Electric Cooking

Key Issues in Universalisation

Sanjay Kumar

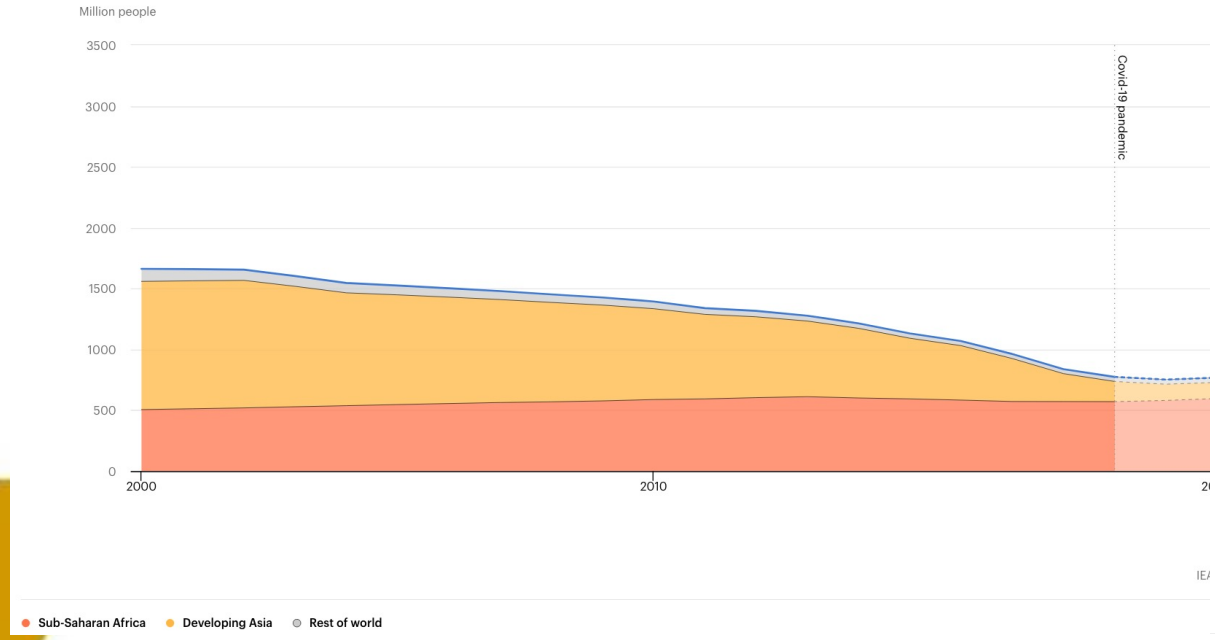
Former Director General of Forests, Govt. of India

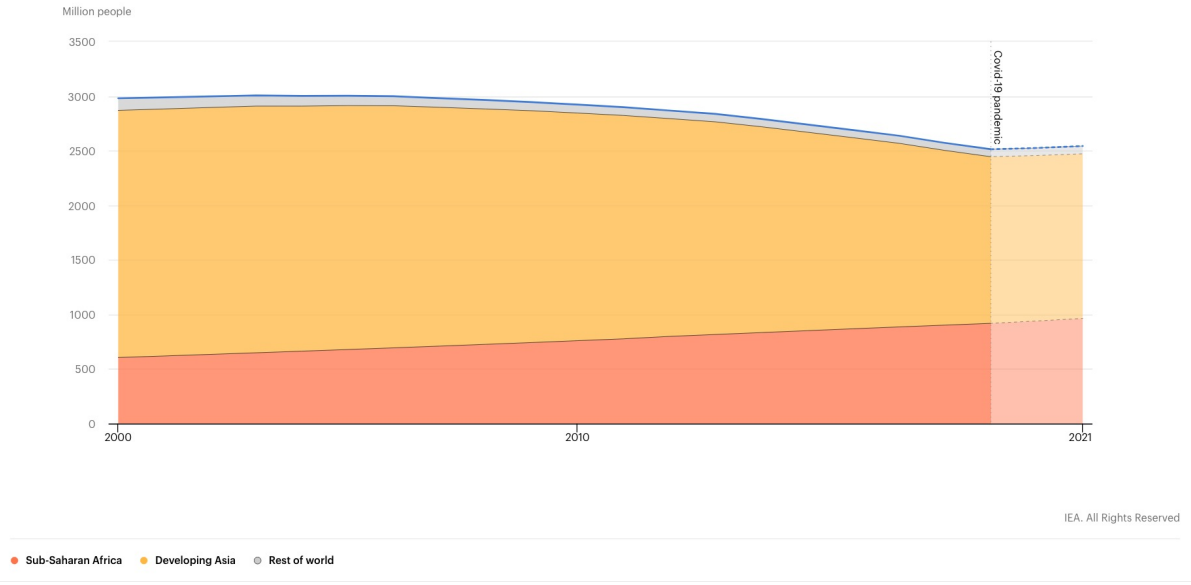
Access to Clean Cooking (CK) affects SDG-7

Access to clean cooking has fallen way behind the progress on access to electricity

(Million persons: without access to electricity (left), without access to clean cooking (right)

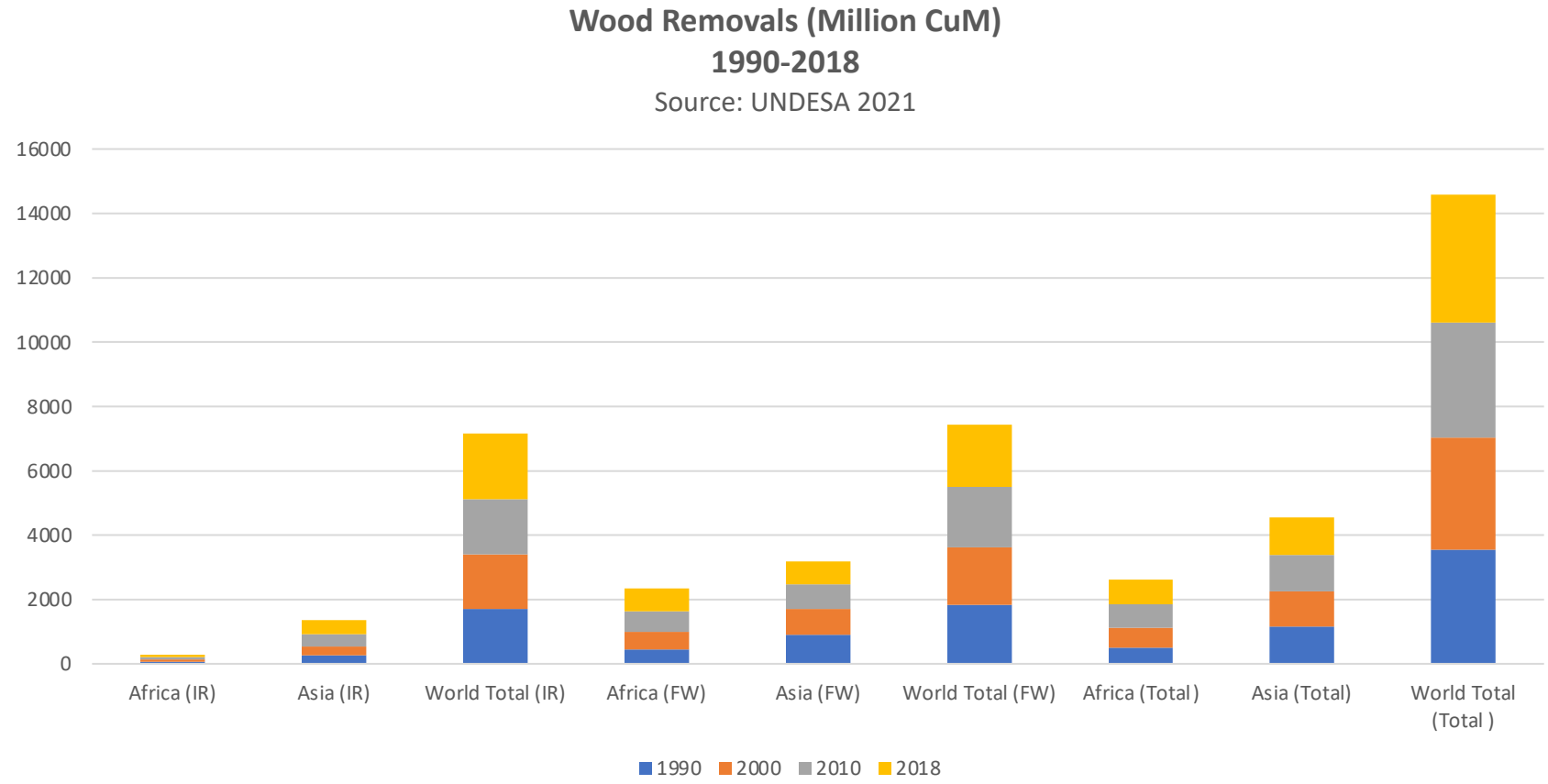
Source: IEA (September 2021)





Poor progress on CK pushing other SDGs back

Fuelwood dependence remains high



Climate Change Impacts

Black Carbon

- 25 per cent of all Black Carbon arises from inefficient cooking and lighting

Carbon emissions

- Emissions from solid fuel ~ 1 Gt $CO_{2\ eq.}$ (~ 2 % of global emission)
- Kenya : household fuel → 22-35 MMt / year (30-40% of total emission)

Raising Net-Zero ambition

- e-Cooking helps significantly improve share of electricity in total primary energy consumption

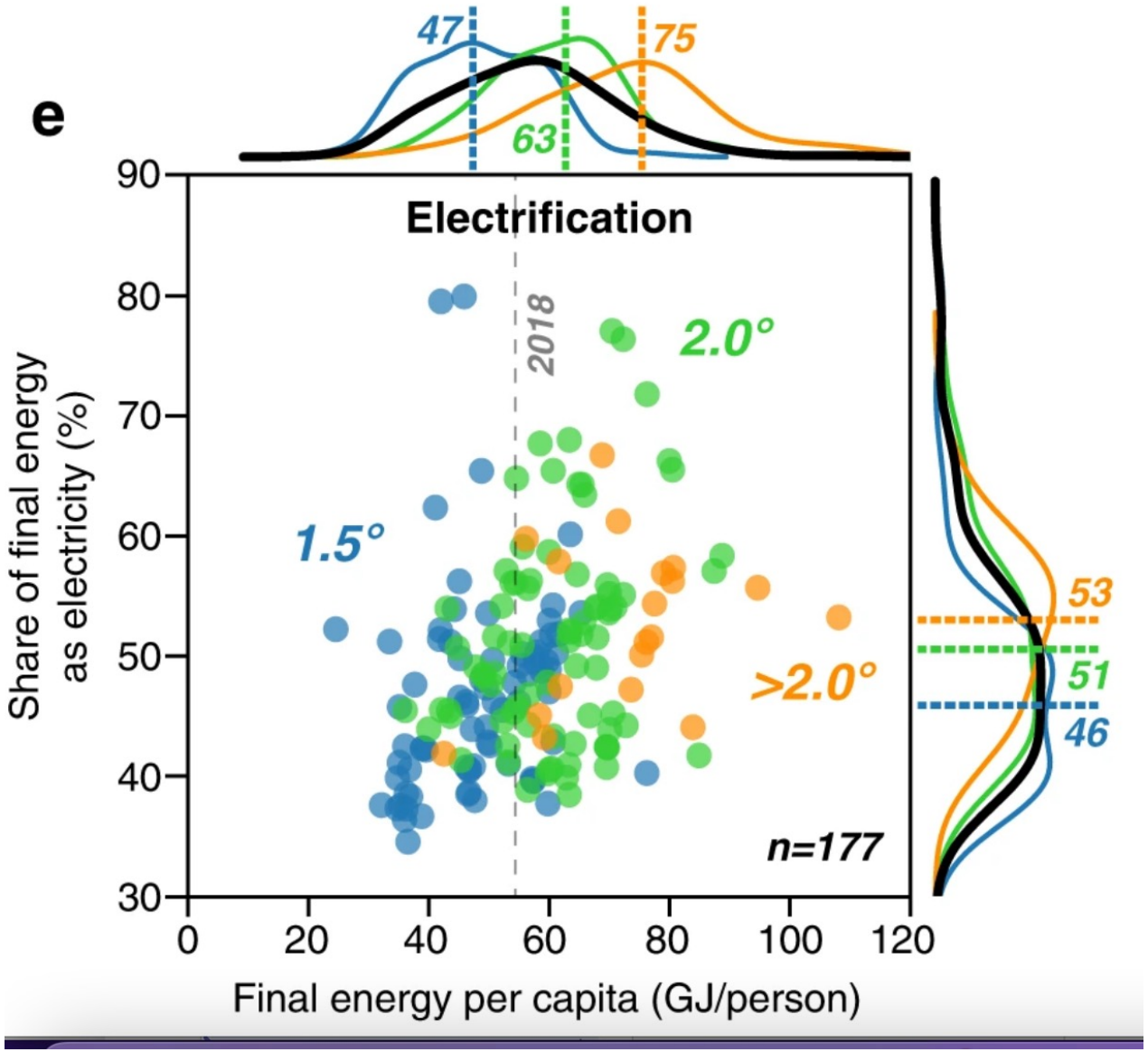
Redistribution of national financial resources

- US$ 1.94 trillion of fossil fuel subsidy since COP-26 (till 27 Feb 2022)

Share of electricity in final energy consumption must increase significantly to mitigate climate change

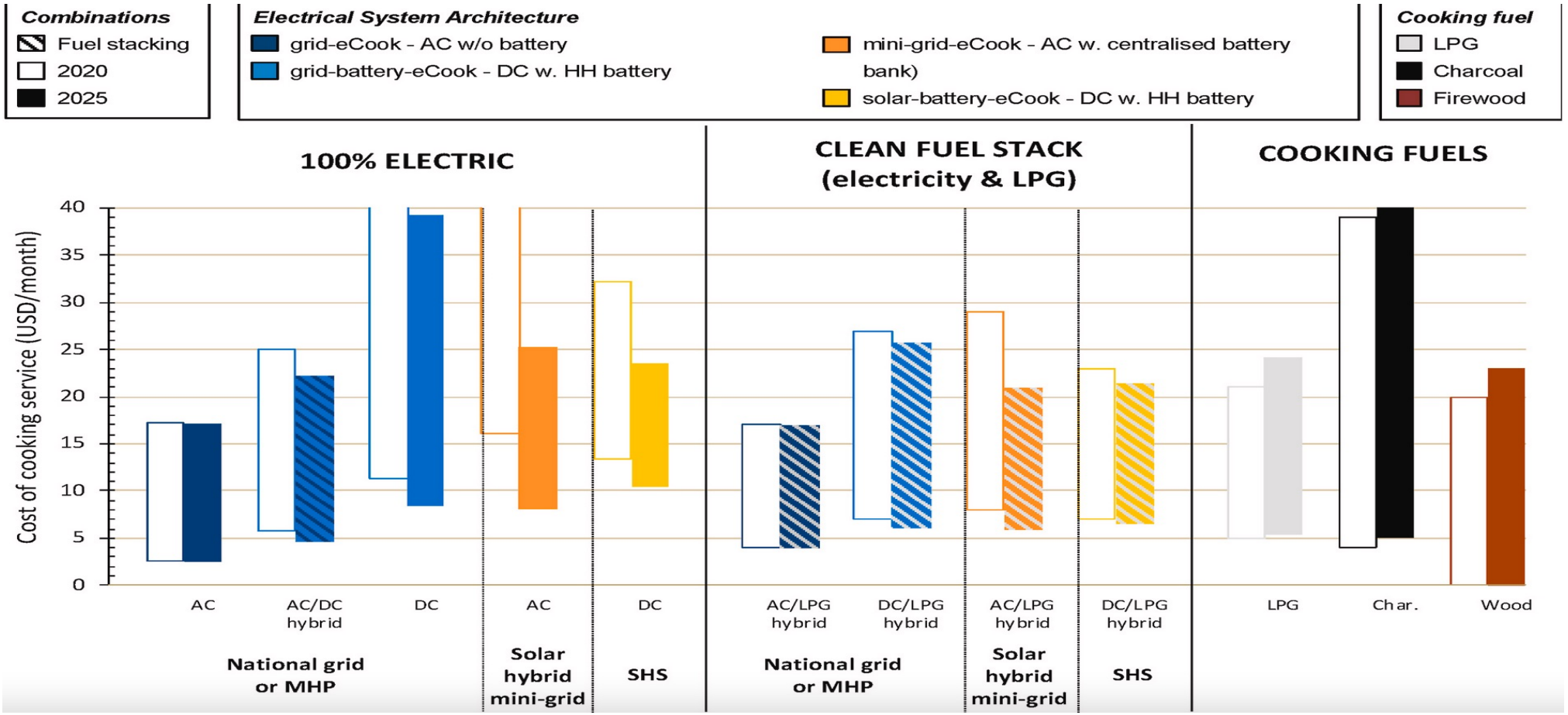
Energy System parameters in Global Net Zero CO_2 emission scenarios in 2050: Electrification

Source: 'Energy systems in scenarios at net-zero CO_2 emissions' DeAngelo *et*. al 2021. Nature Communications, vol. 12.



Cooking service costs vary across eCooking System Architectures, yet are highly competitive to many options

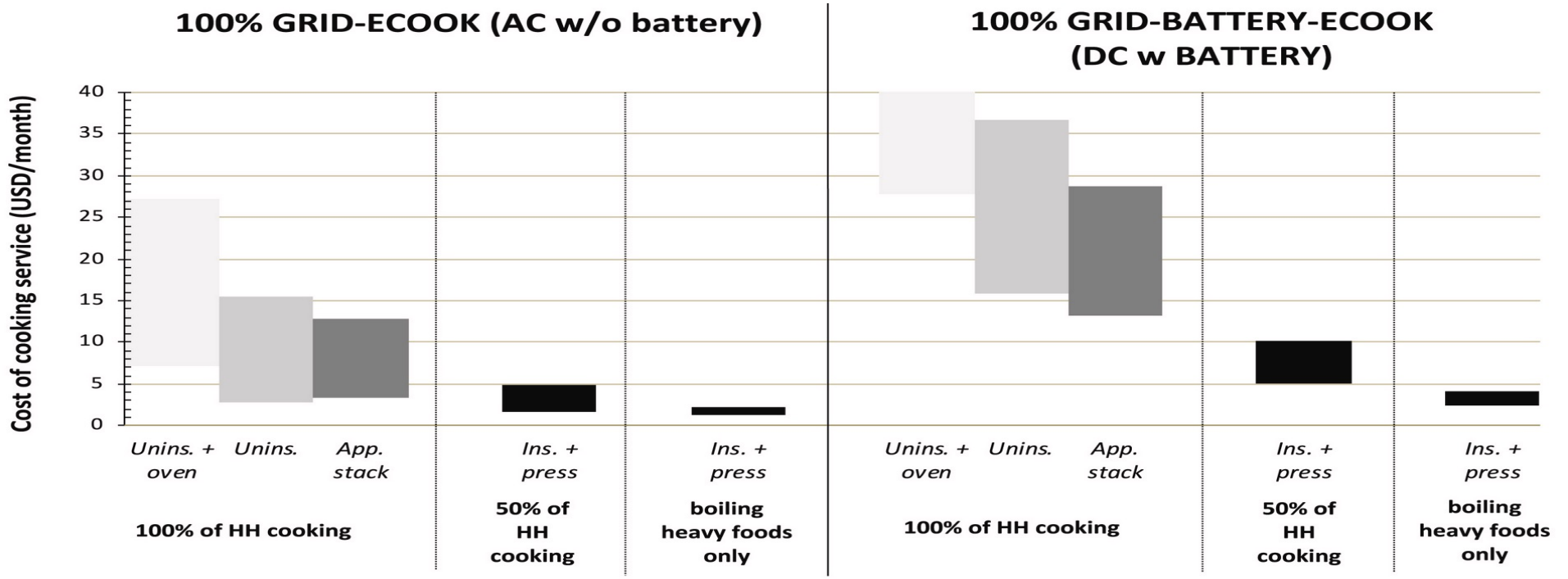
(study countries: Zambia, Tanzania , Kenya, Myanmar)



Source: Leary et al, 2021 Battery Supported eCooking, *Energy Policy* vol 159

Cooking appliances' efficiency matters

(Effect of appliance efficiency on the cost of eCooking; modelled for 2025 with 5 year financing horizon)



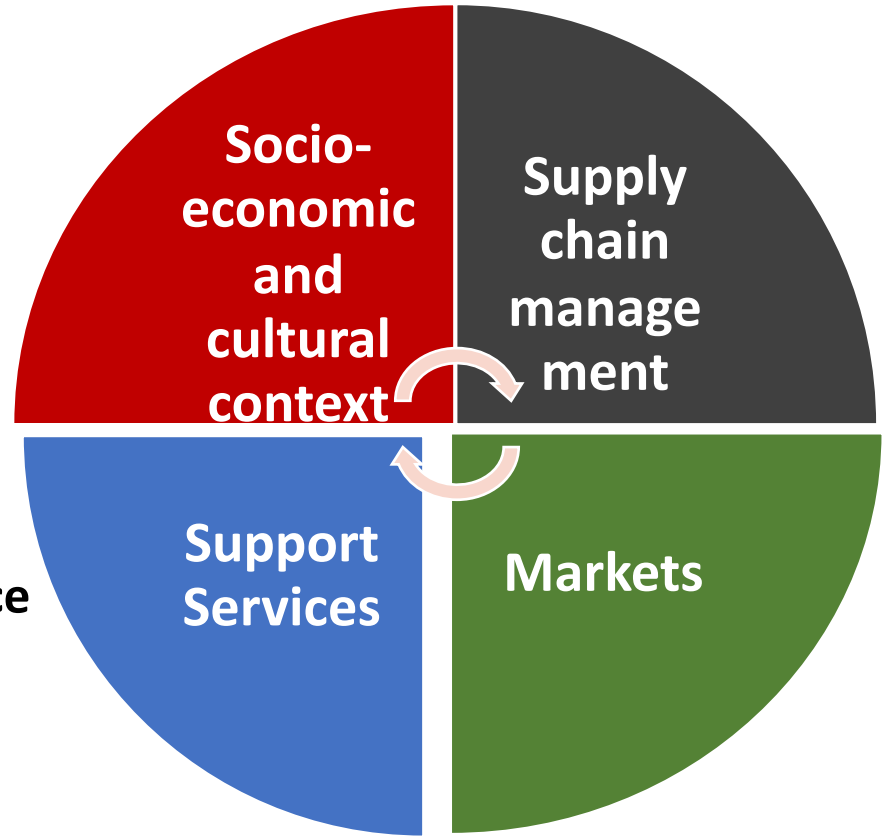
Appliance/s and energy demand			
	Unins.+oven	Uninsulated 4 plate with integrated oven	3.15 kWh/HH/day
	Unins.	Uninsulated single plate (hotplate, induction or infra-red)	1.97 kWh/HH/day
	App. stack	Appliance stack of uninsulated (hotplate, induction, infra-red or kettle) & insulated (EPC, rice cooker, electric frying pan or thermo-pot)	0.49 kWh/HH/day
	Ins.+press	Single insulated & pressurised appliance (EPC)	0.15 kWh/HH/day

Source: Ibid

Strengthen eCooking Policy Regime

(laws/regulations on mandates, compatible standards, fiscal incentives including lifeline tariff subsidy, funded programmes)

- Awareness, knowledge and perception of actors
- Cooking behaviours and traditions
- Cooking experiences
- Willingness to pay, etc.



- Securing finance and repayment system
- Appliance distribution network
- After sales service
- Assured supply of timely, affordable and quality electricity

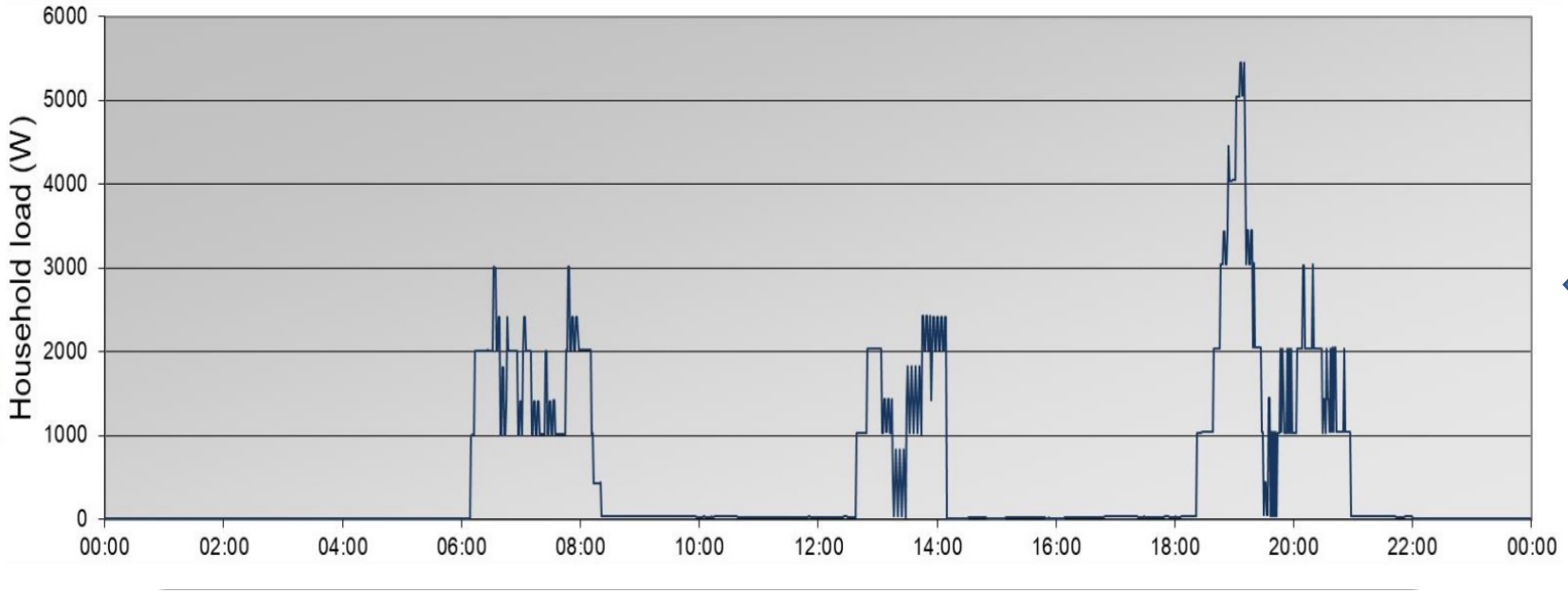
- Start-up grants/ Microfinance
- Awareness/ Capacity bldg.
- Advocacy
- Expand R&D opportunities

- Competitive products and sellers' chain
- Cost to market actors
- Market size, etc.

Key Challenges

National level:

Managing electricity load profile



Domestic level:

Managing cost and capacity for wiring/ appliance upgrade

Kenya Cooking Diary Study: diversified load profile of 10 eCooking households households 24h period (2019) – Peak load 5.4 kW after 7pm

Thank You

For discussions/suggestions/queries email: www.indiasmartgrid.org
www.isgw.in
Links/References (If any)

India Smart Grid Forum
CBIP Building, Malcha Marg,
Chanakyapuri,
Delhi-110021
Website: www.indiasmartgrid.org