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Ministry of New & Renewable Energy
Government of India

CLEAN

Clean Energy Access Network



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GLOBAL ALLIANCE FOR
CLEAN COOKSTOVES

TATA TRUSTS

outcomes report



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Glossary

CCE	Clean Cooking Energy
CLEAN	Clean Energy Access Network
GACC	Global Alliance for Clean Cookstoves
IAP	Indoor Air Pollution
ICCF	India Clean Cooking Forum
LPG	Liquefied Petroleum Gas
MFI	Microfinance Institution
MNRE	Ministry of New and Renewable Energy
MoPNG	Ministry of Petroleum and Natural Gas
NSDC	National Skills Development Corporation
PNG	Piped Natural Gas
RE	Renewable Energy
SCGJ	Skill Council for Green Jobs
WHO	World Health Organization

ICCF 2016 – snapshot

The India Clean Cooking Forum (ICCF) was pioneered by GIZ in partnership with the Ministry of New and Renewable Energy in 2013 with the objective of convening a national platform to highlight the developmental imperative of achieving universal access and adoption of clean cooking energy for and by every Indian. Over the course of four editions, it has successfully mainstreamed the issue of clean cooking access within the national discourse on energy access. This year, the 4th edition of the Forum was organized by Clean Energy Access Network (CLEAN) in partnership with the Ministry of New and Renewable Energy and NITI Aayog, with the continued support of GIZ and previous Forum partners like Global Alliance for Clean Cookstoves, Tata Trusts and World Bank.

ten takeaways

- Our joint vision for 2020 is an India free of the traditional chulha.
- Stove stacking is a reality and is not worrisome per se provided the constituents of the stack are clean, affordable, available and acceptable.
- While LPG and electricity will expand, they will face challenges of distribution and reliable availability.
- Biomass (solid, liquid gaseous) and other RE like solar will remain an important part of the cooking energy mix, especially from the energy security and climate change perspective.
- For solid biomass fuel, it is important to continue focusing on technology development for improving on emissions performance and fuel efficiency, but importantly, also ensuring user acceptance.
- Awareness creation about the need to move away from traditional chulha is important. In doing so, we must highlight the benefits of the alternatives but also keep in mind the limitations.
- Subsidies must be technology-agnostic and targeted towards the most needy without distorting the market.
- The government's major roles should be in supporting awareness creation around indoor air pollution and the need for clean cooking as well as in promoting R&D.
- There is a need to move towards a unified clean cooking energy policy, where the range of improved cooking technologies/solutions are seen to be complementary with decentralized mechanisms for cooking energy selection and implementation design.
- CLEAN is committed to instituting the ICCF as a continuous, pan-India, multi-stakeholder process.

action points for clean

The key messages and action points for CLEAN are summarized in the table below.

CLEAN Action Points	
Information & Networking	<ul style="list-style-type: none">• Market intelligence on consumer preferences/behaviour• Focus on increased adoption/usage• Need for more focussed, regional consultations as a precursor to the national fora like the ICCF
Skills & Capacity Building	<ul style="list-style-type: none">• Work with NSDC/ SCGJ to improve the availability of skilled resources
Technology Standards & Innovation	<ul style="list-style-type: none">• Methodologies for field testing of stoves• Standardisation of devices and fuels• Framework for star labelling• Common facilities centre for innovation
Access to Finance	<ul style="list-style-type: none">• Create awareness to increase flow of funding to the sector/CCE• Increased flow of funding (results based) for R&D• Innovative end user financing to promote adoption
Policy	<ul style="list-style-type: none">• Interministerial coordination on action to address indoor air pollution• Multi criteria framework for assessment of cooking solutions• Innovative tools/approaches to incentivize clean cooking options

BACKGROUND

India's 250 million households, of which one third are urban, consume an estimated 1104 TWh of energy, cooking a variety of foods. Despite progress on various fronts in India, over 80% of rural households and over 25% of urban households continue to use biomass in traditional cookstoves. This persistent trend has far-reaching negative consequences. The health effects of household air pollution resulting from incomplete and inefficient combustion in these stoves are said to be the cause of an estimated 5 lakh premature and needless deaths (of mostly women and children) annually. Further, it is estimated that rural women spend nearly 5-8 hours per day on cooking including fuel collection with consequences in the form of drudgery, health effects and lost opportunities for income generation activities. Concerns are also voiced about instances of unsustainable biomass harvesting for cooking. Yet less than 30% of Indian households use LPG and just 0.1% of households use electricity as a primary source of cooking fuel; the corresponding percentages are much lower (just half) for rural households. Various renewable and sustainable energy options like solar and biogas remain fringe options. While improved stoves using solid biomass (both processed and unprocessed) have been researched and deployed in large numbers, they have failed to make a significant dent in the Indian cooking energy scene. The Unnat Chulha Abhiyan – the most

recent avatar of the government's improved chulha programme – has reportedly only achieved 1% of its target.

Looking ahead, it is expected that over the long term, the share of modern fuels, particularly of gas (LPG, PNG etc.) will rise in India's cooking energy mix. However, biomass-based cooking using sustainably harvested, locally available materials including agricultural, household, industrial and forestry wastes as well as efficient, low-emissions devices can be sustainable options too in some settings; they also offer significant income generation and livelihoods opportunities.

Against this backdrop of a cooking energy space that is dynamic, challenging and full of opportunities, the focus of India Clean Cooking Forum 2016 was on galvanizing action towards expanding "clean and affordable cooking energy for all".

Initiated in 2013 as an annual event, dedicated to the cause of expanding access to clean cooking energy in India and to the creation of a vibrant ecosystem, the ICCF – now in its fourth edition – has emerged as an important part of dialogue in the Indian energy access space.

As in previous years, ICCF 2016 comprised of:

- The main day-long conference
- An exhibition of clean cooking products and services
- A half-day meeting with clean cooking energy practitioners
- An interministerial meeting on clean cooking energy (proposed in the first quarter of 2017, post the Budget)



Clean and affordable cooking energy for all: the thematic focus

The thematic focus for ICCF 2016 is clean and affordable cooking energy for all. The key words are “clean”, “affordable” and “all”. The term “clean” in the context of cooking energy means different things to different people and in different contexts. It includes carbon implications, environmental impacts, household air pollution and associated health effects of cooking energy. The word “affordable” too similarly raises issues of costs (capital and recurring expenses; tangible and

intangible costs) incurred by various categories of users; access to financing for users and businesses as well as viability considerations for cooking energy businesses. The word “all” refers to all cooking energy needs but the focus inevitably has to be on the needs of currently underserved communities – both households and commercial / institutional kitchens typically affected by abject poverty, remoteness of location and/or other disadvantaged situations.

ICCF practitioners' workshop: key takeaways

On December 5, 2016, 45 delegates (55% Clean Cooking Energy (CCE) manufacturers and distributors; 40% intermediaries comprising analysts, researchers and financiers; and several government officials) gathered for a half-day workshop to look back and look ahead. The objectives of the Practitioners' Workshop on December 5, 2016 included the following:

- To agree on common goalposts for the years 2020 and, if possible, for 2030
- To move towards developing a route map for RE-based CCE practitioners on how their businesses need to evolve based on larger changes in the sector arising out of global drivers such as the SDGs WHO guidelines on indoor air pollution (IAP), etc.
- To understand what are seen as “sweet spots” for RE practitioners and what are viewed as challenges based on the renewed policy emphasis on LPG
- To better understand market interest in LPG and electricity (induction and hot plates)

At the outset the group tentatively agreed that the meeting would try to move towards a route map for practitioners keeping in mind a 2020 macro-level goalpost of completely weaning out the traditional chulha (cookstove). On the whole, discussions pointed out that the way forward would have to focus on the following:

- Discovery, design and promotion of cleaner solutions for biomass based cooking – ranging from incremental retrofits on the traditional chulha to Tier 4 stoves
- Development of robust supply chains for all of the “cleaner” to “cleanest” solutions
- Concerted and massive awareness creation for behaviour change to move away from the traditional chulha with a clear message on the alternatives and their benefits
- Consistent upgradation of stove standards in terms of efficiency, emissions and safety while also ensuring user acceptance for the maximum possible cooking applications or food types

The session commenced with practitioners sharing their experiences in the last 3-5 years, followed by a Q&A session with a panel of specialists and an open discussion.



Some of the major observations / concerns and corresponding suggestions that emerged are tabulated below.

Concerns	Comments and Suggestions
<p>The improved cookstoves sector (based on solid biomass fuels) has not yet been able to come up with a solution that can meet the WHO clean air guidelines (Tier 4) or can completely replace the traditional chulha</p> <p>LPG is aspirational and people want it but it is also not able to totally replace the traditional chulha and emerge as an exclusive household fuel in rural India for a number of reasons.</p>	<p>Stove stacking is inevitable but it is important to ensure that the constituents of the stack become progressively cleaner.</p> <p>The biomass sector should identify the specific user needs that it can meet in different contexts. Various stove-fuel combinations should be able to deliver on these counts rather than aspire to become the universally acceptable CCE solution. Their limitations should be understood, accepted and sought to be addressed.</p> <p>Pellets of various categories may be developed and standardised for production in decentralised units. stoves that can work on multiple types of standard fuels must also be developed. This will help in developing and raising standards for solid biomass fuels and stoves.</p>
<p>Research in biomass stoves still has limited traction</p>	<p>Government has to actively and systematically support innovation in the RE-for cooking area, and this initiative has to be driven by clearly laid-down objectives.</p>
<p>Financing has been a challenge</p>	<p>The sector as a whole is attractive to financiers (in aggregate), provided there is a product or basket of products to be financed.</p> <p>There are a number of innovative financing products that can be taken up for both end-user and enterprise financing in the CCE space; these need to be analysed to understand their relevance for various CCE options.</p> <p>It is important for financiers to be given a detailed understanding of “savings” (financial and economic) associated with improved biomass stoves. They also should be made aware of the typically exaggerated risks of default.</p>
<p>Biomass stoves are seen as non-durable</p>	<p>Individual players have to enhance their maintenance services. Designers have to correct faults or relook at materials.</p>
<p>25% of businesses costs go to awareness creation</p>	<p>Government should support a large awareness creation programme similar to the major “Give-it-up” campaign for LPG.</p>
<p>Biomass stove emissions and efficiency performance is multi-faceted involving fuel, device, user behaviour and cooking environment. Lab tests can never be conclusive. Stove testing continues to be expensive and a very opaque process</p>	<p>The sector must move to star rating for stoves which can be based on a number of parameters including emissions and efficiency and these ratings would have to be based on field and lab performance.</p> <p>It is important for manufacturers and distributors to not make claims that are conditional (as is often the case for biomass solutions).</p>

Concerns	Comments and Suggestions
There is a gender dimension in CCE, given that most cooks are women, but the supply and service chains for cooking energy are dominated by men	The Ujjwala scheme revolves around women. In the RE sector too, women have to be involved in design (to better build in user needs) as well as be included as important players in various stages of the supply chain.
Subsidies are distorting the market for biomass stoves	The Government's Unnat Chulha Abhiyan which reached just 1% of its household cookstoves target, needs to be relooked at closely. Subsidies have a role in addressing affordability by the poorest. Subsidies should be revamped to make sure that they are not market distorting, do not affect product pricing and are directly transferred to the most needy. Ideally, the transferred subsidy should be allowed to be flexibly used by the beneficiary on a cooking energy of her/his choice.
In the case of all alternatives – improved biomass, solar, LPG – the focus continues to be on “connections” and not usage	The focus of the sector must shift to adoption or usage. For this, it may be necessary to work with and hand-hold the user in some cases. Usage monitoring mechanisms have to evolve and the extent to which stove use monitors can resolve this must be understood realistically based on field performance of these devices.
There is no convergence of policy on the issue of clean cooking energy.	A unified clean cooking energy policy and the resultant form and shape of a joint programme for MNRE, Ministry of Petroleum and Natural Gas would also have to be thought through and recommended in the form of a roadmap or action plan.
LPG has emerged as a threat for the solid biomass cookstoves sector	LPG has its own challenges which are mainly in terms of its distribution network especially in rural India. The second limitation of LPG lies in its reliance on fossil fuel sources. These are the main strengths of the biomass sector – rural reach and the potential to be a carbon-neutral solution. The improved biomass stoves sector has to find its niche by providing a basket of options that cater to a range of cooking needs using locally available, sustainably gathered fuels. A critical action point is the mapping of LPG distributors. Given that LPG reach is generally limited to around 25 kms from the nearest distributor, the mapping of LPG distributors will throw light on areas where improved biomass stoves can penetrate with relative ease.
Other renewables (other than solid biomass) have also met with limited success.	The work on other RE-based cooking energy such as biogas, liquid bio-fuels and solar must continue. They have a clear role given the goalpost that all chulhas will need to be replaced with a cleaner option.
There is no pan-India cookstove design or business model for clean cooking yet	It is important to accept that there may never be a universally accepted CCE product or business model in India. What is crucial is to appreciate that there are different market segments that represent different needs and will need different offerings. This must be factored in by all stakeholders- financiers, investors, and Government

ICCF main forum: summary of discussions

Attended by over 100 delegates (with several senior government officials and with equal representation from the practitioners and intermediary communities), the ICCF Conference on 6th December 2016, with a thematic focus on “clean and affordable cooking energy for all”, focussed on three key words “clean”, “affordable” and “all”.

The meeting commenced with an hour-long inaugural session in which the panellists presented national and



Session one aimed at arriving at a common understanding of the term “clean”. While no clear definition emerged, possibilities around the technology of biomass combustion and complexities of measuring emissions were parked alongside challenges faced by a manufacturer and the aspirations of a cook. The policy community detailed out the need to balance short-term feasibility with longer term policy goals.

In Session two, the pros and cons of cooking energy supply vis-a-vis LPG / PNG, solid biomass and biogas were discussed while an analyst wove these together to highlight the need for complimenting fuels. Without the right technologies, innovations in financing and implementation alone will not suffice” stated Dr. Chandra Shekhar Sinha, Lead, Climate Change and Urban Resilience Unit at the World Bank. This was followed by an interesting round of open discussions with the audience that raised further questions and opened up more possibilities.

global perspectives, chalking out recent trends, identifying missing and weak links. This session laid out the backdrop for the day’s discussions. During this session, Dr. Arunabha Ghosh, CEO, Council on Energy, Environment and Water, posed a question on why clean cooking energy continued to be seen as the stepchild to the issue of electricity access. Dr. Ajay Mathur, Director General, TERI further remarked that we have not paid adequate attention to what end users of cooking energy want, can afford and can access.

Three different views were presented in Session three – the bird’s eye view, the treetop view and the worm’s eyeview (to borrow phrases used by the Session Chair to describe national, state and local views). The role of the government and financiers at various levels was also discussed. The importance of working in partnership across fuels and agencies was echoed in this session. “We need unified policy and delivery mechanisms along with localised delivery systems that are matched to local user needs” stated Dr. P.C. Maithani, Director, MNRE.

The conference concluded with partners reaffirming their commitment to the Forum and to the cause of clean cooking energy for all in India. The CEO of CLEAN, Mr Hari Natarajan remarked, “It is important for us to figure out a way to promote the most effective and acceptable solution for clean cooking”. Mr. Arijit Basu, Regional Director, GACC promised that they would continue to work with various stakeholders to create a thriving market for clean stoves and clean fuels while addressing health and environmental issues while Mr. Ganesh Neelam, Head of Innovations at Tata Trusts said, “We need partnerships to design, execute and implement the roadmap to a cleaner cooking future in the country. Finally, Dr. Harald Richter, Head of Indo-German Energy Access Program at GIZ observed, “The evolution of ICCF into a forum on multiple sustainability and developmental aspects –health, environmental sustainability, gender along with technology, business and economic sustainability - is very heartening”.

With thirteen organisations participating in the Exhibition organised on the side-lines of the ICCF Conference, a range of new and improved stoves, fuels, stove-use monitors were on display and participants showed a keen interest in understanding more about these products and services.

Matters discussed at the ICCF 2016 are summarised here below.



Trends in the CCE sector: stove stacking to continue; each option to find its own niche

The discussions at the Forum were intense and there were divergent views on many aspects. However, one area of consensus was that stove stacking is a reality and will remain. "Acceptance of stove stacking indicates that there is a spirit of partnership now" said Ms.Svati Bhogle, Chairperson, CLEAN.

All agreed that it is not to be seen as a cause for concern either. In this context, there were heartening references to the evolution of the ICCF from the India Clean Cookstoves Forum, with an exclusive focus on improved biomass stoves in its first two editions, to the third edition of the ICCF, which highlighted the impending emergence of LPG, to the current ICCF where LPG, PNG and induction were discussed freely alongside biomass and other RE options.

This was seen by all as a clear sign of a growing acceptance of not just stove stacking but also a pragmatic acceptance that in order to reach out to as many as 180 million households that are going to make

cooking energy choices, there is no single silver bullet. "The cook is central-her opinions should take precedence over that of the planner's or scientist's.", rightly observed Dr. Satish Agnihotri, Professor at IIT Mumbai. There will have to be baskets of options, keeping in mind, however, that the options would have to:

- Be relevant and suitable to various local contexts
- Improve progressively in terms of efficiency and emissions performance
- Fit in with the larger energy access and development agenda of the country

Much time was spent by various stakeholders listing out the relative strengths of different options with potential to remain or grow in India's cooking energy basket. Represented here are some of the views voiced about various options.

LPG: diametrically differing views

Views on LPG ranged from 'LPG may deliver in the long run, but we can't wait until then' To 'LPG is right now the most easily scalable, but may not be the best option for the long run'. "Scalability is very important and LPG is the most scalable technology at this stage" said Mr Ashutosh Jindal, Joint Secretary at Ministry of Petroleum & Natural Gas.

While many opined that it is a pull product and is aspirational, others pointed out that despite large governmental interest and investment in the expansion of LPG connections, adoption and usage of the fuel remains a challenge in rural India with less than 5% rural households exclusively using LPG. "LPG need not be the only fuel, we must explore appropriate solutions depending on the context" said Ashok Sreenivas from the Prayas Energy Group.

Challenges and corresponding suggestions discussed around LPG include the following:

- Access to and affordability of LPG refills and the spread of the distribution network: rural franchisees and small cylinders suggested to be taken up more systematically.
- LPG adoption low in houses with connections: awareness creation around LPG safety and easing up the availability of refills.
- National costs of LPG subsidy: subsidies to be eventually targeted exclusively towards the poorest.
- Concerns around safety: intensive awareness creation around safe LPG usage.
- Climate change and foreign exchange implications of growing dependence on an imported fossil fuel: LPG not seen as the only fuel over the very long run; to be complemented with a range of other fuels.
- LPG data needs to be more transparent and widely available.

Piped natural gas and electric induction cooking: wedges to take the pressure off LPG

Piped natural gas (PNG) is typically being viewed as the cooking energy fuel in cities and in other settlements close to the natural gas pipeline. PNG is expected to take the pressure off LPG in order to make the latter more easily available. Unrealistically low piped gas tariffs was flagged as a concern but this was seen to be in line with the trend in other infrastructure and RE projects and did not generate much debate.

Electric induction is picking up rapidly wherever electricity is reliable and in many cases, where electricity is available at a low or negligible cost. Contrary to public perception, induction stove adoption/usage picks up irrespective of whether the location is urban or rural and whether or not the households are poor or high-income. Induction is thus another wedge in the cooking energy pie and like PNG, it helps ease the pressure off LPG. However, concerns remain about frequent power outages and voltage fluctuations which are more rampant in rural areas and small towns than in large cities.

RE-based options: dominance of solid biomass, but other options to expand over the long run

Though several decades of research have gone into biomass cookstoves, there is still a very small group of researchers globally and in India who work on combustion of solid bio-fuels. Also, there has been inadequate research emphasis on what people want, can afford and have access to. In terms of emissions and efficiency too, major gaps remain. If public health is the driver, we do not yet have the solid biomass technology to obviate the negative impact. There have been glitches like refractory lining and charging points raising doubts about their practicability and durability. On the other hand, some developments over the last two years – such as lithium batteries, computer fans for cooling, integration of solar panels and electricity-less forced draft stoves - are promising.

It was further felt by many that standardised processed fuels are a must for a good cooking energy system and that decentralised business models for processed biomass showed promise in rural areas. Given the focus on emissions from a public health perspective, there is a definite impetus for biogas. As an illustration, the following was shared: If we deploy 15 million biogas units, the country can save a billion dollars, create 200 million jobs (albeit many temporary or seasonal) and by monetising the carbon avoided, paybacks can be as low as 3 years. Biogas has been a core part of cooking energy

planning in India, but its growth appears to have plateaued and now a push is needed to discover new business models.

On biomass based solutions, the following issues were emphasised:

- The USP for biomass resources would have to be local availability, familiarity and sustainability.
- Though emissions as an issue has gained ground from a public health perspective, fuel efficiency is equally critical given that biomass availability can also potentially become a constraint for both rural and urban areas as adoption rates go up.
- Biomass is often touted as being no-carbon, but this claim holds only if the options are based on waste or if the biomass resources are harvested sustainably.

Solar cooking looks promising for certain applications (e.g. at institutional / commercial scales and for cooking processes such as boiling). Given recent developments, this option has to be examined closely as part of the country's solar focus.



key outcomes/conclusions

Arriving at a common understanding of “clean”, “affordable” and “all”

While it is difficult, nigh impossible to arrive at agreements on any issue in the course of a 1-2 day event, discussions at the ICCF have provided useful pointers to start a constructive debate on three critical terms of the theme this year, i.e., “Clean”, “Affordable” Cooking Energy for “All”.

“Clean”

There was a general agreement that any improvement over the three stove traditional mud chulha – ranging from small retrofits to a transformational Tier 4 stove which may be based on pellets and forced draft to other fuels like LPG, biogas, solar cooking, induction cooktops – can all qualify as “clean” till the year 2020. The discussion on the phase beyond 2020 was ambiguous but indicated a shift to progressively “cleaner” stoves that are also acceptable to users. This then highlights the need for a universal rating system for cooking energy options and to a whole new set of questions around CCE choices and policy making (as discussed below).

“Affordable”

Though there was no distinct attempt made to define affordability, several important ideas were shared:

- Cooking energy cost must include the cost of the stove and the fuel over its lifetime plus other maintenance costs
- Energy cost per meal to be understood for various fuel options for a certain context; when this is estimated relative to income, it can be a reasonable indicator for affordability.

- Full cost of an option to be explored rather than financial cost (e.g. cost of biomass even if it is collected but not paid for, healthcare costs even if these are not really incurred)
- Subsidies can be considered but only for the poorest; alternatively telescopic tariffs (with higher rates for higher levels of consumption) were suggested to address varying levels of affordability

“All”

In the context of serving all communities, there was no consensus on whether practitioners or government should reach out exclusively to the underserved. What came out clearly is the need to rule out any rural-urban bias in choice of cooking fuels. For instance, LPG was not to be seen as primarily an urban fuel. Also the benchmarks of “clean” and “affordable” need to be standardised, there should not be any inherent bias in favour of urban or rich households.

About tribal communities, remote habitations and communities living in forest fringe areas, the importance of understanding their needs and sentiments as well as cultural fit was underscored while designing cooking energy solutions for them. While some rural communities are apprehensive about LPG and welcoming of more familiar biomass options, others feel left out when LPG connections do not reach them. The practical logistical aspects of serving them reliably must also be factored in.

Guiding Principles for the Way Forward

Speakers and participants at the Practitioners' Workshop and the Main Conference envisioned various aspects of the future that may be adopted as guiding principles for the way forward. Several of these are listed here:

- Stove stacking will continue and is not a bad thing; in fact its acknowledgement is a sign that representatives of various CCE options would have to and are willing to work together
 - The CCE access problem is a rather complicated one; technology or policy or financing won't work on its own
 - It is imperative to move away from "fascinations" and focus on constructively developing a practical yet ambitious roadmap of CCE choices and actions
 - The focus has to shift from connections to usage / adoption for all options, including LPG, induction and RE. In fact, it is important to agree on a common metric for adoption / usage across CCE options.
- CCE segments need to learn from each other and draw on each other's strengths. For instance, biomass has the benefit of reach and local acceptance while the LPG sector has demonstrated how it can innovate to cater to user needs and keep costs low
 - It is important to move on a technology agnostic path – for instance: setting standards for performance irrespective of the fuel or device (similar to the Mashekar Committee recommendations for the transport sector)

next steps for various stakeholders

Government

Government to work towards a unified CCE policy framework with flexibility to encourage decentralised choices

There is no doubt that cooking energy access has to become a part of the country's larger development agenda and in fact, the government's emphasis on LPG expansion may be seen as a positive sign in this direction.

Throughout the Forum, there was a repeated call for a unified policy and /or institutional framework for Clean Cooking Energy in a way that the focus would be on the service (that of providing cooking energy) irrespective of which energy source this came from. There was discussion around a coordination committee or a working group to collectively think through the issue in a holistic manner integrating a range of fuel types, market segments and community needs. It was recommended that such a co-ordinated working group be set up at the level of a block or district as a pilot. Such policy / institutional frameworks would have to be evolved in consultation with CCE stakeholders.

It was also suggested to think at an even larger scale in terms of thermal energy needs of which cooking energy would be a part.

Other specific next steps suggested in terms of policy-making include:

- Government to not be a sector player (or service provider) but a facilitator in terms of developing an ecosystem that fosters innovation and market creation
- MNRE should arrive at a common benchmark and rating system in partnership with CCE players to assess the complete range of CCE systems including fuel-device combinations, emissions, efficiency as well as a few context-specific facets like local user / cook acceptance.
- Devise, in partnership with CCE players and researchers, a methodology for gauging adoption/ usage and / or other indicators of success of an option
- MNRE to target subsidies and other financial support from the government at the most need without distorting the market distorting; there was also a suggestion to move from fuel-based to device - based subsidies
- Through an inter-ministerial arrangement or co-ordination committee, devise mechanisms for provision of cooking energy subsidies which may be directly transferred to poorest households who would be free to use this for any CCE option of their choice
- NITI Aayog to develop a tracking mechanism for measuring and reporting progress on effective transition to cleaner cooking energy including stove stacks; monitoring mechanisms to assess changing patterns of cooking energy demand (e.g. more CCE devices for nuclear establishments, trends in community cooking if any etc.); higher transparency and more information on CCE connections and adoption
- Revenue from "Give It Up" LPG funds to be also deployed for RE based clean cooking options
- Broad-spectrum awareness creation campaign through Ministry of Health and Family Welfare, Ministry of Consumer Affairs or Ministry of Information & Broadcasting on the importance of switching to clean cooking [e.g. unnat chulhe ki khariddari mein hi samajhdari hai (be intelligent, buy an improved cookstove) based on a product advertisement from yesteryears]

- Boost research into clean cooking; stove designers to work in partnership with financing institutions with clear research goals

- Stoves to be classified as RE and to be made VAT-exempt

Financial Institutions

Financiers need to provide technology-agnostic financing for end-users and enterprises

- Suggested that a certain percentage of RE priority sector lending be channelized to RE-based clean cooking
- Creation of a credit guarantee fund to unlock capital and kick-start lending from Commercial banks for enterprise and end-user financing

- Consideration of interest waiver on component of Cooking Energy Loans only to Jan Dhan / BPL account holders
- Assessment of CCE financing through framework of risks, but also of holistic impacts

CLEAN

CLEAN to act as network of RE players but also as the go-between for interaction with the non-RE players

In terms of roles expected of various stakeholder groups, the following specific actions were identified. Suggestions from ICCF for inclusion in CLEAN's work plan include the following:

- Support in understanding market segments / agro –eco clusters/ varied user needs / varied feedstocks – for better positioning of stoves
- Co-ordinate the establishment of a common facility centre for learning about products, fuels, product and process innovations (e.g. cost reduction in LPG)

- Interactions with banks, MFIs, Ministry of Finance officials to demystify risks and challenges associated with financing of CCE entrepreneurs and end-users
- Multi-criteria framework for assessing and rewarding CCE – economics, health benefits, environmental (local and global), ease of use, durability / resilience of technology
- Facilitate standardisation of devices and fuels as required to improve quality

- Devise with partners and members a framework for star labelling of CCE options to inform the buyer (and not for subsidy purposes) – possibly drawing on emissions and other facets as proposed in the IWA (International Workshop Agreement) guidelines for cookstoves performance
- Engage with National Skills Development Corporation along with partners to develop a band of skilled technicians to service cookstoves possibly through a programme similar to the Surya Mitra.

- Work with members to promote sales but also highlight the importance of working with end-users to measure and promote consistent adoption / usage
- Study other sectors (energy and non-energy) to identify policy measures and financing tools that can encourage innovation towards specific goals and present suggestions to the policy and financing community
- Along with interested members and government stakeholders, develop strategies for serving underserved markets

ICCF 2017 & Beyond

With the intent of strengthening the ICCF into a continuous consultative process, the following steps are envisaged:

- Inter-ministerial meeting hosted by ICCF government partners – in the first quarter of 2017 with a focus on
 - Establishment of a multi-agency mechanisms spanning government and a few non-government agencies for co-ordinated action around clean cooking energy
 - Enlisting the sector's expectations from the government for the next 1-10 years
 - Positioning of CLEAN as a go-to point for government agencies such as NITI Aayog, MNRE and MoPNG to gather field insights on clean cooking energy
- Regional consultations on clean cooking energy for CLEAN members and other CCE practitioners to determine customized interventions at State or Regional level

- Concrete outputs to be developed by CLEAN over the next 12 months in discussion with its members and ICCF partners
 - Methodology and guidelines for cookstove testing to better reflect field conditions
 - Methodology to measure and monitor cookstove adoption / usage and devise mechanisms to promote adoption rather than only devices
 - Detailed framework for star rating of CCE options to reflect performance and user acceptance criteria
 - Devise steps to enhance the quality of cookstove manufacturing
 - Develop a platform for funding of goal-oriented or results-based R&D around RE-based clean cooking