



Achieving Climate and Health Co-Benefits from Clean Cookstoves

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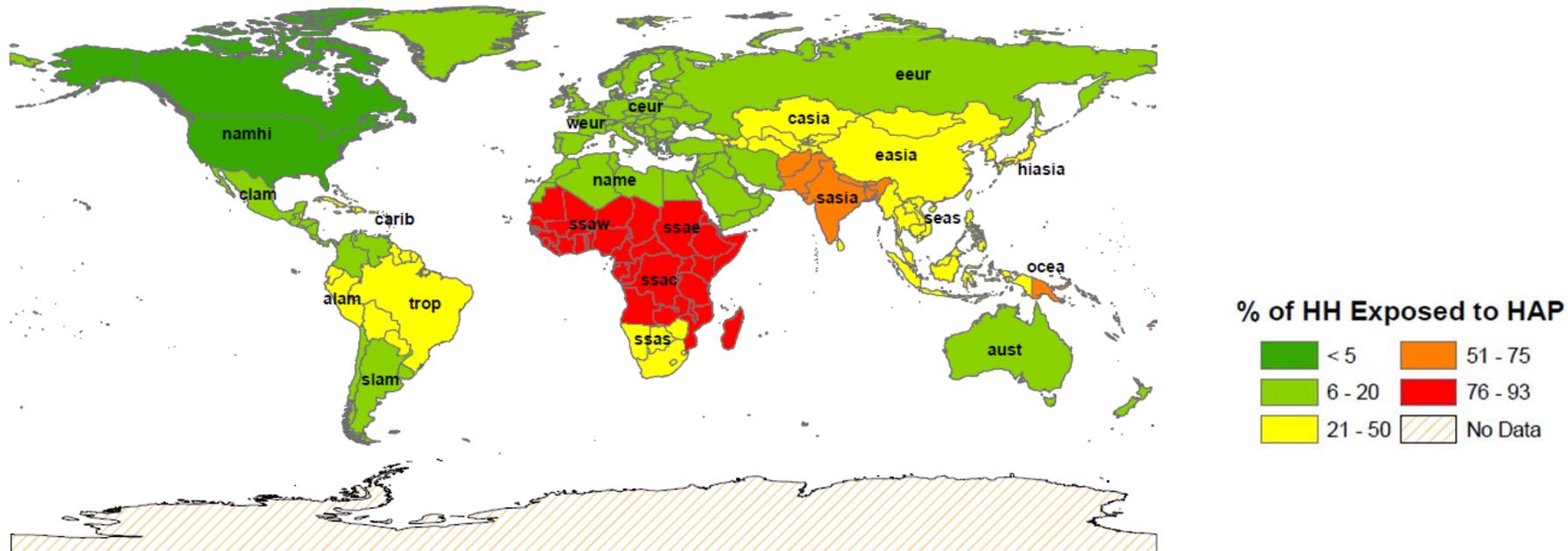
Global Alliance for Clean Cookstoves and UN Foundation

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Technical Workshop on Science and Policy of Short-lived Climate Forcers
September 9-10, 2011, Mexico City



~ 3 Billion People Still Use Solid Fuels for Cooking and Heating



Although the fraction of exposed households is slowly declining, the absolute number of people affected is still rising → more people are exposed today than in any previous period of human history.

Global Burden of Disease from Household Air Pollution

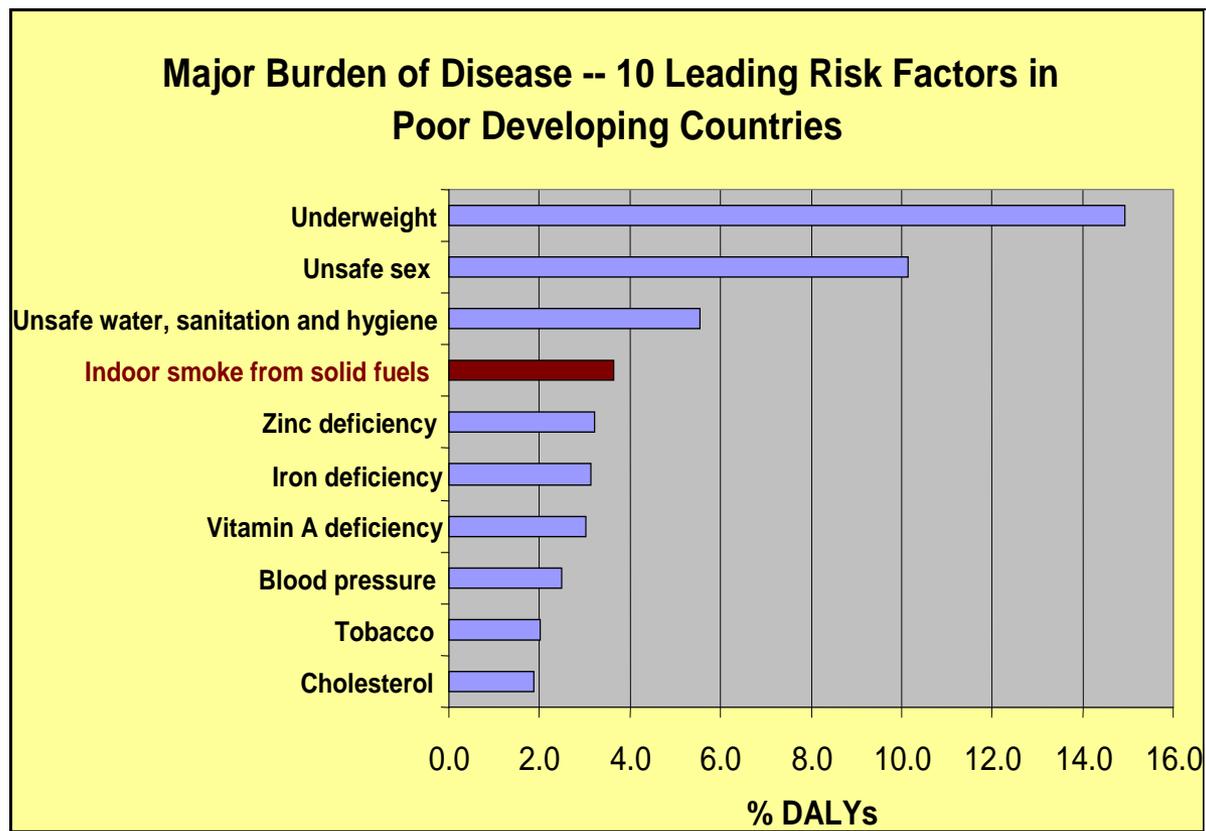
2004*

1.9 million deaths per year

- Acute Lower Respiratory Infections (ALRI) in children < 5
- COPD
- Lung Cancer

2010**

- Acute Lower Respiratory Infections (ALRI) in children < 5
- COPD
- Lung Cancer
- Low Birth Weight
- Cataracts
- CVD



Note: insufficient evidence / not quantifiable: tuberculosis, cancer of UADT, burns and injuries, cervical cancer, adult ALRI, asthma, otitis media

*Smith KR, Mehta, S, Feuz M: The Global Burden of Disease from Household Use of Solid Fuels: A Source of Indoor Air Pollution. In: *Comparative Quantification of Health Risks: The Global Burden of Disease due to Selected Risk Factors*. Geneva, World Health Organization, 2004

**Results to be released later this year.

Other Health and Environmental Impacts of Cookstoves

- Burns and injuries
- Violence: in conflict areas, increased risk of rape and attack during fuel collection
- Time: women and girls can spend as much as 20 hours/week collecting fuel, time that could be spent in school or in more productive activities.
- Local environmental impacts:
 - Environmental degradation: deforestation, erosion, habitat loss, desertification
 - Reduced ambient air quality
- Climate impacts: emissions of greenhouse gases such as methane and carbon dioxide, and aerosols like black carbon

Barriers to Solving the Problem to Date

- Fragmented field with multiple actors → Lack of comprehensive vision and cohesive strategy to solve the impacts from household energy use on a global scale;
- Scant high-level policy-maker, donor, or private sector awareness in developed and developing world regarding the scope of the problem and the range of solutions available;
- Little funding in the sector compared with resources available to address comparable issues or risks in related fields (electricity, clean water, malaria, TB, and health care)



Field is at a 'Tipping Point'

- Strong empirical data on health effects;
- Evidence of stoves' contribution to climate change problem and major role as mitigation option; and
- New stove technologies with measureable efficiency and emissions improvements;
- New commercial entrants with ability to scale-up production and address supply chain barriers;
- Availability of innovative carbon and micro financing to bring down costs of cleaner stoves;
- National programs in Mexico, Peru, India, and China.



Global Alliance for Clean Cookstoves

A \$250 million ten-year public-private partnership led by the UN Foundation to create a thriving global market for clean and efficient cookstoves in the developing world to:

- **Save lives** by reducing exposure to cookstove smoke;
- **Empower women** through productive enterprises associated with stove use, distribution, and production;
- **Improve livelihoods** by reducing disease, freeing time, and saving money (that can be used for food, medicine, or school fees) and other social benefits;
- **Combat climate change** by mitigating black carbon and greenhouse gases;
- **Advance Millennium Development Goals** related to poverty, health, gender equality, and the environment.

Funders include Governments of United States, United Kingdom, Ireland, Norway, Germany, Finland, Denmark, and Malta, Dow Corning, Morgan Stanley, SNV, Shell, Shell Foundation, Bosch Siemens, World Bank, UN Foundation. Partners include 10 UN agencies, and hundreds of national and regional stakeholders and practitioners.



Mission Statement

To save lives, improve livelihoods, empower women, and combat climate change by creating a thriving global market for clean and efficient household cooking solutions

Vision

Universal adoption of clean and efficient cooking solutions

Key Milestone

100 million homes adopt clean and efficient stoves and fuels by 2020



Alliance Programmatic Focus

- **Advocacy** - raise awareness of the benefits of clean cookstoves and advocate for their inclusion on public health, gender, energy access, and climate action agendas and lay the groundwork for a comprehensive advocacy and public awareness strategy;
- **Research** - strengthen the research case and achieve greater clarity regarding health, climate, and gender impacts and benefits;
- **Mapping** - map landscape for stove programs, UN engagement, and donor activities;
- **Market-Based Solutions** - partner with manufacturers and other key stakeholders to identify and respond to the challenges in bringing stoves to market;
- **Standards and Testing** - develop consensus standards and labels, supported by robust field testing, to provide a clear benchmark for clean and efficient stoves;
- **Financing** - explore micro, carbon, and other innovative financing mechanisms for financing stove deployment; and
- **Governance** - build the Alliance infrastructure and governance model to develop and sustain effective programs and outcomes.



Alliance Working Groups

- Standards and Testing
- Humanitarian
- Finance and Investment
- Carbon Finance
- Monitoring and Evaluation
- Technology and Fuels
- Health
- Climate Research
- Reaching Consumers
- *Gender Cross-Sector*
- *Manufacturing Cross-Sector*

Working Group Role:

- Identify shorter and longer term priorities to move the sector forward (completed)
- Offer strategic advice on relevant issues (ongoing)

Select Early Action Recommendations

- Create a toolkit for countries to use in building internal support for stove interventions;
- Develop and test combustion chambers for locally produced stoves;
- Produce an interim tiered ratings system for benchmarking stoves;
- Further quantify the health and environmental impacts of cookstoves;
- Enhance technical capacity of regional testing centers;
- Create low-cost resources for stove developers to access carbon finance and mitigate registration risks;
- Convene “marketplace” to introduce investors with project developers;
- Develop a revised methodology for estimating carbon offsets from clean cookstove projects with improved scientific rigor



Priorities of the Finance and Investment Working Group

- Develop financing mechanisms to meet broad R&D requirements
- Identify promising (clean and efficient) stove models and facilitate manufacturing at scale
- Open up markets and scale up distribution
- Establish financing mechanisms for retail and consumer cookstove consumption
- Establish financing mechanisms to enable the most susceptible populations to adopt clean cookstoves, with a focus on humanitarian settings.

Carbon Finance Working Group Vision

- Goal: Facilitate widespread access to carbon finance at scale
- Target: US \$7.5 billion in carbon revenues generated to support the use of 100 million clean cookstoves by the end of 2020 → aggregate reduction of 500 million metric tons of carbon dioxide equivalent (500 MtCO₂e) over 10 years
- Beyond 2020:
 - US \$7.5 billion in carbon revenues generated annually upon adoption and ongoing use of 500 million clean and efficient stoves
 - Conservative estimate: 1 metric ton CO₂e /stove/ year → 500 MtCO₂e annual emissions reduction

Challenges To Be Addressed

- **Research gaps:**
 - Linking field testing to predictions of GHG emissions
 - Multi-scale global mapping of default emission factors and non-renewability of fuel wood use
- **Access to high value carbon markets remains limited**
 - On average, \$150,000-\$200,000 and 2+ years to access carbon credits
 - Uncertainty about post 2012 (current EU Emissions Trading scheme registration deadline)
 - Needed: reduced market entry barriers for small-scale enterprises, simplified crediting approaches
- **Ensuring health benefits**
 - Improved efficiency *and* reduction in health damaging pollutants
 - Impact assessment of different stove types on climate, health and social metrics

'Improved' Stoves differ in emissions and efficiency

Intermediate Stoves



GERES charcoal stove (SE Asia)

Over \$1M carbon financing in 2008; over 1 million sales



StoveTec 2-door stove (charcoal or wood)

Mass manufactured at low cost; combustion chamber can stand alone



EnviroFit/Shell Foundation wood stove

5-yr warranty on metal combustion chamber (can be stand-alone, too)



HELPS wood plancha stove (Guatemala)

High quality, very safe, but costly stove for local use

Advanced Stoves/Fuels



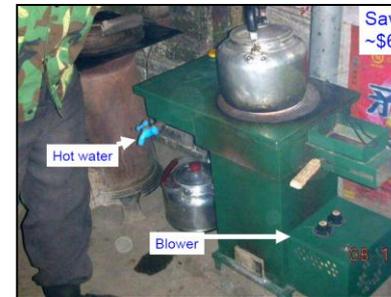
Philips wood fan stove

Very clean; 5-yr warranty; just entering markets



Oorja pellet fan stove (India)

Very clean; pellets from local ag waste; emerging mkt vision



Linhong gasifier stove (China)

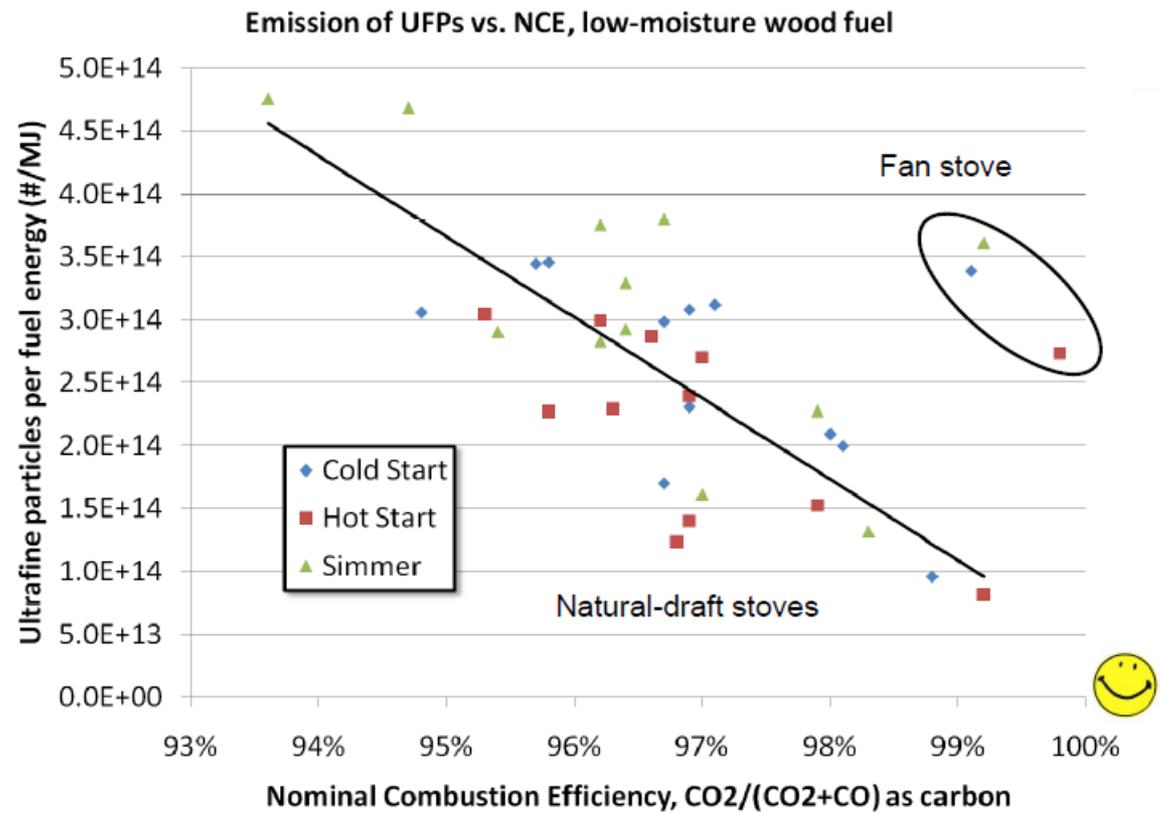
Won international competition prize; very clean



ARTI home biogas system (India)

Very clean, but costly; gas from household waste

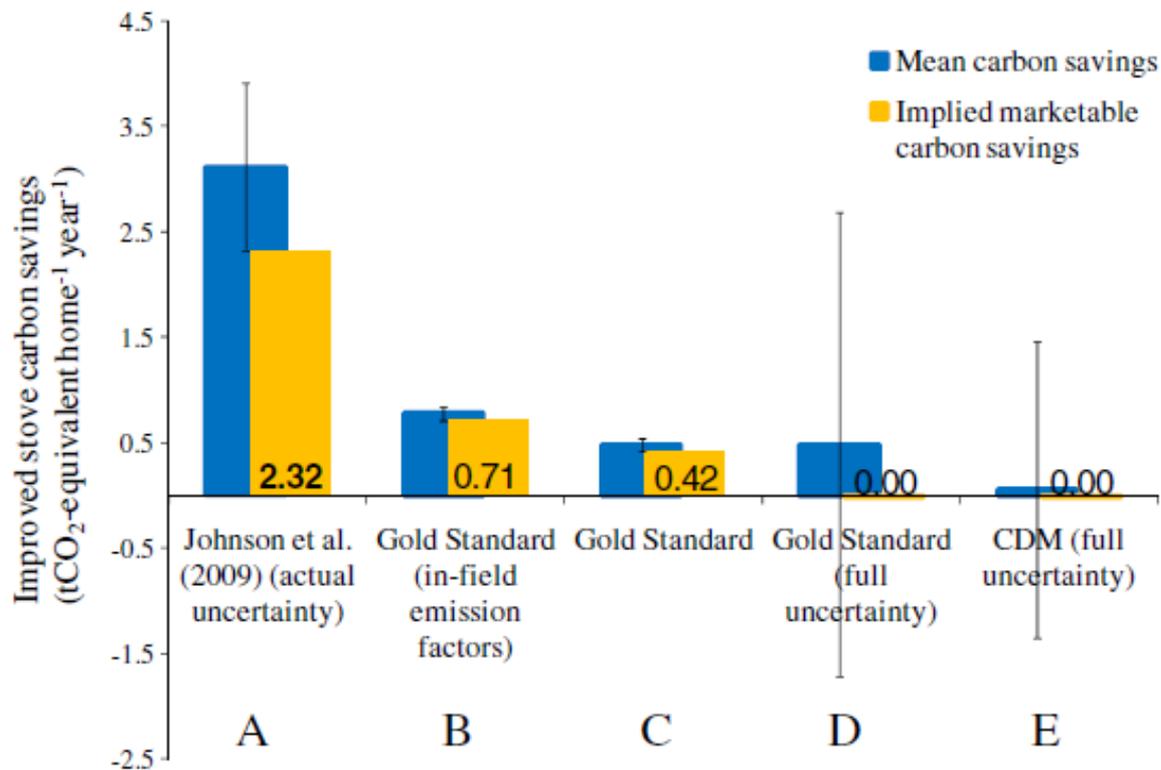
Independent lab evaluation of efficiency and emissions



Source: Jim Jetter, EPA, 2011

Technical challenges to ensuring emission reductions (ERs)

- Lack of standards for clean cookstoves
- Limited information on the influence of user behaviors
- Need to harmonize methods for estimating carbon offsets



Source: Johnson et al, 2010.

Gold Standard Cookstove Projects

- 60+ projects (CER & VER combined)
- Avg. price of a GS project is \$9-10 per ton
- Innovations on the Gold Standard radar:
 - Best practices for reallocating carbon revenues to the local community
 - Whether to certify reductions in black carbon

Example: **Proyecto Mirador (GS690)** :

- Emissions reduction:
 - 1.9 mtCO₂e/year per La Justa stove
 - over 38,000 tCO₂e/yr total
 - Equivalent to taking > 12,000 tonnes of rubbish out of landfill
 - Equivalent to taking ~ 7000 cars off the road for a year



Carbon Markets Are Enabling Access in Humanitarian Settings

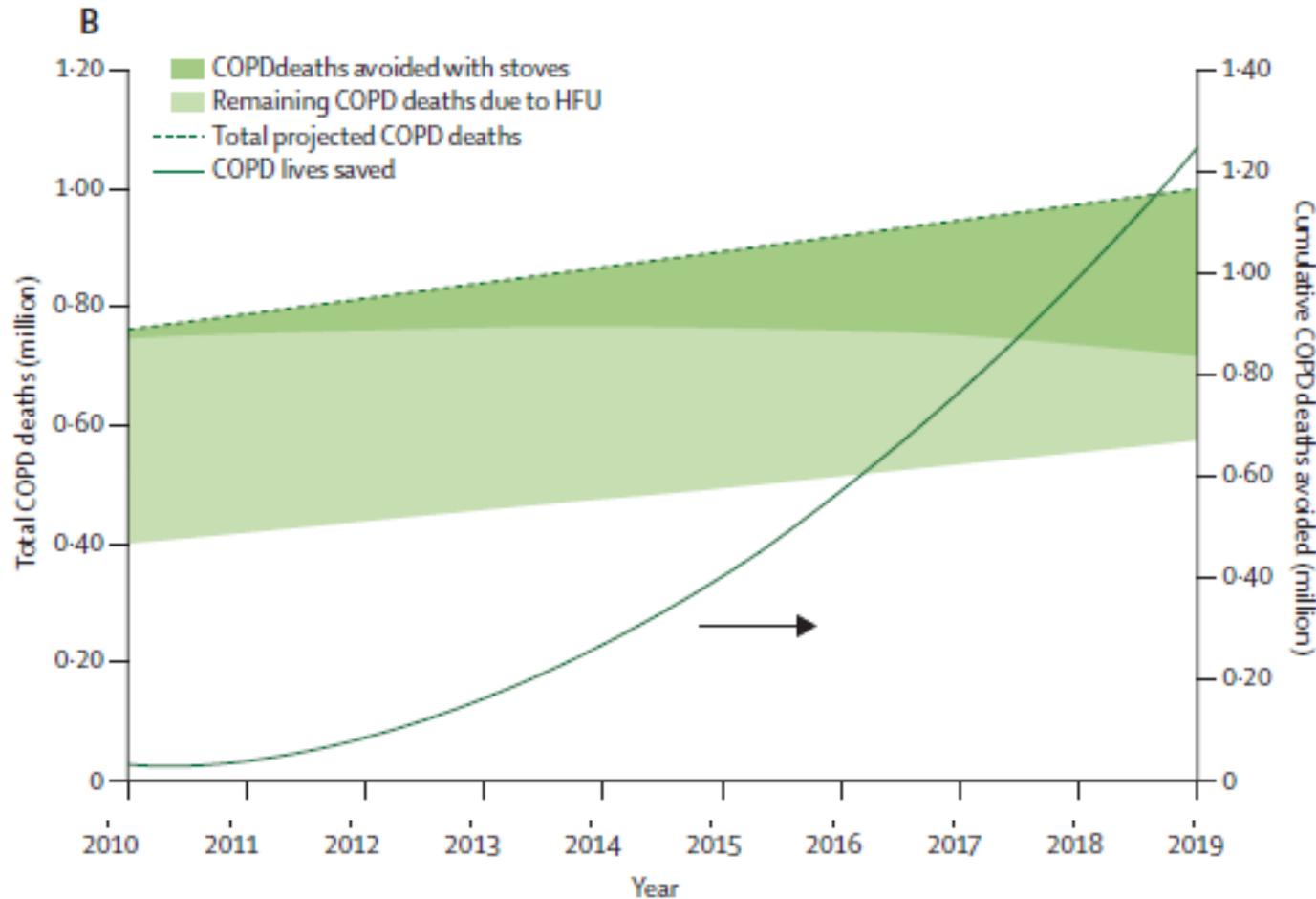
UNHCR (High Commissioner for Refugees): Kakuma Refugee Camp, Kenya

- Community focused solar energy project supporting Sudanese refugees
- Solar cookers, public solar light and personal solar lanterns for students
- Full documentation can be found on the GS registry – project GS924

UN World Food Programme 'SAFE' Project in Darfur

- WFP and the IASC are implementing SAFE (Safe Access to Firewood and alternative Energy in Humanitarian Settings) in Darfur
 - provide and assist ~100,000 women with fuel-efficient stoves and innovative fuel technologies in combination with alternative income opportunities
 - provide fuel-efficient stoves and equipment to 170 schools

Potential Win-Win for Climate and Health: COPD Deaths Avoided by Introduction of Very Clean, Low-Emission Cookstoves in India (15 million households per year)



Source: Wilkinson P, Smith KR et. al. **Public health benefits of strategies to reduce greenhouse-gas emissions: household energy.** *Lancet*, November 2009.

Year One Activities

- Launch Alliance at Clinton Global Initiative and raise visibility of Alliance/issue through participation at high-profile events;
- Execute Working Group process and prepare 10-year strategic plan and Stove Roadmap;
- Fund and Implement early action activities such as:
 - Mapping analysis
 - Voluntary standards and interim benchmarks (Lima Consensus)
 - Indoor air guidelines
 - Carbon Accelerator Fund
 - Field testing of stoves
 - Climate and health impact evaluation work (could include burns)
 - Other Working Group recommendations
- Develop Secretariat and Advisory Board;
- Secure funding for Alliance mission from diversified donor base;
- Initiate advocacy efforts within EU, Congress/USG, UN, World Bank, etc; and
- Develop and execute media and communications strategy.



What Does Success Look Like in 10 Years' Time?

- Demonstration of the health, climate and economic benefits of clean and efficient cooking solutions through development of a robust research, monitoring and evaluation agenda;
- Adoption of 100 million clean and efficient cookstoves by 2020 (roughly 20 percent of the globally affected population);
- Investments to address the issue on par with funding for other public health and environmental risks of a similar severity; and
- Development of a mature global cookstoves sector that can supply clean and efficient cooking solutions – stoves and/or fuels – to the developing world at scale and at low cost.

