Opportunities for transformative partnerships for clean air in Asia

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Program Manager, Clean Air Asia
### Global review of recent source apportionments for airborne particulate matter

Philip K. Hopke, Qili Dai, Linxuan Li, Yinchang Feng (2020) | *Science of the Total Environment*

<table>
<thead>
<tr>
<th>Source</th>
<th>Eastern Asia (excluding China)</th>
<th>Southeast Asia</th>
<th>Western Asia (M49)</th>
<th>Source</th>
<th>Eastern Asia (excluding China)</th>
<th>Southeast Asia</th>
<th>Western Asia (M49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{2.5}$ (µg/m$^3$)</td>
<td>27.5</td>
<td>24.8</td>
<td>46.7</td>
<td>Industry (%)</td>
<td>8.9</td>
<td>15.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Mixed SIA (%)</td>
<td>42.3</td>
<td>23.9</td>
<td>51.8</td>
<td>Biomass burning (%)</td>
<td>10.1</td>
<td>16.3</td>
<td>13.5</td>
</tr>
<tr>
<td>Sea Salt (%)</td>
<td>6.8</td>
<td>7.8</td>
<td>5.6</td>
<td>Coal or No. 6 oil combustion (%)</td>
<td>14.5</td>
<td>13.8</td>
<td>15.9</td>
</tr>
<tr>
<td>Dust (%)</td>
<td>7.2</td>
<td>19.1</td>
<td>6.0</td>
<td>Other (%)</td>
<td>11.9</td>
<td>23.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Traffic (%)</td>
<td>17.6</td>
<td>23.0</td>
<td>14.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 2:** Map showing regional or country average source apportionments for PM$_{2.5}$.

**Fig. 4:** Map showing regional or country average source apportionments for PM$_{2.5}$. 

[Map visualizations with color-coded circles indicating source contributions]
Integrated nature of air quality and climate change underline the importance of partnerships and collaboration.
Relevance of partnerships in operationalizing the strategic framework for air quality management

• Partnerships for air quality management requires, beyond resource mobilization, *joined-up decision-making and implementation of solutions* for coherent results.

• The *air quality agenda* calls for a *systems thinking approach* which rallies stakeholders around *shared goals*.
Relevance of partnerships in operationalizing the strategic framework for air quality management

GUIDANCE FRAMEWORK FOR BETTER AIR QUALITY IN ASIAN CITIES
(https://ibaq.cleanairasia.org/guidance-framework/)

Knowledge Base
- Level of pollution
- Sources of pollution
- Impacts

Solutions
- National policies and frameworks
- Local programs and measures
- Individual and community-level actions

Institutionalized through Integrated CLEAN AIR & CLIMATE CHANGE ACTION PLANS
KNOWLEDGE BASE

• Level of pollution
• Sources of Pollution
• Impacts

SOLUTIONS

• Policies and frameworks
• Programs and measures
• Individual and community-level actions

Government
Leadership, agency, influence

NGOs and CSOs
Networks, technical and management capacity

Academia
Science, innovation

Private sector
Financing, sustainable business models

Communities
Local knowledge, on-the-ground presence
Case Study | Integrating Short-Lived Climate Pollutants (SLCPs) Reduction in the Pakistan’s Air Quality Plans and Program in Pakistan

- Strengthen the capacity of national partners through training on the use of LEAP-IBC
- Develop a set of policy recommendations based on LEAP-IBC application to integrate SLCP mitigation measures into AQM and climate change plans and strategies and sectoral plans at the national and provincial levels.

Training on the use of LEAP-IBC and other tools

Development of LEAP-IBC for Pakistan

Stakeholder validation of results and development of policy recommendations

Ministry of Climate Change

Clean Air Asia

Stockholm Environment Institute

National and sub-national government agencies

Other stakeholders

Academia and Research Institutions

Mitigation scenarios and policy recommendations for Pakistan

Capacity built for LEAP analysis and air and climate action planning

Stakeholder engagement
What we have achieved: Capacity building and baseline scenario emissions inventory

- Trained at least 50 representatives from the Ministry of Climate Change, Ministry of Energy, Pakistan EPA, Balochistan EPA, Sindh EPA and other federal personnel, stakeholders from academe and sector agencies.

- Established core working group for emissions inventory development

- Quantified percent contribution of source sectors to emissions and baseline scenario projections (2022-2050)

Total GHG and PM$_{2.5}$ emissions by source sector for the historic period (2010-2021) and projected for the baseline scenario (2022-2050) for the whole of Pakistan
## What we have achieved: Mitigation measures evaluated

<table>
<thead>
<tr>
<th>Measure Code</th>
<th>Sector</th>
<th>Source</th>
<th>Measure</th>
<th>Timeline</th>
<th>Quantified Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM01-Improved Cookstoves</td>
<td>Residential</td>
<td>SE4All National Action Plan</td>
<td>14 million households using improved cookstoves</td>
<td>2030</td>
<td>Zero households in urban areas will be using traditional stoves by 2030 – 12% will be using Improved Cookstoves. In rural areas a 47% switch from traditional to Improved Cookstoves.</td>
</tr>
<tr>
<td>CM02-Electric Vehicles</td>
<td>Transport</td>
<td>National Electric Vehicle Policy</td>
<td>Increase in the number of sales of electric vehicles (90% of sales to be electric vehicles by 2040)</td>
<td>2040</td>
<td>Assume that 2.5% of vehicles on the road each year are due to new sales</td>
</tr>
<tr>
<td>CM03-Euro V</td>
<td>Transport</td>
<td>Pakistan’s Nationally Determined Contribution</td>
<td>Switch to Euro V emission standards</td>
<td>2050</td>
<td>100% of all vehicles will have Euro V or equivalent standards by 2050</td>
</tr>
<tr>
<td>CM04-Fertiliser</td>
<td>Industry</td>
<td>SE4All National Action Plan</td>
<td>10% increase in fuel efficiency for fertiliser production</td>
<td>2030</td>
<td>10% increase in fuel efficiency for fertiliser production</td>
</tr>
<tr>
<td>CM05-SE4ALL Renewable Energy Generation</td>
<td>SE4All National Action Plan</td>
<td>Increase the share of renewable energy share (not hydro) to 15%</td>
<td>2030</td>
<td>Increased wind, solar and solar hybrid capacity</td>
<td></td>
</tr>
<tr>
<td>CM06-ARE Renewable Energy Generation</td>
<td>ARE Renewable Energy Policy</td>
<td>20% of generation capacity is renewable by 2025 and 30% by 2040</td>
<td>2040</td>
<td>Increased wind, solar and solar hybrid capacity</td>
<td></td>
</tr>
<tr>
<td>AM01-Crop Burning</td>
<td>Agriculture</td>
<td>Additional Measure</td>
<td>Complete ban on crop burning</td>
<td>2040</td>
<td>No crop residue is burnt</td>
</tr>
<tr>
<td>AM02-Rice</td>
<td>Agriculture</td>
<td>Additional Measure</td>
<td>Intermittent aeration of all rice paddy fields</td>
<td>2040</td>
<td>By 2040 all rice is multiply aerated which is a switch from (50% singly aerated and 50% continuously flooded as assumed in the baseline)</td>
</tr>
<tr>
<td>AM03-Enteric Fermentation</td>
<td>Agriculture</td>
<td>Additional Measure</td>
<td>Decrease emissions from enteric fermentation</td>
<td>2040</td>
<td>30% decrease in methane emissions from enteric fermentation</td>
</tr>
<tr>
<td>AM04-Manure Management</td>
<td>Agriculture</td>
<td>Additional Measure</td>
<td>Reduce emissions from manure management</td>
<td>2040</td>
<td>No storage of manure, instead all manure is assumed to be excreted directly onto pasture or in daily spread. This is a switch from 50% of manure assumed to be managed by solid storage in the baseline scenario</td>
</tr>
<tr>
<td>AM05-Waste Collection</td>
<td>Waste</td>
<td>Additional Measure</td>
<td>Increase waste collection</td>
<td>2040</td>
<td>Increase total waste collection to reach 100% in urban areas and 50% in rural areas</td>
</tr>
<tr>
<td>AM06-Landfill Gas Capture</td>
<td>Waste</td>
<td>Additional Measure</td>
<td>Capture methane from landfills</td>
<td>2040</td>
<td>75% of methane from landfills is captured</td>
</tr>
<tr>
<td>AM07-Composting</td>
<td>Waste</td>
<td>Additional Measure</td>
<td>Increase the amount of organic waste composted</td>
<td>2040</td>
<td>75% of organic waste collected is composted</td>
</tr>
<tr>
<td>AM08-Liquid Waste</td>
<td>Waste</td>
<td>Additional Measure</td>
<td>Capture methane from liquid waste</td>
<td>2040</td>
<td>93% of methane from liquid waste is captured</td>
</tr>
<tr>
<td>AM09-Particle Filters</td>
<td>Industry</td>
<td>Additional Measure</td>
<td>Particle filters are applied to industrial chimneys</td>
<td>2040</td>
<td>95% reduction in particulate matter (PM10, PM2.5) and its components (BC, OC)</td>
</tr>
<tr>
<td>AM10-Efficient Brick Kilns</td>
<td>Industry</td>
<td>Additional Measure</td>
<td>Switch from traditional to efficient brick kiln use</td>
<td>2040</td>
<td>100% switch to efficient brick kilns – assuming a decrease in consumption of 20%</td>
</tr>
<tr>
<td>AM11-Clean Cooking</td>
<td>Residential</td>
<td>Additional Measure</td>
<td>Increase in households using clean cooking technologies</td>
<td>2040</td>
<td>50% of all households are using LPG cookstoves and 25% of households are using improved cookstoves</td>
</tr>
</tbody>
</table>
What we have achieved: Emission reductions quantified and policy recommendations developed

Projection of PM$_{2.5}$, GHG and CH$_4$ Emissions to 2050 for the 3 mitigation scenarios in comparison with the baseline scenario

**Policy recommendations**

1: Enhance Pakistan’s National Clean Air Plan with key climate and clean air measures

2: Develop Provincial Clean Air Plans with province-specific priority measures

3: Enhance Pakistan’s NDC with key climate and clean air measures

4: Communicate Pakistan’ Contribution to the Global Methane Pledge

5: Accelerate implementation of priority measures

6: Integrate air pollution and climate change emission inventories for tracking progress
Partnerships for air quality management..

• Aim to secure high-level leadership
• Agree on shared goals, targets, action plans, and implementation mechanisms
• Maximize co-benefits by implementing pollution reduction actions that are proven to contribute to development goals
• Monitor and measure progress towards goals and targets
• Country-led and context specific
• Avoid duplication of effort and fragmentation
• Bring together diverse resources to achieve more impact, greater sustainability, and increased value to all.
Thank you!

For questions, please email dang.espita@cleanairasia.org