Let them breath smoke

Eric Mazzi ¹ and Hadi Dowlatabadi¹,²

¹ Institute for Resources, Environment & Sustainability, UBC
² University Fellow, Resources For the Future, Washington DC.
Adjunct Professor, Carnegie Mellon University, Pittsburgh, PA.
Objective

• To characterize the impacts of climate policy on human exposure to air pollution.
Global Indoor vs. Outdoor Air Quality

Attributable Mortality for the Year 2000

- Urban Air Pollution
- Indoor Smoke from Solid Fuels

Source: WHO, 2002 ed. by Murray & Lopez
Assumptions

1. Exposure to air pollution (indoor and outdoor) is tied to outdoor air quality.
2. Fossil fuels are a major source of outdoor air pollution.
3. Their reduction for GHG reasons reduces outdoor pollution.

Actual:
1. For 2/3 of the world indoor air pollution is tied to indoor fuel use.
2. For >85% indoor fuels are not commercial fossil fuels.
3. Limiting access to fossil fuels leads to higher exposure to pollution.
The energy ladder

Non-commercial fuels

- Dung
- Wood
- Coal

Commercial fuels

- Gas
- Oil
- Electricity, H₂

Climate Policy
The challenges & some possible solutions

Compounding factors:
• Polluting fuels
• Low efficiency combustion
• Poor ventilation
• Crowded dwellings

Possible solutions:
• Less pollution Fuels
• More efficient combustion
• Better ventilation
• Less crowded dwellings
Summary

• There is too much heterogeneity in circumstance and response modes to design *Global Policies* on the basis of high income country conditions and sensibilities.
Some possible pathways

- Annex 1 countries impose energy policy in LIC.
- Kerosene prices rise.
- Transition along energy ladder is retarded.

- Carbon policy in Annex 1 leads to differential pressure on oil, gas and coal.
- Differential pressure can lead to reduced or increased demand (depending on the way coal is treated in A1).
- Lower oil consumption will lead to OPEC price declines.
- Transition along energy ladder is accelerated.
<table>
<thead>
<tr>
<th>Region</th>
<th>Pop x10^6</th>
<th>Indoor $\text{PM}_{10}$ µgm^-3</th>
<th>Outdoor $\text{PM}_{10}$ µgm^-3</th>
<th>Bio. &amp; Coal</th>
<th>Oil &amp; Gas</th>
<th>Elec. &amp; CH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>780</td>
<td>600</td>
<td>150</td>
<td>89%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>L. America</td>
<td>410</td>
<td>450</td>
<td>150</td>
<td>88%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Asia</td>
<td>3,130</td>
<td>450</td>
<td>150</td>
<td>86%</td>
<td>9%</td>
<td>5%</td>
</tr>
<tr>
<td>E.E. &amp; NIS</td>
<td>350</td>
<td>200</td>
<td>75</td>
<td>10%</td>
<td>48%</td>
<td>42%</td>
</tr>
<tr>
<td>OECD &amp; ME</td>
<td>1290</td>
<td>45</td>
<td>40</td>
<td>10%</td>
<td>58%</td>
<td>33%</td>
</tr>
</tbody>
</table>