

# A national mission for smokeless cooking: a proposal

Prayas (Energy Group), October 2018

## 1 Background

Household air pollution (HAP) caused by smoke from burning solid fuels for cooking is a major source of mortality and morbidity in India. According to a recent study<sup>1</sup>, HAP contributes to Lower Respiratory Infection (among children), Chronic Obstructive Pulmonary Disease, Ischemic Heart Disease, and Haemorrhagic and Ischemic Strokes, which are four of the five leading contributors to Disability Adjusted Life Years (DALYs) in the country. Recent evidence suggests that smoke from residential solid fuel use is also a major contributor to outdoor particulate pollution<sup>2</sup>, which is another significant contributor to DALYs. Therefore, this is a major developmental challenge for the country<sup>3</sup>, and a rapid transition to smokeless fuels and technologies for cooking can potentially save many lives and is cost-effective<sup>4</sup>.

The government has recognized the importance of this challenge, and initiated efforts such as the Pradhan Mantri Ujjwala Yojana (PMUY) and the proposed National Clean Air Programme (NCAP). PMUY, spearheaded by the Ministry of Petroleum and Natural Gas, aims to provide subsidised LPG connections to 8 crore households by 2020. The Ministry of Environment, Forests and Climate Change has proposed the NCAP as a means to tackle the country's severe (outdoor and indoor) air pollution problem. Media reports also hint at the Government's interest in trying to provide solar cooking solutions for all households<sup>5</sup>.

The scale of the Indian challenge is formidable. Estimates suggest that more than 15 crore households still use solid fuels as their primary fuel for cooking<sup>6</sup>. Many of them may possess an LPG or electricity connection, but they may not use them as their primary means of cooking for reasons such as affordability and reliability of supply. This nature of this challenge is very multi-dimensional. It is, of course, primarily a health and energy access problem. In addition, it has a gender dimension since women do most of the cooking in India, and it is women and girls who often go through the drudgery of fetching the solid fuels. There is also an environmental dimension as it is understood that the need for firewood has led to rapid deforestation in some parts of the country. Shifting to smokeless fuels and

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<sup>1</sup> India: Health of the Nation's States - the India state-level disease burden initiative, 2017 by ICMR, PHFI and IHME

<sup>2</sup> Burden of Disease Attributable to Major Air Pollution Sources in India, 2018 by IIT Bombay, HEI and IHME

<sup>3</sup> Some HAP is also attributable to uses such as water heating, space heating and fodder preparation. These also need to be addressed though their contribution to HAP is much lesser than cooking. There are also other kinds of cooking such as commercial cooking and institutional cooking but these are much less prevalent compared to household cooking. Therefore, this proposal is limited to addressing HAP from household cooking.

<sup>4</sup> Our analysis suggests that the faster the transition to such fuels, the greater the cost-effectiveness. See <http://prayaspune.org/peg/publications/item/376.html> for details.

<sup>5</sup> See <https://energy.economictimes.indiatimes.com/news/renewable/solar-cooking-facilities-for-every-rural-household-in-4-5-years-piyush-goyal/64925419>

<sup>6</sup> More than 18 crore households used solid fuels as their primary cooking fuel according to the 2011 census. A fuel or technology is the primary fuel in a household if it is the most used cooking fuel or technology.

technologies may have adverse impacts on the current account deficit for an energy resource poor country like India and on climate change. The issue also has a poverty dimension as ability to pay is an important barrier for adoption of such fuels and technologies. Another aspect that makes this challenge multi-dimensional is the variety of smokeless fuels and technologies that are available. Today, these include electricity, piped natural gas and biogas in addition to LPG, while other fuels and technologies may also qualify in future as they mature. Given the diversity across India in resource endowments, network and infrastructure availability, and paying capacity, it is necessary to find location-specific solutions and mechanisms best suited to that context.

## **2 A national smokeless cooking mission**

Building on the ongoing Government programmes, this document proposes a national level mission to streamline the ongoing efforts and accelerate the move towards smokeless cooking in India to address one of its chronic health, gender and energy challenges. This mission proposal has benefited from the views of participants at a roundtable discussion jointly organized by Prayas and the Collaborative Clean Air Policy Centre on June 20, 2018 in New Delhi<sup>7</sup> and discussions with various experts in the relevant sectors. It is hoped that this proposal will stimulate a conversation that can lead to concrete and effective measures to make cooking in India smokeless at the earliest<sup>8</sup>. If the Government sets up such a mission, the mission document should be finalized and published after wide consultations with citizens and stakeholders.

The primary objective of the mission should be to enable Indian households – mostly rural Indian households – to transition to using smokeless fuels and technologies that do not cause any noticeable health impacts for all their cooking needs on a sustained basis. Given the urgency and magnitude of this challenge, it is desirable that this transition should take place at the earliest<sup>4</sup>. Ideally, this transition should and can happen by 2025 given appropriate attention, but this proposal assumes a target date of 2030 to coincide with the target date of achieving the SDGs. Households should eventually have a choice of a basket of smokeless cooking fuels and technologies from which they could choose one or more depending on their preference and convenience.

Another objective of the mission should be to facilitate a transition away from fossil fuels for cooking so as to combat climate change. While this objective is also important, it is less urgent. India's contribution to greenhouse gas (GHG) emissions (on a per-capita or historical basis) and the share of cooking within the Indian GHG emissions basket are very small. Therefore, from a climate change perspective, shifting to non-fossil sources for cooking is a relatively lower priority item. Some mature and smokeless cooking options such as biogas are from renewable sources. Electricity is another smokeless cooking option that is increasingly produced from renewable sources. Such technologies should be encouraged, and development of new non-fossil-fuel based technologies should be supported as part of the mission.

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<sup>7</sup> See <http://prayaspune.org/peg/past-events/145.html> for more information on the roundtable such as the list of participants, presentations and summary of discussions. Not all the participants at the roundtable may agree with this mission proposal.

<sup>8</sup> An earlier version of this proposal was circulated to some stakeholders in July 2018.

### 3 Mission structure and responsibilities

The multiplicity of dimensions and issues relevant to this problem suggests that a single top-down, fuel-specific program is unlikely to succeed in enabling a rapid transition to smokeless cooking. Therefore, the proposed mission needs to be multi-ministerial, multi-tiered and multi-fuel/technology oriented. To ensure smooth coordination and effective functioning of such a mission, it needs to be housed or anchored in a suitably empowered agency which can coordinate among the various ministries of the central and state governments which would be part of the mission. This could be the Prime Minister's Office (PMO), which already drives many cross-ministerial missions and has the requisite authority. Alternatively, it could be driven from a specially created mission office, perhaps housed in some ministry. Such a mission office should be suitably empowered, financed and staffed. The mission could be made accountable to the Parliament, as described later. While the mission would be anchored in the PMO or a specially created mission office, it should include all the relevant government agencies from three tiers of government, as described below.

Tier	Constituents	Functions
Central government	<ul style="list-style-type: none"> <li>• The anchoring organization (PMO or specially created office)</li> <li>• The relevant energy ministries, i.e. the Ministries of Petroleum and Natural Gas, Power and Renewable Energy</li> <li>• Health ministry</li> <li>• Women and child development ministry</li> <li>• Environment ministry</li> <li>• Rural development ministry</li> <li>• NITI Aayog</li> </ul>	<ul style="list-style-type: none"> <li>• Setting broad agenda and direction for the program</li> <li>• Complement strengths of various ministries to effectively achieve the mission's objectives</li> <li>• Cross- agency coordination, and facilitating cross-learning</li> <li>• Identify and develop policies and programmes to achieve the mission's goals</li> <li>• Dovetail individual ministry programmes with the agenda and goals of the mission</li> <li>• Provide financial support to the mission</li> <li>• Collect and collate mission progress data and information, publish it, analyse it and use it to refine the mission</li> <li>• Oversee the mission's functioning and take corrective steps as needed</li> </ul>
State government (with representation from all states)	<ul style="list-style-type: none"> <li>• A nodal agency to represent the state in the mission</li> <li>• State energy / electricity ministries</li> <li>• State health ministry</li> <li>• State women and child development ministry</li> <li>• State environment ministry</li> </ul>	<ul style="list-style-type: none"> <li>• Identify state-specific solutions, programmes based on national level agenda and programmes</li> <li>• Refine policies to suit state realities as needed</li> <li>• Provide feedback to central government on functioning of the mission and its programmes</li> </ul>

	<ul style="list-style-type: none"> <li>• State rural development ministry</li> <li>• State ministry of agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Develop detailed implementation and monitoring plans</li> <li>• Share experiences and learn from other states</li> <li>• Collect state-level data about the mission's progress and provide to central government</li> </ul>
District level	<ul style="list-style-type: none"> <li>• District, Block, Circle and Village level implementing agencies</li> <li>• District level data collection agency (different from implementing agency) appointed by State nodal agency</li> <li>• A District Level monitoring committee, such as the DISHA initiative under the Ministry of Rural Development.</li> </ul>	<ul style="list-style-type: none"> <li>• Implement the mission's policies and programmes</li> <li>• Collect data about mission's progress and state of cooking, and report to state government</li> <li>• Implement any pilots as necessary and assess their success</li> </ul>

The general idea is that the top tier (central government) would provide overall direction and oversight to the programme supported by technical expertise, policies, and financial resources, and be responsible for its success. The middle tier (state governments) would adapt the policies and programmes of the central government to the realities of the state and also develop detailed implementation plans and identify/appoint agencies for them. State governments would also be responsible for collecting and sharing state level data with the central government. The third tier (district level) agencies would actually ensure implementation of the programme and its policies, and collect data about the mission's progress and cooking habits in general for collation at the state and national levels.

## 4 Goals and milestones

The mission's operations should be guided by well-defined short, medium and long-term goals to help track its progress and achievement of various milestones. These goals can be finalized while the mission document is developed, and they should be published as part of the final mission document. Some short, medium and long-term goals are suggested below for consideration.

Goal	Time horizon	Example targets
Short term	2022	<ul style="list-style-type: none"> <li>• In each district, at least two or three smokeless cooking options available within (say) 15 km of each household<sup>9</sup></li> <li>• State and district-specific targets (ranging from say 50% to 75%) for penetration of smokeless cooking solutions such as LPG, PNG, electricity and biogas as the primary cooking</li> </ul>

<sup>9</sup>Available smokeless cooking options could be, for example, a) an electricity connection of the requisite load and the infrastructure to support the load, backed up with good quality of supply, or b) an LPG connection with reasonable supply reliability, or c) an operational biogas plant with good customer service etc. The consumer-facing interfaces for these (e.g. LPG distributor or electricity consumer centre) should be within the requisite distance.

		<p>technologies</p> <ul style="list-style-type: none"> <li>• Eliminate kerosene use for cooking</li> <li>• State-specific understanding of stacking behaviour and reasons for it through studies commissioned by the central government and district specific analysis commissioned by the state government.</li> <li>• Some R&amp;D programmes for renewable energy based smokeless cooking initiated for yet-to-mature technologies</li> <li>• Experiments initiated for different business models for community level biogas solutions in at least (say) 10 states with good biogas potential</li> </ul>
Medium term	2027	<ul style="list-style-type: none"> <li>• In each district, at least two or three smokeless cooking options available within (say) 10 km of each household</li> <li>• Increased district specific targets (say, 75% to 90%) for penetration of smokeless cooking solutions as the primary cooking solution</li> <li>• HAP concentration in households lower by at least, say, 60% compared to the start of the mission</li> <li>• Use of solid fuels even for stacking lower by at least, say, 60%-75%</li> <li>• Established and functioning consumer grievance redressal mechanisms in each state for cooking fuel solutions, with suitable ombudsman etc.</li> <li>• Renewable based solutions such as community-level biogas and stand-alone solar-based cooking established as viable alternatives and widely available in at least 60% of all districts in 75% of states.</li> <li>• Prototype / laboratory solutions for at least two new renewable energy based smokeless cooking solutions</li> </ul>
Long term	2030	<ul style="list-style-type: none"> <li>• 100% of all homes in all districts use only smokeless cooking fuel solutions as the primary cooking option</li> <li>• Solid fuels not used even for stacking in at least 85% of all districts in 80% of states.</li> <li>• HAP concentration levels compatible with WHO standards in at least 85% of households in 80% of districts in India</li> <li>• Reduced expenditure and time-lost due to respiratory and cardiac illnesses, particularly among women and children</li> <li>• Prototype renewable solutions maturing into viable business ideas with at least some pilots</li> <li>• Consumer complaints and dissatisfaction levels with availability and affordability of a cooking fuel of choice below a specified low threshold in each state</li> </ul>

## 5 Operations

The success of the mission will heavily depend on how the various ministries and agencies can effectively coordinate with each other. The operational protocols of the mission and the role of the apex agency such as the PMO will be critical to ensure this. Therefore, these need to be developed carefully. This note does not dwell into these aspects further.

The mission's operations and activities can be broadly classified under two heads: policies and programmes; and tracking, oversight and accountability. These are described below.

### 5.1 Policies and programmes

The mission's success would hinge upon formulating and implementing various policies and programmes to ensure that smokeless options are affordable, available and used by households across the country. Some indicative issues around which policies and programmes would have to be designed as part of the mission are given below.

- Addressing cultural and behavioural aspects: Cooking and food habits are deeply culturally rooted, and such aspects need to be better understood to ensure that proposed solutions can meet the various cooking needs. Specific and targeted programmes would also be required to induce the necessary behavioural and cultural change among households to address gender or culture based misconceptions about smokeless cooking solutions. Outreach, education and awareness programmes would be required to ensure that citizens know about and understand the multiple benefits of shifting to smokeless cooking solutions. Expertise of ministries such as the health ministry, who have successfully engaged in such massive awareness and behavioural change campaigns<sup>10</sup>, may be particularly useful for this.
- Fuel or technology specific policies: These may pertain to making specific fuels or technologies more widely available or affordable. Though such policies and programmes may be operationalized by the respective ministries, they may originate from the mission. For example, policies to spread the usage of LPG may look at issues of affordability, domestic refining capacity, distributor viability and availability etc., while policies around PNG may focus on infrastructure development, pricing, competition and operator accountability. Specific issues around peak load may need attention in some states if electricity is extensively promoted as a cooking solution.
- Pricing and subsidy: Since affordability is one of the key (but not only) barriers to adoption of smokeless cooking solutions, effective policies for pricing and targeted subsidies would be very important. Different pricing and subsidy mechanisms such as direct subsidy, telescopic pricing, consumption-based cross-subsidy are possible, as are different targeting mechanisms. The quantum and nature of subsidy and targeting would vary across states, fuels and technologies given their different characteristics and costs. For example, electricity would typically be used for many other purposes besides cooking and a cooking-specific subsidy may not be possible, PNG may be very infrastructure heavy, and the challenge of biogas may be upfront cost rather than running cost, while it may be the reverse for LPG and PNG. Therefore, policies for subsidies

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<sup>10</sup> Examples include vaccination, contraceptive use, sanitation etc.

and pricing should be tailored depending on the context to ensure sustained use and health benefits. While the mission may recommend suitable pricing and subsidy policies, they would have to be announced and administered by the respective agency at the state or central level.

- Developing and promoting viable business models: It would be necessary to develop and promote business models that are both viable and enable reliable, affordable access of smokeless fuels and technologies to the consumer. This would be required for technologically mature options (e.g. household, community and bottled biogas solutions) without a good business model, and may also be relevant for fuels and technologies being tried out in relatively difficult geographies such as rural LPG distribution. In future, this may be required for other technologies as they mature, such as solar-PV based solutions or other gasification based solutions. If required, viability support – with clearly defined sunset clauses – may have to be provided for such ventures in the initial years until they become established.
- Supporting R&D and technology development: Policies and programmes to support R&D, technology and business development to identify solutions for the future, particularly non-fossil based solutions, would be necessary. Trial and piloting of such efforts would necessarily be explorative in nature and have an element of risk. So, they are best targeted at those who can bear the risk – i.e. those already using smokeless fuels, which would be typically the urban and more affluent households. Once the technologies mature and become affordable, policies and business models can be developed to help their proliferation on a wider basis.

## 5.2 Tracking, oversight and accountability

The progress of crucial parameters towards fulfilling of the objective of the mission should be tracked on a periodic basis at the state and central level. Given the number of agencies and organisations involved at various levels, a multi-tiered technology enabled tracking and oversight mechanism is necessary. For example, many flagship government programmes such as DDUGJY, SAUBHAGYA, MNREGA, and PMAY track and publish important parameters relevant to them. The processes and systems suggested in this section to monitor and track the mission's progress and achievement of milestones have already been implemented in various government programmes, and hence should be easy to adapt and implement them for this mission.

- Baseline creation: At the outset, the mission should commission an exhaustive study of the state of cooking practices and fuel usage in India to establish a baseline for the mission. This should be disaggregated to the district level. The study should understand and document the current cooking fuel usage in the country including stacking practices; its cultural, behavioural and economic aspects; regional or state-level culinary practices; perceptions about different cooking technologies with respect to local cuisines; domestic decision making roles particularly regarding choice of cooking fuels and technologies; perceptions of the impact of solid fuel use on health and barriers to adoption of alternative cooking solutions. Such a baseline study, which should be published within one year of the launch of the mission, can inform the mission's actions and help to benchmark its progress.
- Tracking the mission's progress: As the mission unfolds, it would be important to track its progress along various parameters such as cooking fuel usage (electricity consumption, number

of LPG refills, biogas and PNG use etc.), HAP concentrations in specific locations in every district, consequent health impacts, quality of supply and service delivery, and reduced drudgery. This would enable any course corrections that may be required and ensure that the mission achieves its objectives. For this, systems need to be established to collect data and information from the field to filter up to the mission's central office. It is highly desirable that these systems for data and information collection are independent of the mission's implementing agencies to ensure credibility of data. Examples of some kinds of information that can be collected and used to review the mission are listed below.

- Operational progress can be reviewed at, say, quarterly frequency based on data such as connections issued, fuels consumed, awareness programmes conducted, accidents reported, and availability and reliability of supply by service providers (e.g. number of days for a refill, billing issues, and consumer grievances reported and addressed within specified time frame). More detailed reviews can be undertaken annually.
- An independent, third-party survey-based study may be commissioned, perhaps on a biennial basis, to measure and report aspects such as availability of smokeless options, primary fuel adoption, HAP concentration levels, barriers to adoption of smokeless fuels and technologies, and challenges for reliable supply of smokeless fuels and technologies. These can, in turn, inform the future direction and strategy of the mission.
- Longer duration studies could be commissioned once every, say five years, to assess impacts on health and other developmental aspects (e.g. drudgery, women's labour force participation, girls' education, deforestation due to cooking fuel collection etc.), as such impacts would be evident only over longer periods of time.
- The mission can provide institutional and logistical support for academic and research institutions which want to undertake deeper analyses of the mission's progress and state of cooking in India.
- Parliamentary accountability and publishing of information: The mission should periodically publish data and information about its progress in the interest of transparency and to support independent research that can enrich the mission's activities. The quarterly and annual data collected for the review process, as well as the reports of the commissioned studies should be presented to a suitable Parliamentary committee which can review the mission's progress and issue appropriate directions. These could be in the nature of reports about the 'State of Cooking in India' at the state and district levels, on the lines of the Human Development Reports. Ideally, the reports should be presented to a (newly constituted) Parliamentary Standing Committee on Health. Otherwise, it could be the Parliamentary Standing Committee on Rural Development. Such reports should also be made publicly available, and the mission should actively seek inputs and ideas from outside agencies doing independent research, to enlarge the available pool of information and ideas. The mission should also be subject to periodic audits by the Comptroller and Auditor General.
- Accountability of service providers: It is important to ensure that service providers who supply smokeless fuels and technologies to households are accountable for their services, so that households continue to have usable options of smokeless fuels and technologies. Some accountability mechanisms are listed below for consideration of the mission.

- Guaranteed standards of performance: Certain standards of performance should be guaranteed for each fuel or technology, through appropriate policy or regulatory mechanisms. Compliance to these standards should be tracked on a regular basis and adequate compensation is to be provided to consumers in cases of non-compliance.
- Consumer grievance redressal: Establishment of effective channels of consumer grievance redressal and complaint resolution, and publicizing them is one way of ensuring the accountability of service providers. Such mechanisms should have provisions for appeals and escalation.
- Engaging with citizens and citizens' groups: Actively seeking inputs from, and engaging with citizens, citizens groups and research groups through district and state level meetings convened on a, say, annual basis by the mission office, will help to understand the ground realities and improve systems of accountability.
- Enabling competition: Enabling healthy competition among multiple service providers and across smokeless fuels and technologies, and thus providing households a variety of choices, is another way of ensuring good quality of service.

## **6 Mission staffing and funding**

A mission such as this spanning multiple ministries and tiers of the government can only succeed if it has the necessary staff and adequate financial resources to function effectively. This section proposes a staffing structure and some thoughts on financing the mission.

### **6.1 Staffing**

The mission should be headed and driven by a Secretary level officer of the Government of India whose sole responsibility is the mission itself. As discussed earlier, the Secretary and his office is perhaps best housed in the PMO (or a specially created empowered office) to coordinate the mission effectively. The Secretary should be supported by a dedicated staff that will function as the mission office to drive the mission's operations, act as its secretariat, and monitor the mission's progress.

Each concerned ministry of the Government of India should depute an officer of Additional Secretary or Joint Secretary rank to the mission – this can be an additional responsibility of the concerned officer and work responsibilities within the ministries may have to be adjusted to reflect this. There should be a well-established protocol and process for the mission's Government of India officers to meet, review and plan the mission's activities. It is desirable that such meetings take place about once a month.

At the state level, the nodal agency should be headed by one senior officer dedicated to the mission. Senior representatives from the concerned state ministries should be deputed to the mission. State level officers in various ministries would need to be supported by other staff as required. Further, the operational staff in each district may need to be enhanced as required to help implement the mission's programmes, collect data and track its progress.

There should be well-established protocols and processes for the central government mission officers to engage with the state officers, to enable smooth planning and implementation, and to enable states to

provide feedback to improve the mission based on their experiences. There should also be mechanisms and processes for states to engage with each other and learn from each other's experiences. While there should be continuous electronic engagement of the state level officers with central government officials and each other, there should be a physical meeting, exchange of ideas, and meeting of state level officers with central government officers at least once a quarter.

## **6.2 Financial resources**

The mission would require adequate financial resources to be able to achieve its objectives and perform its functions effectively. The resources required to support the dedicated staff of the mission at the central level should come from the budget of the Government of India. Similarly, any additional funds that may be required for the mission's operations, oversight, data collection and publication, commissioning studies, exploring business models, conducting research and perhaps supporting subsidies should also be provided by the central government. It may be possible that some budget items may be covered under the budget of the respective ministry or agency. For all other items, the central government would have to provide the requisite support. State governments would similarly have to provide financial support for the mission activities at the state level.

The government may consider levying a small cess on the profits of the companies providing the fuels and technologies (OMCs, CGD operators, electricity distribution companies etc.) to create a dedicated fund to support the mission. The cess can be co-terminus with achieving the objectives of the mission.

## **7 In conclusion**

The challenge of using traditional fuels and its associated health and gender impacts is a severe developmental constraint for India to address. While the government has recognized this and initiated some measures in this direction, this proposal suggests streamlining the various initiatives under one integrated mission with a common set of objectives and well-defined goals. While a transition to clean fuels is perhaps inevitable with rising incomes and aspirations, it is important to accelerate the transition with government intervention, as it can save many lives and contribute to more productive living. It is hoped that this note will initiate a conversation that will accelerate India's shift towards smokeless cooking to address a long-standing multi-dimensional challenge of the country.

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