Setting the scene for Workshop 3:

Emerging opportunities in cooking fuels as well as changing cooking habits

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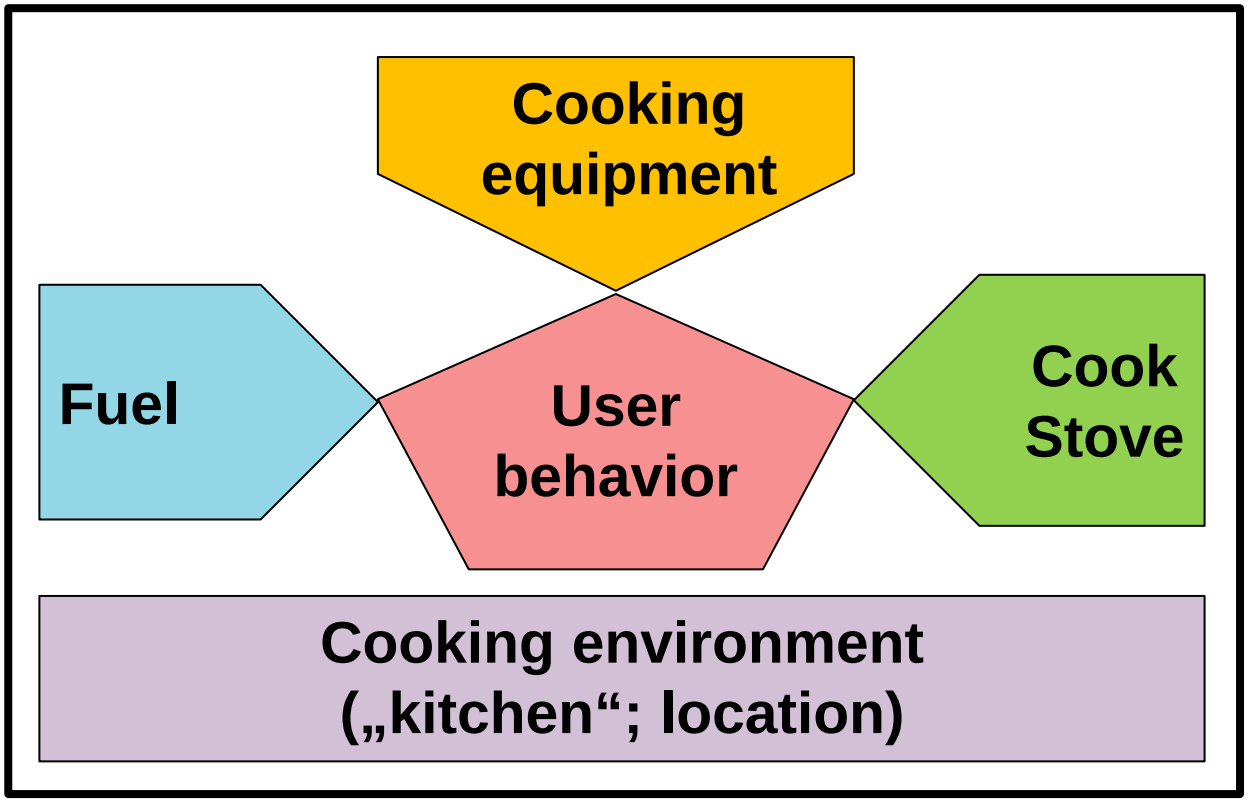
Coordinators for GIZ-HERA: Verena Brinkmann and Christa Roth

Bonn International Cooking Energy Forum

26.-28. June 2013 in Bonn, Germany

Complexity of the cooking energy system



Quality of vital “cooking energy services”

Figure developed by Dr C Messinger GIZ-EnDev

CLEAN COOKING FORUM 2013

IGNITING CHANGE, FUELING MARKETS & SPARKING ADOPTION

MARCH 18-22 | PHNOM PENH, CAMBODIA

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

PROGRESS

FUELS

A range of fuel options was discussed throughout the Forum from multiple perspectives, including research, markets, investment, and adoption. Presenters and participants discussed fuels including but not limited to biogas, biomass (processed and unprocessed), briquettes, charcoal, ethanol, LPG, and solar. Participants also had the opportunity to visit a charbriquette factory and a solar cooker sugar processing plant. Fuel production and distribution impacts many dimensions at once—health, livelihoods, agriculture, and the environment. Thus, interventions and decisions focused on fuel supply and demand must be based on sound data and analysis, which can help support decision-making to balance benefits and impacts, and be incorporated into future standards development. In a fuels-focused session, Forum participants discussed analyses and tools to evaluate the impacts of production and distribution for a variety of fuel types along the value chain.

The Energy-ladder - a Myth?

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Solid biomass

Un-processed	Processed	
Un-carbonised		Carbonised
Agricultural Residues, Dung, Wood	Chips, Briquettes, Pellets	Charcoal

Solid Coal

USER
Mix of Energy for Cooking on demand

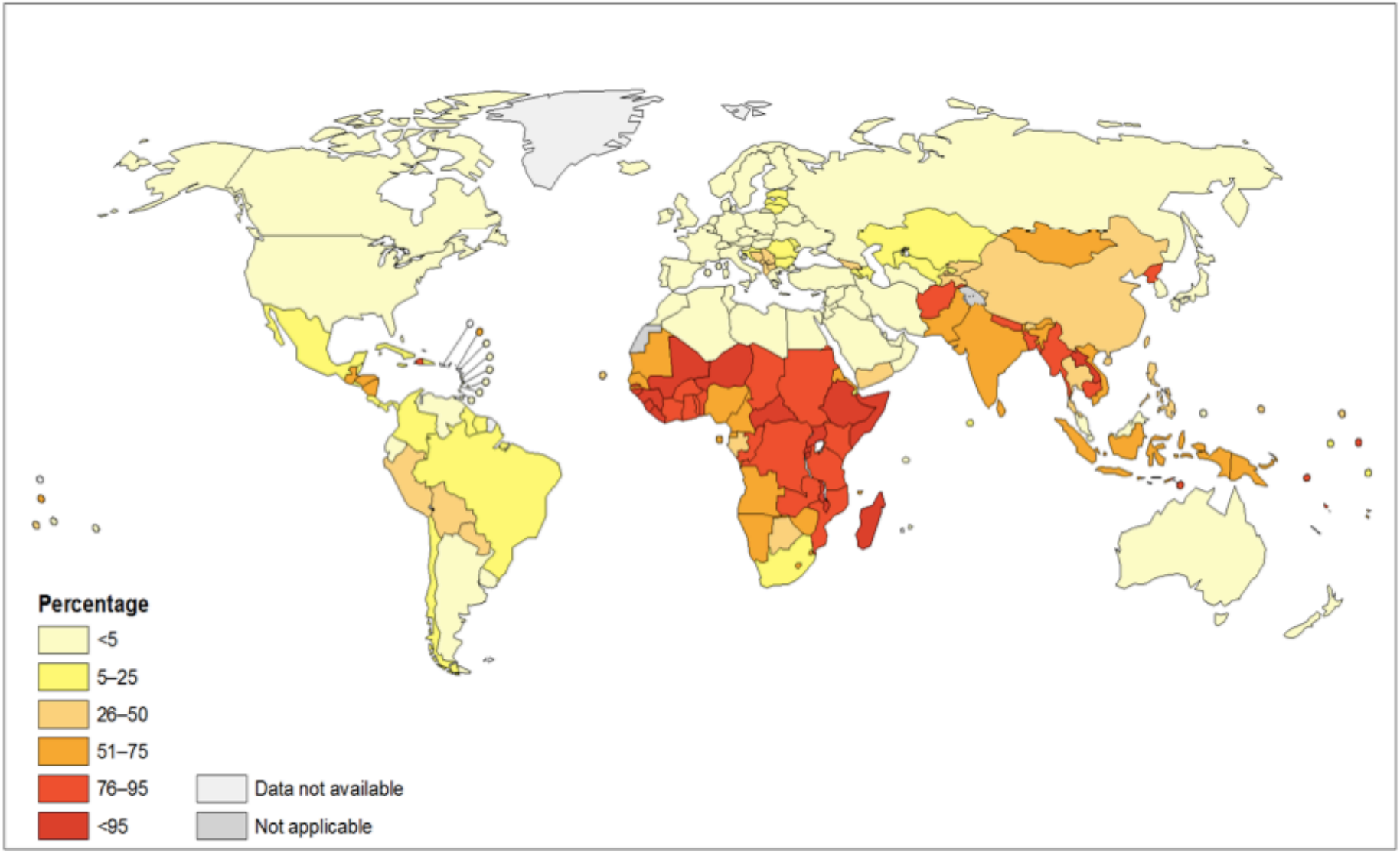
Solar

Liquid	
Kero-sene	Methanol Ethanol, SVO...

Gas	
LPG, natural gas	Biogas Wood gas

Electri-city

Population Cooking with Solid Fuels in 2010 (%)



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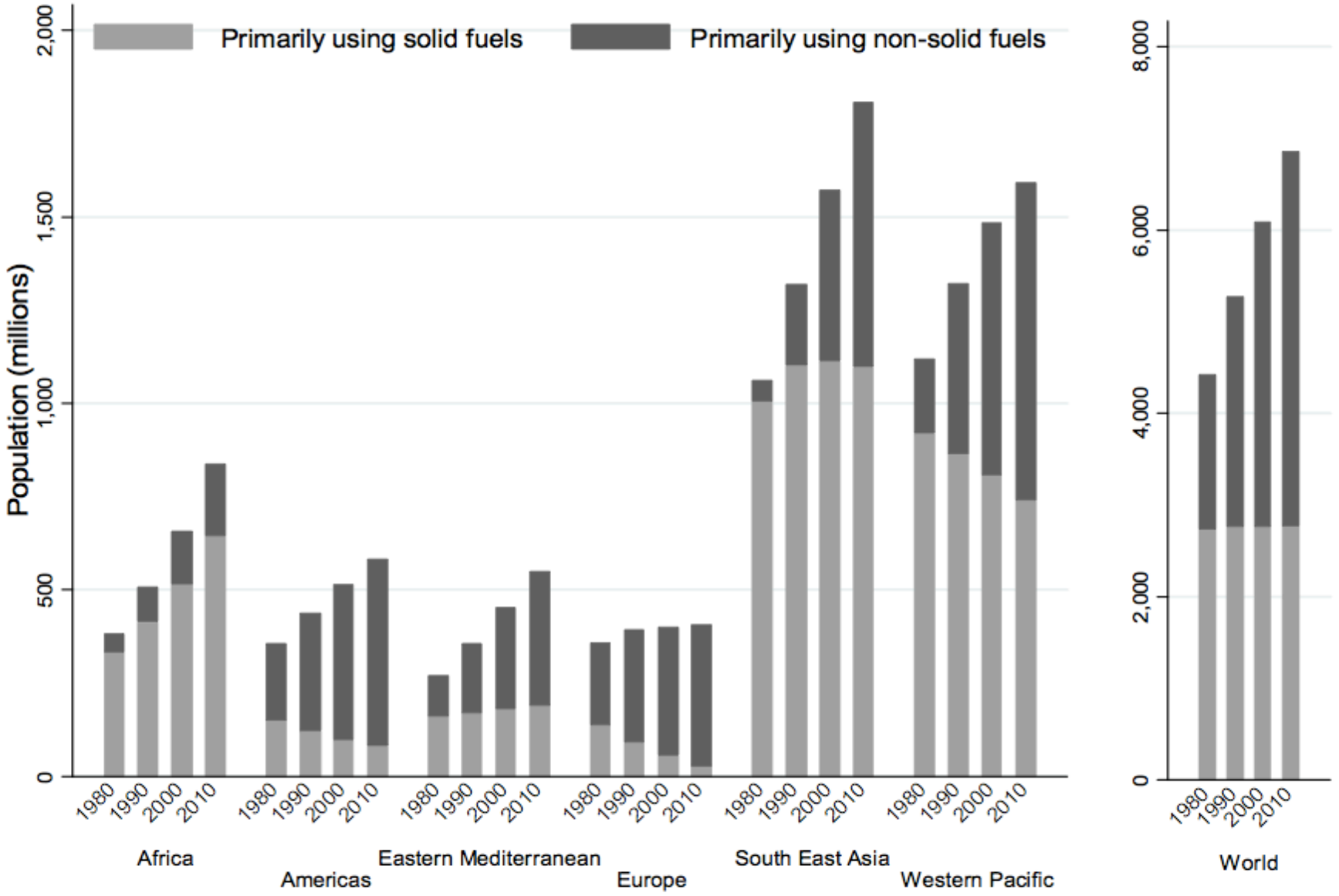
Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

World Health Organization



Total Population Cooking with Solid Fuels

Bonjour et al., CRA-2010

‚Stove' =

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Heat-Generator

= How to make most heat from a fuel

‚complete combustion of fuel'

Optimise influencing factors

Time, Temperature, Turbulence

Specific for size, shape, moisture content and state of carbonisation of solid biomass:

- Uncarbonised ‚stick'-wood
- Briquettes
- Pellets
- Charcoal lumps

Heat-Transfer-structure

= How to get most heat into the pot

‚Form follows function'

Form of ‚stove' depending on

- fuel (size, shape, type)
- cultural factors (type of meal, habits)
- type of cooking (one-handed or two-armed-full-upper-body-motion needed)
- pot-shape, material, size etc.

Recent research findings

Kitchen 2.0: Design Guidance for Healthier Cooking Environments

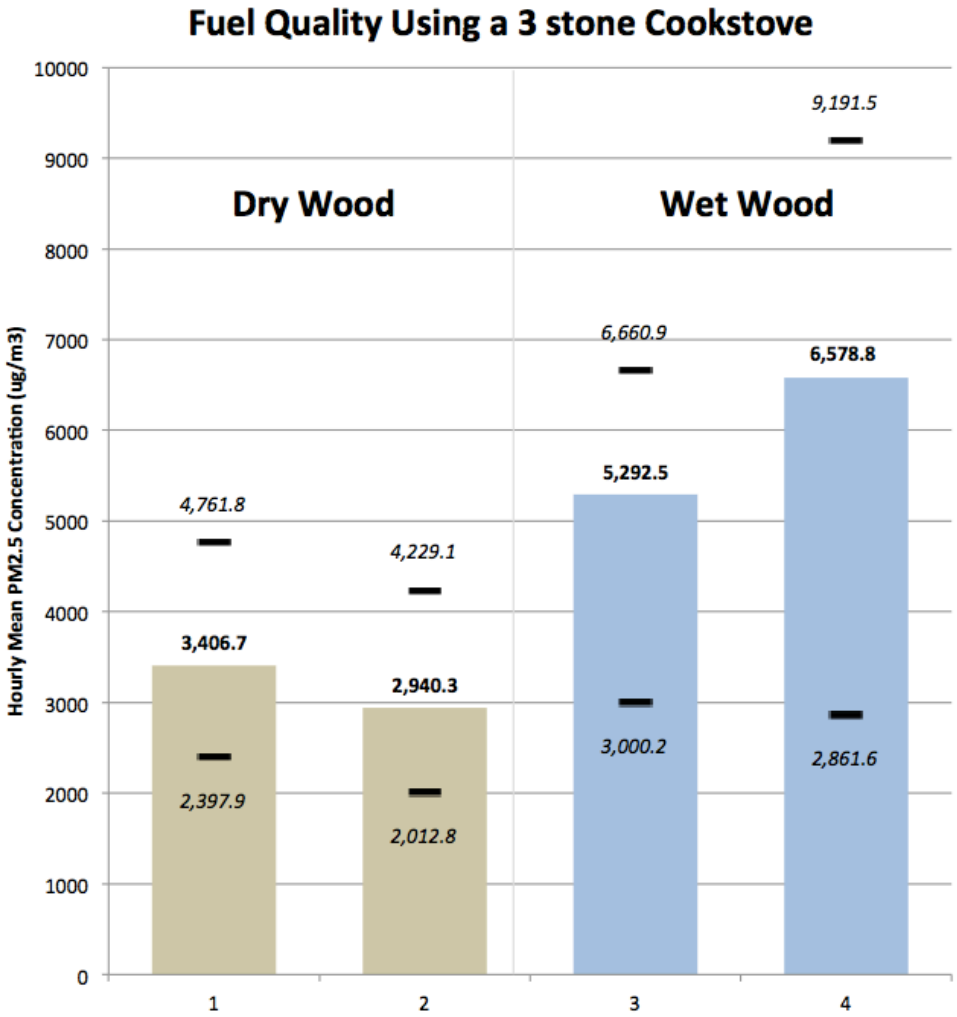
Exert from a report submitted to the US Environmental Protection Agency (EPA) as part of the 2013 EPA People, Prosperity, and the Planet (P3) Competition

Michigan Tech

P3

Kitchen 2.0

June 24, 2013

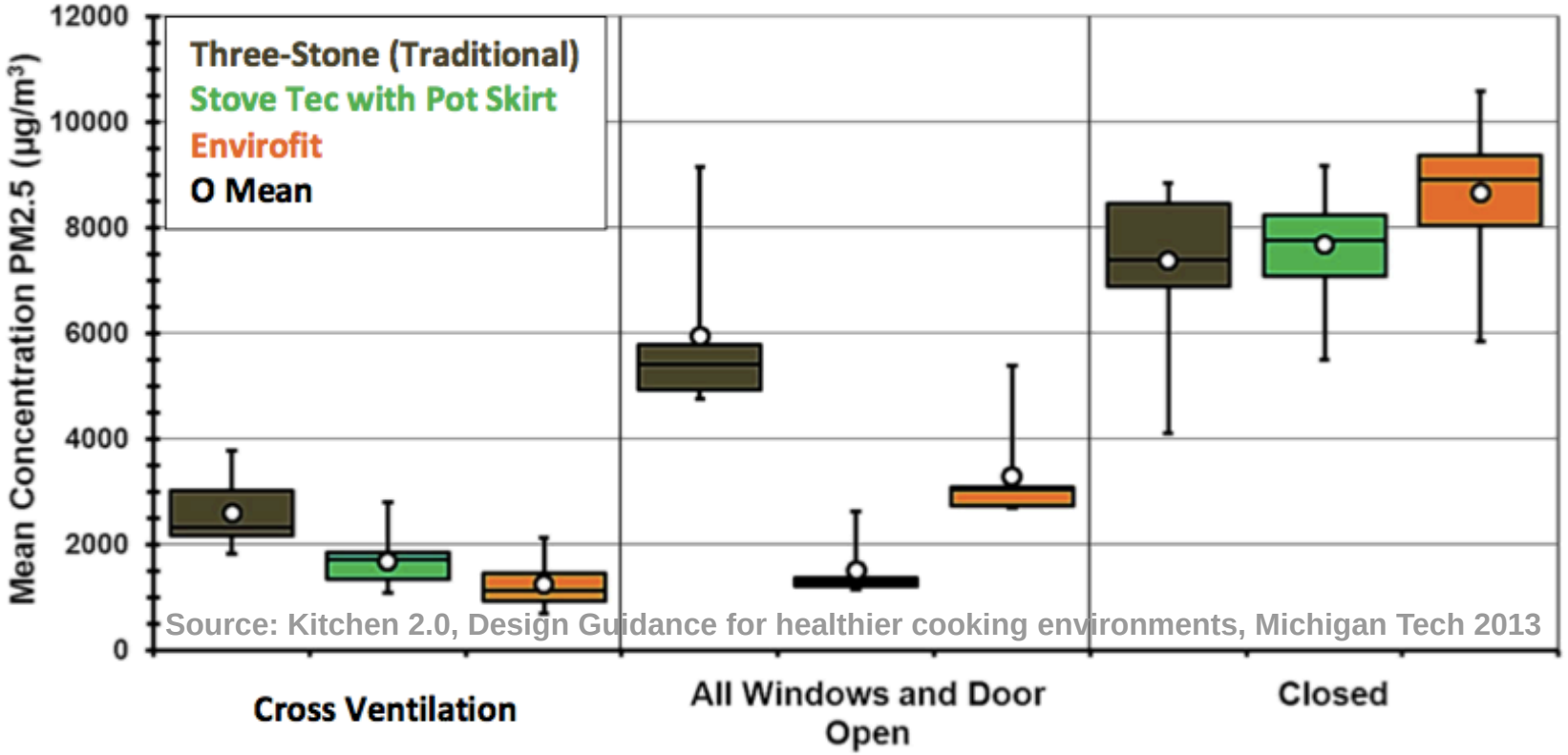


Impact of fuel moisture on air quality:

Evidence emerges that the use of **wet wood** (20-26% moisture) might have a bigger impact on air quality than the type of stove technology.

Source: Kitchen 2.0, Design Guidance for healthier cooking environments, Michigan Tech 2013

Impact of ventilation

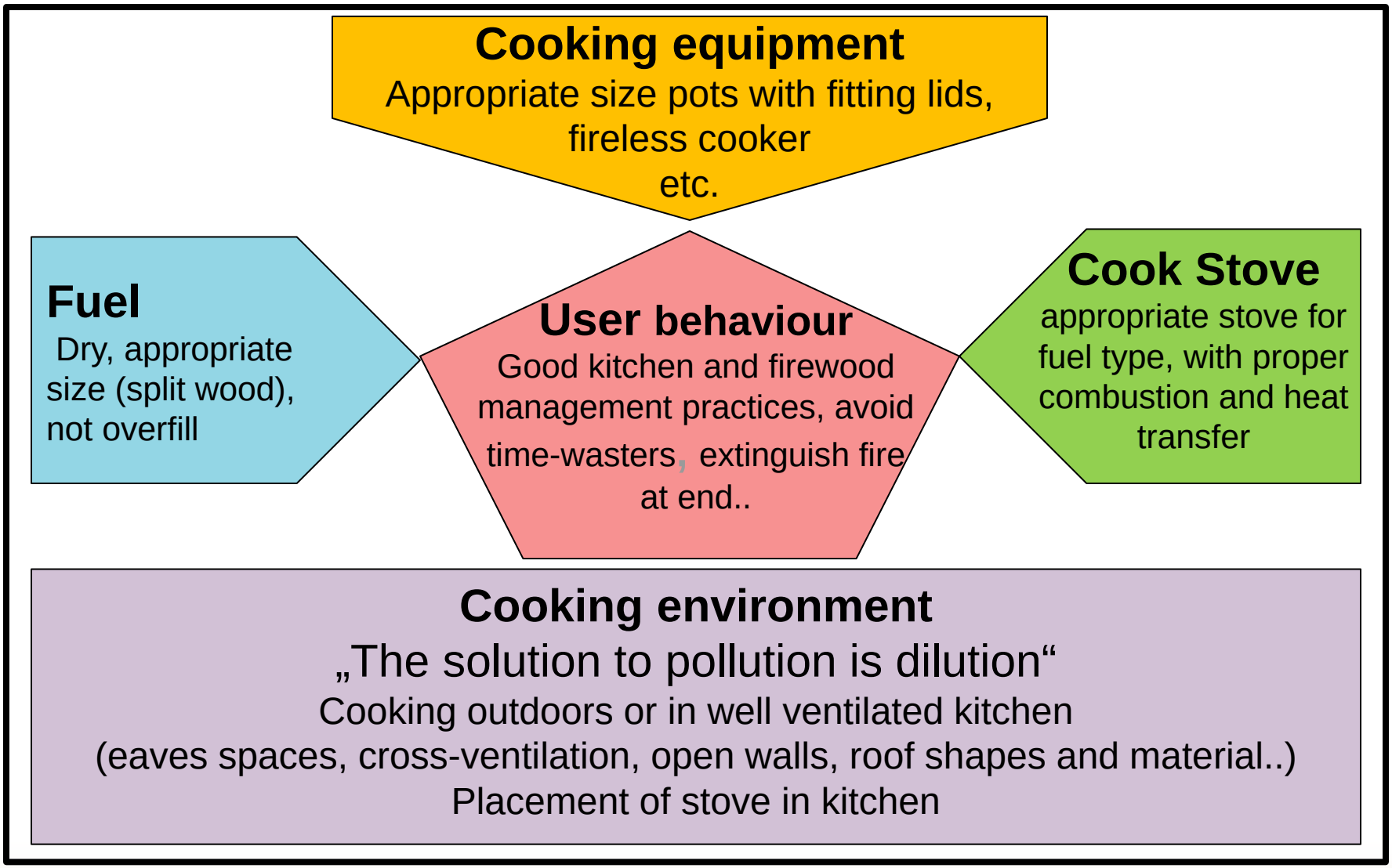


Source: Kitchen 2.0, Design Guidance for healthier cooking environments, Michigan Tech 2013

Figure 4: Depicts UCB monitors' mean averages (n=3) for three stoves under three ventilation variations at standing (60cm) and sitting (39cm) heights (steel roof only) . Averages calculated during first 45 min of trials.

Evidence emerges that the ventilation set-up has much bigger impact on the pollutant concentration levels than the type of stove technology.

Users options to improve combustion, heat transfer, air quality and overall efficiency



- People chose fuels based on availability, affordability and convenience (hastle-factor)
- Fuel choice can vary per task and circumstances
- This session is NOT a discussion of one fuel being ‚superior' by definition
- This session should be a discussion on
  - What realistic options do people have?
  - How to guide decision-making on fuel choices (what makes sense where and for which task like boiling, roasting, frying, baking, heating bath water etc.)
  - Identify the gaps to make informed decisions