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The Role of Solid Biomass in Future Energy Systems: Considering Access to Clean Energy

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Bandung Workshop

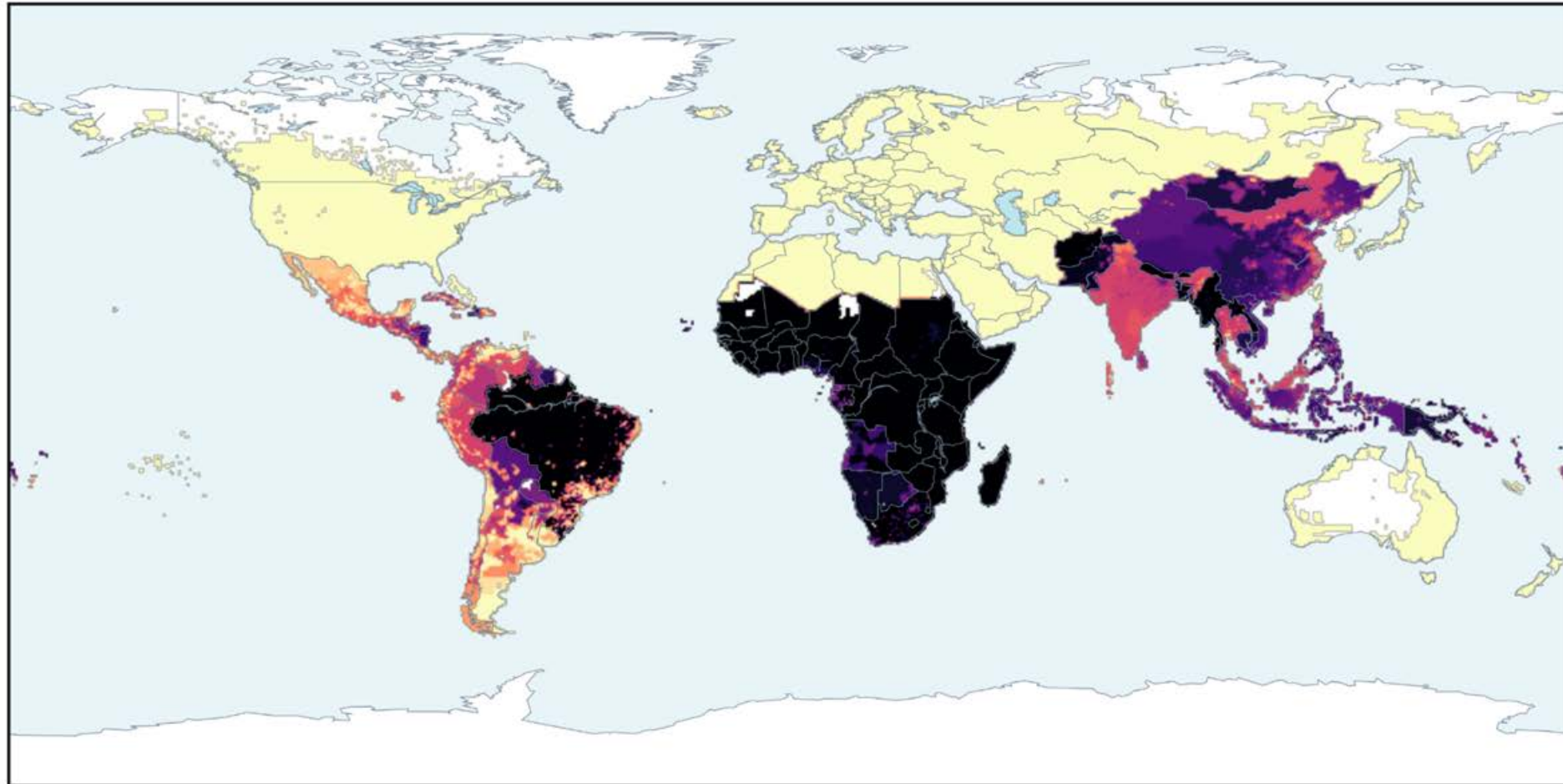
4-5 October 2018



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Background: Clean Cooking Access Low

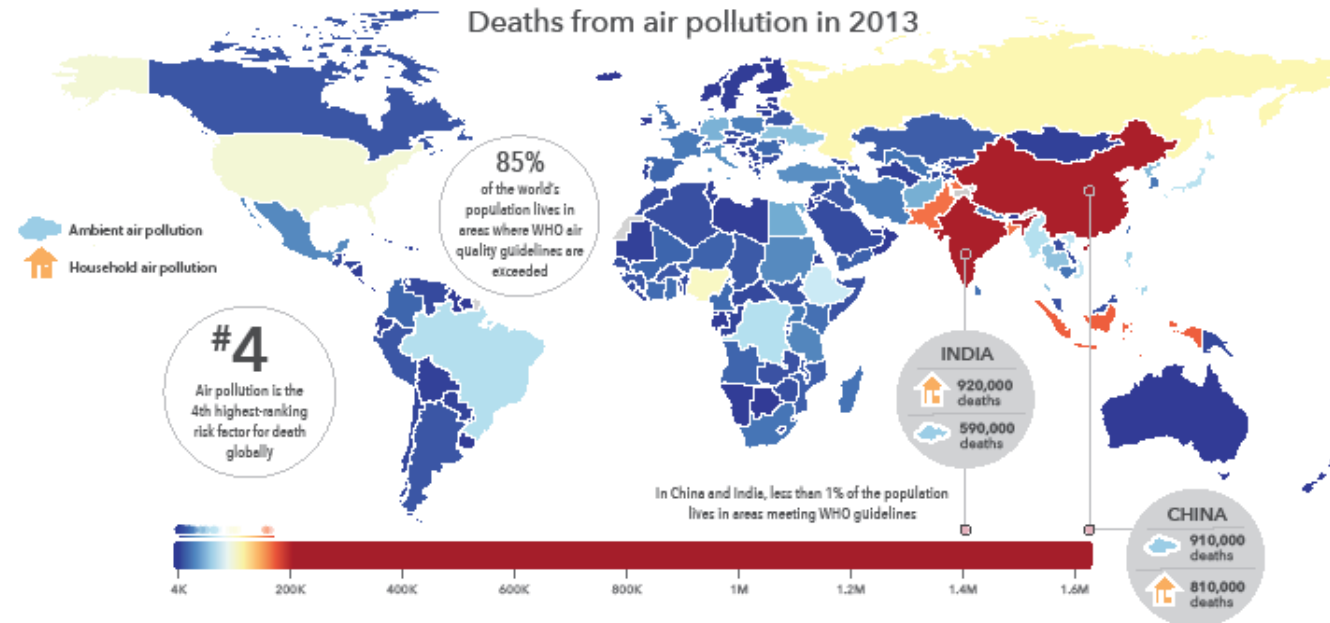
Proportion of Population Dependent on Solid Fuels for Cooking



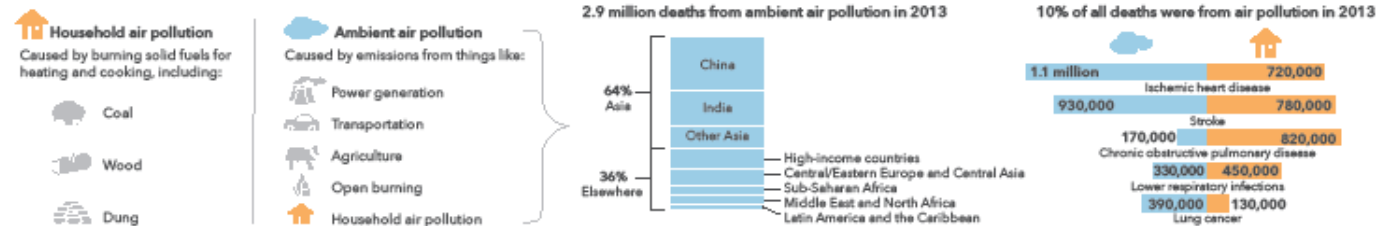
Source: Byers et al. 2018 *Env. Res. Ltrrs.*

Background: Associated Health Impacts High

Global Burden of Air Pollution



Air pollution was responsible for 5.5 million deaths in 2013



Source:
 1. Forouzanfar MH, et al. Global, regional, and national comparative risk assessment of 79 behavioral, environmental, and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*. 2015 Dec 5;386(10010):2387-323.
 2. Brauer M, et al. Ambient air pollution exposure estimation for the Global Burden of Disease 2013. *Environmental Science & Technology*. 2016 Jan 5;50(1):79-88.



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Health & Safety Impacts of Dependence on Solid Fuels

- Almost 3 million die prematurely every year due to exposure to household pollution due to inefficient combustion of solid fuels
- Back aches, pains, and injuries from biomass collection



Livelihood Impacts of Lacking Access to Modern Energy

- Limited productive hours in the day for those who spend time in own fuel collection
- Lack of access to modern energy also limits work and business possibilities



Equity Impacts of Lack of Access to Modern Energy

- The deaths from household pollution and drudgery of fuel collection falls disproportionately on women and children
- Perpetuates poverty, gender and other social disparities



Environmental Consequences of Solid Fuels Dependence

- Local forest, land and soil degradation
- CO₂ emissions if biomass is non-renewably harvested
- Emissions of non-CO₂ GHG and PIC with higher GWP
- Growing evidence of strong climate impacts of black carbon (soot) for arctic and glacial ice melting



Potential Synergies of Clean Cooking with Other SDGs

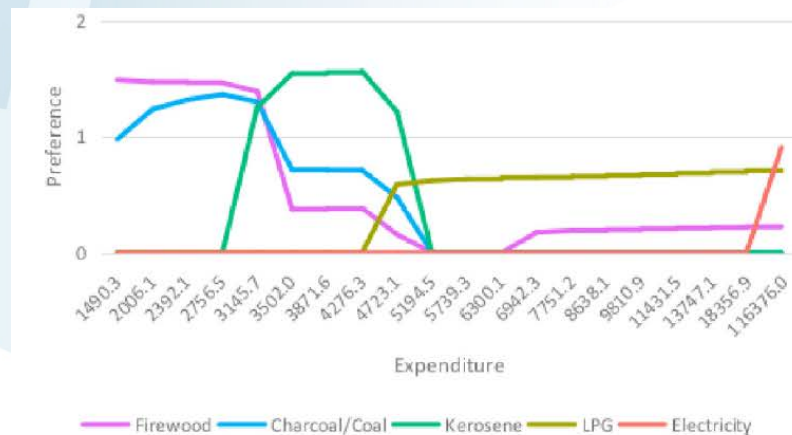
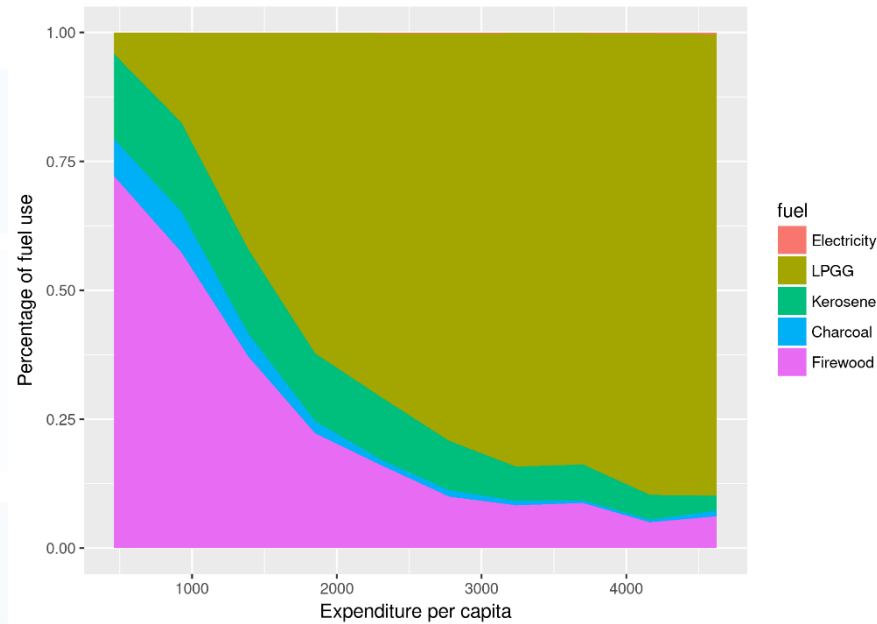
- SDG1 – Poverty alleviation
- SDG3 – Improved health
- SDG5 – Gender equality
- SDG10 – Reduced inequalities
- SDG11 – Livable human settlements and cities
- SDG12 – Improved production and consumption patterns
- SDG15 - Halt deforestation and prevent biodiversity loss

Figure 5 Affordable and clean energy supports all Sustainable Development Goals

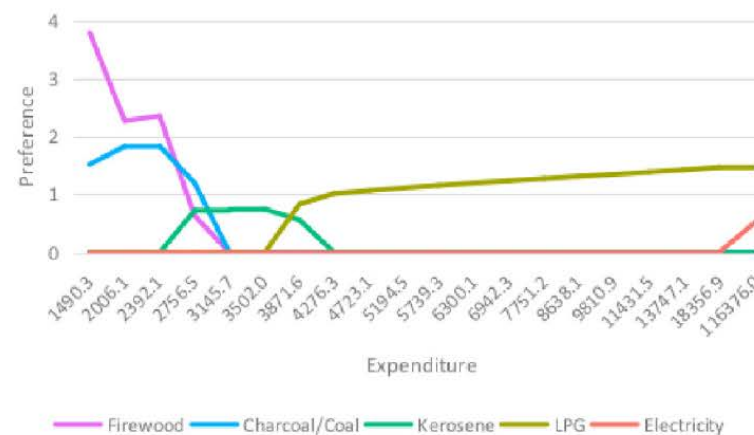


Source: South Centre

Relationship of Fuel Choices with Income in South Asia



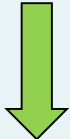
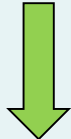




(e) India: Rural



(f) India: Urban

Emissions consequences of cooking transition in India between 2001-2011

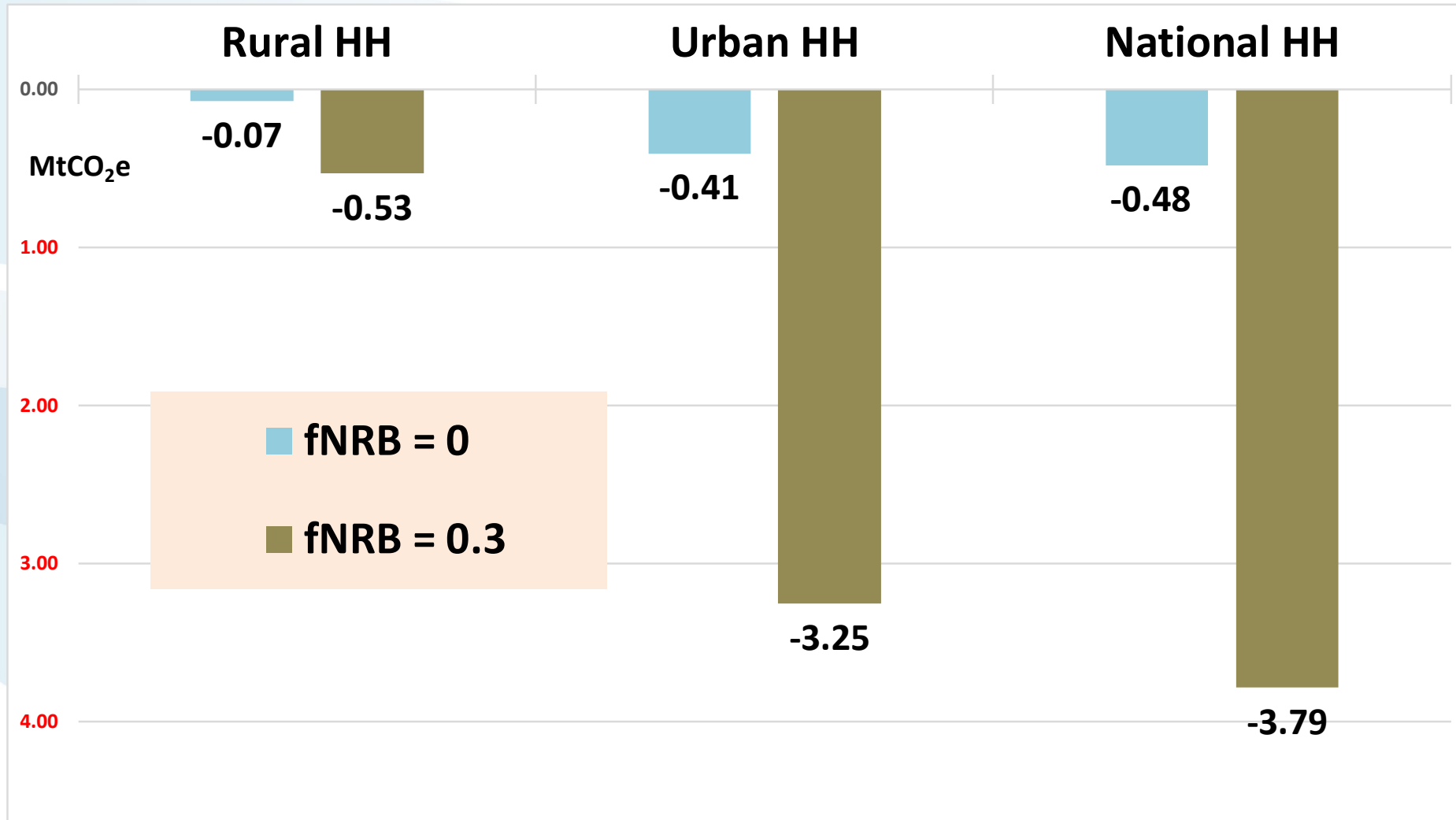
Change in Share of HHs Using Firewood & LPG in India 2001- 2011

	Urban	Rural
Exclusive Fuelwood HH	 8%	 3%
Exclusive LPG HH	 17%	 5%
Multi – fuel HH (min. LPG + fuelwood)	 2%	 5%

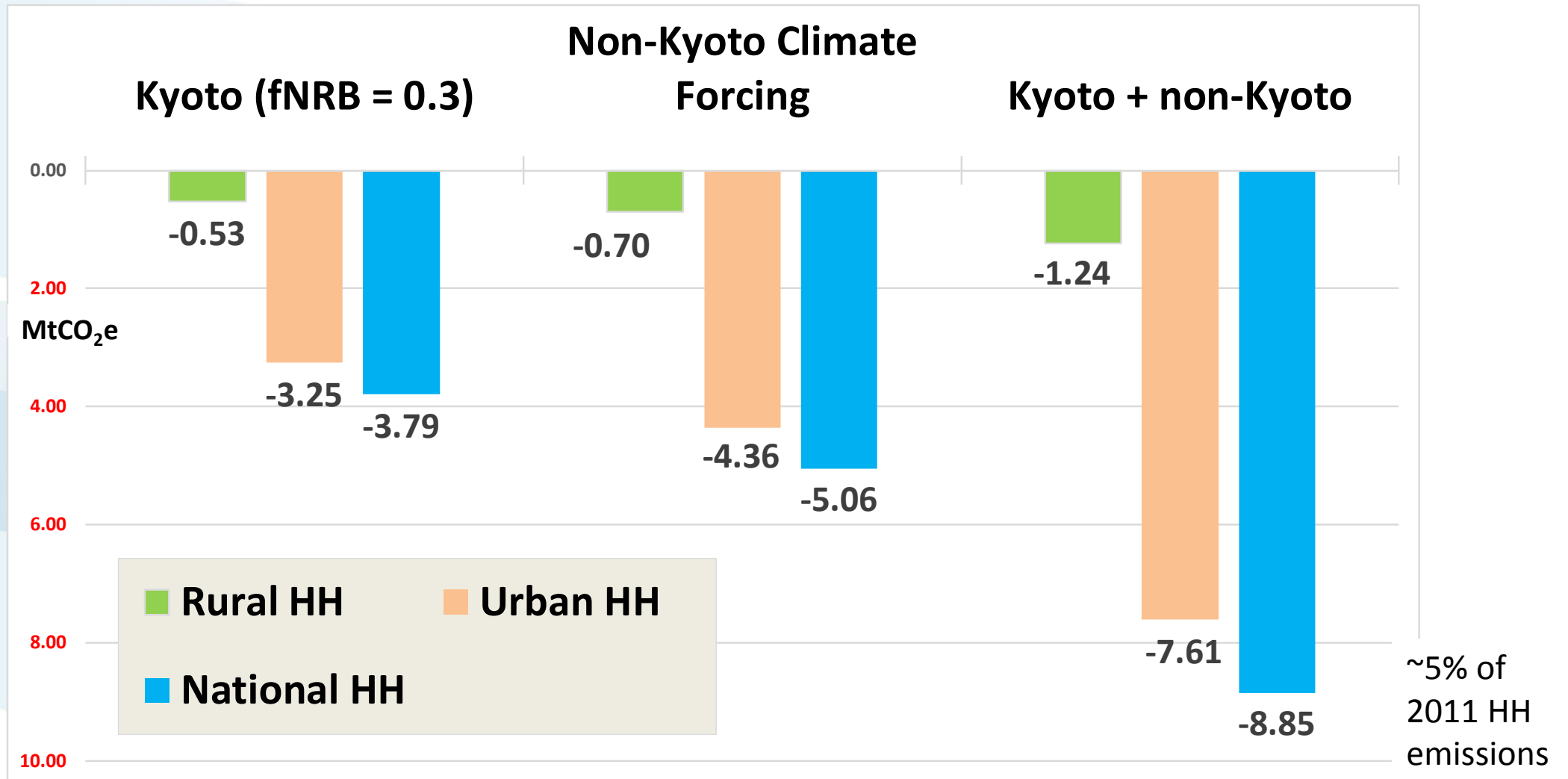
Estimate of Fuel Use for Cooking

- National displacement of 7.6 million tons of biomass. Almost 1 million tons displaced in rural, while over 6 million tons displaced in urban areas.
- Rural displacement of biomass < urban displacement, as fewer rural HHs gained access compared to urban HHs and average per capita LPG use in urban areas is higher than in rural areas.
- About 217 thousand tons of LPG used in 2011.

Net emissions – assumptions on fNRB



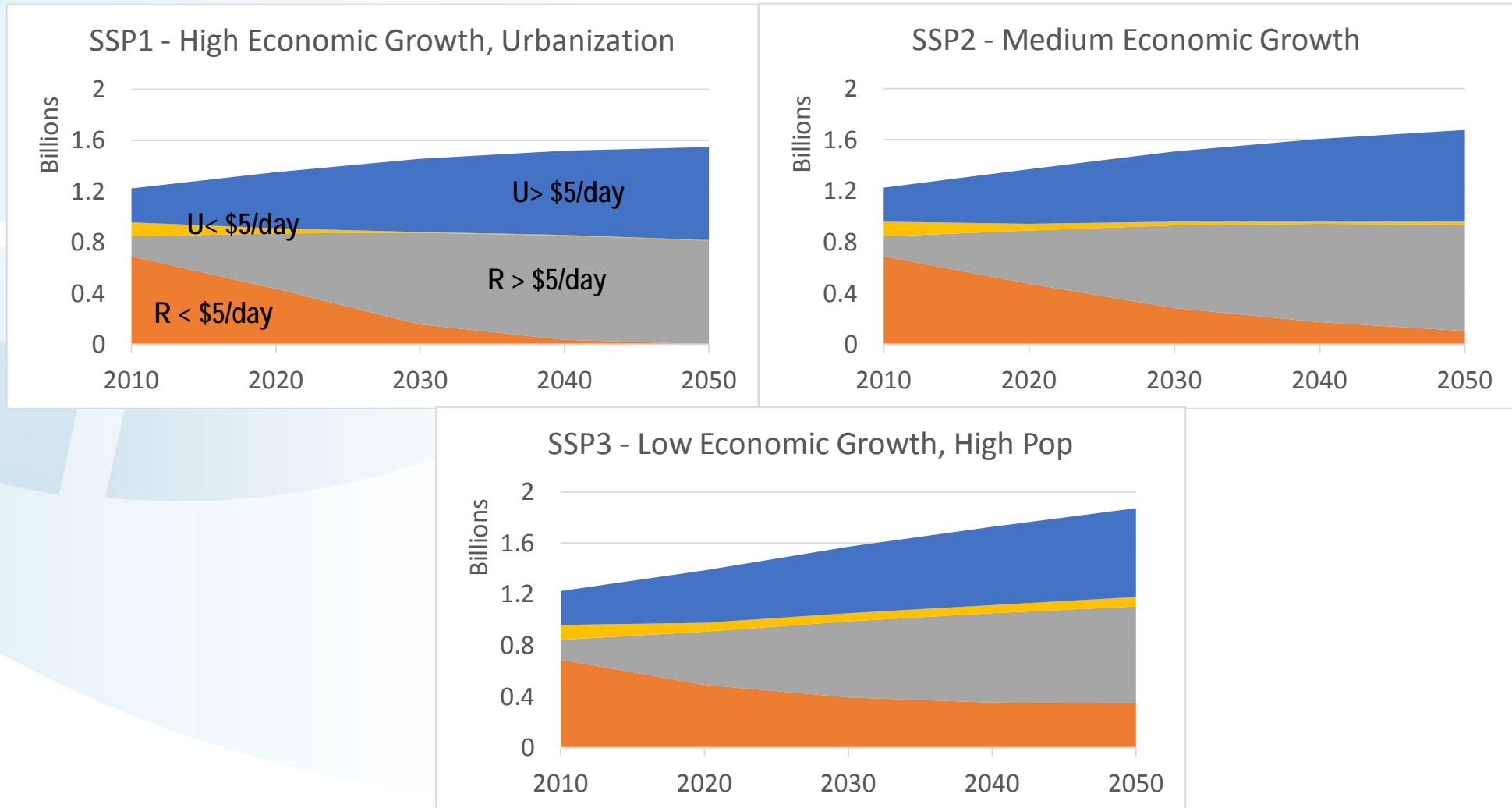
Net emissions: accounting of GHGs



Net Emissions Estimation - Conclusions

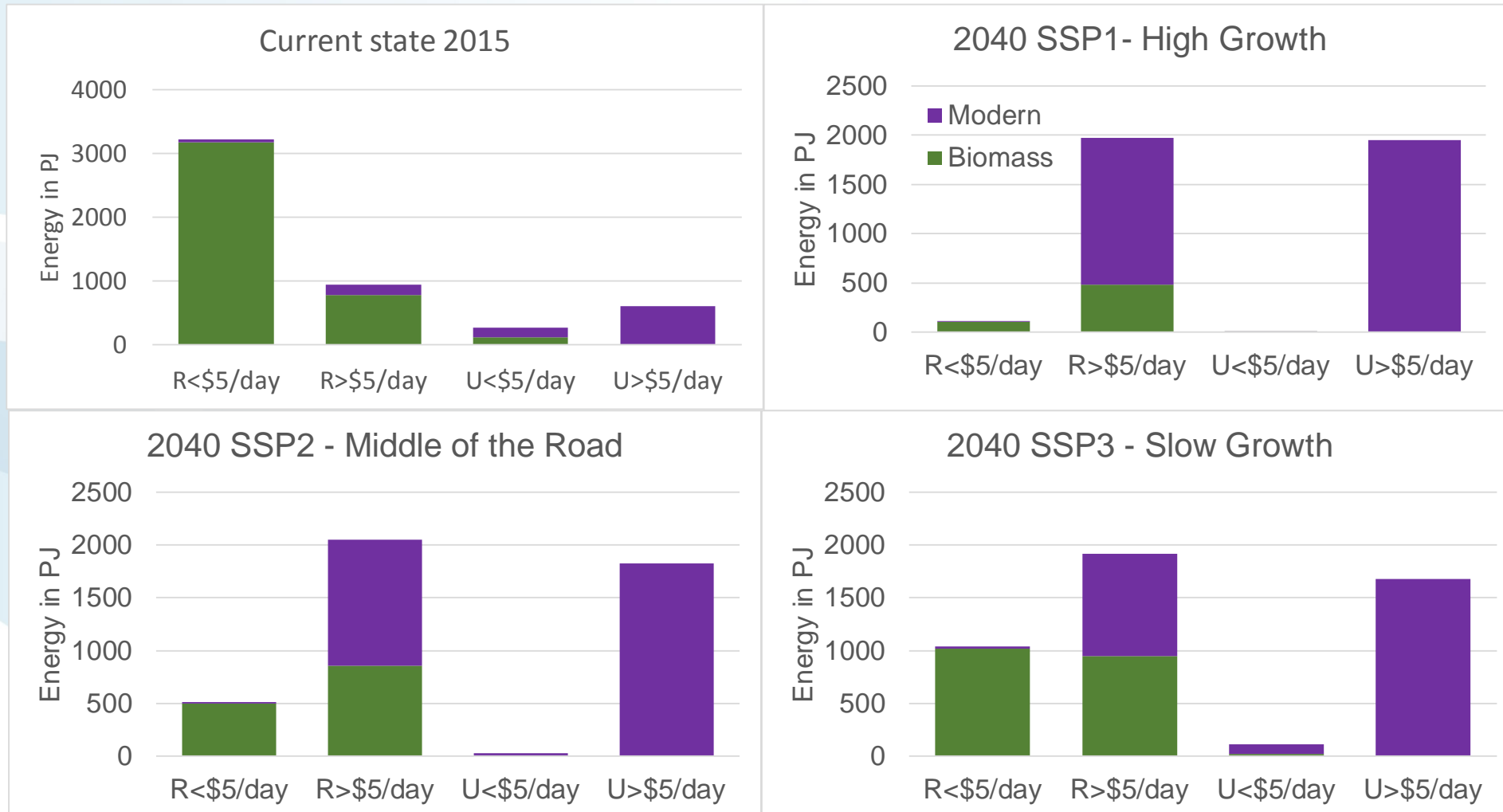
The transition to LPG cooking in India reduced pressure on forests and achieved modest climate benefits, though uncertainties regarding the extent of non-renewable biomass harvesting and suite of climate-active emissions included matters for households emissions accounting and should be considered carefully in any analysis and policy-making.

Population Distribution in S.Asia –Current & in 2040 for Alternate Socio-Economic Futures



Source: Poblete-Cazanave & Pachauri 2018

Scenarios of Cooking Fuel Transition Under SSPs in South Asia in 2040



Source: Poblete-Cazanave & Pachauri 2018

Additional Policies to Accelerate a Transition Away from Solid Biomass Cooking

- R&D for improved combustion and conversion technologies
- Standards for improved stoves
- Grants or reduced-cost dissemination of clean stoves
- Fuel subsidies on alternative fuels, like LPG
- Targeted cash transfers to below poverty line households
- Information and education campaigns
- Incentivizing electric induction cook stoves

Key Insights

- Without new policies achieving the SDG 7 target of universal access to clean cooking by 2030 unachievable
- Futures with higher economic growth, more equitable income distribution and faster urbanization are likely to have more rapid transitions away from biomass cooking
- Policies that combine subsidies on cleaner fuels (LPG) with grants for the stoves and deposits are more effective
- The emissions consequences of shifting from biomass to LPG cooking are negligible and could be even negative if some biomass is unsustainably harvested
- The potential air quality and health benefits are large and synergies with other SDGs are also significant



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Thank You!

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