



RCSI

Leading the world
to better health

Addressing the global environmental threat caused by household air pollution

Dr Debbi Stanistreet

Senior Lecturer in Public Health, Dept of
Epidemiology and Public Health Medicine
Royal College of Surgeons, Ireland

Senior Honorary Research Fellow, University
of Liverpool



This presentation will cover

1. Household air pollution –
What is the extent of the
problem?
2. What can be done about it?
3. Should we be concerned
about household air pollution
in our own homes?



Household air pollution: the killer in the kitchen

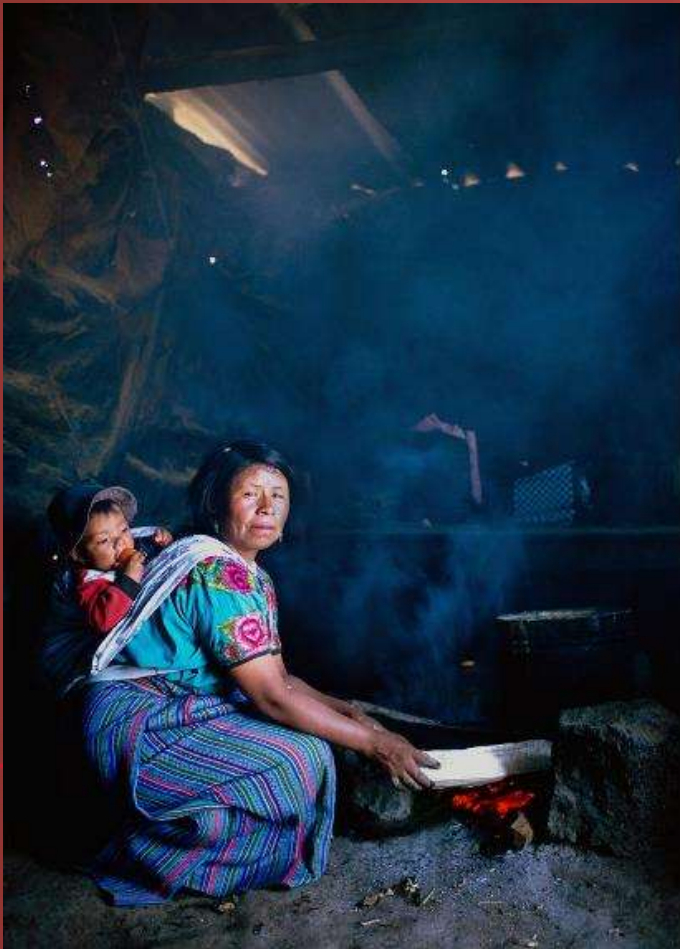


Household air pollution due to cooking with solid fuels is a major global environmental health risk factor that kills approximately 4 million people annually, mostly from poorer communities in low-and middle-income countries.



“Having an open fire in your kitchen is like burning 400 cigarettes an hour,” **Kirk Smith**

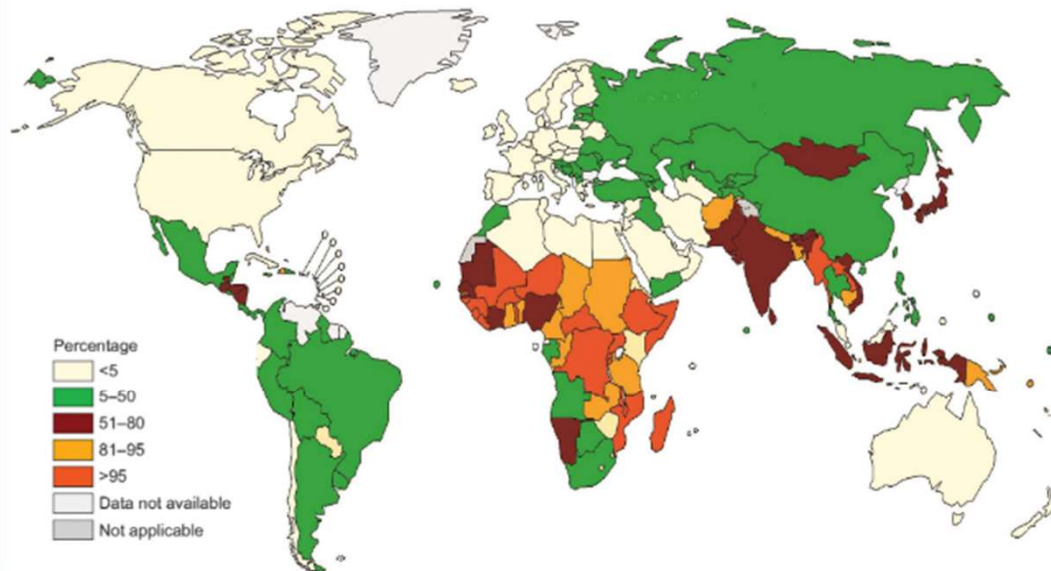
Traditional use of 'solid fuels'



- Solid fuels:
 - Wood
 - Animal dung
 - Crop wastes
 - Charcoal
 - Coal
 - Plastic bottles, etc
- 3 billion people:
 - 2.6 billion use 'biomass'
 - 0.4 billion use coal

Who uses solid fuels?

>40% of world uses biomass fuels



Kurmi et al Eur Respir J 2013

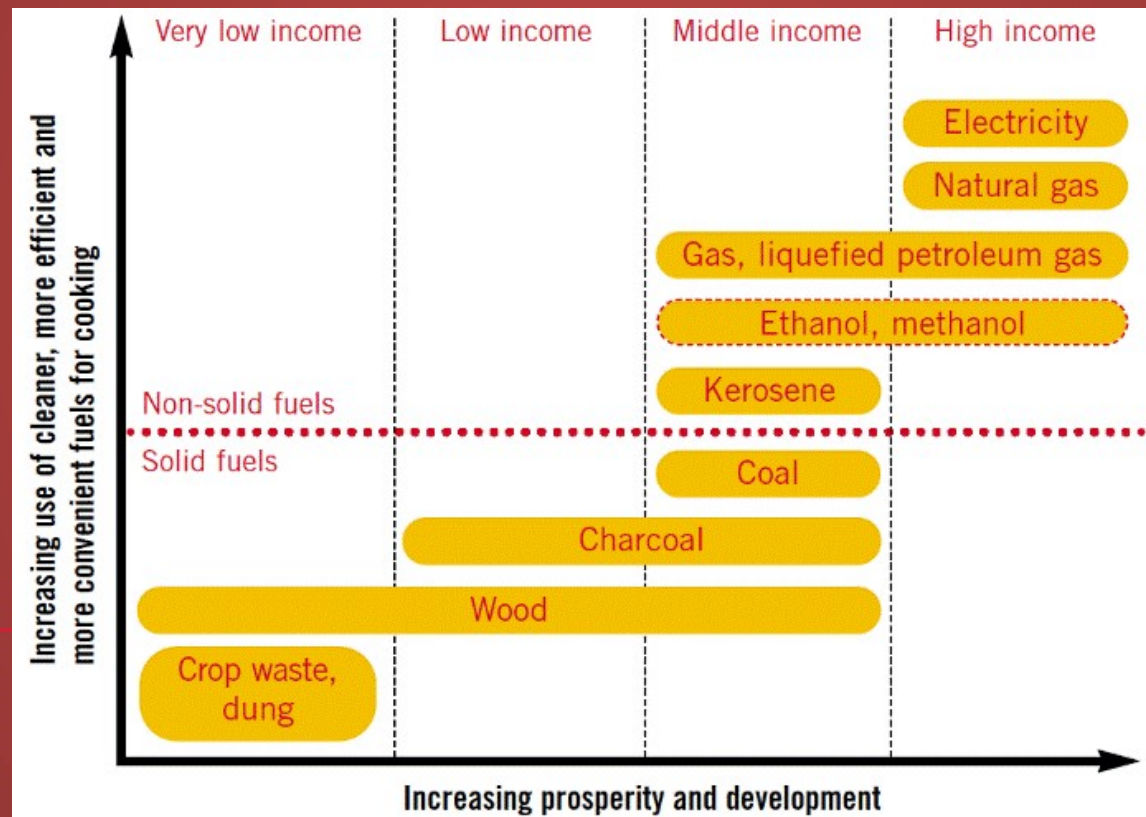
Global Burden of Disease from Household Air Pollution

The World Health Organization estimates that “ *7 million people a year die as a result of air pollution, 4.3 million people a year dying prematurely from illness attributable to the household air pollution caused by the inefficient use of solid fuels.*” (WHO 2016)

- 27% are due to pneumonia
- 18% from stroke
- 27% from ischaemic heart disease
- 20% from chronic obstructive pulmonary disease (COPD), and
- 8% from lung cancer.

See www.who.int/airpollution/household for further information

Household energy and development

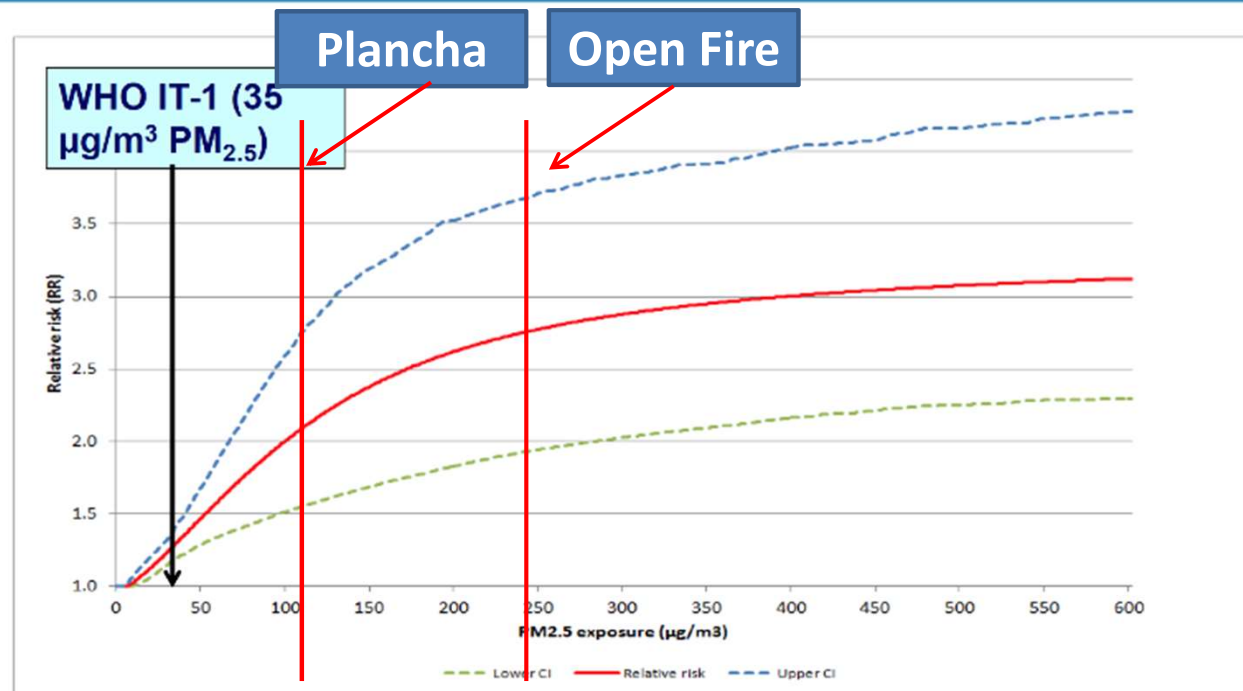


Impact on time, personal safety and economic development

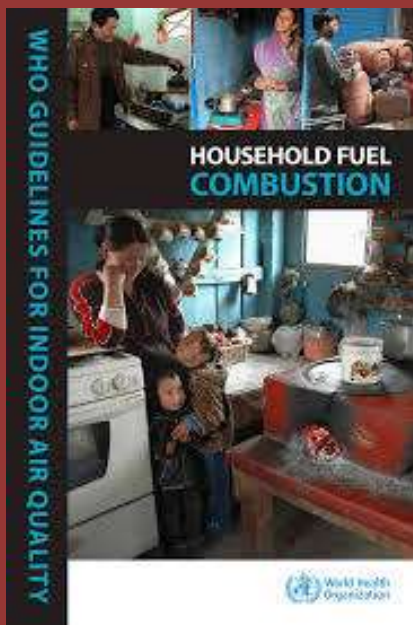
- Collection time
- Injury, rape
- School
- Income
- Burns



IER function for PM_{2.5} and child ALRI risk (linear scale)



WHO Guidelines for global action 2014



Recommendations:

1. WHO guideline levels and interim targets (IT) for average fine particulate matter ($PM_{2.5}$) to benefit health – emissions targets
2. Recognition of transition to cleaner technologies and fuels in LMICs to meet guideline levels
3. No use of unprocessed coal for fuel
4. Discourage use of kerosene for fuel
5. Consider opportunities for securing health and climate co-benefits in reducing HAP

Charcoal stoves

- A lightweight 'easy-to-handle' fuel that is very popular in Africa and Asia especially in peri-urban and urban areas
- Causes high emissions of lethal carbon monoxide
- Price is linked to the size of the city, distance to exploitable forests etc. and can result in a heavy financial burden



Improved biomass stoves

They can reduce HAP, even if it is not down to safe levels. This can reduce the risk of health effects

ICS can result in burning of less biomass leading to less forest degradation.

However, even the most clean burning fail to come close to meeting AQG guidelines



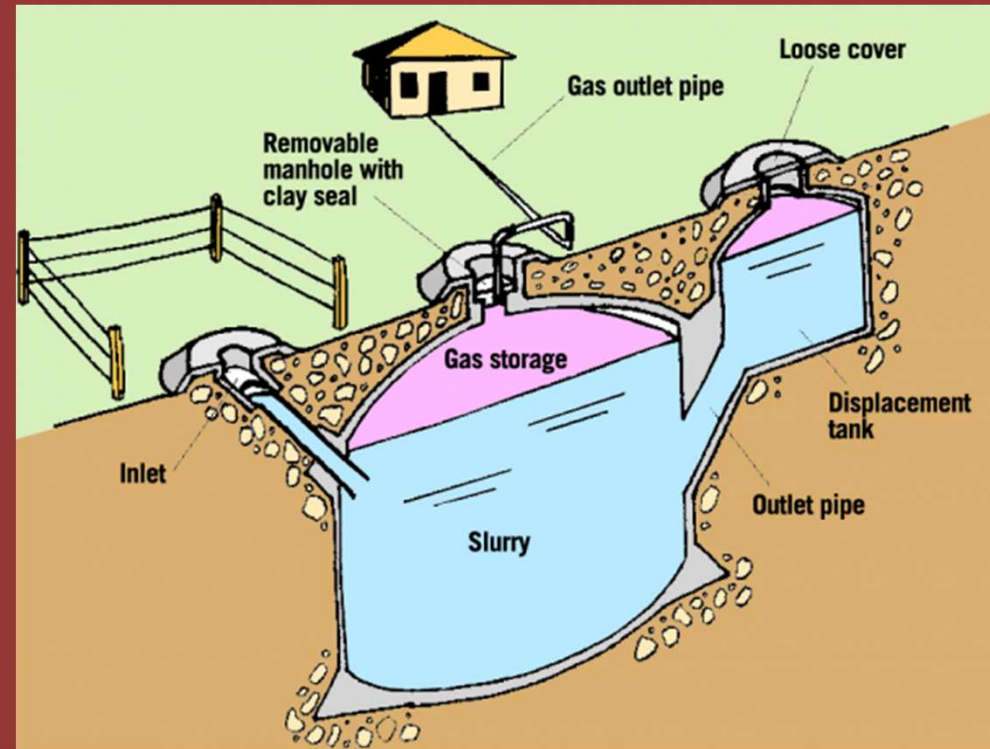
Ethanol stoves

- A clean liquid biofuel made from sugar, molasses, sugar beet and maize
- Generally comparable to LPG in terms of cleanness
- Price of ethanol is still high, partly because it used as a transport fuel in parts of Africa



Biogas

- A by-product of anaerobic digestion of animal and human dung
- Some popularity in Asia , especially China, India and Nepal
- Can be used for cooking and lighting
- Expensive to build, requires maintenance, requires dung from at least two large animals, and cannot operate below 10 degrees



Liquid Petroleum Gas

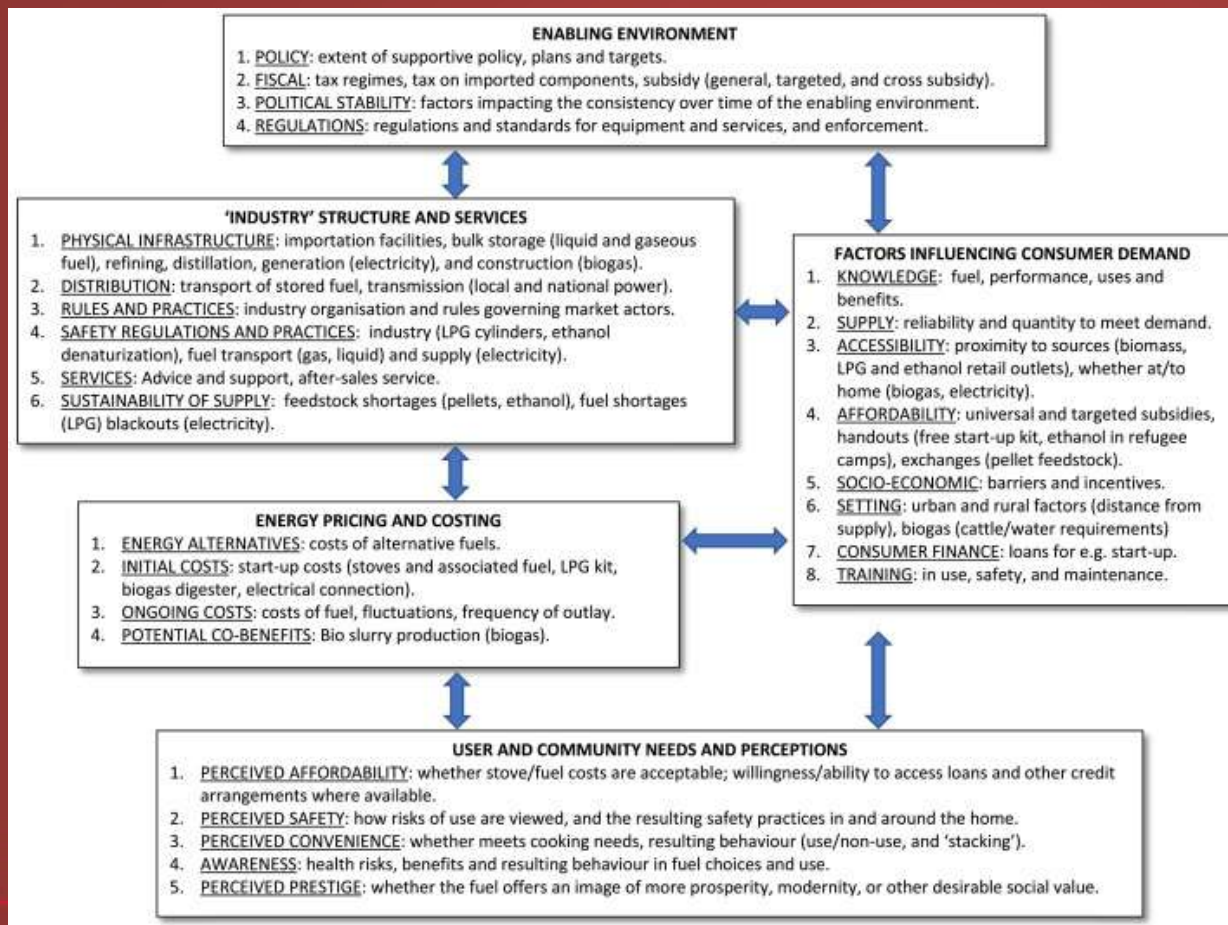
- Gaseous fuel that burns very cleanly, usually consists of propane and butane.
- Cost effective
- Main challenges for poor rural communities are cost and availability



Electricity

- Electric stoves convert electric energy into heat for cooking
- Limited to areas that have access to sufficient and reliable power
- Direct use is often too expensive, even to those households connected to a supply





Key dimensions and factors for clean fuel scaling up and sustained adoption

Taken from Quinn, A, Bruce N, Puzzolo E, Dickinson K, Sturke R, Jack D, Mehta S, Shankar A, Sherr K, Rosenthal J (2018). An analysis of efforts to scale up clean household energy for cooking around the world. *Energy for Sustainable Development* (46) pp 1-10

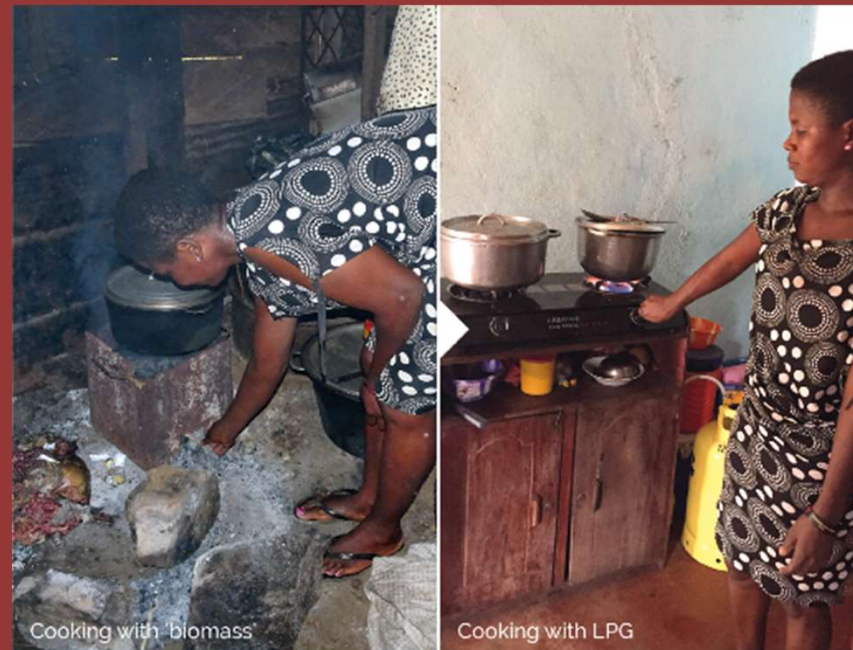
Brief case study - Liquid Petroleum Gas (LPG) scale up in Africa

The CLEAN-Air(Africa) NIHR Global Health Research Group University of Liverpool, UK, RCSI, and partners.



Facilitating clean energy transition

- Focus on Liquified Petroleum Gas/ bottled gas as a clean, scalable household energy option (short to medium term solution)
- Work in LMICs where there is a national commitment (including policy development) to scale adoption of LPG.



Facilitating clean energy transition

- Engage with relevant stakeholders (e.g. ministries of energy and health) to inform policy.
- Research focus on communities for equitable and effective scale of transition to clean energy (downstream).
- Facilitate engagement between stakeholders and the public to maximise impact of policy.



Goals of CLEAN-AIR(Africa)

Goal 1

- **Inform strategies to support more equitable uptake of clean fuel (LPG)** across the population by **evaluating enabling/inhibiting factors and testing interventions** to address identified barriers

Goal 2

- **Estimate the impacts of scaled clean fuel adoption in line with governmental targets on health and climate** by using advanced statistical techniques, thereby providing evidence for national/international policymakers to advocate for widespread transition to clean fuel

Goal 3

- **Develop capacity through health systems strengthening by equipping health practitioners to intervene early to 'prescribe' clean household energy solutions/fuels** to vulnerable populations

Goal 4

- **Facilitate engagement between the general public and policymakers to exchange knowledge on how best to achieve rapid transition to clean household energy**

And finally a little closer to home....

- Do we need to be concerned about air pollution in Ireland following on from the very successful 1990 coal ban?
- The European Environment Agency (EEA) Air Quality in Ireland 2016 estimated 1,510 premature deaths in Ireland in 2014 were directly attributable to air quality, with the predominant culprit being fine particulate matter (PM_{2.5}) from the use of solid fuels such as wood, coal and peat for home heating.



Wood chippings and peat are causing extreme air pollution in Dublin

- Air pollution in Dublin often breaches WHO AQG due to burning of peat and wood
- Up to 70% of air pollution is due to burning peat and solid fuel
- It is especially urgent to introduce new emission controls on residential solid fuel burning.
- See work of Professor Colin O'Dowd and Dr Jurgita Ovadnevaite at the Ryan Institute's Centre for Climate and Air Pollution Studies



Pathways to Clean Cooking Conference

- **Leaving No-one Behind International Conference: 30-31 May, 2019, Wexford, Ireland**
- For more information visit:
www.pathways2cleancooking.info



Conference

Themes for the conference

- o Households and settings
- o Evaluating pathways to modern, sustainable cooking energy systems
- o Impact based finance for cleaner cooking
- o Modern, clean, sustainable bio-energy in a low-income country context
- o Policy options for a just transition
- o Transitional and hybrid multiple fuel-device cooking systems

For suggestions for those making a verbal presentation or submitting a poster click [here](#).

Registration Open

Registration is required to participate in the conference even for presenters.

To register please click this [link](#).

Draft agenda coming soon

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Thank you for listening!

