India's LPG Programs: What Can We Learn?

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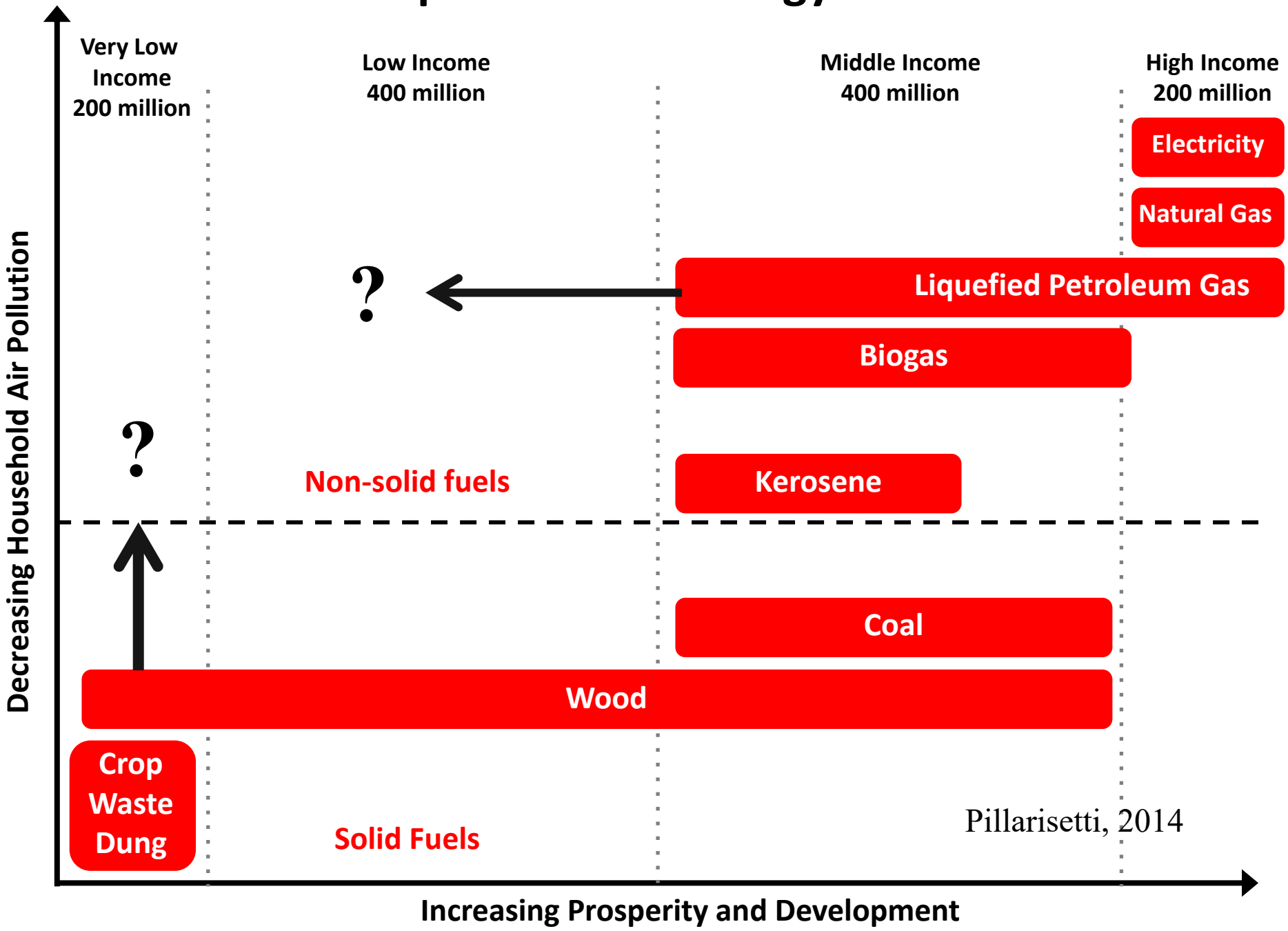
ICMR/CDC/CCAPC/Vital Strategies meeting, New Delhi
Jun 21, 2018

Conceptual Indian Energy Ladder



Pillarisetti, 2014

Why do we care?

- Wish to understand the impacts
- Wish to optimize the performance and benefits
- Wish to understand the costs and downsides
- Wish to glean lessons for sustainability in India
- Wish to glean lessons for other countries

First

- The scale and speed of the program is unprecedented
  - Perhaps 2-3 million connections a month in PMUY
  - And many more lakh in “normal” growth among the middle class
  - And regular changes being instituted
  - National energy databases all out of date
- This means that it is nearly impossible to apply many normal research techniques, such as RCTs

On the other hand

- The wide use of IT (digital India) in its operation, potentially allows types of research and analysis never before possible in the household energy arena
- Starting with the vast OMC websites that document refill rates of every customer in the country
- And the apparent willingness of the Ministry and OMCs to collaborate, within the limitations imposed by their own needs

Research can be done

- Not only on the PMUY program, which attempts to push LPG use into poor populations, but also
- On the normal growth among the middle class because data are available for this group as well.
  - What household and other parameters trigger the conversion to LPG?
  - How long is the transition – stacking period?

Enabling Factors

- The digital India revolution – JAM
- National commitment from top to bottom
- Massive use of social media
- Little serious push back, from the media, academics, and other political parties
- Willingness to find ways to cut waste, e.g., ghost connections
- And reduce long-accustomed subsidies to the middle class.
- Something for which “its time has come”

Pahal

- Move subsidy payments to electronic bank accounts
  - Greatly reduce duplications – coordinate among OMCs
  - All LPG sold at market prices
  - Lays the groundwork for everything else
  - But has downsides

Give It Up

- Ask middle class to give up their subsidies
  - 11 million households so far -- direct GIU
  - Perhaps 10 million others did not sign up
- Innovative approach to an old problem of subsidies – they are hard to get rid of
- Massive media campaign at the time
- Depending on the calculation approach, arguably this pays (in terms of subsidies given up) for the entire PMUY program
- Income limits also applied, but hard to enforce

Special conditions in India

- IT revolution – JAM
- Commitment by the PMO on down – Modi too
- Long separation of “connections” into separate marketable item under complete control by OMCs
  - due to history of subsidy
  - Price controls for fuel based on formula that had long been accepted by OMCs
- OMCs that are run as private companies but with majority ownership by the GoI
- LPG not critical to profits of OMCs and with a gentlemen’s agreement to not compete, too much
- Undertaken at a time of low international LPG prices – no longer true

PMUY issues

- First requirement of BPL status did not work well – out of date
  - New criteria are recently applied, not clear what will happen
- Actual costs borne probably too much by OMCs and thus reflected in lower profits, i.e. not directly paid by GoI.
  - As GoI owns OMCs, this works, but is probably not sustainable
  - May need to slow program down to fix this cash flow situation

PMUY issues, cont.

- Separation of “connection” costs, makes provision of access possible and measurable
  - Up front costs being a major hurdle for the poor
- Costs of the stove itself, however, are not covered by most states
  - And provision of a less-expensive “PMUY stove” (still meeting BIS standards) under installments has meant that people who refill at low rates see high costs for refills, a barrier

PMUY issues, cont

- New distributorships not provided significantly different financial conditions to promote them in difficult rural conditions
- Official requirement of 48-hour delivery for refills is not suited to rural areas – promotes misreporting
- No special provisions for second cylinder which is the norm in urban India and addresses refill timing issue

Access is not usage

- In its simplest formulation, the Indian LPG system has found a way to provide access to hundreds of millions, very quickly
- But, as health scientist well know, providing access to a health-saving technology, is only half the battle
  - Witness latrines, condoms, bednets, institutional delivery access, TB drugs, etc.
- Promoting usage is the next challenge

Known barriers to usage

- Perception
- Reliability
- Money

Perceptual issues

- Awareness of program alone is a barrier
  - Unscrupulous distributors and others charging for access
  - Some cynicism about any GoI programs
- Awareness of health and other benefits
  - Health messaging from LPG distributors is not trusted
  - Usual disconnect between personal experience of risk and actual risk – e.g. smoking
- Ministry's recent Panchayat program aimed at dealing with this – 100k villages

Reliability

- Delivery of refills is a serious issue
- If cannot expect refill for several days,
  - Slow down usage in anticipation
  - Need something to use while waiting
  - Both promote biomass usage
- Provision of second cylinder eliminates this problem
  - the way urban people deal with it
  - Our pilot work in Junnar Block has shown this for pregnant women – 85% purchase the second cylinder we loan them during pregnancy
  - Also, surprisingly, 84% of newly married women do the same after a free trial

Reliability, cont.

- Also, 65% of women who received a second cylinder were willing to destroy/disable/move their chulha
- Another approach to this problem is the Smart valve, which accurately detects the remaining fuel in the cylinder and contacts the distributor by cell to refill before it runs out.
  - Customer can pay by the meal, day, or whatever using cell tech

Money

- This problem can be divided into two components
  - Up-front costs
  - Recurring costs

Up-front costs

- This is the barrier that PMUY addresses
- Problems created, however, by not covering stove or second cylinder in the costs

Recurring costs

- Primarily the cost of fuel, which has two components
  - The mean cost per year
  - The variation (uncertainty) in these costs due to the changes in international price
- The variation is supressed by the subsidy being set each month to keep the price to the consumer constant and predictable
- The way it is collected, however, requires consumers to put up the full price and receive the difference later in their bank accounts – causes concern among people with low cash availability

Mean cost over time

- Still the biggest constraint to the very poor with easy access to gathered biomass (not everyone has easy access, however)
- Even if better targeted, current subsidy still goes mostly to the middle class – wasted, as they would use LPG anyway
- More needed to better target
    - This means higher subsidies to very poorest,
    - And further elimination among the middle class
  - Studies show that lowering cost to 4% of income of the very poorest, would cause a major shift in usage. And lower net cost to GoI.

Mean cost, cont

- Another approach is to link LPG with other social programs in villages
- Most likely is to link to the village employment scheme which is widespread
  - perhaps more than 40% of villages
    - Guarantees ~2 hundred Rs per day of work and a minimum number of days per month
    - Would not take too many days extra to be equal to the cost of LPG (about 80 Rs/wk)
- Is a great talking point for village women

Mean cost, cont

- Another option is the Universal Health Insurance scheme being discussed
  - Give discounts on insurance if a LPG user, or vice versa
- Another approach is to target specific health-vulnerable groups better
  - Pregnant women are likely candidates
  - Now 15 million per year in biomass using households

Pregnant Women

- Most vulnerable easily identified group for health effects
- Lives and behaviors are changing
- Receiving many benefits already, including up to thousands of rupees each to deliver in institutions – home deliveries have nearly disappeared
- Free fuel during pregnancy would add not much more (~2k Rs) – start them on the road to a clean kitchen for life
- Already in the system – 1.4 million ASHA workers
- Focus of our research in Junnar Block

Major big data research

- Understand factors leading to usage by analyzing the national LPG databases
- Discover effect on ambient pollution by linking databases with satellite pollution data
- Initiate national cohort/subsample of households joining PMUY, by conducting health assessment before they start and sometime later
- Continue to promote household fuel changes as part of national ambient air pollution control

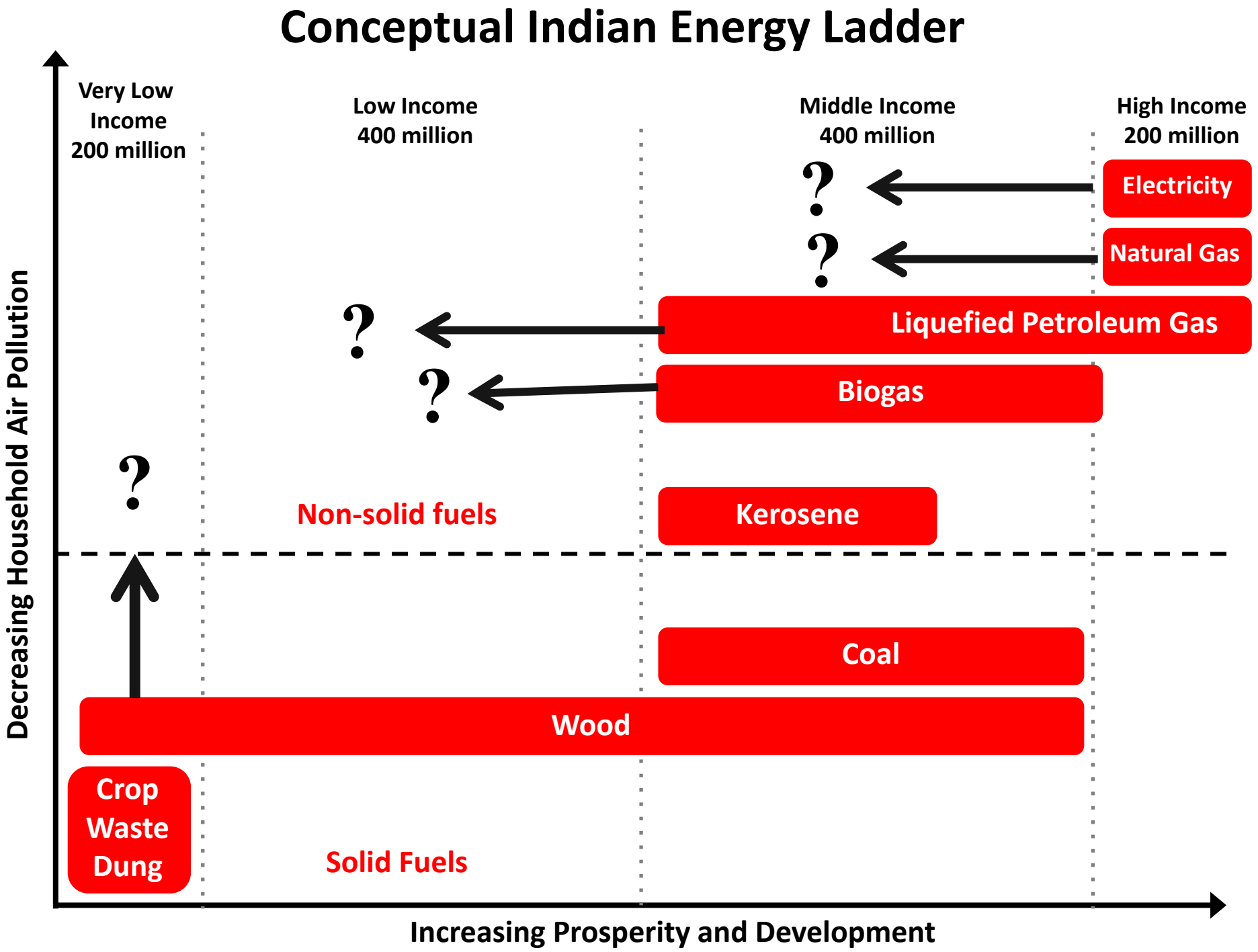
Other needs

- Understand and accelerate the reduction in kerosene use – major economic benefit to the GoI as well, but linked to electrification
- Understand better the “all Indians cook in one kitchen” -- pushing PNG and electric cooking in one part, gives more access to LPG in others
- And lower ambient pollution for all
- Develop better the growing market in electric technology for water and fodder heating
- Improve efficiency and flexibility of LPG technology

Major strategies

- Continue to work to turn the pejorative term “subsidies”, into the positive term “social investments” with continued research on benefits and better targeting

- Work toward a sub-component of the current program we are calling “Ujjwala Mamta” aimed to pregnant women and in collaboration with the Health sector and Ministry.


Conceptual Indian Energy Ladder
Very Low Income 200 million
Low Income 400 million
Middle Income 400 million
High Income 200 million
Electricity
Natural Gas
Liquefied Petroleum Gas
Biogas
Kerosene
Coal
Wood
Crop Waste Dung
Non-solid fuels
Solid Fuels
Decreasing Household Air Pollution
Increasing Prosperity and Development

Many thanks

For publications
& presentations:
Just “Google”
Kirk R. Smith