

# Asia Clean Energy Forum :

## Improved Cooking Solutions

### Challenges with Universal Thermal Energy Access

18<sup>th</sup> June 2014

Asian Development Bank, Manila

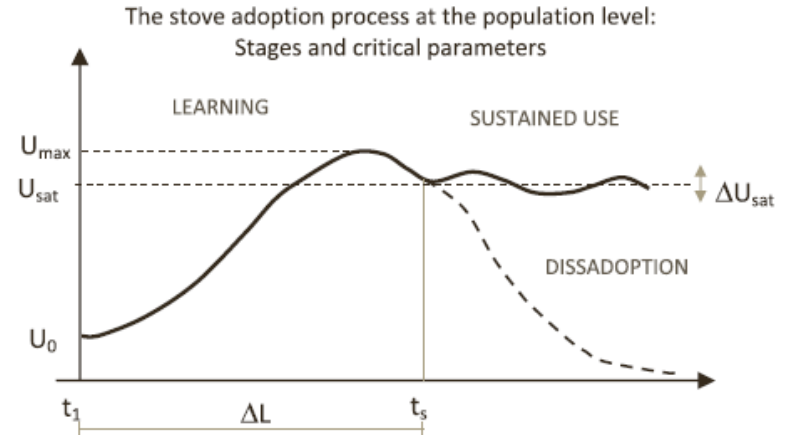
Dr Binu Parthan, SEA

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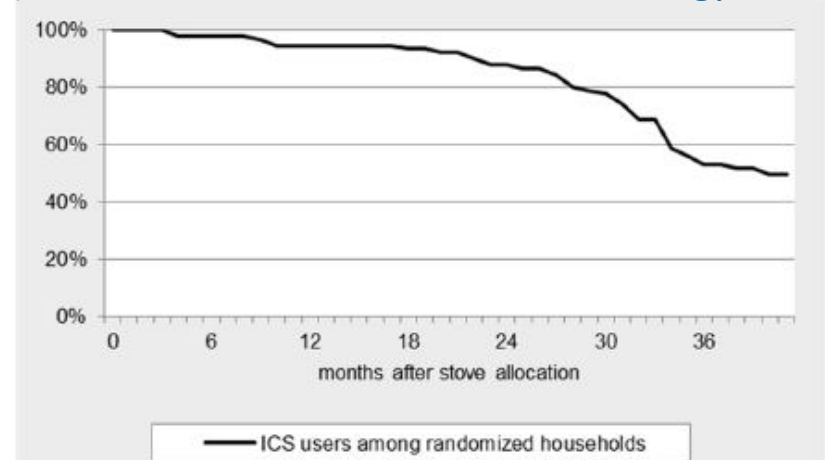


# Challenges

- Safe Clean Cooking Access – GTF 2015 2.9b 125m Vs 138m;
- Sustained use Vs distribution and delivery;
- Overwhelming focus on cooking – space heating/cooling, sanitation, productive use largely ignored.
- Limited innovation – financing, business models, policy & regulation



(Source: Ruiz-Mercado et al, 2011, Energy Policy)



(Source: Bensch and Peters, 2015, Health Economics)

# Objectives

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- 5 partners – UK, SAf, Can, India.
- Develop a thermal energy service model - STEPs;
- Implement the model;
- Research Publications – Peer Reviewed Journals;
- Draw lessons; Replicate; influence global public policy;
- Research – literature, field study, global survey – 70+
- 2013-17, Mid-way;



## Initial Findings

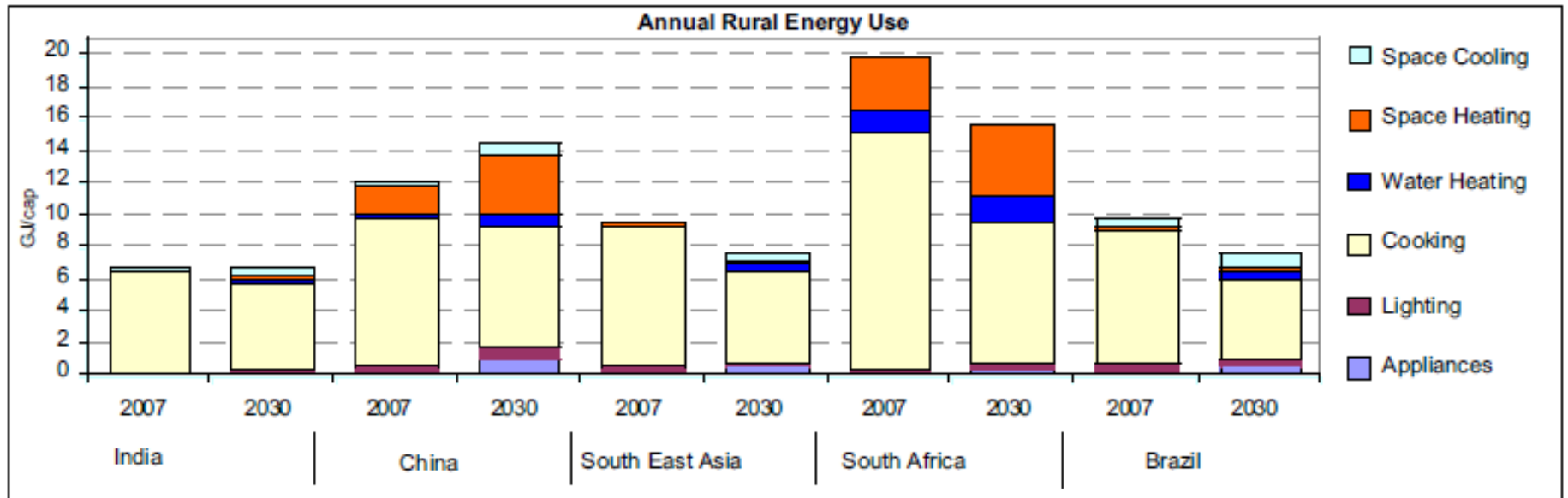
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- Thermal energy needs other than cooking significant – colder regions – significant expenditure – increases – annual/seasonal;
- Examples of thermal energy service – CDM 262 projects -, UNDP – Lesotho, India, REEEP- Caribbean;
- Govt/Private/NGO - China, India, Afghanistan; South Africa, Zambia, Rwanda;
- Service arrangements – fuel supply contracts, Progressive purchase, Barter, lease rentals



(Source: COAM)

# Space and Water Heating - Significant and increasing



(Source: Diaoglou et al, 2011, Energy)

# STEPs Model – Current Approach

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- Institutional Arrangements –PPP, Public – Anchor customer; Integrated – electricity + thermal
- Technology – neutrality – Electric, LPG, ICS, solar thermal;

# Business and Enterprise Model

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- Ownership – Open- Private, NGO,
- Ownership of systems with enterprise;
- Investment/User Vs Revenue/User : Less Than 3 years
- Operation Costs = 25-35% revenue;
- Use of mobile phone technology - MNOs— financial transactions & control;
- Payment Systems – FFS; PAYG; Progressive Purchase; Fuel purchases; barter; lease-rentals
- Robust Distribution network, high levels of sales/collection agent incentives;

# Financing

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- Initial investments/customer lower Vs electricity;
- Enterprise financing rather than end-use financing;
- User contribution – refundable – 25-35% of system cost;
- Debt and equity – softer – below market terms – carbon finance – interest subsidy – sustainable?
- Securitisation more appropriate – scalable – soft terms;





## Policy & Regulation

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- Area based thermal (and electricity) energy service concessions;
- Public services mandated to purchase thermal energy service;
- No capital subsidies;
- Direct cash transfers – interest/service subsidies;
- Regulatory framework for transfer of cross-subsidies – urban to rural



# Outlook

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- Need to move to a service arrangement – sustained use;
- Less technology – more enterprises, financing, policy and regulation;
- STEPs – South Africa; Kenya, Asian government;
- Need more efforts – significant challenge 2.9 b

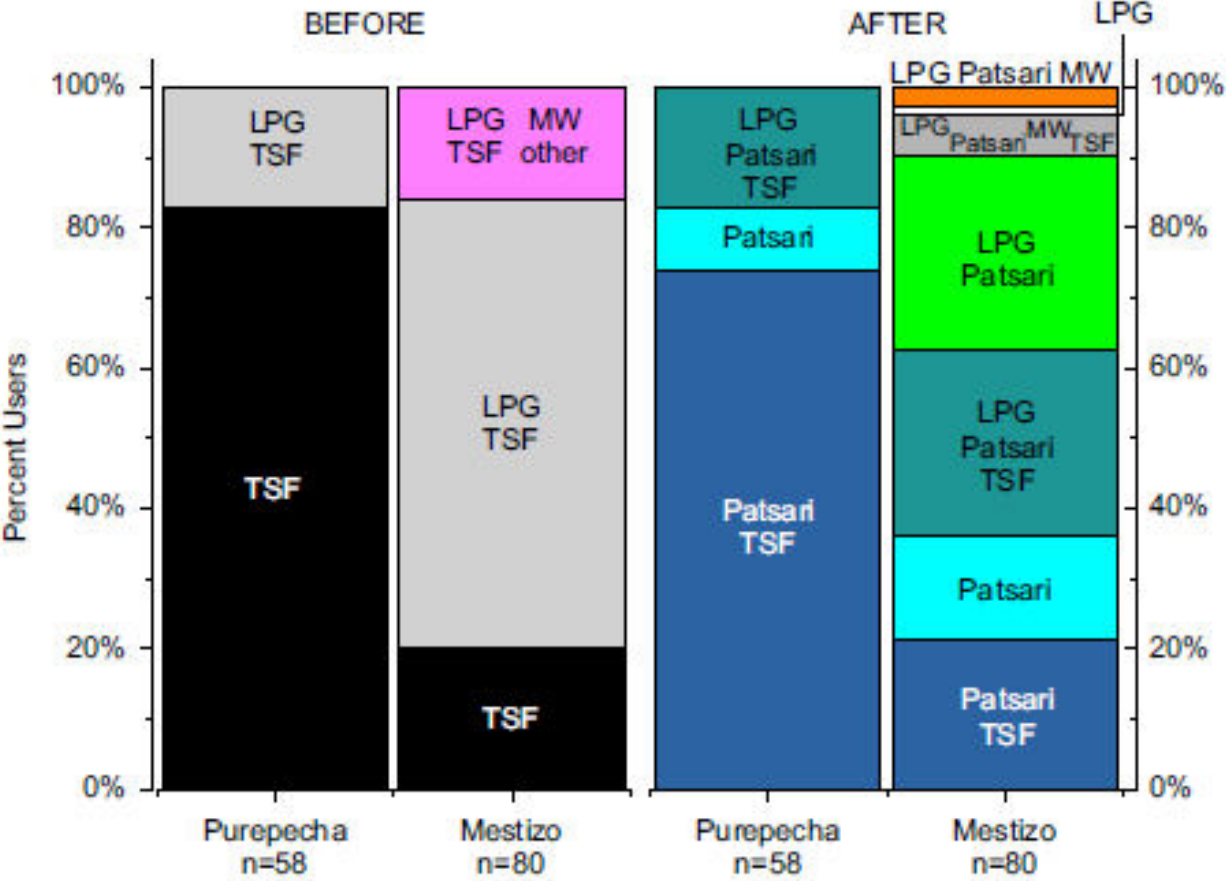
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# Thank You

Disclaimer: This is an output from a project co-funded by UK aid from the UK Department for International Development (DFID), the Engineering & Physical Science Research Council (EPSRC) and the Department for Energy & Climate Change (DECC), for the benefit of developing countries. The views expressed are not necessarily those of DFID, EPSRC or DECC, or any institution partner of the project.

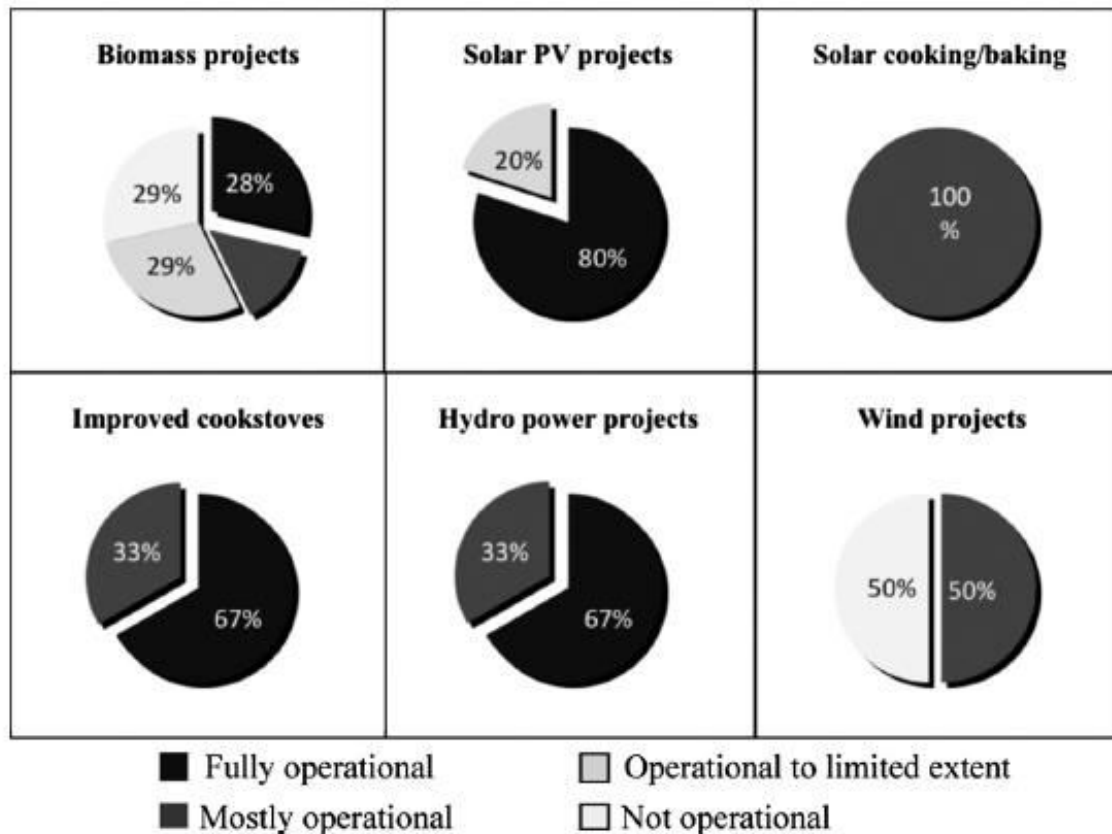


# Fuel Stacking after Cook stove Adoption



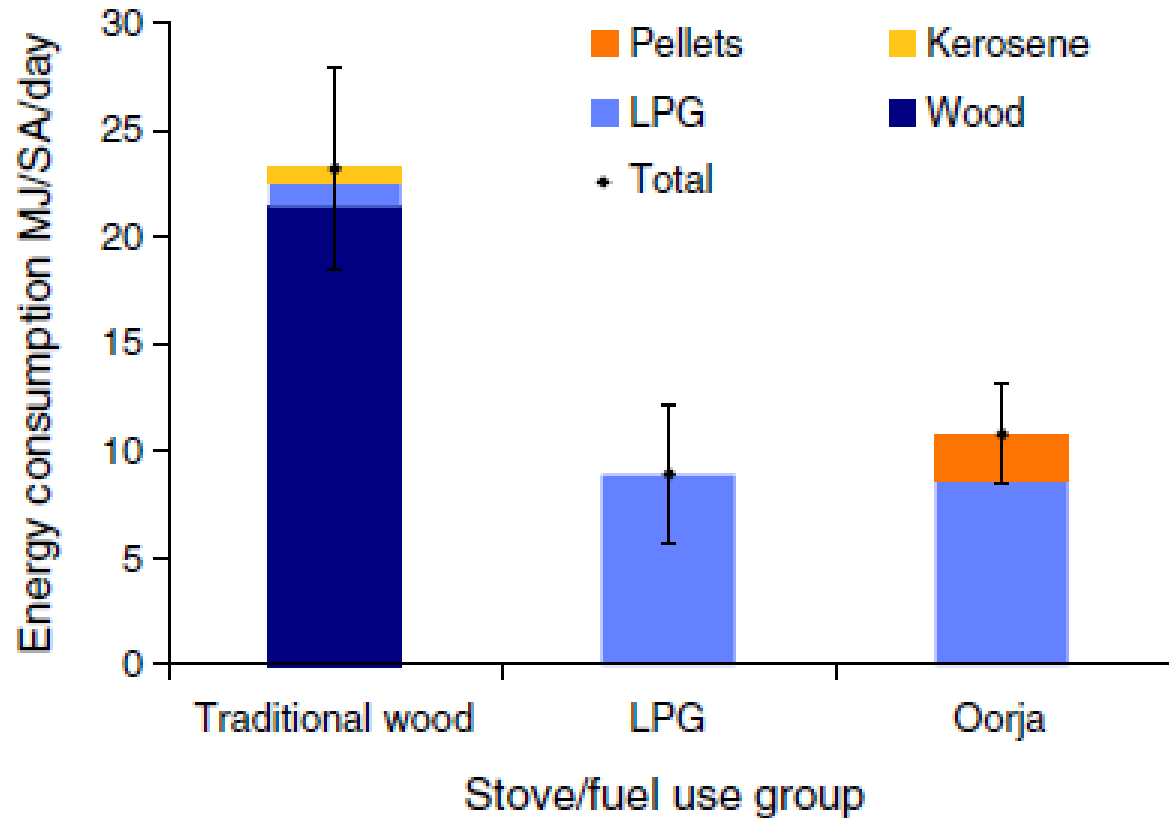
(Source: Ruiz-Mercado et al, 2011, Energy Policy)

# Performance of Small Scale Renewables Over Time



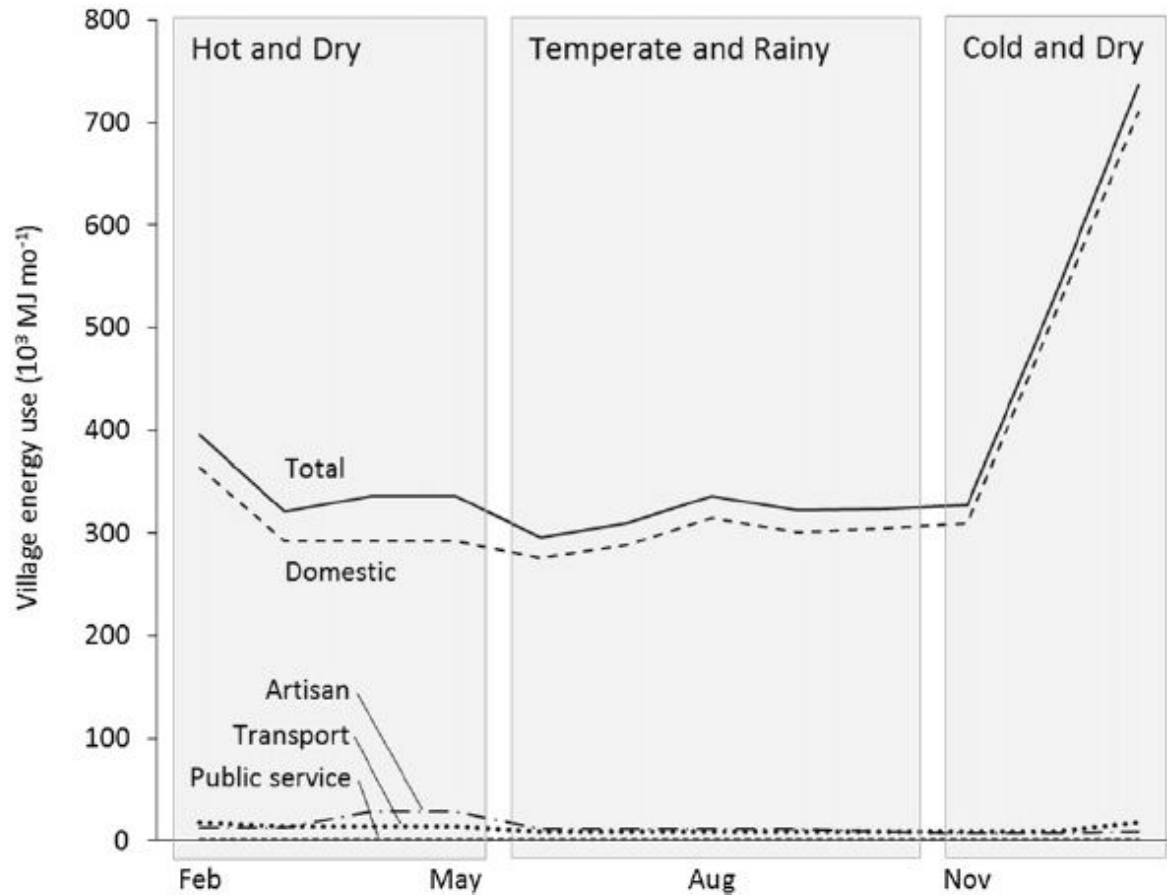
(Source: Terrapon-Pfaff et al, 2014, Applied Energy)

# Energy Efficiency in Cooking - India



(Source: Johnson et al, 2013, ESD)

# Village Energy Use



(Source: Johnson and Bryden, 2012, Energy)