# Partnership for Clean Indoor Air

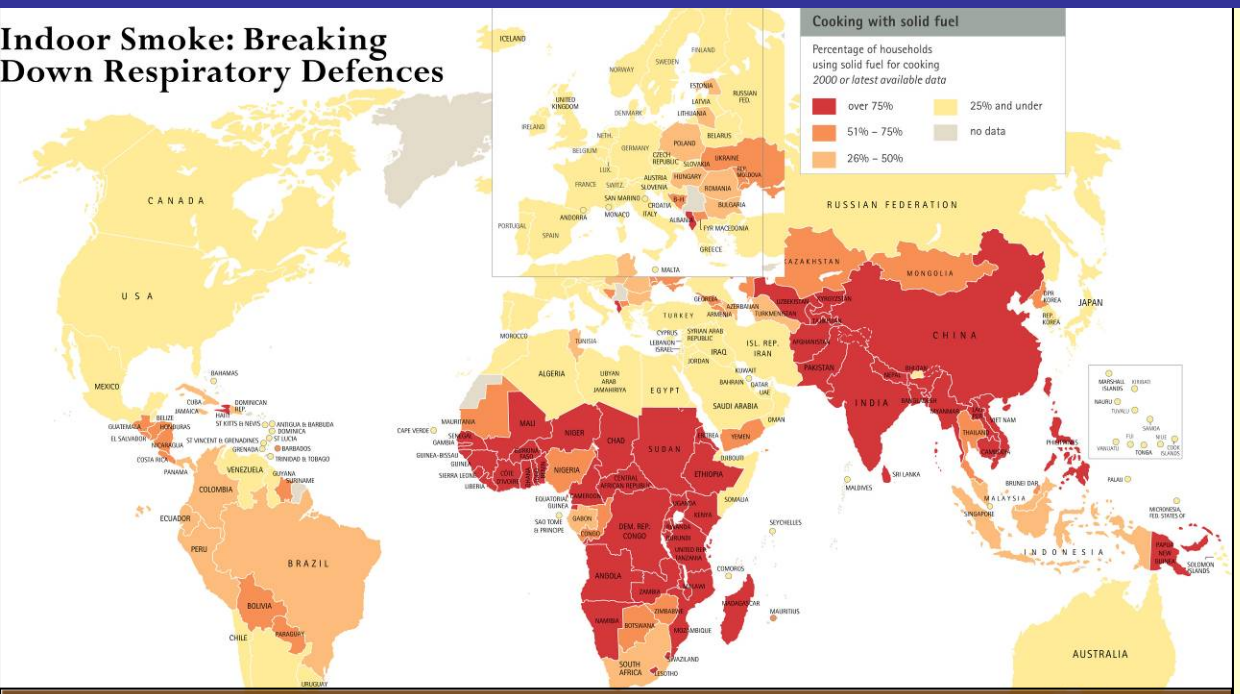



# Solving the Biggest Health Risk Factor You've Never Heard Of

Jacob Moss, U.S. EPA

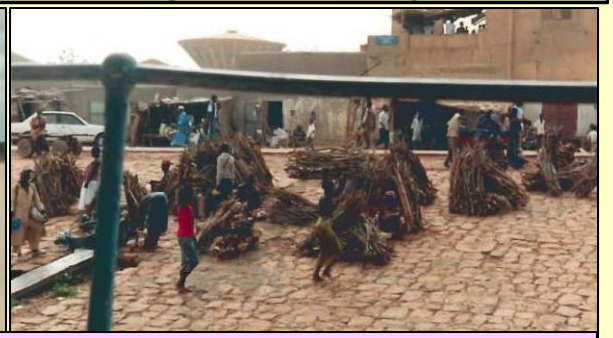
May 2009

# Solid Fuel Use and Collection

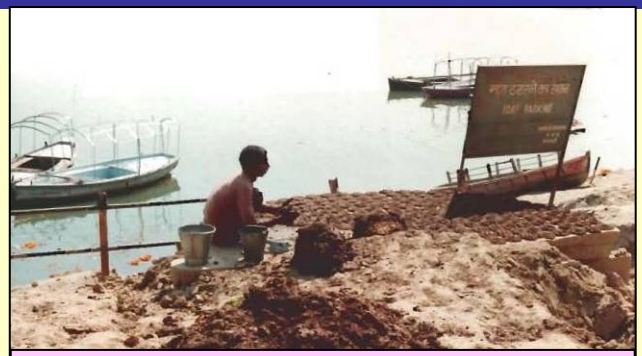



**Half the world cooks with solid fuels (wood, dung, coal,...).**

**200 million more people will be using biomass by 2030.**



**Fuelwood transport and sale (Niger River, Mali)**



**Making dung patties (India)**

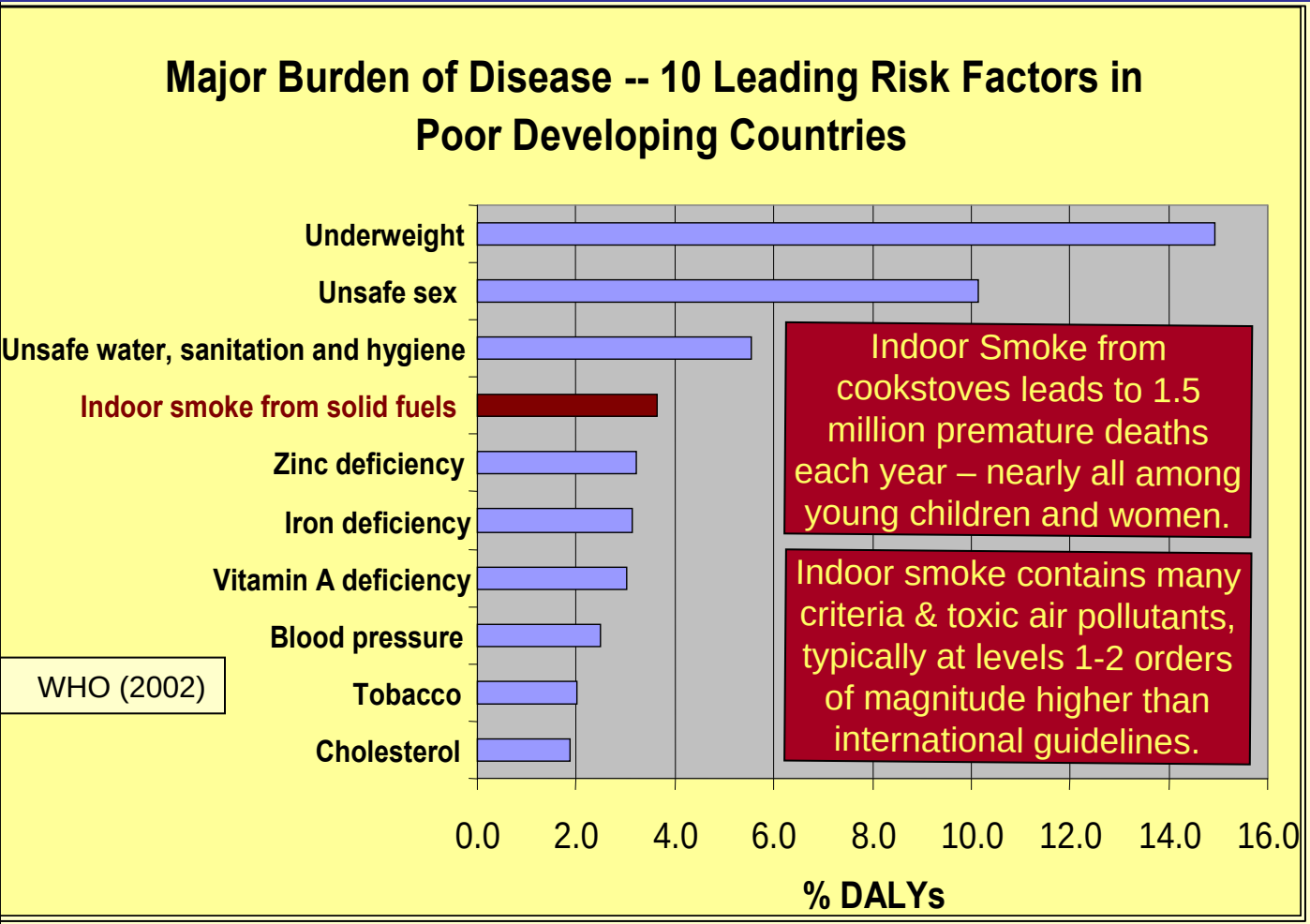
**Collecting fuelwood (Togo)**

**Charcoal on sale (Togo)**



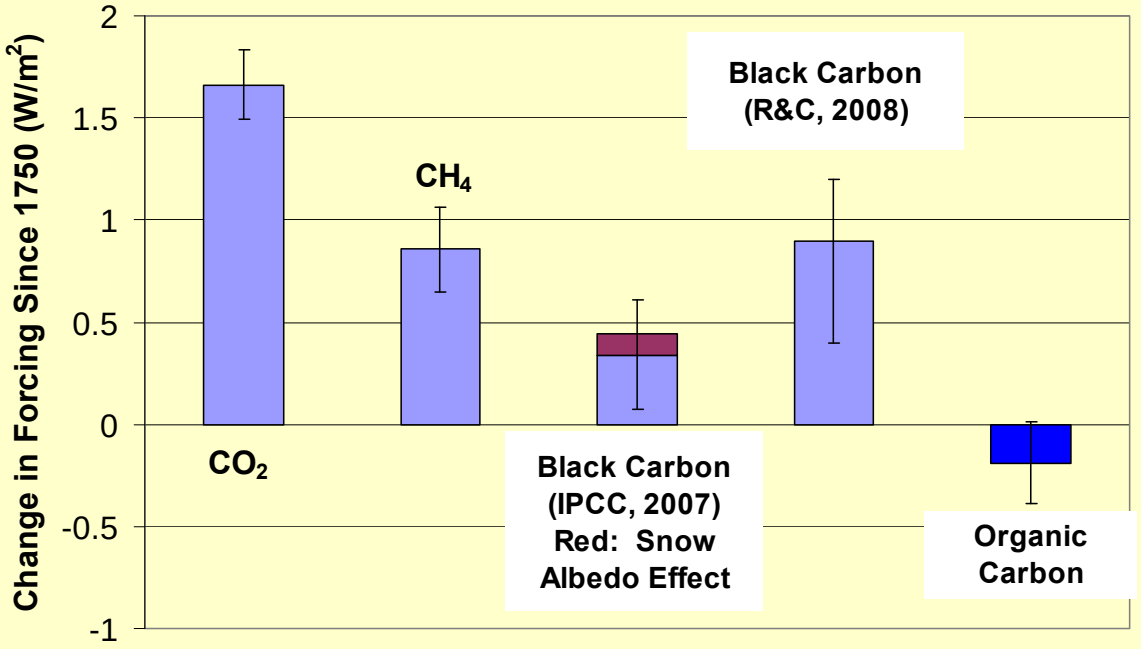
Sources: WHO (2002); IEA (2007)

# Indoor Smoke from Cookstoves is the 4th Worst Health Risk Factor in Poor, Developing Countries




These estimates derive almost entirely from childhood pneumonia & COPD in women – they do not include many other likely acute (e.g., stillbirth, low birth weight) and chronic (cardiovascular disease, various cancers) diseases for which adequate evidence does not yet exist.

# Black Carbon has a Significant Impact on Global Warming




- ***IPCC* (2007): BC warming is large at global (and regional) scale. BC deposition on snow has a strong warming effect**
  - BC forcing ~9-48% as large as $CO_2$ forcing
- ***Ramanathan & Carmichael*: BC may be 2nd strongest contributor to current warming.**
  - ~25-88% of $CO_2$ forcing

Table 3.10 Radiative forcing in milliWatts per square meter (mW per m²), from regional emission sector perturbations in the GISS model.

| Region | Sector | Sulfate | BC | OC | Nitrate | Ozone | Methane (indirect) | All |
|---|---|---|---|---|---|---|---|---|
| North America | Domestic | 0 | -3 | 2 | 1 | 2 | 1 | 4 |
| | Surface Transportation | -3 | -5 | 0 | 1 | -5 | 4 | -9 |
| | Industry/power | 14 | -2 | -1 | 0 | 5 | 2 | 18 |
| Asia | Domestic | 0 | -42 | 13 | 1 | -12 | -2 | -41 |
| | Surface Transportation | 2 | -8 | 1 | 2 | -5 | 7 | -2 |
| | Industry/power | 13 | -4 | 0 | -1 | -1 | 5 | 12 |

**Black Carbon:** "Reductions of short-lived pollutants from the domestic fuel burning sector in Asia, whose climate impacts in this study are dominated by black carbon (soot), appear to offer the greatest potential for substantial, simultaneous improvement in local air quality and reduction of global warming."

*From Key Finding #3, U.S. Climate Change Science Program, SAP 3.2 (9/2008)*

# Cookstoves & Carbon Credits

- $CO_2$ indicates more complete combustion – it is good!
  - If biomass is harvested renewably, net $CO_2$ impact is a wash.
  - If not, $CO_2$ savings = biomass displaced x fNRB x emissions factor
- Reasons for Optimism:
  - Powerful incentive to keep using stoves year after year
  - Transaction costs incentivize large projects
  - No reductions, no money – much more rigorous
- Reasons for Caution:
  - Monitoring for highly bundled projects difficult
  - if not done right, could undermine field for years
  - More efficient doesn't necessarily mean clean
- Example: Patsari Stove in Mexico
  - 3.1 $tCO_2$-e/year for $CO_2$ & $CH_4$
  - 3.9 $tCO_2$-e/year for w/CO & NMHCs too

  (Source: Johnson et al, March 2009)

Patsari Stove

# Additional Impacts of Solid Fuel Use

Time loss for women ..... and children

Women's & girl's personal safety in conflict zones

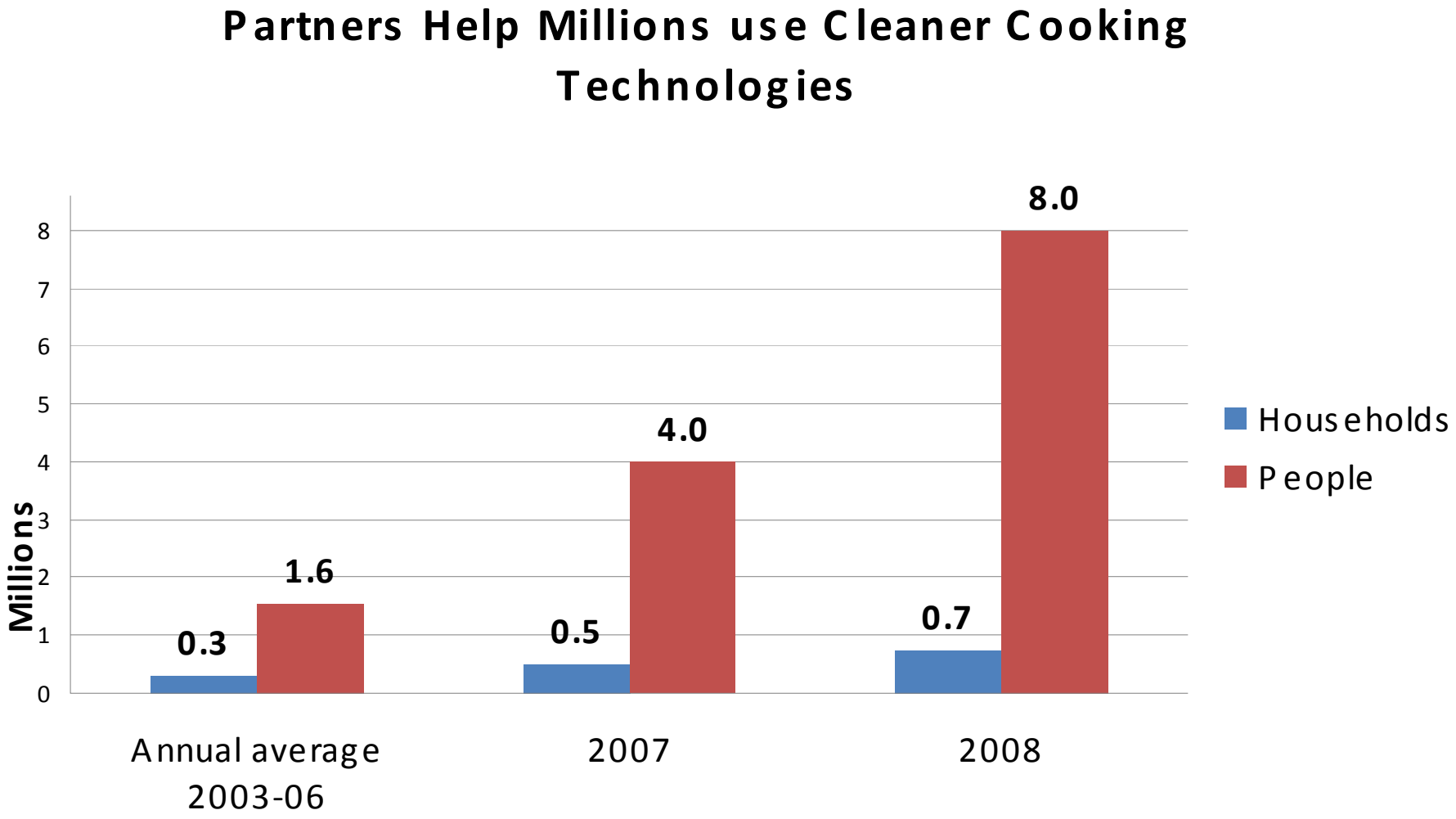
Contributes to deforestation

Contributes to loss of critical habitat

# Partnership for Clean Indoor Air (PCIA)

- **Grown** from 13 to over 265 partners in since 2002 launch
- **PCIA Mission**: To improve health, livelihood, & quality of life by reducing exposure to indoor air pollution, primarily among women and children, from household energy use through the use of clean, reliable, affordable, efficient, & safe home cooking & heating practices.
- **Current Activities:**
  - Knowledge Management: website, bulletins, tools, guides, etc
  - Capacity Building: stove design, monitoring, commercialization
  - Implementation: replicating and scaling up effective approaches


# Results Reporting at the 4th PCIA Biennial Forum in Kampala (March 2009)




Results reported from 87 implementing organizations

# Examples of Improved Stoves & Fuels

**Local Manufacturers**

Cambodia: GERES charcoal stove

Guatemala: ONIL wood stove (for tortillas)

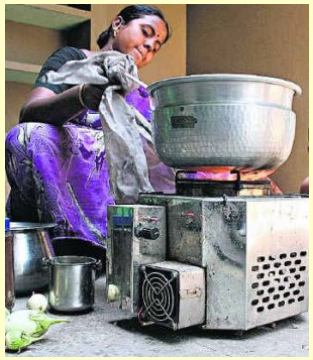
Uganda: wood Ugastove

India: household biogas System

**Multinational Manufacturers**

Philips stove (wood)

Envirofit/Shell Foundation stove (wood)



BP Oorja stove (pellet stove)

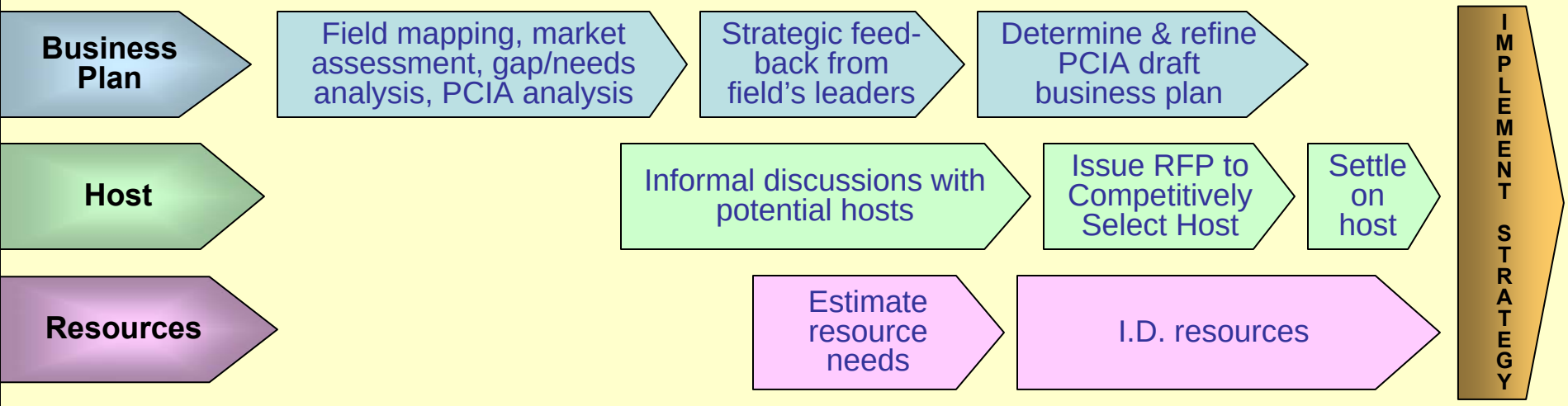
Bosch-Siemens Protos-2 (plant oil)

# PCIA Expansion

PCIA faces 2 major limitations while it is hosted by the U.S. EPA:

- ***Financial:*** As a regulatory agency, EPA cannot raise or accept funds from government, donor, or private sector partners.
- ***Operational:*** While PCIA is managed, staffed, and funded by EPA, it will continue to be viewed as simply an EPA initiative.

***Question: How can government incubate a sustainable development initiative, and then re-launch it as a bigger, independent, & sustainably funded entity?***



# Blueprint to Transform the Field

PCIA Role w/Partners

Not PCIA Role

## PHASE 1: Demonstrate Ability to Reach Scale, 2010 – 2015 (Budget ≈ $50 million)

### *PHASE 1a: Support Commercial Markets to Demonstrate Success at Regional Scale*

**CONVENE REGIONAL NETWORKS**

**Users**
- Homes
- Institutions
- Businesses

**Public Awareness**

**Financing**

**Testing Centers**

**Government Policy**

**Manufacturers**
- Local Businesses
- Multi-National Corporations

**Sales/Distribution**
- Local Businesses
- Multi-National Corps
- Local NGOs

DEMAND

SUPPLY

Monitoring & Evaluation

### *PHASE 1b: Mature Global Infrastructure*

- Standards & Measures
- Global Communications
- Knowledge & Networking

### *PHASE 1c: Priority Research*

- Health Effects
- Climate Change: Impacts & Remedies
- Economic Metrics
- Clean Stove & Fuel Research

**Goals:** Bring clean cooking practices to 20 million homes (100 million people), and for this group:
- ► Reduce fuel use – and GHG emissions – by 50-70%
- ► Reduce stove emissions – including black carbon – by 60-90%
- ► Reduce daily personal exposure by at least 50% and reduce severe child pneumonia by 30-40%

## PHASE 2: Global Campaign to Reduce Smoke from Cookstoves, 2016 – 2030 (Budget: $100s millions/yr)

- Communicate Results of Large-Scale Demonstrations
- Develop Strategy with Global Leaders
- Identify Global Resources

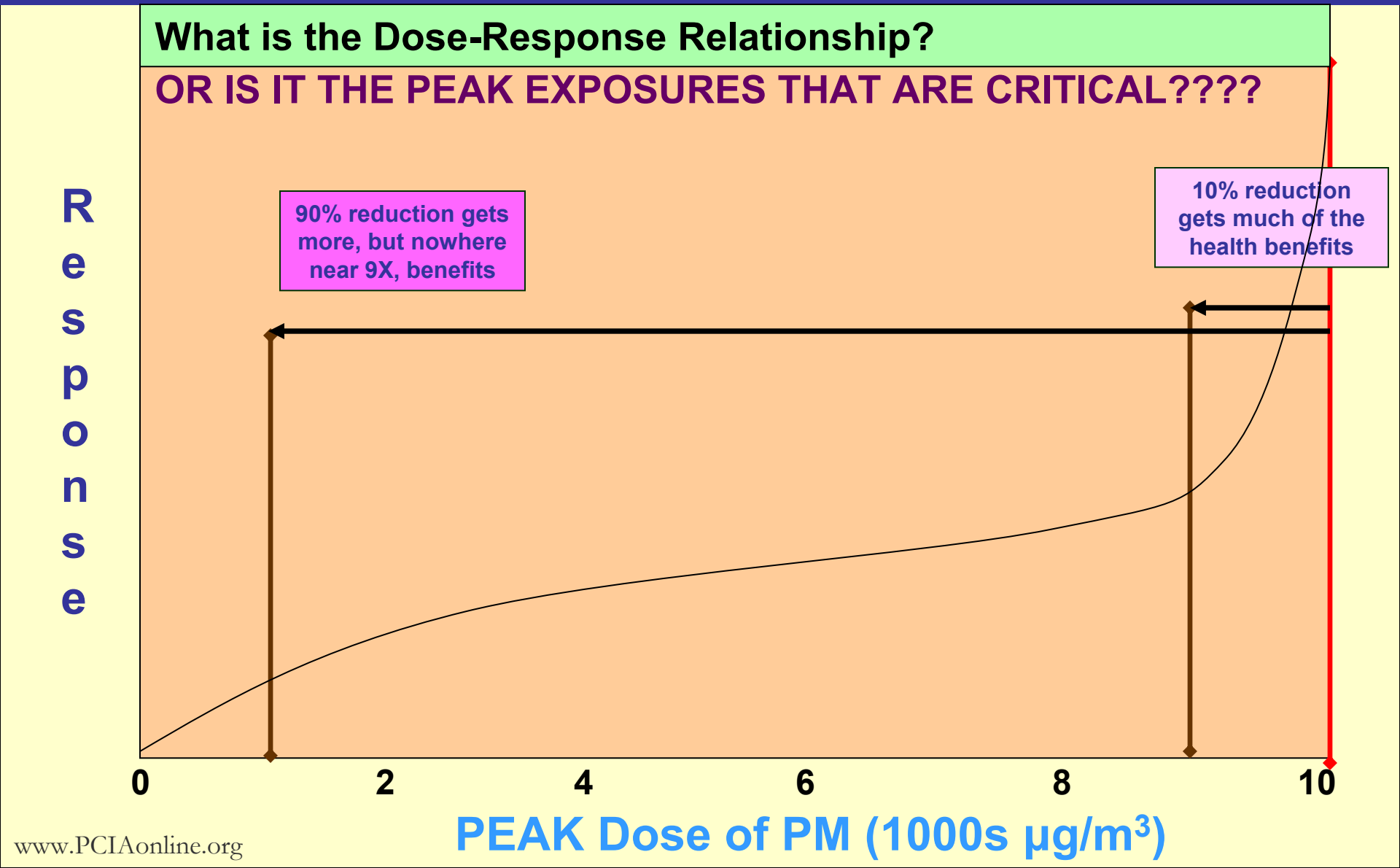
**Goal:** Eliminate these risks for half of the 3 billion affected people.

# Key Question: Are clean stoves and fuels improving health???

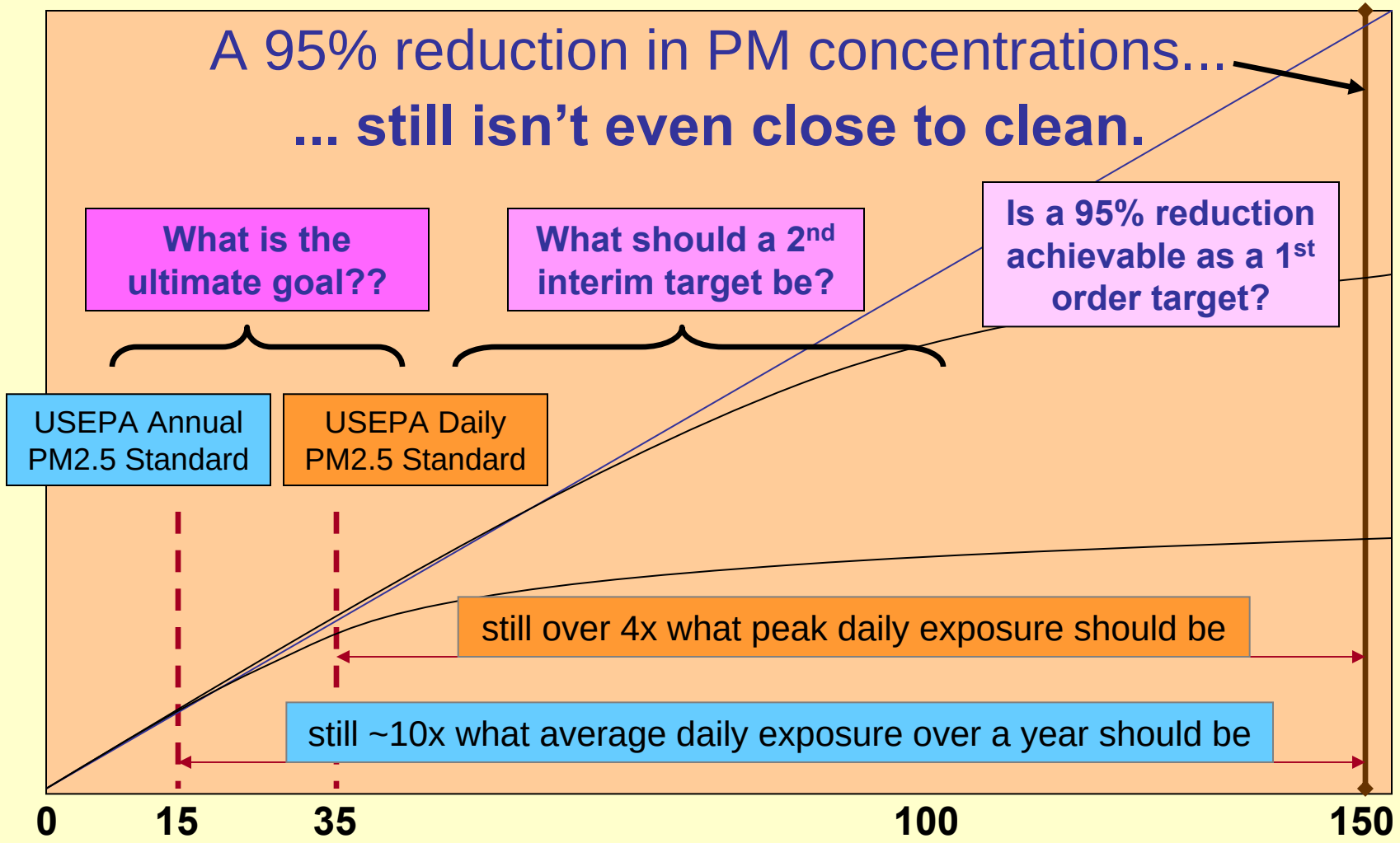
## What is the Dose-Response Relationship?

**Example: Uganda project where baseline daily exposure concentrations were ~3000 µg/m³?**

# Key Question: Are clean stoves and fuels improving health???



# How Clean is "Clean"?



# The Time is Ripe for PCIA to Lead a Quantum Leap for this Field

**Leadership:**

- This is little agreement among leaders in this field on what works.
- Most leading organizations in this field work independently of each other.
- A need exists to convene and raise the game of the entire field.

***It is a rare opportunity to lead solutions to the 4th worst health risk factor in poor countries.***

**Is the Field at a Tipping Point?**

- Leading donors are ramping up efforts.
- Major corporations are investing and leading NGOs are achieving scale
- Climate change is causing global environmental awareness to peak.
- More complete health data is emerging.

***It is a particularly ripe and important time to enter and catalyze this field.***

**"We followed the road into cooler hills, where women walked barefoot carrying firewood."**

**"A lovely young mother... invited me into her hut. It was a cramped, pitch-black space with a five-foot-high ceiling. The woman told me her family cooked, slept, and kept newborn calves in it. The smoke was blinding, and after a minute I had to leave."**

***President Obama, in his book, "Dreams from My Father," during his 1st trip to Kenya***