ground with innovators

-Smita Rakesh, Social Alpha



MECS programme is looking to assist the Indian clean cooking ecosystem through finance, technology, market access, piloting, trial research toolkit etc and creating platform for manufactures to tap unexplored market opportunity

-Vimal kumar, Finovista (MECS Partner)



Honorable Prime Minister has set up a very ambitious plan to make solar cooking popular not only in rural areas but also in urban by the end of this decade i.e by 2030

-Subrahmanyam Pulipaka, NSEFI

”

## 6. Round Table Overview



Building on two previous Round tables – one led by GIZ India and one by MECS in partnership with IRADe and CLEAN, MECS programme had organized this Round Table in India to discuss the shape of this programme and the role that different bodies can play.

### Objective of the Round table

*To explore the potential for collaboration between the MECS Programme and Indian institutions to support clean cooking in India and wider, and develop concrete project proposals*

- *To identify key areas to work on*
- *To identify the roles of each organization*
- *To identify where finance can come from*

*Connecting the stakeholders for better understanding and alignment and building an effective clean cooking ecosystem*

### Round Table Discussion Structure

The roundtable discussions with key stakeholders in clean cooking aims to gather experiences and insights around four major strands i.e Innovation Areas for focus; Solution assessment; Pilots and evaluation and Scale up. The round table participants were requested to suggest, how can they work together with MECS in supporting the ecosystem align with these strands.

### Participation

Round Table was attended by a group of manufacturers, senior representatives of ministries and policy think-tanks, financial institutions, energy researchers and corporate foundations.



## Glimpse of Round Table



## 6. Summary of MECS in India Workshop & Round Table

This document sets out in overview what happened at the recent event that took place in Delhi, India on 26 February 2020.

The event explored the case for the Modern Energy Cooking Services (MECS) programme to work with India on the development and implementation of cooking with electricity.

This has the potential to save millions of lives across the world, both in India and in the MECS target countries in East Africa and South East Asia.

While much has been done to attempt to reduce deaths from household air pollution 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 barriers to households securing eCooking devices can also be massively reduced if we can harness eCooking’s potential generate a much-needed additional load and potential revenue stream for energy providers. It also has the potential to demonstrate and release funds as a result of the substantial carbon emission reductions.

India is an ideal partner in this work as the agenda is of great importance with the need to reduce the deaths from household air pollution across the country and the dependency on foreign imports of LPG. India has already invested substantially in these challenges and the Government of India is now open to exploring new solutions. The Indian manufacturing, technology and research base as well as substantial trade relationships with African and Asian markets puts it in a unique position to benefit economically from the foreign as well as domestic need for clean cooking solutions.

Building on two previous Round tables – one led by GIZ India and one by MECS in partnership with IRADe and CLEAN, on 26 February, with the help of Finovista, organised a manufacturers’ workshop and policy Round Table to discuss the shape of this programme and the role that different bodies can play.

The aims of the day were to:

- *To launch of MECS programme in India*
- *To brief Indian businesses in the cooking device sector/supply chain regarding market opportunities, innovation requirements and support available to build sales across Africa and SE Asia*
- *To explore the potential for collaboration between the MECS Programme and Indian institutions to support clean cooking in India and wider, and develop concrete project proposals*
- *Connecting the stakeholders for better understanding and alignment and building an effective clean cooking ecosystem*

***The day was a great success with over 80 participants between the two events representing the Government of India, UK Department for International Development, leading financial institutions, Social Alpha, RIS, ISA, TERI, CSIR, IIT Delhi and business chambers***

The initial briefing workshop highlighted the great interest across India and Africa to find ways to enable households and others to stop using polluting wood and charcoal for cooking.

The inaugural session included warm words of support from the UK Department for International Development (DFID) India, Social Alpha, International Solar Alliance (ISA) and Research and Information System for Developing Countries for Developing Countries (RIS). All these bodies pledged their support in working collectively on this agenda.

***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 through our , partners shell foundation partner who are actually supporting , enterprises rolling it out on the supply end we have new programme coming up which can also invest in these type of programme. We can be together with MECS for design these types of initiatives*

***Social Alpha** 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 from each other experiences.*

***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 like partner with MECS for floating a large-scale tender for cost optimisation** to achieved economy of scale by aggregating of demand through the marketplace model for its member countries*

***RIS Global Development Centre** would like to collaborate with like- minded institutions who fit into the overall development narrative that GDC has in mind*

***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*

***NEERI** would be happy to provide support, Infrastructure support as we do not have any commercial interest out of it*

*Skill Council can assist in development of training module for the clean cooking in India.*

The session on **The Market Opportunities** highlighted that, **Globally, 3 billion people still cook with biomass, yet 2 billion of these now have access to electricity.** 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). We believe there are real business opportunities that can be developed with the right approach, not least because we know that households often have to spend considerable sums or time to secure cooking fuel. In Sub-Saharan Africa, for instance, \$34 billion is spent on wood, charcoal and kerosene.

*The speakers included Prof Matt Leach, MECS Delivery Partner, Jessie Press-Williams, whose Kenyan company, BURN, is developing new electric cooking devices for the Kenyan market, Joseph KABAKEJA, from the High Commission of the Republic of Rwanda and Dr Jyoti Parikh, Integrated Research and Action for Development (IRADe).* Each shared valuable insight into different markets and the scale and nature of the opportunities and challenges. It was also clear from the presentations and discussion that no one solution will work everywhere and that a collective effort is required to develop new solutions and explore more openly a wider range of technologies.

The session on **The Support Ecosystem for Companies Developing Solutions for Clean Cooking** highlighted the wide-ranging presentations set out an impressive array of different forms of support that is available for all stages of the process from initial conception of an idea through to scale up and market entry and support for consumer finance. *The speakers represented a range of sectors and areas of expertise in addition to the MECS programme’s package that is being developed. Ms Smita Rakesh, Social Alpha highlighted the growth ecosystem that her incubator/accelerator can provide, with the backing of the Tata Group, Mr Vimal Kumar, MECS Programme & In-country Partner, spoke about the different financial institutions with which we are in discussion to line up different forms of financial support, Mr Mayank Joshi, Cash Invoice spoke about their means of accelerating access to finance and Mr Subrahmanyam Pulipaka, CEO, National Solar Energy Federation of India spoke about the need to focus on an approach that does not depend on public sector finance.*

The last session of the workshop discussed the different devices that can be relevant and some of the research that has helped to identify and build an understanding of users’ needs. The speakers conveyed a lot of detailed information about studies that they have been involved in and the implications for practitioners. It was generally agreed that it is particularly important to work closely with the affected communities and gain their buy-in to any approaches while paying close attention to their cooking needs and behavior.

***The first workshop session wrapped up with a commitment from the MECS team to keep those that participated in touch as the programme develops and when opportunities to access support are finalized. The opportunity for those making Electric Pressure Cookers to nominate devices for the Global LEAP Award was highlighted***

**The Round table** followed with a focus on how the MECS programme, which is focused on delivering change across a number of African and SE Asian countries can find common ground with the Indian ecosystem. Dr Nick Rousseau introduced and proposed that the areas of common interest lie particularly in relation to support for innovation and the development of new solutions, in piloting promising new approaches in both India and elsewhere, where there is good alignment of conditions, and in providing support to Indian companies that want to scale up production and reach overseas markets.

The **Innovation** strand, is expecting to come up with new ideas, assessing it for real potential, prototype development, supporting them for further improvement, evaluating, piloting and deployment and market access. We are exploring the opportunity with India and MECS programme working together in some of these areas, as we are not resourced to help India to achieve massive change that required to transition to clean cooking across India. But we are keen to work on specific areas.

In **Research** strand, there are lots of opportunity for us to share methodologies, learn from each other and underpinning, work being already done in different ways for energy access, modelling of energy for use & demand and research into cooking behaviour and how to achieve the change. These data driven research would help us in working the Policy maker. We are not in position to get policy support in India but happy to share our findings in working in other countries and learn from what India is doing. We all are on journey, can work together for this common cause as some of the agencies such as GIZ working closely with the ministries.

In **Promotion** strand, MECS programme has produced eCookBook for Kenya and in process of developing similar for India. We believe, there's opportunities, which could be tailored to the Indian environment, and could be a useful way of promoting for people, the benefits of using electric cooking or energy cooking. In terms of implementation, onboarding people for field trials, delivering products to users, collect feedback and scale up uses. Again, we can share some learning on that, but not resourced to invest maybe can help Indian organisations, and can learn from support.

Last strand is **Scale up**, it is most important for Indian context as we are interested in Indian manufacturers who have the good solutions, keen to work with them for both India and programme countries. Our finance team is focussing around assisting the manufacturing in securing finance such as Social Alpha, EXIM Bank, SIDBI, CDC, World Bank, Acumen etc from early stage to large scale production and rollout. MECS programme is promoting innovative devices, assessing different options providing more choices to users. We will be helping them in entire value chain such as R&D, Prototype, piloting, large scale deployment and happy to work together for joint programme development and promotion.

This generated a positive response from the participants with many bodies suggesting practical ways forward and/or offering to participate and help take this forward.

## Detailed – MECS in India Round Table

## 7. Round Table Agenda & Participation

### Agenda

14.30 – 14.45 Welcome and introductions

14.45 – 15.00 Brief review of the background and MECS approach

15.00 – 15.15 Reactions

15.15 - Explain the exercise

Tasks, input requested on sticky note / flip chart

- your organisations (or another)
- Suggestions
- Contributions

16.15 – 16.30 Plenary and next steps

### Objective of the Round table

- To explore the potential for collaboration between the MECS Programme and Indian institutions to support clean cooking in India and wider, and develop concrete project proposals
  - To identify key areas to work on
  - To identify the roles of each organisation
  - To identify where finance can come from
- Connecting the stakeholders for better understanding and alignment and building an effective clean cooking ecosystem

### Round Table Participants

The Workshop will be concluded with the Roundtable, scheduled at 1430 – 1630 Hrs, and invited the key potential partners with expected outcome

### Discussion structure of the Roundtable

The roundtable discussions with key stakeholders in clean cooking aims to gather experiences and insights around four major strands i.e. **Innovation Areas for focus; Solution assessment; Pilots and evaluation and Scale up.**

Building on two previous Round tables – one led by GIZ India and one by MECS in partnership with IRADe and CLEAN, **this roundtable has been organised to discuss the shape of this programme and the role that different bodies can play.**

The Workshop with Roundtable was well attended by clean cooking device manufacturers, senior representatives of ministries, policy think-tanks, financial institutions, energy researchers, corporate foundation, DFID-India and African High Commissions to explore possible collaborations between MECS and Indian organisation around clean cooking in India, and in particular to stimulate Indian clean cooking device manufacturers to explore the huge market opportunity, we are creating in India, South East Asia and African countries.

## 8. Modern Energy Cooking Services (MECS) Programme

Modern Energy Cooking Services (MECS) programme to work with India on the development and implementation of cooking with electricity. This has the potential to save millions of lives across the world, both in India and in the MECS target countries in East Africa and South East Asia. It is about cooking systems that are powered by electricity, by LPG, by gases, by ethanol, ideally from renewable resources. The kind of sources of electricity that the programme is interested in is everything from main grid to mini grids, to off grids operate, either for solar home systems or as part of dedicated solar cooking.

While much has been done to attempt to reduce deaths from household air pollution 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.

India is an ideal partner in this work as the agenda is of great importance with the need to reduce the deaths from household air pollution across the country and the dependency on foreign imports of LPG. India has already invested substantially in these challenges and the Government of India is now open to exploring new solutions. The Indian manufacturing, technology and research base as well as substantial trade relationships with African and Asian markets puts it in a unique position to benefit economically from the foreign as well as domestic need for clean cooking solutions

MECS also believe there is scope for more fundamental innovation and the design and development of new solutions that are optimized for different energy and cooking contexts and needs. A key focus for the MECS in India programme will be to stimulate and support innovation that will solve the need to enable eCooking to take place across the variety of contexts you have in India and also create products that would be effective in foreign markets.

The Programme aimed to support companies at different stages in device design and development, so that we can create a “pipeline” of new products that are developed and tested, and supported to enter the market. The table below summarizes this:

Stage	Support
Initial idea, conception, feasibility assessment	Innovation briefings, sandpits, hackathons, networking, matchmaking and support voucher, challenge fund for market study, introductions to UK companies/specialists
Prototype development and testing	Challenge fund and Indian Govt support for R&D, Newton-Bhabha funding, manufacturing coaching
Existing product requiring some modification /integration	Challenge fund and Indian Govt support for R&D, Newton-Bhabha funding, Piloting. Global LEAP Award.
Viable product trials	Piloting. Global LEAP Award.
Proven solution rollout	Market intel and access, export finance. Scaling up support. Global LEAP award.

## 9. Key Outcomes – Workshop & Roundtable

**Mr Udit Mathur, Advisor – Energy**

**Department for International Development (DFID) India**

**We are actually very happy that the MECS is launching in India, our global colleagues have funded this programme, I happy to understand that the programme is doing quite well in Africa and India is everyone's favourite.**

- At DFID, India we sense that the opportunity for the shift to the electric cooking is quite large already and its growing
- **As per the last Global climate summit, there were discussions on BIO mass cooking resulting in 3- 8% of global emissions, that's a big number.** Clean cooking fund setup is a big initiative by world bank and there is a global spot light on Clean cooking. In fact, government of India has made it a priority with **minister RK Singh (Power Minister) mentioning that, India will be an Electricity based economy and off which clean cooking will be the next major kind of an opportunity besides Mobility. There is also a National mission on Clean Cooking being formed,** so there is a priority in India that MECS could Feed into
- **Electric cooking** the number are quite large, since not even a quarter of those who got LPG are actually refiling those which means they are using something else and that's something else is either bio mass cooking and there is an opportunity for that to grow. **And if u add African markets to it the numbers would actually be huge.** These number should be set out for our manufacturers, supply chain companies, integrators to see the market size and opportunity.
- There are already **favourable conditions for electric cooking,** under the **“Saubhagya Scheme”** by ministry of power, a large set of house hold that gets electricity. Further in parts of India and rural areas Electricity is free up to certain units, and with efficient Electric Cooking devices meals can be prepared in cost less than charcoal cost.
- In one of DFID India's previous experience of Clean Cooking Solutions (Induction Plates), there were behavioural aspects as barriers to user adoption. To address this behavioural challenge, we organized Cooking Demonstrations, local competition campaigns “master chiefs”. We conducted demonstrations village by village and there were costs to it. **So, these kind of costs for behavioural needs to be built up into any model.**

*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 through our , partners shell foundation partner who are actually supporting , enterprises rolling it out on the supply end we have new programme coming up which can also invest in these type of programme. We can be together with MECS for design these types of initiatives*

## Ms Smita Rakesh, Portfolio & Programs Social Alpha / TATA Trust

- **User centricity** needs to be built in right from the day zero, when we are designing the products for environmental benefits and efficiency and for all the other factors that we think are important and then later on as an afterthought building in the user feedback or are we keeping user centricity affordability, accessibility and at the top of it user experience very much factored in from the day zero
- Technologies that come at idea stage, **need nurturing from idea to prototype**. And that's a very different kind of support that needs to go in there, then they'd be technologies or solutions that are at the prototype stage and **have had some proof of concept, and before they actually scale in the market they need funding support that helps them directly and creates a pipeline** for other investors, for channel partners
- A **three-prong approach** for promotion of Clean Cooking in India is: -
  - User trials and Deployment through grants and investments
  - Technology support for clean cooking solution
  - User adoption by supporting actual research, enabling technologies to measure usage and adoption, behaviour change communication, on -ground research on adoption and building in feedbacks

*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.*

## Dr Priyadarshi Dash, Assistant Professor Global Development Centre (GDC), Research and Information System (RIS) for Developing Countries

- Smoke inhaled by a woman is equivalent to burning 400 cigarettes per hour. **Clean cooking gas will not only address the health issues but will also empower the woman** and rural households especially rural women by giving them **a dignified choice of energy**.
- GDC believes that any type of development solutions that we are visualising for people of India, **should be affordable**, should not discriminate in terms of affordability, **should not dislocate local industry** and businesses and **indigenous innovations**.

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

**Mr Rakesh Kumar, Programme Director  
International Solar Alliance (ISA)**

- ISA 's main mandate is to scale up solar through organising a competitive cost financing, aggregating the capacities across countries and scale up different solar activities in our member countries.
- The experience of Indian households though they have this LPG connection but this till want to have an alternate type of arrangement they are still going for biomass and kerosene, so we still need to find ways to take them away from those resources and give them solution that are efficient
- The challenge to see from ISA's perspective and its member countries, the **energy access is a big challenge**, I mean so adopting such electrical devices will happen only when you are reaching that stage. Solar can bring some of the off-grid solutions which has the potential but seeing the kind of electrical devices and their consumption and wattage which is very high, so this is a challenge.
- The end aim is to eliminate the use of traditional biomass and **this would require a multi fuel multi-pronged approach, multi-stakeholder approach, by taking into consideration regional requirements, appropriateness of technology and household income**. Rural households face the challenges to fund such kind of appliances which are efficient cooking devices.
- Not just Energy Ministry but other ministries like **rural development, health and family welfare, agriculture** should be integrated to see that the challenges of households are met for adoption of innovative cooking solutions.
- ISA does not a very specific programme on clean cooking, however **we are looking at solar cooking in a big way**. We can look at an aggregation models of solar cookers to take these devices to our member countries in Africa and in South Asia
- ISA believes in usability, efficiency, convenience etc in cooking is fine but needs to factored affordability of devices.

*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 like partner with MECS for floating a large scale tender for cost optimisation** to achieved economy of scale by aggregating of demand through the marketplace model for its member countries.*

**Dr Meenakshi Singh, Sr Principal Scientist  
Council of Scientific and Industrial Research (CSIR)**

- CSIR is a public funded research institution having 38 labs across India, working on various cutting-edge technology areas. As per CSIR, Clean cooking promotion needs to create awareness programme in targeted population, based on food habits etc. Devices need to provide alternative of electricity, as electricity is not available everywhere. Need dual system hence need innovation. Cooking utensil also need to innovation at material science and coating level. Further, like to know about the Terms and Condition for the Challenge Fund to access of the fund, 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.
- Any cooking process required to preserve the nutritional value on food, even institutional cooking is also important, programme should develop the cooking system for these purposes as well.

*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 Nitin Labhassetwar, Chief Scientist & Head, Energy & Resource Management Division  
CSIR – National Environmental Engineering Research Institute (CSIR - NEERI)**

- Clean cooking Solutions should be tested on criteria like affordability and adoption and you know like the recurring cost and even the sustainability and the durability
- **In the country we do not have advance equipment testing facility, NEERI-CSIR labs are working on it. We need to define what is clean cooking. Electric pressure cooker would be good for parts of India where the rice-based meals are predominant. We can have dedicated workshop on this.**
- EPC is not about the rural or urban product, it is more about the cooking habit, it should start from the middle / higher income and subsequently transition to lower income group. Pilot should not have many variables and focusing on areas where charcoal and wood process are costlier or even not available. Let's also evaluate and test the product where users have multiple options and still ready buy and use this. Further, users need to cook variety of food items and too much subsidy may not work hence work out on economics of eCooking. As we know, dal, chapatti, rice is staple food in India hence cookability of these food items are important for cooking devices to be succeed.

*NEERI would be happy to provide support, Infrastructure support as we do not have any commercial interest out of it.*

**Mr Manish Pandey, Fellow and Area Convenor  
The Energy and Resources Institute (TERI)**

- There is a **huge potential for electric pressure cooker**. Because I think this can operate in the rural area with, support from individual house-holds solar panels. And also, through the grid electricity, and **it can actually leapfrog because it doesn't have any recurring costs**.
- **Alternative fuels for cooking in villages are free of cost and readily available**. In case there is any issue with clean cook stoves whether technical, financial or behavioural there is an **immediate switch back** to traditional fuel usage. Thus, the adoption to the new and modern cooking technologies, has been really slow in rural areas
- Innovations in product, distribution and financing models is critical to success. To increase penetration in rural markets, self-help groups (SHGs), livelihood promotion societies etc can play a vital role. Grant components can be built in for the SHGs to bring down the costs.

**Mr Subramanyam Pulipaka, CEO  
National Solar Energy Federation of India (NSEFI)**

- *“Prime Minister has set up a very ambitious plan to make solar cooking. Popular or to develop appetite for solar cooking, not only in rural context but also in urban context by the end of this decade by 2030”*
- Office of the Principal Scientific Advisor has given the initiative to **NSEFI to take this mission for making solar cooking popular** in the country. As an industry body we have been working with the PSA Office and the PMO, to raise awareness about clean cooking solutions.
- 95% of India's micro grid projects which are funded through grants are either not functional, or, or malfunctioning or not at right place.
- **Integration** is a missing link and **integration is innovation**. We need to look at it as a micro grid model, where solar cooking becomes an inevitable part of the entire micro design

**Dr Praveen Dhamija, Advisor  
Skill Council for Green Jobs / SCGJ**

*Skill Council can assist in development of training module for the clean cooking in India.*

**Mr Robin Arya and Ms Deepika Pandey  
Export Import Bank of India (EXIM Bank)**

- We are Development Financial Institution, and provides finance to Indian company for export from India. We are happy to learn more about the programme and synergies for their Govt of India's scheme Ubharte Sitare programme, jointly implemented by EXIM Bank and SIDBI.

## 10. Key Discussion Points

### a. Introduction of MECS programme and Roundtable agenda

Dr Nick, gave the opening remarks with a quick introduction and explanation of the structure of the roundtable discussion.

The programme is not just looking for cooking appliances but whole context of integration of cooking appliances into the overall energy system, which is a very promising and advanced. In our view, Electric Pressure Cooker (EPC) is probably most advanced and required further improvement. Additionally, looking at various range of potential cooking solutions, which are already in market and other products don't exist or at development stage.

MECS programme visited India thrice and interacted with various potential stakeholders in meeting, roundtable, event etc discussed the processes and activities, linking with the clean cooking, it helped us in understanding and strategizing our self for the India.

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 in unique and unique set of conditions in terms of the energy mix for cooking the availability of other resources and geography.

I have visited Indian thrice in recent times and thank you all for meeting us and taking through your process & activities and linking with the clean cooking. India has opportunity in both areas as Device supplier side at global scale and transitioning in India as around 80 Million still depended on biomass. We understand, the challenges faced here, complexity but there is huge amount of opportunity.

MECS Theory of Change is about, how a country transition from biomass to modern energy and combination of these is key aspect of Programme management policy development and solving these.

While replying the queries from Social Alpha on "Challenge process and getting inputs from the people". MECS programme is like to work in line with Morocco project, where having initial discussions and workshops with people who reflect the cooking culture in that country. Understand that cooking culture, and then think about what kind of devices might work. And then study their cooking practices on a small scale, maybe four or five families understand that, and then offer them a range of devices, observe them for four weeks and then see which devices they actually use. So working really closely with people in represent that cooking community. So that might be the thing you'd have to do on a step by step basis. And then as you start to say actually out of those four or five devices.

#### Round Table Discussion Structure

The roundtable discussions with key stakeholders in clean cooking to gather experiences and insights around four major strands **Innovation Areas for focus; Solution assessment; Pilots and evaluation and Scale up**. Let's look all these strands in details.

The **Innovation** strand, is expecting to come up with new ideas, assessing it for real potential, prototype development, supporting them for further improvement, evaluating, piloting and deployment and market access. We are exploring the opportunity with India and MECS programme working together in some of these areas, as we are not resourced to help India to achieve massive change that required to transition to clean cooking across India. But we are keen to work on specific areas.

In **Research** strand, there are lots of opportunity for us to share methodologies, learn from each other and underpinning, work being already done in different ways for energy access, modelling of energy for use & demand and research into cooking behaviour and how to achieve the change. These data driven research would help us in working the Policy maker. We are not in position to get policy support in India but happy to share our findings in working in other countries and learn from what India is doing. We all are on journey, can work together for this common cause as some of the agencies such as GIZ working closely with the ministries.

In **Promotion** strand, MECS programme has produced eCookBook for Kenya and in process of developing similar for India. We believe, there's opportunities, which could be tailored to the Indian environment, and could be a useful way of promoting for people, the benefits of using electric cooking or energy cooking. In terms of implementation, onboarding people for field trials, delivering products to users, collect feedback and scale up uses. Again, we can share some learning on that, but not resourced to invest maybe can help Indian organisations, and can learn from support.

Last strand is **Scale up**, it is most important for Indian context as we are interested in Indian manufacturers who have the good solutions, keen to work with them for both India and programme countries. Our finance team is focussing around assisting the manufacturing in securing finance such as Social Alpha, EXIM Bank, SIDBI, CDC, World Bank, Acumen etc from early stage to large scale production and rollout. MECS programme is promoting innovative devices, assessing different options providing more choices to users. We will helping them in entire value chain such as R&D, Prototype, piloting, large scale deployment and happy to work together for joint programme development and promotion.

So our proposal from the group to suggest how we can together to supporting the ecosystem align with these strands. Some of the example are:

- A company has developed innovative solar thermal cooking pod looking for prototyping support
- A biomass based cookstoves company is looking for expand in eCooking and looking for technology expertise and other supports
- A solar cooking device start-up, has developed innovative product, looking for technology and funding support in reducing the cost of equipment, making it more efficient
- A Development Agency is looking for floating a global mega tender for optimising the solar cooking devices on marketplace model
- Govt of India is looking for data driven research for developing conducting policy support and many more such examples

Further, we are enabling the conception of new technologies and new business models and collaborations. We are in discussion with Social Alpha for organising 2-3 day Workshop and bringing experts, market access, speed dating, hackathon, demo day, pitching session etc, so people can develop their network and take the discussion forward. This workshop can lead in proposals for funding, challenge fund, LEAP award etc.

We also understand that, we are not going to solve everything but can work with India on some challenges under MECS programme mandate while aligning with potential partner's organisations mandate. It is too narrow but as per our research electric pressure cookers have a lot of potential, and further investing in supporting that particular type of product through the Global LEAP Award for EPCS. We have done the research in East Africa and also heard from Rwandan delegates that, some of the cooking process take good amount and this can be easily solve through EPC. EPC is very energy efficient, having enormous benefits, we not saying it would be the best solution for India and not limited to particular solution and very open for working with others for finding other best solutions.

### **b. Remarks by Finovista**

Under the MECS programme, we are holistically helping the ecosystem for promotion of clean cooking, through the Challenge Fund, Global LEAP Award, pooled support from financial institution, world bank, UK govt and other agencies. MECS in India programme is working with various ministries for recognising the clean cooking as one of the priority areas in their support scheme.

The primary purpose for the entire exercise is to enable the manufacturers to develop the sustainable commercial solution in this space. Happy to hear from the manufacturer to kind of support they are expecting in term of funding, technology, market access, policy support etc.

Additionally, Global LEAP Award is inviting application for selection of best EPC devices across world. We suggest the EPC device manufacturers to submit your proposal for the awards, it will in recognising the best devices globally.

### **c. Remarks by Social Alpha:**

Social Alpha is actively promoting clean cooking through improved biomass cookstoves, other cleaner modes and is happy to enter into eCooking space. Social Alpha is happy to partner with the MECS programme at various stages with special focus on helping the companies in supporting for prototype testing, user-centric testing, marketing exercises, piloting and continuous improvement based on feedback, letting users to decide the best suitable devices and mode of cooking.

On the contribution, from TATA Trust more from Social Alpha, we would happy to anchor lead support for pilots, we have more 450 NGO partners, they are working on ground, designing pilots, and happy to happy to received idea, methodology, knowledge etc for other organisation and happy to partner with organisation like NEERI etc for technical parameter testing.

Social Alpha has conducted a comparative study for piloting of improved cookstoves, and picked up group of households and gave them different cooking device options and collected regular feedbacks. In this exercise, there was no commitment from the households, volunteers closely monitored, observed the pattern and analysed the data in a smart way. The users were not asked directly how much they would pay but i users were given an option to buy these devices at highly subsidised rate, and that gave them an actual feedback and helped in understanding actual revenue.. Surprisingly most of the people opted for the black colour device as it is presumed that, it has longer durability however we have never thought of these feedback at all. Going by this pilot experience, it is suggested

that while designing the pilot, focus on user prospective, flexibility and not focusing on templated feedback.

#### **d. Remarks by International Solar Alliance (ISA)**

ISA believes usability, efficiency, convenience etc in cooking is fine but affordability needs to be really factored into the devices. Affordability, can be achieved by economy of scale, by aggregating of demand through the marketplace model. With the help of Financial Institutions, ISA can develop innovative financing models to achieve scalability. Energy efficiency of EPC devices, such star levelling, some benchmarking should also be considered. One of the examples, is of solar energy / devices. They were not very popular during initial phases however started picking after introduction of CFL bulb and now LED lighting system has transform the lighting sector.

#### **e. Remarks by Council of Scientific and Industrial Research (CSIR)**

CSIR is a public funded research institution having 38 labs across India, working on various cutting-edge technology areas. As per CSIR, Clean cooking promotion needs to create awareness programme in targeted population, based on food habits etc. Devices need to provide alternative of electricity, as electricity is not available everywhere. Need dual system hence need innovation. Cooking utensil also need to innovation at material science and coating level. Further, like to know about the Terms and Condition for the Challenge Fund to access of the fund, 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.

Any cooking process required to preserve the nutritional value on food, even institutional cooking is also important, programme should develop the cooking system for these purpose as well.

#### **f. Remarks by Telecom Centres of Excellence (TCoE) India**

DOT has recently launched 5G Grand Challenge Hackathon it is in line with 5G trial, which is going to take place in the country through private player and Govt led open network. If devices are connected with IoT, tracking can be done on various parameter defect, actual uses hours, electricity fluctuation etc which further help in proving it with minimal cost. This exercise may become self-sustainable once we link carbon credit investment into it. Considering the market size and volume, these tracking systems have potential to come down to low cost or no cost.

#### **g. Remarks by Skill Council of Green Jobs**

Dr Dhamija is working on clean cooking for over four decades and her experience says, food habit is very diverse in India, need multiple options, and electric cooking appliances can be one of the option. TTK Prestige has installed Induction stoves in the rural areas, these house has the LPG gas stove still they purchased Induction as option and it became very successful. Multiple cooking appliances option to be given to woman, reaching out to these people on ground, need strong distribution system, organising awareness camp, finding interested people, connecting, demonstrating and evaluating

paying capacity of people. She is happy to work on training module for the clean cooking through Skill Council.

#### **h. Remarks by EXIM Bank**

EXIM Bank, we are Development Financial Institution, and provides finance to Indian company for export from India. We are happy to learn more about the programme.

#### **i. Remarks by Centre for Rural Development and technology (CRDT), Indian Institute of Technology (IIT) Delhi**

Prof V K Vijay, Lead, Centre for Rural Development and Technology (CRDT) at IIT Delhi. Working on biogas energy for over two and half decades, my focus is develop clean energy systems for rural areas and for last six years also working on improved cookstoves.

We are one of the three centre in India, having Testing facility for biomass cookstoves, can approve any kind of biomass cookstoves suitable for India.

As per my views, eCooking is not feasible in India considering the food habit, wide variety of food, staple, in most of the rural areas. In particular, In southern and central India, Solar cooker is not feasible as they need to cook chapatti, hence different kind of system is required sophisticated system only simple system, which can be repaired maintained by the people from rural India. .

IIT Delhi is managing Unnat Bharat Abhiyan programme it is Govt of India programme. Under this every higher educational institute has to adopt and develop cluster of five villages around them, and work on development of these villages. They would have to utilize local student / faculty members for the development of that area in collaboration with the district collectors or district administration. It is has developed network of 2474 colleges, covering over 13,500 villages. In next five years, targeting to develop network of 45,000 colleges, covering 250,000 villages, that's means our network would be very large in higher education system involving college students and faculty members.

My centre has experimented with the clean cooking system in Punjab. In Hoshiarpur district, promoted one centralised large size biogas plant with supply capacity of over 150 families. It provides gas twice a day 3.5 hours in morning and 3 hours in evening and for last five years, it is performing well. The improved slurry goes back to the farmer, from whom the biomass for farming purposes.

Further, one of our PhD scholars has developed a biomass based thermoelectric generator, it is very much suitable in Indian condition. Cost of the device is INR 5,000 at present and looking forward for reducing the cost further down.

CRDT has installed 40 stoves in 2-3 villages with the support of ONGC CSR fund. Customers has paid INR 1,000 and ONGC supported INR 4,000. We are studying the health impact, efficiency, performance, working time and other parameters associated with cooking and evaluating that whether it is feasible for our country or not.

### **j. Remarks by Dharma Life Foundation**

Dharma Life is working in clean cooking space for last five years. We work on last mile distribution of clean cooking devices through network of our rural entrepreneurs and mostly are woman and also run behaviour change campaigns.

### **k. Remarks by India Energy Storage Alliance (IESA) / Customized Energy Solutions Ltd (CES)**

CES is looking to work on under-utilised micro grid in country for better monetisation as grid power is not used properly as load is very low. Hence clean cooking is very useful and also understand that, it has own challenges, user willingness to pay the cost etc. IESA/CES is looking forward to piloting of EPC in two places in India, to understand the cooking pattern, pattern for cooking, timing, items etc.

### **l. Remarks by BURN Manufacturing, Kenya**

MECS programme team in Kenya is very active, supportive, researchers, with whom we have worked with possess wide prospective and expertise, helped us in significant improvement. They develop partnership, working with govt, utility companies, financial institutions etc. This programme is not promoting particular device, it is open to all kind of modern energy devices and developing new opportunity. It helped us getting right answer through pilot and most importantly helped us utilising energy in better way. EPC best device, energy efficient, convenient, as it require full energy during initial heating process and once it reaches to optimum level, energy consumption is very low or no energy required because of it is designed, its sealed container is helping the pot to retaining the heat and pressure. It is reducing around half of time for various cooking in Kenya (as per estimation). It improves cooking time, cooking experience, convenience (no need to sit, even can leave the house during cooking), time saving for woman and utilising for other productive activities. EPC is simply a game changer innovation. BURN is regularly improving the devices through product innovation while factoring the customer feedback into it. We tested with wide range of people, location, income, family size, and almost everybody said that, where we can buy this EPC.

### **m. Remarks by Integrated Research and Action for Development (IRADe)**

It need to address all challenges such as economic, paying capacity of buyer, expensive solution for some customer, cheaper for other, product scalability, price optimisation, modern product, biomass may not suitable in long run, as it involved drudgery. It need to create sustainable market of this device.

### **n. Remarks by Simplified Technologies for Life**

Simplified has developed, innovative solar cooker with health consideration and preservation of nutritional properties of food. We have tested the food cooked on our stoves and compare with LPG cooked food and found that it improves the immunity level. Our product is purely focussed on health prospective. Further, normally woman cooks for one-two hour per meal and we believe in engaging her for income generation activities though our devices and cooking. Simplified is running a successful

pilot, where, there is group of woman, trained them in cookies baking, we procure the cookies and sell in market. With this intervention, they are able to earn some money with their cooking and most importantly, they are able to saving recurring fuel cost. Further need to promote through awareness programme.

#### **o. Greenway Grameen Infra Pvt Ltd**

Greenway is into manufacturing of biomass based improved cookstoves and exploring the opportunity in eCooking domain.

#### **p. KrishnaArya Tech Corp LLP**

KrishnaArya, has developed a pod called Annapurna energy pod, it is energy device with power back-up and provides cooking energy. It is capable for cooking anything including Chapati also. Can cook any food which requires temperature ranging 150 – 300 degree, currently this devices is in prototype and field trials stage.

#### **q. TTK Prestige**

TTK Prestige, we deals in cooking applications / cooking devices / electric cooking, in rural areas of Gurugram, Haryana.

#### **r. NTPC Ltd**

I am Rajan Varshney from NTPC, takes care of solid waste management, sewer management and other new initiatives such as hydrogen technology etc

#### **s. Remarks by Non-conventional Energy and Rural Development (NERD) Society**

We are working in clean energy domain for over 35 years and observing clean cooking very closely. The evolution of clean energy, starting from biogas plants biomass solar devices like solar cookers, and devices. As 60% of the population could be needy of this solution, as sun energy are available in abundance affordability of devices is key factor and these solution is useful in all areas viz, rural, semi-urban and urban places like Mumbai.

Solar cooking is already available for over four decades, it needs to further improved sophisticated device, as it has huge potential in India and other tropical countries. Govt of India is also prioritising clean cooking and solar cooking.

NERD works with over 2000 SHGs in rural and urban areas and mainly woman. We create opportunity, livelihood and doorstep marketing with potential users, happy to explore the opportunity in this areas as well.

## 11. Compilation of inputs received during the Roundtable, collected through Sticky note and sheet (open platform)

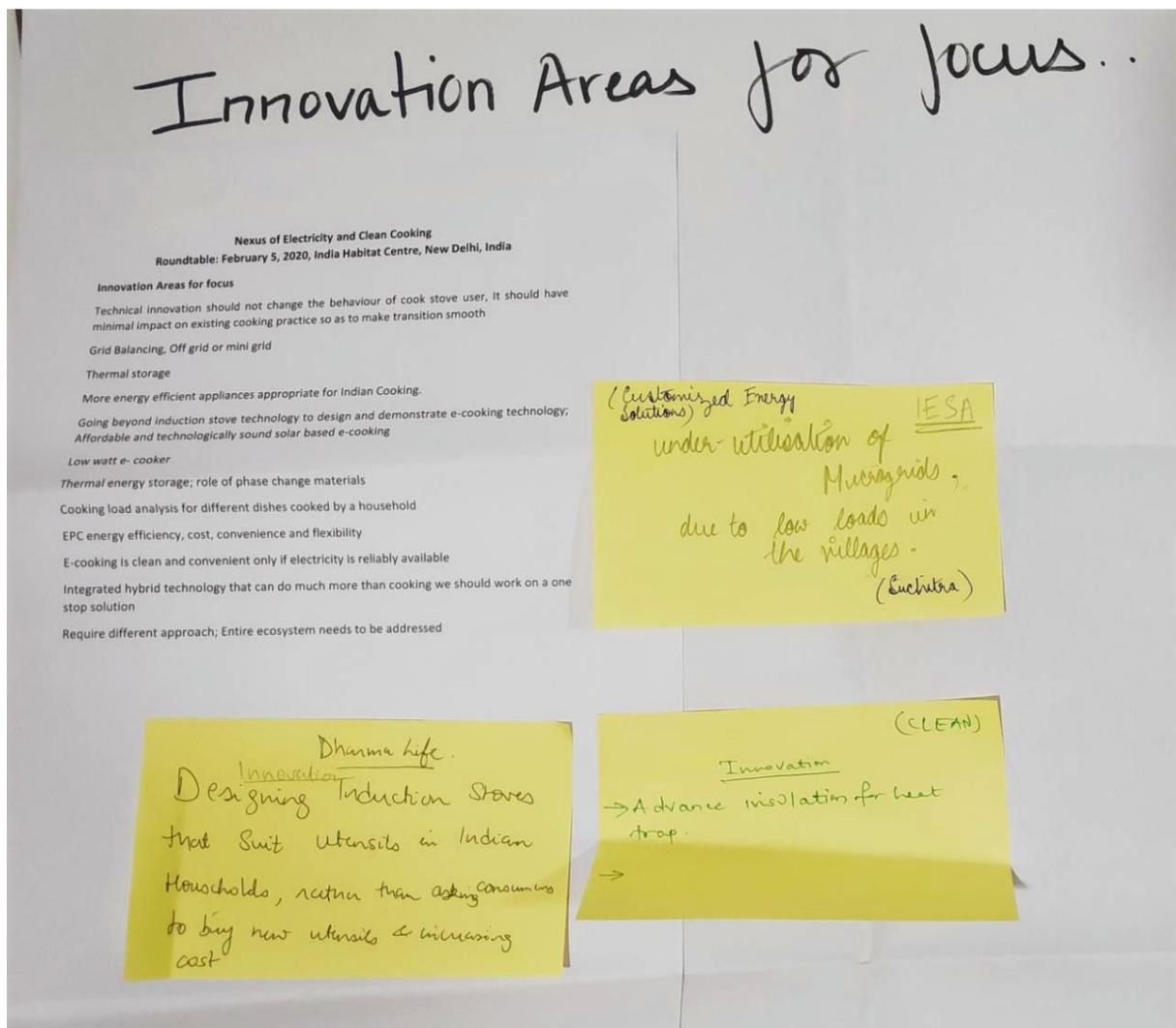
Organisation Type	Organisation	Suggestion
<b>Innovation</b>		
Government Organisation	International Solar Alliance (ISA)	Suggestion- Energy efficiency to be improved by supporting innovations
Business Chamber	The CLEAN Network	- Advanced insulation for heat trap -
NGO	Dharma life Foundation	- Designing Induction stoves that suit Utensils of Indian households rather than asking consumers to buy new utensils & increasing cost
Others	Others	- Develop of Hybrid cooker having Solar cooker, PV and Electric backup
<b>Pilots and Evaluations</b>		
Corporate Foundation	Social Alpha	<p>Social Alpha would work with MECS for</p> <ul style="list-style-type: none"> <li>- Participating user feedback (detailed)</li> <li>- comparative feedback</li> <li>- Actions to assess WTP</li> <li>- multiple Locations</li> </ul> <p>Social Alpha is open to support / contribute, subject to meeting the criteria:</p> <ul style="list-style-type: none"> <li>- Affordability</li> <li>- accessibility</li> <li>- user experience</li> <li>- Safety</li> <li>- emissions</li> <li>- Efficiency</li> <li>- versatility</li> <li>- Durability</li> </ul>
Business Chamber	The CLEAN Network	<ul style="list-style-type: none"> <li>- Mini Grid pilots: 5 in urban and 5 in rural area (total 10 pilots)</li> <li>- Workshop on cooking meals for rural and urban population.</li> <li>- Exposure to Financing systems (MFIs &amp; RRBs)</li> </ul>
Policy Research	The Energy and Resources Institute (TERI)	<ul style="list-style-type: none"> <li>- Pilots in Bihar with the support from existing partner organization and district level energy entrepreneurs</li> <li>- Customization/ modifications in the product / business model based on pilot.</li> </ul>
Technology Research	National Environmental Engineering Research Institute CSIR – NEERI)	<p>NEERI can take up can take up pilots studies including</p> <ul style="list-style-type: none"> <li>- user perceptions</li> <li>- emissions monitoring including GHG burden reduced</li> <li>- Estimating health burden / daily avoided, cost saved and other aspects</li> </ul> <p>As we have enough expertise &amp; experience and pan India presence</p> <p>Further, approached would be:</p>

		<ul style="list-style-type: none"> <li>- Identify potential users based on food habits. This product may be suitable for commonly cooked foods like, rice, dal, biryani etc, areas where solid fuels are not available or costly</li> <li>- Instead of rural-urban this product acceptability will depend on affordability / economic status.</li> <li>- We need to clearly highlight advantages of this product as compared to what is available in market.</li> </ul>
Skill Council	Skill council for green jobs	<ul style="list-style-type: none"> <li>- Take up region wise pilots to assess food habits and also awareness.</li> <li>- Suggested to Collaborate for Developing training modules for eCooking for distributor and user</li> </ul>
Technology Research	Indian Institute of Technology (IIT) Delhi	<p>Suggesting two options for collaborations / support pilots:</p> <ul style="list-style-type: none"> <li>- TEG (Thermo Electric Generation) based biomass cookstoves</li> <li>- Piped biogas distribution to all homes in a village from a large biogas plant on charge basis (New Entrepreneurship Model)</li> </ul>
Policy Research	India Energy Storage Solar Alliance (IESA)	<ul style="list-style-type: none"> <li>- Pilots in villages with lower loads, but with existing micro Grids nearby.</li> <li>- Villages with existing Villages Energy Committees (VEC) where consumer is willing to pay</li> </ul>
Policy Research	Integrated Research & Action for Development (IRADe)	<p>Our Offers</p> <ul style="list-style-type: none"> <li>- Market Matching &amp; Documenting Pilots</li> <li>- Research to understand socio-economic acceptability, market potential assessment and roadblock in scalability</li> </ul>
Others	Others	<ul style="list-style-type: none"> <li>- Mini grids with surplus generation in an area where people pay for cooking fuel (ideally)</li> <li>- Pilot of EPC with and without battery</li> </ul>
Others	Others	<ul style="list-style-type: none"> <li>- Cooking Dairy trials to measure what people cooks, how they cooks and how much fuel an electricity they use</li> </ul>
Others	Others	<ul style="list-style-type: none"> <li>- Piloting EPC fuel stacking with LPG for 100% modern energy cooking</li> </ul>
<b>Solution and Assessment</b>		
Government Organisation	International Solar Alliance (ISA)	<p>Contribution ISA can offer:</p> <ul style="list-style-type: none"> <li>- In achieving the economy of scale by aggregating the demand from member countries.</li> <li>- Finding Innovative Financial Models</li> </ul>
Business Chamber	The CLEAN Network	<ul style="list-style-type: none"> <li>- Assessing Fuel stacking and cooking fuel prices in urban &amp; rural context</li> </ul>
Business Chamber	India Energy Storage Solar Alliance (IESA)	<ul style="list-style-type: none"> <li>- Under - utilisation of Micro grids due to low loads in the villages are suitable for pilot / deployment</li> <li>-</li> </ul>
Policy Research	Integrated Research & Action for Development (IRADe)	<ul style="list-style-type: none"> <li>- Business model development and assessment</li> </ul>
NGO	Non-conventional Energy and Rural Development (NERD) Society	<ul style="list-style-type: none"> <li>- Can associate in creating awareness on use of electric pressure cooking system</li> <li>- We suggest that MECS and other players to come up with a simple hassle free efficient solar cooking system / devices</li> </ul>
Others	Others	<ul style="list-style-type: none"> <li>- Women Livelihood through clean cooking mediums</li> <li>- Awareness Programme for usage of the clean technologies</li> </ul>

Others	Others	- Finance available for the consumer so that they can buy the product on easy term / repayment
Others	Others	- Rural level cooking competition with various cooking devices to showcase each products potential
Others	Others	- Induction cook stove powered by mini grid (Solar) - Transform one village at time to run purely on solar Grids (like smart Cities)
<b>Scale Up</b>		
	CLEAN	- Improvement in after sales and service channel - Awareness at Self-Help Groups (SHGs) level
	Others	- Provide us the specification of products consumption etc along with price etc. What is project cost if collaboration under make in India works

## Annexure 1: Inputs received from the participants

### INNOVATION AREAS FOR FOCUS



## PILOTS AND EVALUATION

# Pilots and Evaluation

**Issues of Electricity and Clean Cooking**  
Bhuvanathala, February 5, 2020, India Habitat Centre, New Delhi, India

**Pilots and evaluation**

Targeting under-utilized micro-grids

Project to test e-cooking effect on underutilized micro-grids

Innovative behaviour change campaigns to demystify the wide spread perception that e-cooking is not for rural markets

Incentive based one per use for cooking period 2 years

Targeted may support user trials/assessment

Innovative business model for technology and skill development

Maintenance ecosystem

Trained women can as distributor knowledge dissemination

- NEERI can take up pilot studies including

- success perceptions
- customer monitoring including OPEX and other related
- addressing health issues / DALYs avoided, cost avoid & other aspects

As we have enough expertise and experience (and PAN India presence)

NEERI

**TERS**

- 1) Pilot in action with the support from existing Partner organization & Govt level energy entrepreneurs
- 2) Customization/Modification in the Product / Business Model based on

Security potential users based on food habits. This product may be suitable for community used like Rice, Rice, hot Chapatti etc, avoid where solid fuel are not available or costly.

Method of Distribution: this product acceptability will depend on affordability/economic status.

Use need to check, highlight advantages of this product as compared to what is available in market.

NEERI

**People Characteristics**

- 1) Market matching
- 2) Documenting Pilot
- 3) Research to understand socio-economic acceptability, intellectual practical assessment and availability in scalability

**Plan**

- integrating user feedback (distributed)
- Co-facilitate feedback
- Incentives to women in SP
- Multiple locations

**Non-Governmental Energy and Rural Extension Society (NERES Society)**  
Gambhara  
Tamil Nadu  
www.neresociety.org

**Pilot**

EPC fuel stacking with LPG for 100% Modern Energy cooking.

**Pilot & Evaluation**

Costs: Capex to supply (flexibility)

- Affordability	- Economic (Energy)
- Scalability	- Efficiency
- Low operation	- Maintainability
- Safety	- Durability

NERES Society (NER) organizations can associate to, creating a network across states on the E Electric Promoting Cooking System

Women Livelihood through clean cooking mediums

Business program for usage of the Clean Technologies

"Cooking diary" trials, to research what people cook, how they cook, and how much and on what frequency.

NERES Society, Gambhara

No biggest amt, MECS and others players to come out with a simple, simple yet, efficient, Solar Cooking System device.

**Pilot**

Minigrid with surplus generation, in a area where people pay for cooking fuel (diesel)

- Pilot EPC, with a without battery.

**Pilots in Villages** IESA

with solar loads but with existing Mini-grid ready.

Villages with existing village Energy Committee who are willing to pay. (Chattisgarh)

Two options for

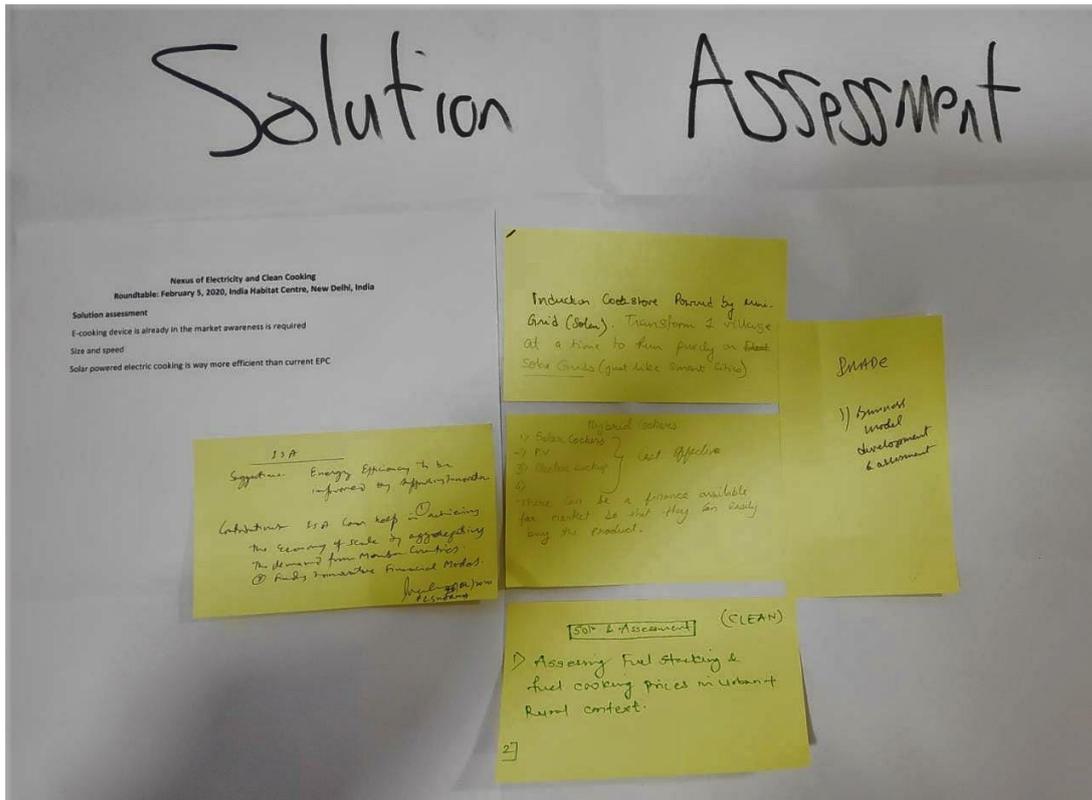
- 1) TE4 (Tubular Electric Ground based biomass Cook stove)
- 2) Pilot hinges distribution to all in a village for a (sustainable) (new Electric model)

Rural level Cooking Competition with various products, to assess local products potential

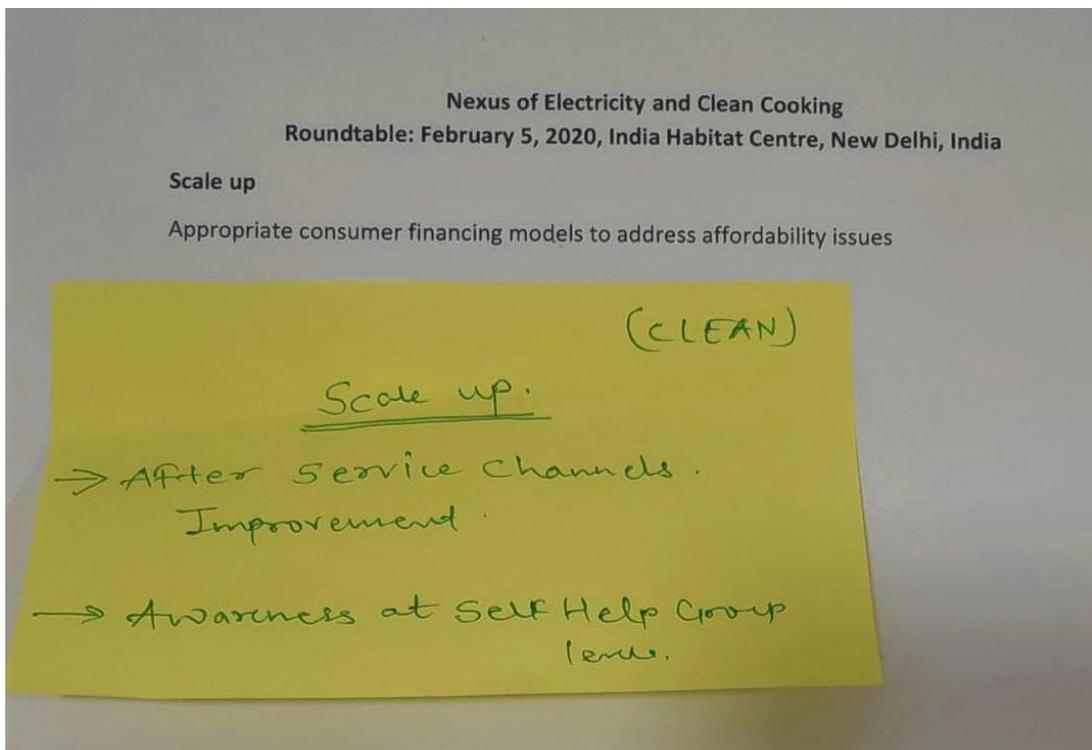
- 1) Pilot & Evaluation (CLEAN) Mini Grids - Pilots 7, Simran 10 pilots, 5 simran
- 2) Workshop on cooking meals for rural + urban population. MFIs + RRBs

PI and I give to my rural Complete specifications of products Consumption etc along with time etc. What is Project Cost? If Collaborate under motto in India workshop. Thesis: Int. C-App

## SOLUTION ASSESSMENT



## SCALE UP



## GLIMPSE OF THE EVENT



## Annexure 2: List of Participants

Type of Organisation	Organisation Name	Salutation	First & Middle Name	Last Name
Technology Research Organisation	Indian Institute of Technology (IIT), DELHI	Prof.	Virendra K	Vijay
Technology Research Organisation	Indian Institute of Technology (IIT),DELHI	Dr.	Vandit	
Technology Research Organisation	Council of Scientific and Industrial Research (CSIR)	Dr.	Nitin	Labhasetwar
NGO	Collectives for Integrated Livelihood Initiatives (CInI)	Mr.	bikash	sahu
Power company	NTPC Limited	Mr.	Rajan	Varshney
Policy Research Organisation	The Energy and Resources Institute (TERI)	Mr.	Manish	Pandey
Policy Research Organisation	IRADE	Mr.	Chandra	Kumar
PMC	Finovista	Mr	Vimal	Kumar
Business Chamber	Clean Energy Access Network (CLEAN)	Mr.	Nitin	Akhade
NGO	Non-conventional Energy and Rural Development Society, Coimbatore	Mr.	S	Inderjeet
Manufacturer	BURN, Manufacturing	Ms.	Jessie	Press-Williams
Manufacturer	SIMPLIFIED TECHNOLOGIES FOR LIFE	Mr.	Ritesh	Raithatha
Manufacturer	Greenway Grameen Infra Pvt Ltd	Mr.	Saanaee	Naik
Manufacturer	KrishnaArya Tech Corp LLP	Mr.	Siddharth	R Mayur
Manufacturer	TTK Prestige Ltd	Mr.	Jagdish	Khatana
Manufacturer	KrishnaArya Tech Corp LLP	Mr.	Dadasaheb	Shendage
Institution	Loughborough University	Dr.	Nick	Rousseau
Institution	Loughborough University	Mr.	Malcom	Bricknell
Institution	MECS Delivery Partner and University of Surrey	Prof	Matthew	Leach
Financial Institution	Export-Import bank of india(EXIM) BANK	Mr	Robin	Arya
Financial Institution	Export-Import bank of india(EXIM) BANK	Ms	Deepika	Pandey
Government Organisation	Telecom Centre of Excellence (TCoE) India	Cdr	Anurag	Vibhuti
Development Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)	Mr.	Florain	Postel

Technology Research Organisation	Council of Scientific and Industrial Research (CSIR)	Dr.	Meenakshi	Singh
Development Agency	Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)	Mr.	Jitesh	Kumar
Business Chamber	The India Energy Storage Alliance (IESA)	Ms	Suchitra	Subramanyam
Financial Institution	ex-State Bank of India	Mr.	Ranjit	Datta
Government Organisation	Skill Council for Greenjobs	Ms.	Praveen	Dhamija
Corporate Foundation	Social Alpha	Ms	Smita	Rakesh
NGO	Dharmalife Foundation	Mr.	Suryansh	Nagar
Business Chamber	Confederation Of New And Renewable Energy (CNRE)	Mr.	N.C.	Rajput
PMC	Finovista	Ms	Sheetal	Rastogi
PMC	Finovista	Mr	Adarsh	Kumar

### Annexure 3: Inputs received during previous interactions (on 5 Feb 2020 at New Delhi):

Organisation Type	Organisation	Suggestion
Manufacturer	Unesar Pvt. Ltd.	R- Grid Balancing, Off grid or mini grid F- Size and speed O- Thermal storage
Manufacturer	IIT Bombay	T- Require different approach; Entire ecosystem needs to be addressed
Manufacturer	Krishna Arya Tech	T- Integrated hybrid technology that can do much more than cooking we should work on a one stop solution R- Need for large pilots for shortlisted technologies across cooking practices geography and climate conditions. Research funding to gather data F- Viability gap funding for manufacturer at LIBOR and innovative financing for end user
Manufacturer	Envirofit Pvt. Ltd.	T- Thermal energy storage; role of phase change materials R- Cooking load analysis for different dishes cooked by a household
Manufacturer	Ecosense Appliances Pvt. Ltd.	F-Incentive based one per use for cooking period 2 years R- Electricity affordability to support users for next 2 years
Industry Association	CES/IESA	T-Targeting under-utilized micro-grids
Association in clean cooking	Clean Cooking Alliance	T- More energy efficient appliances appropriate for Indian Cooking. F- Appropriate consumer financing models to address affordability issues O-Intensive behaviour change campaigns to demystify the wide spread perception that e-cooking is not for rural markets
Corporate foundation	Tata Trust	T- Solar powered electric cooking is way more efficient than current EPC F- Tata trust may support user trials/assessment
Policy and tech research Organisation	TERI	R- Going beyond induction stove technology to design and demonstrate e-cooking technology; Affordable and technologically sound solar based e-cooking
NGO	Gram Oorja	R-Project to test e-cooking effect on underutilised micro-grids

Skill Council	Skill Council for Green Jobs	T- Low watt e- cooker T-Innovative business model for technology and Skill development T- Maintenance ecosystem
Research Partners	Barefoot College	O-Trained women can as distributor knowledge dissemination
Research Organisation	WEFT	T-EPC energy efficiency, cost, convenience and flexibility O- E-cooking is clean and convenient only if electricity is reliably available
German Development organisation	GIZ, India	T- Technical innovation should not change the behaviour of cook stove user, It should have minimal impact on existing cooking practice so as to make transition smooth
Expert	Individual Consultant	T- Mini grids utilization become more skewed O- E-cooking device is already in the market awareness is required
Others	Mohit Gupta	T-Awareness for public Product design as rural a rural product
Others	Pluss	O- Thermal Energy storage material can also be used



## Annexure 4: Feedbacks from the Workshop and Roundtable

S N	Type of Organisation.	Organisation	Participant Name	Area(s) of Expertise	Comments on what will help you to develop new clean cooking solutions.	Comments on Workshop - how can, we improve for future ones?	Comment on our Sandpit and other proposals in this document.	Any other suggestion , offers or requests.
1	MECS Programme	Loughborough University	Mr.Malcom Bricknell	Financial				
2	Government Organisation	Telecom Centre of Excellence (TCOE) India	CDR A Vibhuti	Not for profit	IOT solutions and Programme / Fund Management in India (large scale)	To benefit from carbon credits and have continuous feedback have monitoring feedback have monitoring IOT/ IOE devices fit in the devices		Wish all success
3	Government Organisation	Energy Efficiency Services Limited (EESL)	Mr. Ashish Jindal	Clean energy	The solutions should be financially viable technically usable in all application and can replace traditional ways of cooking effectively	With more of business models	NA	NA
4	Government Organisation	International Solar Alliance (ISA)	Mr. PC Sharma	Solar energy	Availability of some successful models	Very good		
5	Skill Council	Skill Council for Green Jobs	Ms. Praveen Dhamija	Biomass	Cooking solution should consider different lifestyle and food habits provide multiple options including electricity and also consider the paying capacity of consumer. Skilling and training is also important			
6	Business Chamber	Confederation of New & Renewable Energy (CNRE)	Mr. Ramesh Chand	Solar system	Need funds for projects			
7	Business Chamber	Confederation of New & Renewable Energy (CNRE)	Mr. NC Rajput	Thermal / photovoltaic (renewable energy)	Financial support to the Industry	Excellent		
8	Business Chamber	India Energy Storage Alliance (IESA) / Customized Energy Solutions(CES)	Mr. Suchitra S	Energy storage and electric vehicles	Guidance and a direction towards funding agencies	Improved clarity for roundtable sessions in. Advances		
9	Technology Research	National Institute of Solar Energy (NISE)	Mr. Senthil Kumar	Solar and thermal renewable energy	data is actually good realities and constraints	Research funding		
10	Technology Research	National Environmental Engineering Research Institute (CSIR - NEERI)	Mr. Nitin Labhsetwar	Cleaner energy, improved cook stoves, field evaluation	Already mentioned during panel discussion	Can be better structured Can cover a little wider perspectives	Provided on board	Thanks for inviting willing to work with in the field evaluations and other studies

11	Technology Research	Indian Institute of Technology Delhi (IIT Delhi)	Mr. Vandit Vijay	Biomass and bioenergy	Diverse cooking needs to be understood depending upon that we can demonstrate the power of product	Session should have more set agenda To get target inputs we should be informed		
12	Policy Research	Integrated Research and Action for Development (IRADe)	Mr. Chandra Shekhar Singh	Energy access	We will work in rolling out of pilots before that identifying the target market We can also support in doing research, development and scalable business.	It is a good programme that helps people from different background to come together and interact with each other		
13	Financial Institution	Cash Invoice	Mr. Mayank Joshi					
14	Financial Institution	Jigyasa Livelihood MFI	Mr. Manish kmalkho	Group loans to women	Livelihood promotion of rural areas Reduction in house kitchen accident and diseases			
15	Manufacturer	Simi Stoves Ltd	Mr. Arshdeep Singh	Manufacturing stoves	A greater exposure to the market demand			
16	Manufacturer	Baja Electricals Ltd.	Mr. Arup Chandra Dey	Consumer durable both domestic and kitchen appliances	Electric cook stoves Research and development support Designing support			How do we connect with MECS to take it forward
17	Manufacturer	Sistemio.bio	Mr. Atul Mittal	Biogas	Promote and disseminate new and hybrid biogas solutions to small farmers of South Asia	Request speakers to Present real core studies	Good luck	Stay connected
18	Manufacturer	Bajaj Electrical limited	Mr. Davinder Behal	Electrical and Non electrical consumer profiles	R&D support	Sound quality should be good		
19	Manufacturer	Krishna Arya tech Corp LLP	Mr. Sidharth R Mayur	Battery fuel cell clean cooking	We are in the field trial and funding, market access for the same will help	Make it more interactive		
20	Manufacturer	TTK-PRESTIGE	Mr. Jagdish Khatana	Marketing in Rural areas				
21	Manufacturer	Greenway Grameen Infra Pvt Ltd	Ms. Saanee Naik	Improved biomass cook stoves				
22	Manufacturer	BURN Manufacturing	Mr. Jessie Press-Williams	-Funding - manufacturing partnerships	Timing- felt rushed, need seating / adequate time for networking and post workshop reception	Need name tags with names and organisation	Sounds great	
23	Manufacturer	Sistemio.bio	Mr. Piyush Sohani	Bio gas	Funds to develop new cooking appliances facilities			
24	Manufacturer	Simplified Technologies for Life Pvt Ltd	Mr. Ritesh M Rathia	Manufacturing	Marketing and existing solar cooker	Continuous engaging of agencies & manufacturers Focus on all medium regardless of EPC	Good initiative looking forward	
25	Power Company	NTPC Limited	Mr. Rajan Varshney	Engineering				
26	Consulting - Carbon Credit	Climate - Secure Services	Mr. Rohit lohia	CC	Make clean cook more affordable by helping them secure the carbon			Look forward to seeing

					credits and revenue associated with them			initiatives in African region
27	Consulting	CSR consultancy services	Mr. Adil Firoze	Development sector	Not into developing solutions. Like to promote innovate solutions and implement			
28	NGO	Dharma Life Foundation	Mr. Suryansh Nagar	Clean cooking , clean water etc	Marketing budget to expand rural level cooking competition to help adoption of clean cooking solutions	Consumer financing to ease the burden of payment		
29	NGO	Non-conventional Energy & Rural Development (i.e. NERD) society	Mr. S Inderjeet	Promotion of biogas plants , biomass solar, water heating etc	We can help in creating awareness, importing training to field level through SHG in rural areas	Good		
30	NGO	Collectives for Integrated Livelihood Initiatives (CINI)	Mr. Bikash Sahu.	DRE	Collaboration, funding and scaling up	Time management	Interesting and will be useful in developing our proposal	NA
31	Expert – Finance	ex - State Bank of India (SBI)	Mr. Ranjit Datta	Finance				

## Annexure 5: Clean Cooking Background paper

# Modern Energy Cooking Services: Partnering with India



## 1. Executive Summary

This document sets out the case for the Modern Energy Cooking Services (MECS) programme to work with India on the development and implementation of cooking with electricity. This has the potential to save millions of lives across the world, both in India and in the MECS target countries in East Africa and South East Asia.

While much has been done to attempt to reduce deaths from household air pollution 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.

India is an ideal partner in this work as the agenda is of great importance with the need to reduce the deaths from household air pollution across the country and the dependency on foreign imports of LPG. India has already invested substantially in these challenges and the Government of India is now open to exploring new solutions. The Indian manufacturing, technology and research base as well as substantial trade relationships with African and Asian markets puts it in a unique position to benefit economically from the foreign as well as domestic need for clean cooking solutions.

The MECS programme has developed a Theory of Change around which a transformation programme can be built and our research into different cooking needs and solutions can complement your own research and drive the development of Indian-designed and manufactured solutions. To be effective, the programme will need to be wide-ranging and address both demand side, supply side and policy domains. We look forward to working with you to take this forward.

Building on two previous Round tables – one led by GIZ India and one by MECS in partnership with IRADe and CLEAN, on 26 February, we are organising a Round Table to discuss the shape of this programme and the role that different bodies can play.

## 2. The Modern Energy Cooking Services (MECS) programme

Globally, 3 billion people still cook with biomass, yet 2 billion of these now have access to electricity<sup>1</sup>. 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.

Modern Energy Cooking Services (MECS) Programme is funded by UK Aid through the Department of International Development (DfID) and represents a key example of the UK acting as a global thought leader. It is a partnership between researchers, innovators, policy makers, and ESMAP drawing on their 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 World Bank, UN, WHO and national Governments along with major financial institutions.<sup>2</sup>

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 2018<sup>3</sup>), contribute to climate change and cause loss of economic opportunity.

“Clean cooking must be a political, economic, and environmental priority, supported by policies and backed by investments and multi-sector partnerships. To make that kind of change, the level of commitment and the scale of investment matter. To that end, the World Bank’s Energy Sector Management Assistance Programme (ESMAP) has established a planned US\$500 million Clean Cooking Fund (CCF), with contributions from the Netherlands, Norway and the United Kingdom also support the Fund.”

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 now<sup>4</sup>. 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.

<sup>1</sup> Sustainable Energy for All, “SEforall.org,” 2019. [Online]. Available: <https://www.seforall.org/>.

<sup>2</sup> 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.

<sup>3</sup> 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].

<sup>4</sup> 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.

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 for this challenge fund is Electric Cooking Appliances (particularly pressure cookers) and their acceptance both to users and to those managing loads and delivery of grid and off-grid electricity.<sup>5</sup>

More details can be found on the website [www.mecs.org.uk](http://www.mecs.org.uk) and Appendix I shows the wide-ranging impact that could be achieved by a shift to modern energy cooking.



Figure 1. Research by the UK universities and innovators is laying the groundwork for a different approach to the enduring problem of cooking

### 3. The significance in India

India is a natural partner to MECS in the drive towards a global shift towards clean cooking given its substantial, innovation and manufacturing base, commitment and investment from the top of the Government of India to bring the many benefits of clean cooking to the Indian population, and the expertise and research that has already been invested in the search for solutions.

While there is considerable experience both within India and elsewhere of gas-based cooking with its strengths and challenges, we see 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 benefit of creating a substantial base load that creates increased revenue generation opportunities and improved return on investment prospects.

We see the potential for a great many benefits from establishing a long-term partnership between the MECS Programme and India – its Government, leading institutions and business community. We believe that this could make a huge difference towards achieving the transition from biomass to clean

<sup>5</sup> 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.

cooking on a global scale.

In particular:

- The investments and support that the Government of India has already put into driving the transition for its population to clean cooking and solar PV shows its understanding of the importance of this and provides an excellent basis for developing a Government-Government partnership focused on clean cooking;
- There are tremendous business opportunities for Indian companies with the right cooking devices and business models, in the energy sector and investors that support both of these – both within India’s own domestic market and across the many countries with which the MECS programme is working;
- The considerable research and policy development support provided by a number of India’s leading institutions and policy think-tanks demonstrates the potential for sharing experiences, learning and methodologies with the MECS programme partners;
- The support initiatives that the MECS Programme and its partners – ESMAP, Clean Cooking Alliance, the UN, CLASP – are putting together and offering to interested companies compliments well the programmes already in place run by Indian institutions that can be extended to include a focus on clean cooking.

In December 2019, we attended a round table on Solar PV cooking for India. At this, we learnt that PM Modi has specifically instructed the PSA to identify how cooking with solar PV could become a reality for the Indian population. There is clearly a shift taking place in thinking, at the top of Government of India making this an ideal time to engage.

*“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**

In this regard, we are organising a Workshop and Roundtable on 26 Feb 2020, at India Habitat Centre (IHC), New Delhi, A complete plan with expected outcome and Agenda are provided in Annexes 1 and 1.1.

MECS programme is active engaging in India since December 2019 and part of the two Roundtable, details as under:

- MECS programme team visited India during first week of and met with the several key stakeholders in the country. Further, also attended a “Roundtable Discussion on Solar for Cooking”, organised by the GIZ India and The Clean Network on Dec 3, 2019 at New Delhi. This roundtable was attended by the dignitaries from the Office of PSA, MNRE, MECS Programme, Researcher, Policy Think Tank, Manufacturer, Franchiser and Experts. During the discussion, Govt officials has highlighted that the great need to the Solar PV cooking and happy to pilot the devices with ideal costing range is INR 50,000. A Minutes of the Meeting is **Annexure 2**
- Modern Energy Cooking Services (MECS) programme and Integrated Research & Action for Development (IRADe) has again hosted roundtable on “Nexus of Electricity and Clean Cooking” on February 5, 2020 at New Delhi, in side-line of India Energy for All Summit 2020. This was conducted in collaborate with the Clean Energy Access Network (CLEAN). A wide variety of participants have attended the roundtable such as Manufacturer, service provider, Corporate Foundation, International Development Agency, Think-tank body, Industry Association, Financial Institution etc. The round table was structured from the prospective of manufacturer’s and Support Agencies

and requested their need and offering to support the Clean Cooking in the areas of research, technology, Finance and other suggestions. A Minutes of the Meeting is expected to be released by the organiser shortly however we have summarised inputs provided by the participants in a Sticky note, in **Annexure 3**

## 4. What solutions are we focused on?

Essentially, we are arguing that a focus on cooking powered by electricity (however generated and delivered) is both feasible and offers huge benefits due to its ability to benefit from 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, especially if the ones currently on the market can be modified or enhanced. These are devices that have achieved very substantial take-up in Western markets and these are becoming saturated. The markets offering the best prospects of growth are now in Africa and Asia.

## 5. Why focus on cooking with electricity?

In 2018 the number of people without electricity access fell to 860 million. However, 80% of those who gained access are concentrated in Asia<sup>6</sup>. Sub-Saharan Africa has major challenges, but nevertheless is making gains.

The increase in grid and off-grid capacity has been significant over the last few years and created contexts whereby the idea of electric cooking could be considered. Indeed, its affordability particularly in urban areas suggests an easy gain in the challenge of clean cooking.

By 2025, Africa's population is projected to exceed that of both India and China<sup>7</sup>. The African Renewable Energy Initiative (AREI) plans to develop at least 10 GW of new renewable energy generation capacity by 2020, and at least 300 GW by 2030<sup>8</sup>.

According to a recent World Bank report about half a billion people in Africa and Asia could be cost-effectively supplied with electricity through mini-grids<sup>9</sup>. Mini-grid models are evolving, from providing only basic electricity services for households, to providing electricity services for income-generating activities.

In 2010, building on mature solar and mobile money technologies there were a number of start-ups offering a new generation of solar home systems (SHS) to remote rural markets with sustainable, affordable and safe electricity on market terms, generally using Pay as You Go business models. However, the resilience of current PAYG business models is still undecided. The acquisition of new customers is a significant expense, and to get the return based on a low load consumption of a simple light makes profitability challenging.

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<sup>6</sup> <https://www.iea.org/reports/sdg7-data-and-projections>

<sup>7</sup> Africa Energy Outlook 2019 - <https://www.iea.org/reports/africa-energy-outlook-2019#overview>

<sup>8</sup> [http://climateinitiativesplatform.org/index.php/Africa\\_Renewable\\_Energy\\_Initiative](http://climateinitiativesplatform.org/index.php/Africa_Renewable_Energy_Initiative)

<sup>9</sup> Mini Grids for Half a Billion People : Market Outlook and Handbook for Decision Makers - <https://openknowledge.worldbank.org/handle/10986/31926>

There is then the prospect of integration between the three modes of electrification – stand-alone systems, mini-grids and grid, unlocking 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.

## 6. What devices and cooking systems show potential?

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. 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.<sup>10</sup>

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.

According to two market reports we have reviewed, globally in 2018, 93,883 pressure cookers were sold generating US\$4,477m (growing steadily year on year from US\$3,656m in 2014). Sales of Multicookers meant that in 2018, the global market reached a value of US\$578.3m growing at a CAGR of 10.9% during 2011-2018. Looking forward, they expect the global multi cooker market to reach a value of US\$1,049.7m by 2024, exhibiting a CAGR of 10.2% during 2019- 2024<sup>11 12</sup>.

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.

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<sup>10</sup> [S. Batchelor, E. Brown, N. Scott, J. Leary Experiences of Electric Pressure Cookers in East Africa?](#)

<sup>11</sup> <https://www.marketresearch.com/IMARC-v3797/Multi-Cooker-Global-Trends-Share-12352720/>

<sup>12</sup> <https://www.marketresearchnest.com/Global-Pressure-Cooker-Market-Research-Report-2019.html>

While commonly available Electric Pressure Cookers are highly energy efficient, being generally rated at 1kw, they do potentially place an excessive load on a 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. 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.

A forthcoming policy report<sup>13</sup>: Electric Cooking: Needs, Challenges and Ways forward provides further evidence of the relevance of electric cooking to India with recent research and policy recommendation.

Appendix II goes into much more detail on the research evidence that underpins this.

## 7. Resources the MECS Programme can offer

MECS partnership also includes research partners from across the UK, with extensive experience across a broad range of key research themes that will support our transition away from a business as usual approach. The research focuses on:

- developing genuinely clean, efficient cooking technologies and energy storage options;
- providing full life cycle analysis that captures and defines costs and the characteristics of the supply side, including second life or end of life use, recycling or safe disposal of electrical appliances;
- understanding consumer culture - understanding consumer culture, demand and the social drivers for modern energy cooking services choices;
- building local capability to absorb ongoing innovations and adapt the new knowledge to different contexts and needs;
- generating evidence on other drivers for transition including understanding and optimisation of multi-fuel use;
- establishing the evidence base to support policy environments that can underpin a pathway to scale and support well understood markets and enterprises

Resources developed by the MECS Programme could be adapted to the Indian context or developed in partnership with Indian institutions:

- A comprehensive Theory of Change on which a country strategy can be built
- Economic studies of the impact of policies such as tariffs on adoption
- Modelling the impact of cooking with electricity on load profiles and demand management requirements
- Challenge Fund grants to support Research and Development
- Partnerships with institutional investors and other financial institutions to support business scale-up, including a framework to enable carbon trading facilitated by eCooking device automated monitoring
- Technology development – prototyping devices, monitoring systems, integration of cooking systems into wider energy access

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<sup>13</sup> ESMAP forthcoming March 2020.

- Market analyses including our work with ESMAP on the use of a multi-tier framework to build a realistic picture of electricity access
- Research methodologies to enable in-depth understanding of cooking cultures, device preferences of cooks and the energy usage implications.
- Frameworks for understanding the “innovation ecosystem” that can support change

## 8. The MECS Theory of Change

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 place<sup>14</sup>.

This advises that the ground needs to be laid with the following:

- Stakeholder engagement
- Policy overview
- Comparative pricing of alternatives
- Market segments
- Discrete choice modelling
- Cooking Diaries

In terms of an action programme, the following are the key strands:

- Consumer Awareness
  - Aspiration – making eCooking aspirational for all
  - eChef recipes – reflecting the local cooking culture
  - Mixed media promotion – diverse routes to consumers including use of ambassadors
- Value Chain – ensure all links in the chain are in place
  - Investment finance
  - Components, assembly, spares..
  - Consumer finance
  - Marketing
  - Support, help centre, maintenance
- Policy enabling environment
  - Access to modern energy – facilitated by the addition of eCooking load
  - Import tariffs and facilitation for overseas suppliers in the value chain
  - Job creation and skills development
  - Specific/general finance
  - Public good focus – gender, health, child welfare, climate change
  - Waste disposal

## 9. Stimulating the drive to solutions

As well as these enabling strands that will drive the creation of an effective market, there needs to be support for the research and innovation that is required to identify viable eCooking solutions –

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<sup>14</sup> [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.](#)

whether adapted/enhanced Electric Pressure Cookers or more custom built devices/systems for different contexts and needs.

There are many devices already on the market that might be applicable to eCooking for users on weak or off grid situations. The current Global LEAP Award is inviting companies already making Electric Pressure Cookers to submit their models for testing.

Some of these may still need some additional support to ensure they do not overload a minigrid or, if used at scale present too much load for a grid.

We also believe there is scope for more fundamental innovation and the design and development of new solutions that are optimized for different energy and cooking contexts and needs. A key focus for the MECS in India programme will be to stimulate and support innovation that will solve the need to enable eCooking to take place across the variety of contexts you have in India and also create products that would be effective in foreign markets.

Appendix III discusses some areas where we see particular innovation opportunities.

The aim, therefore, is to support companies at different stages in device design and development, so that we can create a “pipeline” of new products that are developed and tested, and supported to enter the market.

The table below summarizes this:

Stage	Support
Initial idea, conception, feasibility assessment	Innovation briefings, sandpits, hackathons, networking, matchmaking and support voucher, challenge fund for market study, introductions to UK companies/specialists
Prototype development and testing	Challenge fund and Indian Govt support for R&D, Newton-Bhabha funding, manufacturing coaching
Existing product requiring some modifications/integration	Challenge fund and Indian Govt support for R&D, Newton-Bhabha funding, Piloting. Global LEAP Award.
Viable product trials	Piloting. Global LEAP Award.
Proven solution rollout	Market intel and access, export finance. Scaling up support. Global LEAP award.

## 10. Towards a Programme with India

Our discussions to date show that there are a great 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.

Key Strands/roles will include:

- 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
- Device and wider solution assessment to set criteria and establish which have potential and could be piloted – we would expect to find some existing products that could be piloted with minor adjustments
- 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

The Round Table that is to take place on 26 February will review the above options and proposals and seek to establish individuals and organisations who can lead, finance or otherwise contribute to the agreed strands of work.

## Appendix I: Potential impact of the achieving a shift to clean cooking

In terms of the Sustainable Development Goals, the achieving the shift to modern energy cooking that we are seeking has far-reaching consequences. Enhanced access to Modern Energy Cooking Services (MECS), as a key part of SDG 7, can significantly help strengthen progress across a range of other SDGs (Figure 1):

- **SDG 1 No Poverty.** Clean cooking is part of the basic services necessary to lead a healthy and productive life and saves households time and money.
- **SDG 2 Zero Hunger.** Efficient cookstoves reduce the amount of fuel needed to cook, thus reducing the burden on families who would otherwise have to collect it, buy it, or trade their food for it.
- **SDG 3 Good Health and Well-being.** Reducing smoke emissions from cooking decreases the burden of disease associated with household air pollution and improves well-being, especially for women and children.



**Figure 1 : Access to MECS as a Key Part of SDG 7 across other SDGs**

- **SDG 4 Quality Education.** Children, particularly girls, are often kept out of school so that they can contribute to household tasks, like cooking and collecting fuel.

- **SDG 5 Gender Equality.** Unpaid work, including collecting fuel and cooking, remain a major cause of gender inequality.

- **SDG 8 Decent Work and Economic Growth.** Energy access enables enhanced productivity and inclusive economic growth. The clean cooking sector offers many job opportunities.

- **SDG 11 Sustainable Cities and Communities.** Clean cooking addresses household and ambient air pollution, resource efficiency, and climate vulnerability.

• **SDG 13 Climate Action.** Up to 25% of black carbon emissions come from burning solid fuels for household energy needs<sup>15</sup>. Clean cooking solutions address the most basic needs of the poor, while also delivering climate benefits.

- **SDG 15 Life on Land.** Up to 34% of woodfuel harvested is unsustainable<sup>16</sup>, contributing to forest degradation, deforestation, and climate change.

The recently published SDG7 Tracking Report<sup>17</sup> shows that, despite advances on other SDG7 targets, there is little progress on improving access to clean cooking fuels and technologies. In particular, the annual access growth rate during 2014-2016 did not keep pace with population growth, thus resulting in an increase in the absolute global deficit in access to clean cooking.

<sup>15</sup> <https://www.who.int/sustainable-development/LR-HAP-27May2016.pdf?ua=1>

<sup>16</sup> Bailis, R.; Drigo, R.; Ghilardi, A.; Masera, O. The carbon footprint of traditional woodfuels. *Nat. Clim. Chang.* **2015**, *5*, 266–272.

<sup>17</sup> <https://www.irena.org/publications/2019/May/Tracking-SDG7-The-Energy-Progress-Report-2019>

## Appendix II: Evidence of the potential feasibility of cooking with electricity and Electric Pressure Cookers in particular

### **The Rationale for a focus on electricity**

In 2018 the number of people without electricity access fell to 860 million. However, 80% of the those who gained access are concentrated in Asia<sup>18</sup>. Sub Saharan Africa has major challenges, but nevertheless is making gains.

The increase in grid and off grid capacity has been significant over the last few years and created contexts whereby the idea of electric cooking could be considered. Indeed, its affordability particularly in urban areas suggests an easy gain in the challenge of clean cooking.

**Providing universal access to affordable, reliable, sustainable and modern energy for all is not going to be easy.** By 2025, Africa's population is projected to exceed that of both India and China<sup>19</sup>. The African Renewable Energy Initiative (AREI) plans to develop at least 10 GW of new renewable energy generation capacity by 2020, and at least 300 GW by 2030<sup>20</sup>.

While grid extension-based electrification has long been perceived as the reference model in developing economies, private sector is spearheading the design of innovative electricity supply models based on off-grid technologies. According to a recent World Bank report about half a billion people in Africa and Asia could be cost-effectively supplied with electricity through mini-grids<sup>21</sup>. These solutions hold the potential to successfully address peri-urban and rural contexts that are characterised by limited, sparse demand as well as lower ability to pay among customers. The World Bank is working on 37 mini grids projects in 33 countries, with a total commitment of more than \$660 million, with an expected additional \$1.1 billion in co-financing<sup>22</sup>. Mini-grid models are evolving, from providing only basic electricity services for households, to providing electricity services for income generating activities.

In 2010, building on mature solar and mobile money technologies there were a number of start-ups offering **a new generation of solar home systems (SHS) to remote rural markets with sustainable, affordable and safe electricity on market terms.** Most of these started by providing basic lighting and phone charging utilising the system as a service with prepaid mobile payments or on a pay-as-you-go (PAYG) basis. The role of mobile money was to enable companies to reduce the costs associated with bill recovery in remote rural areas, while maximising affordability and responding to the customers need to pay by small regular payments. According to GOGLA, Sub-Saharan Africa is the major market for SHS and East Africa represents 63% of the total sales by volume - 300,000 units<sup>23</sup>.

In cash sales of PAYG devices generally, India remains the largest cash market with 1.2 million units for \$58 million value with Kenya buying 450,000 units<sup>24</sup>. The resilience of current PAYG business

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<sup>18</sup> <https://www.iea.org/reports/sdg7-data-and-projections>

<sup>19</sup> Africa Energy Outlook 2019 - <https://www.iea.org/reports/africa-energy-outlook-2019#overview>

<sup>20</sup> [http://climateinitiativesplatform.org/index.php/Africa\\_Renewable\\_Energy\\_Initiative](http://climateinitiativesplatform.org/index.php/Africa_Renewable_Energy_Initiative)

<sup>21</sup> Mini Grids for Half a Billion People : Market Outlook and Handbook for Decision Makers - <https://openknowledge.worldbank.org/handle/10986/31926>

<sup>22</sup> <https://www.worldbank.org/en/news/press-release/2019/06/25/mini-grids-have-potential-to-bring-electricity-to-half-a-billion-people>

<sup>23</sup> [https://www.gogla.org/sites/default/files/resource\\_docs/global\\_off-grid\\_solar\\_market\\_report\\_h2\\_2018\\_opt.pdf](https://www.gogla.org/sites/default/files/resource_docs/global_off-grid_solar_market_report_h2_2018_opt.pdf)

<sup>24</sup> Ibid

models is still undecided. The acquisition of new customers is a significant expense, and **to get the return based on a low load consumption of a simple light makes profitability challenging.** Nonetheless, the sector keeps growing and servicing previously unelectrified people at a fast pace.

**There is then the prospect of integration between the three modes of electrification – stand-alone systems, mini-grids and grid.** This should also integrate climate change and environmental factors and forecasts. Mini-grids and stand-alone systems are crucial solutions to deliver initial electricity access relatively faster than grid-based solutions. They can unlock latent community demand for sustainable electricity.

**Mitigating upfront payments.** 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. The requirements are to mitigate the upfront cost of devices to the consumer. Utilities, 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. The same is true for off-grid solutions including mini grids and solar home systems. However, in the case of these latter options, the developer themselves need finance to mitigate the upfront capital expenditure of investment in renewable energy, with enough flexibility in terms of debt, equity or grant financing that they can pass the benefits on to the consumer in terms of mitigating the household upfront expenditure on appliances.

**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.**<sup>25</sup> By inclusion in planning for larger projects, clean cooking could leverage long-term loans associated with a special purpose vehicle (SPV), typically involving guarantees, loans and project bonds. Auctions have brought the costs of development and construction of RE down, the availability of a feed-in-tariff has been a win-win for development of distributed electric generating capacity based on RE, tax incentives have enabled greater revenue generation. A key point is that as renewable energy investments grow over the coming ten years, clean cooking has an opportunity to leverage such larger investments and to use power purchase agreements to bridge the current shortfall in SDG7 clean cooking requirements.

Within this context **load management for cooking needs to be deeply embedded in all planning of electrification.**

### **What cooking devices show potential on electric pressure cookers?**

The typical electric appliance found in retailers in sub Saharan Africa and Asia, is a hotplate. The cheaper hotplates have a heating element exposed to the air, and a pan sits on top of it. The heat transfer between hotplate and pan has considerable losses, and for this reason some people suggest induction stoves. While induction stoves improve the heating up of the pan, the sides of the pan still radiate heat, and for longer term cooking such as simmering beans for an hour or more, the losses are considerable.

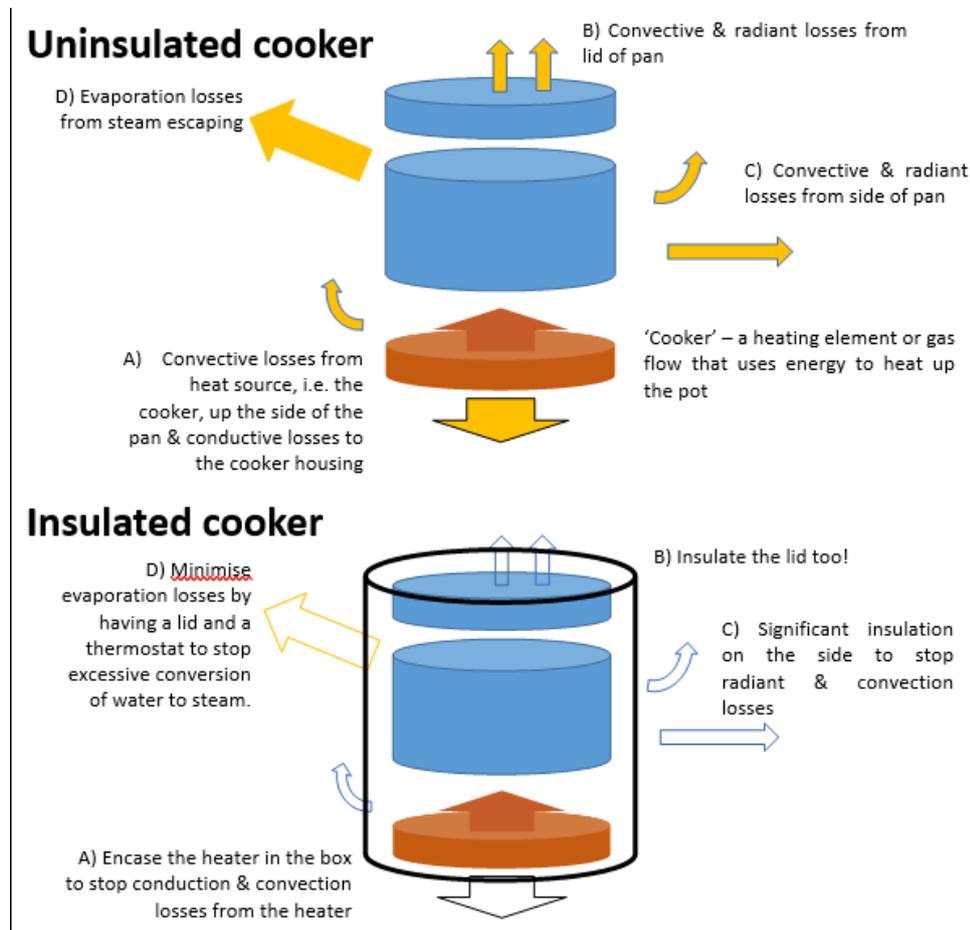
Batchelor et al<sup>26</sup> explain that unlike other cooking fuels that rely on combustion, electricity does not need air flow to create heat. It therefore opens up the possibility of the food being cooked in a highly insulated environment. This principle is used in many popular electric cooking appliances, such as rice

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<sup>25</sup> [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.](#)

<sup>26</sup> [S. Batchelor A Talukder, R Uddin, S K Mondal, S Islam, R Redoy, R Hanlin and M. Rezwan Khan; “Solar e-Cooking: A Proposition for Solar Home System Integrated Clean Cooking,” \*Energies\*, vol. 11, no. 11, p. 2933, Oct. 2018.](#)

cookers, slow cookers and thermo pots. Having raised the temperature of the device to the cooking temperature, the insulation reduces heat loss, meaning that little to no extra energy is required to continue to cook the food (see Figure 3). Indeed this is the basis of the ‘fireless’ cooker, sometimes called Wonderbag or Lindamoto. A pot of beans, for instance, is cooked for some minutes to remove toxins, and then taken off (any) stove and placed in the fireless cooker. With the highly insulated bag keeping the temperature high, the beans continue to cook – thus saving fuel.



**Figure 3: Heat loss mechanisms mitigated by insulating the cooking pot and heating device. Adapted from Batchelor et al.<sup>27</sup>.**

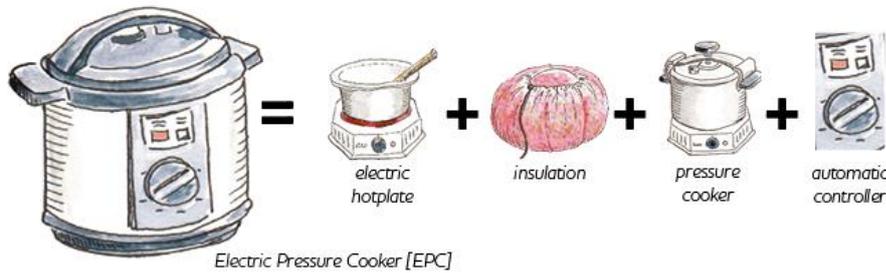
Whilst rice cookers are also insulated and automated, they are not sealed and their control system is much simpler, merely dumping full power into the pot until all the water has been vaporised. However, they are much more useful than their name suggests, as one participant noted: “I have learnt that rice cookers are badly named – they can cook so much more than rice!” It should also be noted that because of the insulation, ‘full power’ on a rice cooker is generally much lower than on a hotplate, which has important implications for systems where peak power is a constraint, such as battery-supported cookers or mini-grids.

In addition to minimising heat losses through insulation, the Electric pressure cooker (EPC) adds the option to pressurise. This raises the boiling point of water and enables the food to be cooked faster. Figure 5 shows that after the initial pressurisation, the hotplate in an EPC only comes on periodically to maintain the temperature in the sealed environment inside and resulting in considerable energy savings. As Prof. R. Khan states: “it is temperature that cooks food, not energy per se”<sup>28</sup>. The EPC (or

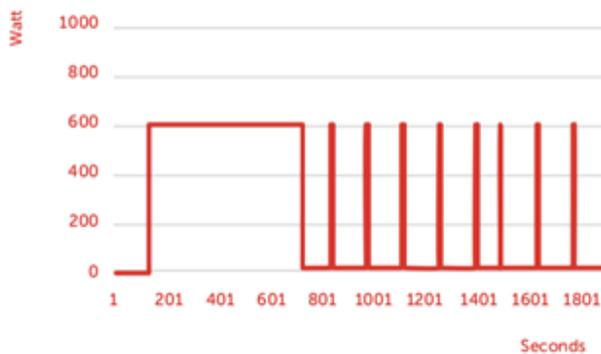
<sup>27</sup> ibid

<sup>28</sup> ibid

multicooker) simply combines an electric hotplate, a pressure cooker, an insulated box and a fully automated control system (Figure 4)

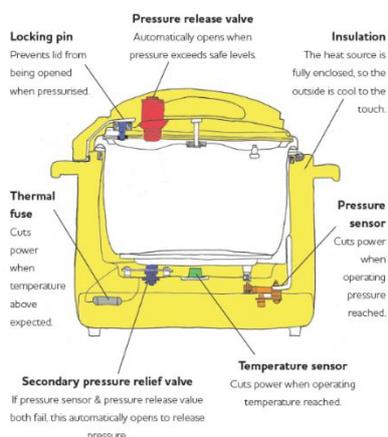


**Figure 4: The fundamental components of an EPC.**



**Figure 5: Typical load profile for a 700W rated EPC on a half hour cooking cycle<sup>29</sup>**

As stated above, the EPC goes further by pressurising the system; during this stage the boiling point of water is raised up from 100°C to around 120°C. The increased temperature enables the food to cook faster, resulting in shorter cooking times and therefore reduced energy consumption. ‘Manual’ stove-top pressure cookers (heated by charcoal and gas) are common in East Africa, although their safety is of concern to many users. EPCs integrate an array of safety and control features, offering multiple redundancies if any one were to fail (see Figure 6). It controls the energy input into the device, such that the cook can walk away and leave the device cooking autonomously.



**Figure 6: Automatic control and safety features of a typical EPC<sup>30</sup>.**

<sup>29</sup> T. Couture and D. Jacobs, “Beyond Fire: How to Achieve Electric Cooking,” HIVOS & World Future Council, 2019.

<sup>30</sup> J. Leary *et al.*, *The Kenya eCookBook: Beans & Cereals Edition*, no. September. Nairobi, Kenya: Available from: [www.MECS.org.uk](http://www.MECS.org.uk), 2015.

While the sealed environment has a positive effect on energy consumption, the sealed, blind, nature of pressure cooking can make inexperienced cooks nervous. They believe that more stirring is required, or they need to see the food to make sure it is cooking, or has not overcooked. Such responses hold back many cooks from utilising the EPC. In fact, much less stirring is needed, as no water escapes from the sealed environment during pressure cooking and the temperature is automatically limited to 120°C, so it is almost impossible to burn the food. In the data below we identify whether these beliefs are an insurmountable barrier to using EPCs in East and Southern Africa or whether the other benefits might outweigh this particular challenge.

### **A short review of other cooking devices on the market<sup>31</sup>**

The global **slow cooker** market was valued at over \$1.2 billion in 2014. Jarden, whose slow cooker from Crock-Pot sold more than four million units in 2014. The market for slow cookers has grown as they offer additional benefits compared to a traditional pressure cooker at a lower price than a multicooker. While multicookers are priced between \$80 and \$350, slow cookers can be purchased in the price range of \$50-\$220.

A comparison of slow cookers and EPCs shows...

**Slow cookers** - Slow, even heating traps the moisture of the food product, so usually there's no need to add water. The appliance is temperature controlled, and you're not supposed to take the lid off during cooking, so little supervision is required. It is typical that meals in a slow cooker take approximately four hours on high heat or six to eight hours at a lower temperature.

- Slow Cooker Pros
  - Preferred for “low and slow” recipes like beans and gravies where longer simmering or stewing adds flavour. (Beans don't even necessarily need to be soaked first like they would if you're using a multicooker.)
  - Deemed the ultimate “set it and forget it” cooking appliance.
  - Preferred for making party food because it can be kept warm for a long period of time.
- Slow Cooker Cons
  - There are fewer functions (though certain late models have a sear function).
  - Though they don't need to be tended to, it might not be the best idea to leave them on all day when no one is home.
  - Meal prep still requires planning. For instance, if you forget to put the ingredients in the pot before you leave the house or before you go to sleep, there's no fast fix to the meal.

**Multicooker** - This is the next evolution of the pressure cooker, and it does many things, including slow cooking, pressure cooking and rice cooking. The pressure function works with steam heat (achieved by heating water to 30 degrees over the boiling point) and yes, pressure — measured in pounds per square inch (PSI). These cookers also perform other functions like searing, sautéing, making cakes

- Multicooker Pros
  - Extremely versatile, performing all the cooking steps that used to require a stovetop and oven.

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<sup>31</sup> <https://www.hormelfoods.com/inspired/story/the-debate-slow-cookers-vs-multicookers/>

- It can accomplish formerly hands on tasks, like sautéing, with the push of a button.
- Can make multiple dishes at the same time with “pot-in-pot cooking.”
- The pressure setting cooks food much faster than any conventional cooking method.
- Multicooker Cons
  - There is a learning curve to mastering the multifunction cooker; many believe they need a science lesson before they can cook with it.
  - It has a heating element only at the bottom instead of around the perimeter like slow cookers do.
  - You can’t see or taste the food during the cooking process.
  - While it can sear, sauté and steam, it cannot replace the flavour gained from a grill.

### The global market for EPCs

We have investigated the latest reports on the EPC market, globally, in order to understand how the markets we are focusing on in Asia and Africa compare, and to draw lessons from the experience of Western markets. EPCs can also be referred to as Multicookers. Two reports have been drawn on:

- Multi Cooker Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2019-2024 - IMARC Group<sup>32</sup>
- Global Pressure Cooker Market Research Report – Market Research Nest<sup>33</sup>

They define the devices, geography, etc. differently, hence their findings are not entirely consistent.

According to the Pressure Cooker report, in 2018, 93,883 pressure cookers were sold generating US\$4,477m (growing steadily year on year from US\$3,656m in 2014). According to the Multicooker report, in 2018, the global multi cooker market reached a value of US\$578.3m growing at a CAGR of 10.9% during 2011-2018. Looking forward, they expect the global multi cooker market to reach a value of US\$1,049.7m by 2024, exhibiting a CAGR of 10.2% during 2019- 2024.

The split of market share growth figures in each report are:

Region	Pressure Cooker market share 2018 - %	Pressure cooker latest annual growth - %	Multicooker market share 2018 - %	Multicooker projected growth to 2024 - %
North America	15	7	45	9
Europe	17	5	26	11
Asia-Pacific	61	5	20	12
Middle East and Africa	3	9	5	11
South America	3	6	4	11

Of the pressure cookers sold, 89% were Electric Pressure Cookers (up from 87% in 2014 – so EPCs are increasing in popularity), and 87% were for home use, rather than commercial. The Multicooker report finds 71% of multicookers are for home use.

### Independent assessments of Electric Pressure Cookers and evidence of their take-up

<sup>32</sup> <https://www.marketresearch.com/IMARC-v3797/Multi-Cooker-Global-Trends-Share-12352720/>

<sup>33</sup> <https://www.marketresearchnest.com/Global-Pressure-Cooker-Market-Research-Report-2019.html>

Assessments of the future market potential for EPCs/multicookers from these reports and elsewhere<sup>34</sup> include:

#### Drivers for take-up

- Healthier eating
  - The increasing instances of obesity are making consumers more conscious about their health and dietary habits, encouraging them towards new cooking and healthy living practices. Consumers are now incorporating healthy eating practices and shifting from junk food to home cooked food.
  - Because of the cooking approach, vitamins and minerals are not leached (dissolved) away by water, as they would be if food were boiled in large amounts of water. Due to the shorter cooking time, vitamins are preserved relatively well during pressure cooking.
- Cooking at home
  - Increasing consciousness of the high calorie and fat content in foods served at restaurants is also driving people to enjoy home-cooked meals. Multi-cookers have the potential to bridge two conflicting desires: preparing meals from “scratch” and making meal preparation as fast and painless as possible.
  - Consumers overwhelmingly say that cooking a meal from scratch at home is their preferred approach to food preparation. According to Global Data’s 2018 Q3 survey, 74% of consumers globally and 66% in the US see this as preferable to eating prepared or packaged meals at home, ordering meal delivery, or eating at a restaurant or other foodservice operation.
  - Most at-home dinners are still made from scratch, but this trend has declined in recent years because consumers do not have the time to prep ingredients and prepare homemade meals, according to NPD Group.
- Versatile
  - The electric pressure cooker is an upgraded product of the traditional pressure cooker and rice cooker. It combines the advantages of the pressure cooker and the rice cooker to completely solve the safety problem of the pressure cooker and relieve the safety hazards that the ordinary pressure cooker has plagued consumers for many years.
  - Multi cookers are used for several applications like boiling, simmering, baking, frying, deep frying, grilling, roasting and steaming. Besides this, they can also be utilized for warming, reheating or cooking food at different time intervals.
  - Due to the convenience provided by multi cookers, they are gradually replacing kitchen appliances like pans, ovens, stoves, microwaves, deep fryers and bread-makers.
- Efficient use of water, energy and time
  - Pressure cooking requires much less water than conventional boiling, so food can be ready sooner. Using more liquid than necessary wastes energy because it takes longer to heat up; the liquid quantity is stated in the recipe. Pressure cookers can use much less liquid than the amount required for boiling or steaming in an ordinary saucepan. It is not necessary to immerse food in water. The minimum quantity of water or liquid used in the recipe to keep the pressure cooker filled with steam is sufficient.
  - Less energy is required than that of boiling, steaming, or oven cooking.
  - Since less water or liquid has to be heated, the food reaches its cooking temperature

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<sup>34</sup> <https://www.hormelfoods.com/inspired/story/the-debate-slow-cookers-vs-multicookers/>  
<https://www.cnbc.com/2018/11/26/how-instant-pot-became-a-kitchen-appliance-with-a-cult-following.html>  
<https://www.retail-insight-network.com/comment/multicooker-trend/>  
<https://www.kerry.com/insights/kerrydigest/2019/easier-faster-better-appealing-to-the-instant-pot-consumer>

faster.

- As the number of working members in the families rises, people are increasingly opting for time-saving electric appliances for their kitchen. [1] [SEP]
- Though people are cooking more frequently, there is a trend of cutting corners. Of the Americans who cook at home, 75% invest in electric appliances that help in saving time and require low maintenance.
- Peer pressure and word of mouth promotion
  - The online sales of Instant Pot are largely fuelled by the word-of-mouth marketing strategy.

**Consumers want home-prepared, fresh and healthy food without the hassle of investing time and effort into actually preparing and cooking a meal. Electric multicookers have been sold as the perfect tool to simplify and speed up the cooking process.**

**According to NPD Group, “multicookers are hitting all of the hot buttons for today’s consumers—speed and convenience in healthy at-home meal-prep, multi-functionality, and ease of use.**

Data points showing the scale of take up

- On 2018 Amazon Prime Day promotion in July, Instant Pot sold over 300,000 units in just 36 hours.
- The Instant Pot community Facebook page—which has 1.5 million members—focuses on recipe suggestions and promotes the Instant Pot recipe app. Facebook offers roughly 200 different groups dedicated to Instant Pot.
- Amazon carries over 1,000 cookbooks that target electric multicookers - written by amateurs and professionals alike, including numerous on specialized cooking focuses ranging from vegan to ketogenic and paleo diets.
- According to a recent CNBC report quoting sales data from the NPD Group, sales of multi-cookers increased by nearly 80% to over \$300 million in the US in 2017. That growth figure has actually accelerated this year, running just under 100% for the year-to-date.

### **Use of different appliances at cooking East/Southern African foods<sup>35</sup>**

Controlled tests in a ‘kitchen laboratory’ for the eCookbook in Kenya revealed that EPCs can save up to 85% of the cost of cooking ‘heavy foods’ on charcoal. ‘Heavy foods’ typically involve boiling for an hour or more on conventional stoves. They include beans, tripe, githeri (beans and maize stew) and stews with tougher cuts of meat.

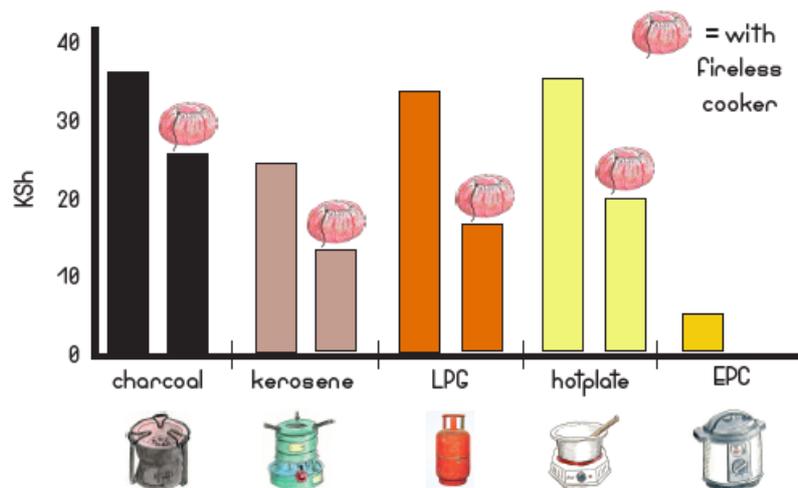
A fireless cooker utilises the principles of insulation (but not pressurisation) as a means to save fuel on any conventional cooking device during the simmering section of a recipe. For beans, the pot is heated until they are partially cooked (there is a need to cook until the toxins are removed) and then

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<sup>35</sup> Leary, J.; Serenje, N.; Mwila, F.; Yamba, F.; Scott, N.; Batchelor, S.; Leach, M.; Brown, E. eCook Zambia Country Report: Opportunities and Challenges in Zambia; Lusaka, Zambia, 2019. Batchelor, S.; Leary, J.; Sago, S.; Minja, A.; Sawe, E.; Shuma, J.; Scott, N.; Leach, M.; Brown, E. eCook Tanzania Country Report—Opportunities and Challenges in Tanzania; Dar es Salaam, Tanzania, 2018 Leary, J.; Myint, A.; Hlaing, W.W.; Sane, S.; Soe, T.T.; Scott, N.; Batchelor, S.; Leach, M.; Brown, E.; Siew, K. eCook Myanmar Country Report: Opportunities and Challenges in Myanmar; Yangon, Myanmar, 2019 All available online: <https://www.mecs.org.uk/working-papers/>

the pot is transferred into the fireless cooker and sealed in an insulated environment. Because the temperature is maintained with minimal heat losses, the food continues to cook with no further input of energy. Figure 2 shows that judicious use of the fireless cooker can save between 10 to 15 KSh (0.10-0.15 USD) on fuel for charcoal, kerosene, LPG or an electric hotplate.

As it is an insulated appliance, a fireless cooker is effectively inbuilt into every EPC, allowing it to prevent heat from escaping from the pot throughout the entire recipe (not just the simmering stage). As a result, Figure 2 shows that whilst cooking on LPG or an electric hotplate works out roughly the same cost as charcoal, the pressurisation and automatic control features of the EPC make it an order of magnitude cheaper. Kerosene is slightly cheaper than charcoal, LPG or an electric hotplate, however still several times more than the EPC.



**Figure 2: Cost comparison for ½kg dried yellow beans on the most popular fuels in urban Kenya (Nairobi costs, July 2018)<sup>36</sup>.**

Energy savings on ‘heavy foods’ are clearly substantial in controlled and semi-controlled conditions; however, it is important to understand how they fit into the kitchen routines of everyday cooks. The evidence from the cooking diaries shows that ‘heavy foods’ comprise approximately one third of all dishes on a typical urban East African household’s menu (see Table 1). In fact, many other dishes can also be cooked on an EPC, however there are several that are extremely challenging on most models of EPC available on the market today (e.g. chapati).

A typical East/Southern African menu can be understood as composing of a set of categories of dishes, each with varying degrees of compatibility with EPCs. We propose the following categories:

- ‘Heavy’ foods – usually require boiling the main ingredient (e.g. beans) for over an hour on a conventional stove and may also contain a frying stage with extra ingredients to add flavour (e.g. a tomato and onion sauce).
- Staples – normally boiled for approximately half an hour. Some require stirring (e.g. ugali, porridge), but others are simply left to boil (e.g. rice).
- Quick fryers – usually fried for 5-15 minutes, a shallow pan and high heat is often preferred, but not essential. Access to the pan is usually required to stir the food and prevent burning.
- Deep fryers – food is completely submerged in oil at 175-190°C.

<sup>36</sup> J. Leary *et al.*, *The Kenya eCookBook: Beans & Cereals Edition*, no. September. Nairobi, Kenya: Available from: [www.MECS.org.uk](http://www.MECS.org.uk), 2015.

- Flat breads – medium heat, evenly distributed across a shallow pan is required to cook the whole of the flat bread at the same rate. Access to the pan is required to turn the bread frequently.

**Table 1: Categorisation of typical Kenyan foods by their compatibility with EPCs.**

Food category	Frequency on urban Kenyan menu	Typical dishes	Compatibility with EPCs	Energy savings with EPCs	Enablers
'Heavy foods'	32%	Beans, matumbo (tripe), meat stews	Users instinctively use EPCs	High (50-90%)	Cooking times & water quantities for popular local foods
Staples	39%	Ugali (maize meal), rice	Users use EPCs if encouraged	Moderate (20-50%)	Demonstrations, extra EPC
Quick fry	20%	Sukuma wiki (kales), eggs	Users use EPCs if encouraged	Low (5-20%)	Demonstrations, manual heat control, extra EPC, shallow pan
Deep fry	2%	Mandazi (donut), fried chicken, chips	Users cannot currently use EPCs	Low (5-20%)	Manual heat control or deep fry settings (175-190°C)
Flat breads	4%	Chapati (flat bread)	Users cannot currently use EPCs	Low (5-20%)	Manual heat control & shallow pan
Other	3%	Unknown			

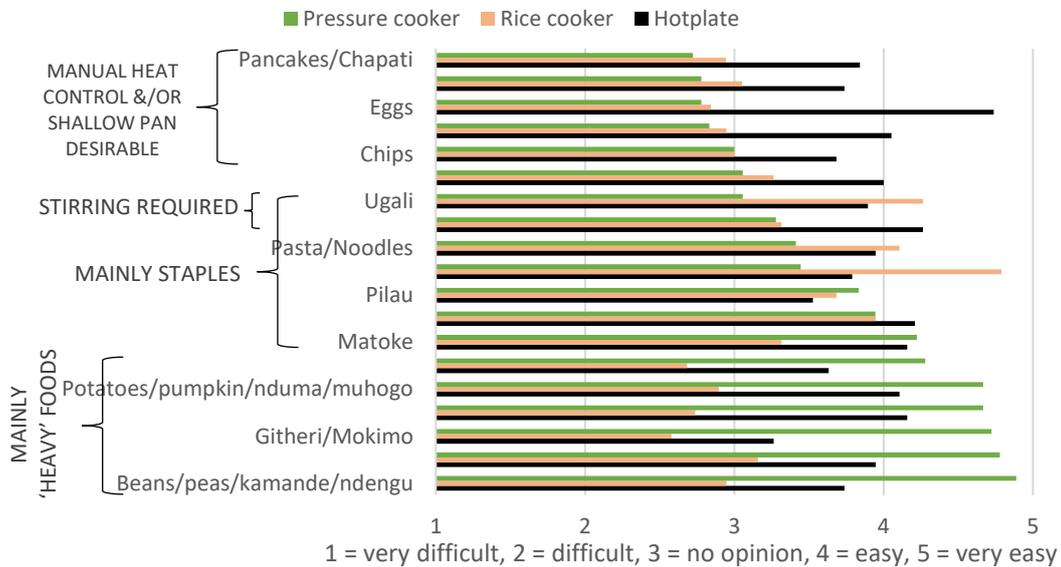
The data suggests that it is actually possible for urban Kenyan households to cook over 90% of their menu on an EPC.

**Table 2: Measured and modelled energy consumption for 100% electric cooking on a mixture of inefficient and efficient appliances.**

	Median daily energy consumption (kWh/household/day)	Household size (no. ppl)	Median per capita daily energy consumption (kWh/person/day)
<b>Zambia</b>			
100% electricity measured, median	1.63	7.9	0.21
<i>Total if EPC at 90% of menu</i>	<i>1.1</i>		<i>0.14</i>
<b>Tanzania</b>			
100% electricity measured (with EPC proportion modelled)	2.06	4.2	0.49
<i>Total if EPC at 90% of menu</i>	<i>1.44</i>		<i>0.34</i>
<b>Kenya</b>			
100% electricity measured (with EPC proportion modelled)	1.4	3.1	0.46
<i>Total if EPC at 90% of menu</i>	<i>0.96</i>		<i>0.30</i>

### User experience of EPCs<sup>37</sup>

Whilst cost, driven by energy efficiency, may be a strong driver, if the cooker is not easy to use and the food is not as tasty as usual, households will be unlikely to adopt it. This section presents insights from the exit survey from the Kenya cooking diaries, which asked the households who had been using EPCs (plus rice cookers and hotplates) for a month, about their experience with this new cooking device.



**Figure 3: Average responses to the question from 20 trial households in Kenya: “how easy is it to cook each food on the eCookers?” Ranked by ease of cooking on an EPC.**

‘Heavy foods’ such as beans or matumbo (tripe) that usually require boiling for an hour or more to soften are unsurprisingly rated as much easier to cook on the EPC than the hotplate (Figure 3). In contrast, foods that require manual heat control &/or a shallow pan, such as chapati or mandazi, are rated much easier on the hotplate.

Perhaps surprisingly to some, food cooked on electricity was rated as the tastiest, just ahead of LPG & charcoal (Figure 4). Wood & kerosene lag far behind. Figure 5 shows that whilst some respondents missed the smokey flavour in specific foods, many did not miss it at all.

<sup>37</sup> *ibid*

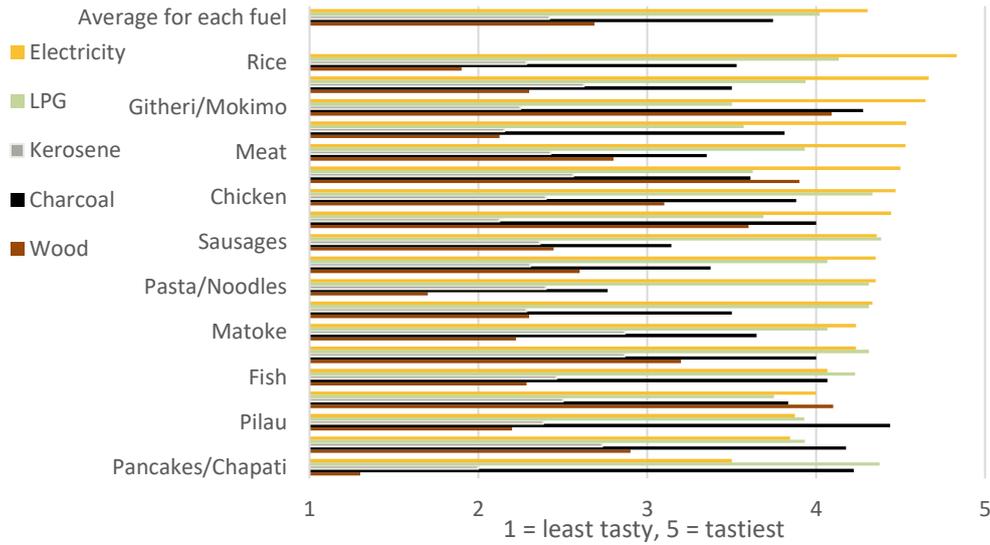


Figure 4: Average responses to the question from 20 trial households in Kenya: “Do foods taste different when cooked on different fuels? If so, please rank each fuel for each food.” Foods ranked by tastiness when cooked with electricity.

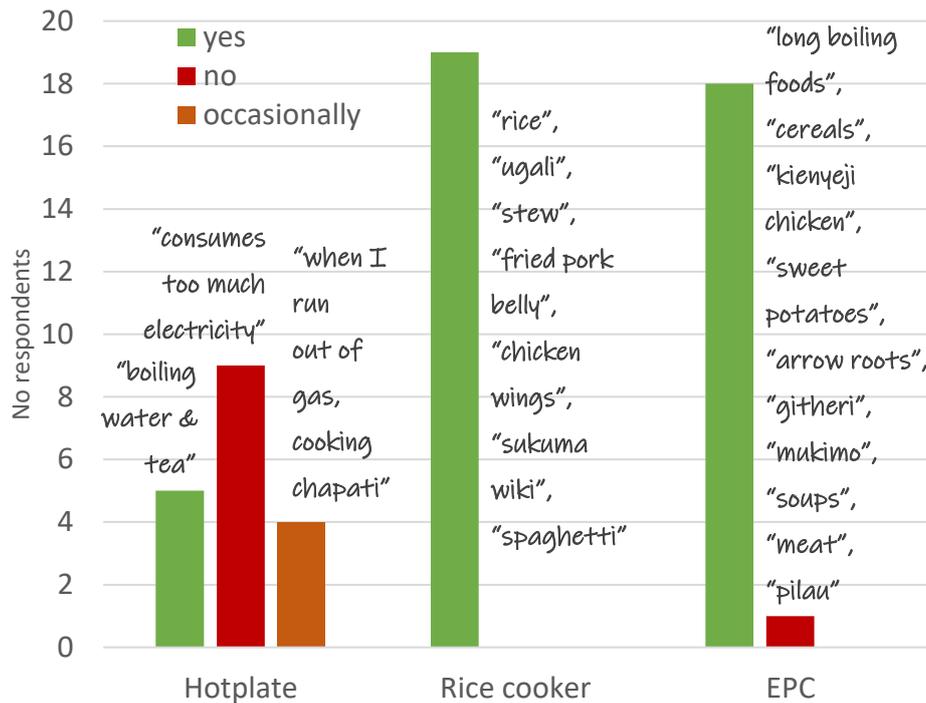


Figure 5: Responses to the question from 20 trial households in Kenya : “Do you miss the smokey flavour of food? If so, for which dishes in particular?”. Words sized according to the number of responses.

The automated control systems of the EPC & rice cooker makes cooking easier, enabling multi-tasking & preventing food from burning (Figure 6). Being able to cook faster & keep the kitchen clean are also both highly valued by the urban participants of the Kenya cooking diaries study, however, priorities may well be different in rural areas. Figure 7 shows that the rice cooker & EPC have clearly found a place in almost every participant’s home.



Figure 6: Responses to the question from 20 trial households in Kenya: “What were the best/worst things about cooking with electricity?”



**Figure 7: Responses to the question from 20 trial households in Kenya: “We are done with our survey and are leaving the cookers with you. Will you continue using the e-cookers or will you switch back to your old stove?”**

The evidence to date shows that EPCs are significantly more energy efficient than electric hotplates in both laboratory and real kitchen environments. The empirical data from the kitchen laboratory shows that EPCs can cook the most energy intensive dishes with just one fifth of the energy of electric hotplates. This is complimented by results which show that everyday cooks choose EPCs for about half of their cooking and that across the full range of dishes they were used for, they use approximately half the energy of electric hotplates. Cooking with both hotplates and EPCs was found to use approximately 2kWh per household per day, with the cook choosing to cook 50% of the menu on an EPC. Analysis of the range of dishes that make up a typical menu and experimentation in the kitchen laboratory has shown that EPCs are capable of cooking over 90% of the typical urban Kenyan menu. Training and experience are likely to move the proportion of EPC use from 50% nearer to 90%. In poorer households which are used to only having one ‘device’ for cooking, the EPC is likely to be used for a greater proportion of the menu.

## Appendix III: Innovation Challenges

Two immediately evident innovation challenges are:

- Make a large capacity device that cooks using, heat and pressurization, with all necessary safety features and well insulated – and heats up and then retain temperature without needing a constant energy consumption, compatible with an electricity source that cannot cope with lots of 1kw devices all working together.
- Make a device that can cook different types of bread – energy efficiently, without too high a power load, and recreates the product close enough to the original to be acceptable. A key challenge in an EPC is to cook chapati or shallow fry an egg. Many EPCs have a sauté mode which keeps the heating element on when the lid is open - the problem then is not so much the heating element as the depth of the pan, that prevents lifting the final product without breaking it up. Are there modifications that could address this<sup>38</sup>?

The following are some other areas where our research suggests there is scope for innovation:

- **Lower power efficient appliances:** - Most EPCs have heating elements that draw 1kW power or more when on and have a 6 to 8 litre pot. There are EPCs on the market that present 3 litre pots and have a power rating at 600 or 700W, however these are considered too small for the majority African market. In weak grids (weak by virtue of their transformers, or wiring) drawing high power can trip fuses or burn out wiring and transformers. We think that there is room on the market for an EPC that present a 6l pot being heated by between 500W to 700W. Applicants suggesting such a device should discuss what tests they will conduct to ensure the resulting device will have a good consumer experience.
- **Other modified efficient appliances:** - Rice cookers can be used for much more than just rice. However, many are set up to switch off when the rice is cooked, and to use them for other recipes requires some adaptation of the device.
- **Enhanced insulation:** – the air gap in most rice cookers and EPCs is quite effective. The weakness of many devices is the seal around the lid and the insulation built into the lid. What could be done to enhance the overall heat retention of cooking appliances while still maintaining an acceptable cooking experience for the user.
- **Robustness:** - the cooking environment in Africa can be quite harsh with higher environment temperatures, dust and rough handling by users. How can appliances be made more robust.
- **User experience of appliance:** - Many EPCs do not have handles on the pot, and this makes holding it to stir hot food difficult. Some of the newer brands have now addressed this, but tend to be the more expensive end of the range. Some recipes require the user to stir the food during the cooking process. EPCs are predicated on not having to stir the food. Are there modifications or adaptations that could be introduced that enabled the user to stir the food during the cooking process (in an EPC or in a pan with a lid). Are there more local solutions as additions to cheaper EPCs.
- **Direct current appliances:** - The majority of EPCS are based on alternating current (AC). When we consider the off-grid markets in Africa and Asia, there is a need for a direct current device.

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<sup>38</sup> We note that there are commercial chapati cookers, and frying pans. The data from Kenya suggests that 90% of a typical menu can be cooked in an EPC, and so to purchase a whole appliance for a small percentage of the menu seems cost inefficient. However, if the applicant wishes to argue the case that a secondary appliance is the best way of tackling this issue, the proposition should include details of how this may affect household finances.

These appliances might be applicable to Solar Home Systems and DC mini grids. Can a DC based energy efficient appliance be created?

The above list is not exhaustive and not intended to be limiting to the range of potential solutions. The examples are presented to illustrate that we see value in everything from a small additional tool that might help the user use an electric cooking appliance for their traditional cooking, to significant redesign of an appliance to enter a relatively new market (such as off-grid DC use).

## Workshop Speaker Profiles

# WORKSHOP SPEAKERS





**Prof. Matthew Leach**

MECS Delivery Partner &  
Strand Lead for Modelling

Matthew Leach has more than thirty years experience of the challenges in delivering secure and sustainable energy services. From July 2019 Matthew is part time at Surrey, and an independent consultant/researcher for the remaining 80% of his time. His consulting focus is now on 'Modern Energy Cooking Services', a £39.8 million programme funded by DfID.

Following 12 years as a member of staff at Imperial he joined CES in 2007 as Professor of Energy and Environmental Systems; he was Director of the Centre from 2008 to 2015.

An engineer by training, Matthew holds a bachelors in Mechanical Engineering from the University of Southampton, an MSc in Environmental Technology from Imperial College London and a PhD in Energy Policy also from Imperial. Matthew has been Vice President of the Energy Institute and is a past Chair of Council of the British Institute of Energy Economics.



**Malcolm Bricknell**

International Liaison Manager,  
MECS Programme

Malcolm Bricknell worked for many years at the OPEC Fund for International Development (OFID) where he was involved in structuring and managing financings of private sector developmental projects in Sub-Saharan Africa and elsewhere. He has broad experience with energy projects, but has been increasingly involved with developmental initiatives linked to energy access and clean energy including social impact funds and minigrid projects for base of the pyramid social and economic development. Malcolm was also actively involved in developmental projects in the financial sector. These typically involved lines of credit channeling funds through established institutions to SMEs and micro entrepreneurs and supporting new institutions through founder equity investments such as for leasing companies, microfinance and housing finance companies aimed at deepening and broadening local capital markets.

In his earlier career Malcolm worked in corporate finance arranging and executing different types of debt and equity transactions particularly international bond issues.

Malcolm has a degree in Government from the London School of Economics and a Masters of Business Administration from Manchester Business School. He is an International Liaison Manager for MECS mainly focusing on international development issues.



**Dr. Nick Rousseau**

International Liaison Manager,  
MECS Programme

Nick has over 20 years of experience of working in UK Government – his final role was Head of International Innovation Strategy at the Department of Business, Innovation and Skills. Nick led the innovation strand of the Newton programme and Government to Government policy dialogues. Nick's consultancy, Unconventional Connections, focuses on innovation collaboration included work funded by DfID on harnessing the UK's strengths in clean energy technology to increase access to clean energy in Africa and SE Asia. Nick has a personal interest in sustainable solutions to local and global food-related challenges – in 2015 he set up the Woven Network – UK-based network for those working on insect protein.

Nick holds BA, MSc and PhD degrees in psychology from the universities of Cambridge, Loughborough and Sheffield with a focus on psychology and user-centred system design. Within the MECS project, Nick is one of the International Liaison Managers with a focus on driving growth in availability of modern energy cooking devices within the developing world



**Udit Mathur**

Energy Advisor, Department  
of International  
Development(DFID) India

Udit Mathur has 16 years of experience of working on clean energy, climate change and environment. Expertise in policy influencing, international affairs and program leadership. Strong thematic expertise on low carbon growth strategies, renewable energy financing, energy efficiency policies and incentives, electricity access (grid and off-grid), carbon finance and climate change adaptation. Strong experience in facilitating partnerships at Ministerial or senior bureaucratic levels and with the private sector. International experience covering most South Asian countries.



**Rakesh Kumar**

Programme Director,  
International Solar Alliance (ISA)

At present Program Director & Senior Consultant (Technical), International Solar Alliance, an inter-governmental body initiated by India and France to promote & scale-up solar energy in 121 prospective member countries.

Has a diverse experience of 36 years in energy sector, in companies like NHPC, POWERGRID, PTC India, Solar Energy Corporation of India and last two years with International Solar Alliance (ISA).

He played key support role in Cross-Border Transmission Inter-connections & power trade with Bhutan, Nepal and Bangladesh and in the development of a vibrant power market in India. His team efforts in rooftop solar won SECI a National Award from Ministry of New & Renewable Energy, Government of India in year 2016.

He has earlier been National Consultant – India for ADB “SAARC Regional Energy Trade Study, March 2010”; contributed to World Energy Outlook 2011 as member of peer review team, served as member of National Task Force on Power Exchange in India and Programme Director for “Indo Norwegian Programme for Institutional Cooperation”. In ISA, he is leading the Program 4 “Scaling Rooftop Solar”, part of expert groups’ support to member countries, team initiatives for assessment/ aggregation of demands for solar irrigation pumps and solar rooftops, besides assistance in developing select institutional partnerships/ collaborations and ISA outreach to its member countries.



**Smita Rakesh**

Portfolio & Programs,  
Social Alpha

Smita leads the Energy Portfolio at Social Alpha. Social Alpha is an initiative to strengthen the science and technology start-up ecosystem in India with a focus on “lab to market” enablement. Supported by Tata Trusts and Govt of India, the Social Alpha architecture integrates the innovation, incubation and investment ecosystems and allows for an effective mechanism for allocating resources to mission driven entrepreneurs.

Working in the energy access ecosystem for more than 12 years, she has closely worked with and advised social enterprises, not-for-profits, philanthropies and private and public sector agencies in designing and implementing evidence-driven strategies that accelerate and sustain social impacts. Passionate about catalyzing large-scale yet inclusive social change through responsible investments and honest engagement with the primary stakeholders, Smita is a believer in market-based solutions and a strong advocate of better contextualized solutions, intended to include women and other on-the-margin population categories. Her ability lies in unpacking the intersectionality of people, systems and processes. Smita has a significant body of work at the grassroots. Having worked on executing programs for organisations such as TERI, Sambodhi, Ashden India Renewable Energy Collective (AIREC) and Tata Trusts, she also possesses experience in policy advocacy, social enterprise mentoring and designing effective impact pathways. Smita is also a Rockefeller Foundation Global Fellow on Social Innovation



### **Dr. Priyadarshi Dash**

Assitant Professor – Research and Information System for Developing Countries (RIS)

Dr. Priyadarshi Dash is Assistant Professor at Research and Information System for Developing Countries (RIS), New Delhi, India. His research interests include foreign exchange reserves, macroeconomics, international trade and finance, and blue economy. He contributes to RIS work programme on issues of regional economic cooperation in Indian Ocean Rim Association (IORA), BIMSTEC, Asia-Africa Growth Corridor and G20. He is also working on financing and policy issues in renewable energy sector in South Asia and BIMSTEC regions. Dr. Dash has published a book titled “Universal Banking in India: Evolution, Trends and Performance” and several papers in peer-reviewed journals and edited volumes. He is a member of the Editorial Advisory Board of Cambridge Scholars Publishing, London; Editorial Board member of Advances in Economics and Business, and Managing Editor of G20 Digest. He has worked with Korea Institute for Industrial Economics and Trade (KIET), Seoul as a ‘Visiting Fellow’ in 2012 with a fellowship by the Asia Foundation. Dr. Dash holds M.Phil (Planning & Development) and PhD degree in Economics from Indian Institute of Technology (IIT), Bombay, India, and has received the “Award for Excellence in Thesis Work” in 2011.



### **Vimal Kumar**

Co-Founder,  
Finovista(MECS Partner)

Vimal hold strong expertise in Program & Fund Management, Government Technology Fund, Development Finance, Technology Transfer/Management, Multi-stake Program Management, International Trade & Investment, Strategy and Corporate Development for Startup/Spinoff & MSME.

Currently, Co-founder & COO of Finovista, a global Program Management & Consulting firm, works as PMC, Contractor, Sub-contractor, Partner with Development Agencies. Finovista has close collaboration with European, North American, Israeli and Korean companies. During short span of time, Finovista is already working with DCMSME, CSIR, GIZ, FISME etc

Vimal managed Capacity Building and Technology Funding Program for various Indian government ministries viz DoT, MoMSME, DPIIT, DST, MeitY, DHI, DRDO and State govts.

Prior to Finovista, was Head of Strategy & Partnership with GITA (Global Innovation & Technology Alliance), a JV between Govt of India (DST) & Confederation of Indian Industry (CII) and has also worked with TATA Capital, UCO Bank and IDBI Bank.

Vimal is Member/Expert for various government committees and an avid Speaker at National & International Conferences.

Vimal integrates Technology with Finance, subsequently, translating into marketable preposition. He is CAIIB, MBA in Finance and Mathematics Honours graduate.



**Joseph Kabakeza**

Acting High Commissioner,  
High Commission of Rwanda

Currently serving as the Chargé d Affairs at the High Commission, Joseph Kabakeza is a first Counsellor at Rwanda High Commission in New Delhi.

Served as Director General, Bilateral and Multilateral Cooperation at the Ministry of Foreign Affairs and International Cooperation of Rwanda

Served as Director, Planning, National University of Rwanda Director of grants and Personal Assistant to the Rector National University of Rwanda

Visiting lecturer, at the National University of Rwanda Faculty of Economics, Social Sciences and Management. Holds a Masters Degree International Development from Korea University and Bachelors Degree in Business Administration, National University of Rwanda



**Jessie Press-Williams**

Design Engineer,  
Burn Manufacturing

Jessie is a Design Engineer at BURN Manufacturing, leading development of BURN's Electric Pressure Cooker and working on the New Product Development to scope out other potential new fuels for future cookstove products. BURN Manufacturing is a leading clean energy company based in Nairobi, Kenya that has sold over 700,000 improved charcoal and wood cookstoves around the world. Before joining the BURN team, Jessie worked in Zambia for an international development consulting firm, leading research and data collection for a variety of projects across Southern and East Africa. She has a degree in Mechanical Engineering from the Massachusetts Institute of Technology (MIT) where she focused on the application of appropriate technology in low-resource settings. As a student, she worked on engineering and research projects in Zambia, Ghana, Tanzania, and Indonesia.



### **Dr. Jyoti Parikh**

Executive Director, Integrated  
Research and Action for  
Development(IRADe)

Professor Jyoti K Parikh is Executive Director of Integrated Research and Action for Development (IRADe), New Delhi. She was a Member of the Prime Minister's Council on Climate Change –India and is a recipient of Nobel Peace Prize awarded to IPCC authors in 2007. She was a member of science and technical advisory panel (STAP) for Global Environment Facility (CEF) and a member of "Decarbonizing Energy" for World Economic Forum.

Recently She has been appointed as the advisor for Global Commission on Adaptation set up by UN Secretary General and Gates foundation managed by World Resources Institute. She was also a member of World Economic Forum's Global Agenda on Decarbonization of Energy Sector. She has served as energy consultant to the World Bank, the U.S. Department of Energy, EEC, Brussels and UN agencies such as UNIDO, FAO, UNU, and UNESCO, Environment Consultant to UNDP, World Bank and so on. She worked as an advisor to various ministries for Gov. of India.

She obtained her M.Sc. from University of California, Berkeley, in 1964 and Ph.D. in Theoretical Physics from University of Maryland, College Park in 1967. She has given lectures in more than 40 countries around the world.

Her experience for nearly forty years on environment and climate change problems of the developing countries is reflected in nearly 200 project research papers and 25 books and monographs in the area of environment and guided Ph.D and Masters thesis in climate change, climate modeling, environment economics, natural resource management, disaster risk reduction, climate mitigation, adaptation as well as global negotiations. Her papers on climate change and agriculture were path breaking and cited and referred many decades.

Dr. Parikh served as the senior professor and Acting Director of Indira Gandhi Institute of Development Research (IGIDR), Mumbai 1986-2003. International Institute for Applied Systems Analysis (IIASA), Austria for 8 years (1980-86, 76-78) and Planning Commission, as senior energy consultant at New Delhi (1978-80).



**Nitin Akhade**

Manager Technology & Markets,  
The Clean Energy Access Network

Nitin holds more than 7 years of work experience in the energy sector, Nitin's core focus areas have been new product development and project planning & management. He previously worked with Lloyd's Register Consulting and National Institute of Industrial Engineering (NITIE).

Nitin holds a B.Tech degree in Electrical Engineering and European Masters in Energy Engineering (power plant safety) from Technical University of Catalonia, Barcelona and Grenoble Institute of Technology (INP), France. He holds an executive degree in energy management from Grenoble Ecole de Management, France. Nitin also completed a short term course on Clean Technologies from Wietz Center for Sustainable Development, Israel.

His hobbies include cooking, swimming, travelling and teaching.



**Mayank Joshi**

Director, Cashinvoice

Mr. Mayank Joshi is the Director of Cashinvoice, a digital Supply Chain Finance platform based out of Mumbai.

Mr. Joshi has Banking & Finance experience of over 12 years and completed his Post Graduate Diploma in Banking & Finance from NIBM, Pune. He has worked with various premium Institutions like – State Bank of India, Standard Chartered Bank, Kotak Mahindra Bank and Tata Capital.

He started his carrier as a founding member of Supply Chain Finance department of State Bank of India which today manages SCF assets close to INR 26,000 Crs. He headed Vendor Finance product of Kotak Mahindra Bank and was Supply Chain Finance representative for Standard Chartered Bank (North). His last stint was with Tata Capital where he headed Strategy for Corporate Finance Division and was also the head of Corporate Program Management for Supply Chain Finance.

He has worked in different roles – product management, sales, policy underwriting, credit appraisal & project management for system development.



**Subrahmanyam Pulipaka**

CEO, National Solar Energy Federation of India (NSEFI)

Subrahmanyam Pulipaka is the youngest chief executive officer of National Solar Energy Federation of India. National Solar Energy Federation of India (NSEFI) is an umbrella organisation representing solar energy companies in India that are active along the whole photovoltaic value chain: project developers, manufacturers, engineering companies, financing institutions and other stakeholders. NSEFI is a platform for various solar energy industry stakeholders with the objective of strengthening the communication and taking a unified stand for greater good of solar energy industry. NSEFI is directed by leaders who have decades of experience leading private organizations as well as policy initiatives.

He is the recipient of BRICS Energy for Thought - Young Scientist award - 2018. Previously he was the co-founder and CEO of Soreva Energy, one of the 10 Energy startups representing India at RISE-2017, Hong Kong. Subrahmanyam is one of the 50 Indian young CEOs shortlisted for Global Entrepreneurship Summit- 2017, Hyderabad chaired by Hon. PM of India Narendra Modi and Ms. Ivanka Trump - advisor to the President of the United States of America.

He is an alumnus of BITS Pilani and is also the founding chairman of India Africa Youth Energy Forum(IAYEF), a platform dedicated to nurture future energy leaders in the Indian subcontinent and African continent. He also started series of Youth Energy Dialogues for carrying forward the youth centric energy revolution dialogues in different cities in India as well as different countries in Africa

He has been involved in active research on the reliability of solar photovoltaics since last 4 years and was one of the youngest researchers to represent India at many international forums. Apart from this, he has also been actively involved in solar skill



**Dr. Nitin Labhasetwar**

Chief Scientist & Head,  
National Environment Engineering  
Research Institute (NEERI)

Dr. Nitin Labhasetwar is a Ph.D. in Chemistry with over 32 years of research experience in environmental and energy related research. He has worked as an STA/JSPS Fellow and Visiting Overseas Researcher at NIMS, Tsukuba, Japan and as a Visiting Professor at Kyushu University, Japan under the GCOE programme on Novel Carbon Resource Sciences.

He has been actively working on- Rural indoor emission control, cleaner energy generation including carbon capture, rural energy (Development of Improved cook stoves, their implementation and IEC activities) etc. He has over 160 research publications with over 4800 citations and 22 international patents, 6 design registrations of Improved cook-stoves in addition to a few contributions in books. He was so far involved in more than 75 projects and also coordinating the CSIR-800/HARIT programme of Rural Development at CSIR-NEERI.



**Manish Kumar Pandey**

Fellow and Area Convenor,  
The Energy and Resource Institute(TERI)

Mr. Pandey has over 10 years of project implementation experience in off-grid rural electrification and distributed generation. At TERI, he has led several projects for the dissemination of clean energy lighting and cooking technologies, collectively covering more than 4 million people across India and countries in Sub-Saharan Africa.

Currently working as Fellow and Area Convenor of the Centre for Rural Action, which also hosts TERI's flagship energy access program, Lighting a Billion Lives (LaBL), Mr Pandey is responsible for partnership development, project planning and coordination as well as capacity building of different stakeholders including local energy entrepreneurs, for the effective implementation of energy access interventions in India and Africa. In 2014, he was selected to represent India at the Future Energy Leadership Program during the World Energy Congress organized at Daegu, South Korea. Mr. Pandey has a Post Graduate Diploma in Rural Management from the Institute of Rural Management Anand (IRMA), Gujarat.



**Sasmita Patnaik**

Programme Lead, Council of  
Energy Environment  
and Water(CEEW)

Sasmita Patnaik is a Programme Associate at the Council on Energy, Environment and Water (CEEW), where largely focuses on the intersection of developmental issues including environment, health and labour. At The Council, she is currently handling projects on access to energy for healthcare, cooking and income generation. In her research, she is keen to understand the nuances of socio-economic contexts that define access to, and use of, energy.

Sasmita has six years of research experience in rural development, sustainability and social entrepreneurship. She has co-authored research on social entrepreneurship and facilitated multi-stakeholder projects across sectors. She has also conducted strategic research to support project development for donors and non-profits. Her work in sustainability involved assessment of policies and practices of industries on biodiversity and land use, health and safety, and carbon emissions.

Sasmita holds an M.Sc. in Development Studies from School of Oriental and African Studies (SOAS) and a Post-Graduate Diploma in Rural Management from Xavier Institute of Management, Bhubaneswar (XIMB)

## Partner Company Profiles

# PARTNER PROFILES





The Clean Cooking Alliance works with a global network of partners to build an inclusive industry that makes clean cooking accessible to the three billion people who live each day without it. Established in 2010, the Alliance is driving consumer demand, mobilizing investment to build a pipeline of scalable businesses, and fostering an enabling environment that allows the sector to thrive. Clean cooking transforms lives by improving health, protecting the climate and environment, empowering women, and helping consumers save time and money.

Achieving universal access to clean cooking solutions requires scaling up a range of technologies and business models. The Alliance's work is built around three core pillars:

- ◆ Driving consumer demand for cleaner, more modern stoves and fuels by supporting behavior change and awareness-raising interventions.
- ◆ Mobilizing investment to build a pipeline of scalable businesses capable of delivering affordable, appropriate, high-quality clean cooking products.
- ◆ Fostering and enabling environment for industry growth by advocating for effective and predictable policies, providing trusted, relevant data, and serving as the convener and champion of the clean cooking sector.



The necessity of establishing a global institution in India for sharing India's development experience with partner developing countries was strongly felt in recent times. Economic transformations in India and the ever widening scope of inclusive development have gained high momentum in recent years based on paradigm shifts in policy making. India has also emerged as a key global and regional player through leadership on issues of common challenges; and has multiplied its instruments and reach in supporting development initiatives in the Global South in the spirit of South-South Cooperation; and is increasingly engaged in the emerging modality of Triangular Cooperation.

With this perspective, RIS conceived the idea of establishing a Global Development Center (GDC) at RIS to create an institutional architecture to analytically contribute to the contextualization of the emerging development narrative; promote learning from plurality of development experiences globally; and formulate plans to engage with stakeholders in partner countries to facilitate sharing of India's development experiences and models with due emphasis on endogeneity as an element in the development framework.

Development Center (GDC) at RIS..



MSME-Technology Development Centre (PPDC), a Government of India Non-profit Autonomous organization under Ministry of MSME, was established in the year 1986. The Management of affairs of the Centre is governed by its Governing Council constituted by Government of India. The Additional Secretary and Development Commissioner (MSME), Government of India is the Chairman of the Governing Council.

The Institute is a Common Facility Centre (CFC), Consisting of Tool Room, State of Art Testing Centre and a Training Section with multi discipline. It is engaged in quality up-gradation, technical assistance, R&D facility and providing skilled manpower through training to MSME sector in the region specially sports goods sector. The Centre is specialized in training of sports goods manufacturing, management techniques, CAD/CAM & CNC technology, Leather & garments manufacturing techniques, software/hardware of computer, tool and die making and testing of various materials and products.



The Energy and Resources Institute (TERI) is an independent, non-profit organization, with capabilities in research, policy, consultancy and implementation. TERI has multi-disciplinary expertise in the areas of energy, environment, climate change, resources, and sustainability. With the vision of creating innovative solutions for a sustainable future, TERI's mission is to usher in transitions to a cleaner and more sustainable future through the conservation and efficient use of the Earth's resources and develop innovative ways of minimizing waste and reusing resources. TERI's work across sectors is focused on:

- ◆ Promoting efficient use of resources across sectors
- ◆ Increasing access and uptake of sustainable practices
- ◆ Reducing the adverse impact on environment and climate

Currently, TERI's work is structured around seven sectors: Agriculture, Climate, Energy, Environment, Habitat, Health and Nutrition and Resources. TERI's research and research based solutions have had a transformative impact on industry, businesses as well as communities. TERI has fostered international collaboration on sustainability action by creating a number of platforms and forums as well as translated the research into technology products, technical services and policy products. TERI works with a diverse range of stakeholders across governments, both at the national and state levels, international agencies, and civil society organizations to help deliver research-based transformative solutions. Headquartered in New Delhi, TERI has regional centers and campuses in Bengaluru, Gurugram, Guwahati, Mumbai, Nainital, and Panaji.



The CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) is a research institute created and funded by Government of India. It was established in Nagpur in 1958 with focus on water supply, sewage disposal, communicable diseases and to some extent on industrial pollution and occupational diseases found common in post-independent India. NEERI is a pioneer laboratory in the field of environmental science and engineering and part of Council of Scientific and Industrial Research (CSIR). NEERI has five zonal laboratories at Chennai, Delhi, Hyderabad, Kolkata and Mumbai. NEERI falls under the Ministry of Science and Technology (India) of central government. The NEERI is an important partner organisation in India's POPs national implementation plan (NIP).

The National Environmental Engineering Research Institute (NEERI), Nagpur was established in 1958 as Central Public Health Engineering Research Institute (CPHERI), when environmental concerns were limited to human health with a focus on water supply/sewage disposal/ communicable diseases and to some extent on industrial pollution and occupational diseases. The chemical and biological solutions to address these problems were simple, though challenging. However, slowly worldwide public awareness on the contamination of the environment on regional to global scale started getting attention in 1970's. Shrimati Indira Gandhi, the then Prime Minister of India, rechristened the Institute as National Environmental Engineering Research Institute (NEERI) in the year 1974. National Environmental Engineering Research Institute (NEERI), Nagpur is devoted to research and innovations in environmental science and engineering besides solving a range of problems posed by industry, government and public.



IESA is the premier trade body representing the Indian Electronic System Design and Manufacturing ESDM industry and has represented it since 2005. It has close to 300 members - both domestic and multinational enterprises. IESA is committed towards building global awareness for the Indian ESDM industry and supporting its growth through focused initiatives in developing the ecosystem. This is through publishing credible data, networking events and alliances with other international associations. IESA works closely with the Government as a knowledge partner on the sector, both at the centre and at the state level.



The Council on Energy, Environment and Water (CEEW) is one of South Asia's leading not-for-profit policy research institutions. The Council uses data, integrated analysis, and strategic outreach to explain – and change – the use, reuse, and misuse of resources. It prides itself on the independence of its high-quality research, develops partnerships with public and private institutions, and engages with wider public. In 2020, CEEW once again featured extensively across nine categories in the '2019 Global Go To Think Tank Index Report'. The Council has also been consistently ranked among the world's top climate change think tanks. Follow us on Twitter @CEEWIndia for the latest updates.



Telecom Centres of Excellence, set up in Public Private Partnership (PPP) mode, are an example of the Government, the Academia and the Industry working together for the sustained growth and progress of the country in the Telecom sector. The idea of Telecom Centres of Excellence was initiated with the shared realization, by the Government and the Telecom Industry, that boosting the growth of telecommunications was essential for the overall progress of the country. It was conceptualized in May 2007 and brought into existence by February 2008 with the signing of 7 MoUs between DoT, participating premier Academic Institutes and the sponsors from the Telecom Industry. The eighth TCOE with participation of Railtel came up in Jun 5th 2013. The TCOEs set up in Public Private Partnership (PPP) mode, are an excellent example of the Government, the Academia and the Industry working together for the sustained growth and progress of the country.



Cashinvoice is a digital marketplace for Supply Chain financing and is a one stop destination for all the buyers, suppliers and financiers to collaborate, and derive a win-win value proposition. Cashinvoice extends products like – Pay Early, Reverse Factoring, Account Receivable Purchase & Channel Finance to its clients through its partners – Banks / Financial Institutions. This platform helps in improving overall efficiency by quickly converting receivables into cash.

Cashinvoice through its platform enables quick onboarding of customers for financial institutions by supporting them in end to end documentation, credit underwriting / appraisal & policy formation. The platform also enables digital and seamless transactions between the parties, and it has capabilities of direct /FTP/H2H integration. Cashinvoice also shares early warning signals about the financial health of suppliers and buyers to take preventive measures.



IRADe is an institute that focuses on research and effective action through: Multi-disciplinary and multi-stakeholder research for implementable solutions for sustainable development. Policy and action research that accounts for the effective governance of techno-economic and socio-cultural issues.

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It is a 'think tank' that works with 'action tanks'.



# finovista

Finovista, is an ISO 9001:2015 certified consulting company with core offerings as Project Management Consultancy, India Representation, Technology Management and Financial Consulting. In a short span the company has worked with Developmental Agencies, Government Bodies, Industry Chambers, Academia, Labs, Startup/Spinoff, MSME and large Industry.

Some of our key International partnerships include:- Loughborough University, UK for UK Govt funded MECS Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, a German Development Agency; Trade and Economic Mission, Embassy of Israel in India. Our key National partnerships are PPDC Agra / Office of Development Commissioner MSME (DC MSME), Govt of India; Department of Telecom (DoT), Govt of India, Council of Scientific & Industrial Research (CSIR), India's National R&D Organisation, Telecom Centre of Excellence (TCOE).

Finovista provides, India Representation/Partner services, Outreach & Promotion, Delegation Management, Piloting, Intelligence & Assessment, Survey, Techno Feasibility Report, Detailed Project Report (DPR), Valuation, Due-diligence, Accounting & Compliance, Policy & Regulatory, Technology and Financial advisory.





Globally 1.8 billion people have access to electricity but still cook with biomass. Load shedding, weak grids, affordability of electricity, accessibility of liquid petroleum gas (LPG), tradition, perceptions, and a lack of suitable cooking appliances all act as barriers to scaling up the use of electricity or gas for cooking – clean cooking.

Modern Energy Cooking Services (MECS) Programme is funded by UK Aid through the Department of International Development (DfID) and represents a key example of the UK acting as a global thought leader. It is a partnership between researchers, innovators, policy makers, and ESMAP drawing on their 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 World Bank, UN, WHO and national Governments along with major financial institutions.

The programme aims to break out of business as-usual approaches and rapidly accelerate the transition from biomass to clean cooking on a global scale. Partners include World Bank, UN, WHO and national governments along with major financial institutions. The MECS partnership also includes research partners from across the UK, with extensive experience across a broad range of key research themes that will support our transition away from a business as usual approach.





THANK  
YOU

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