PTA MEETING 2006/07
VIEWS FROM AN "SLIGHTLY ALIEN" PERSPECTIVE

H S Mukunda
ABETS, CGPL, Indian Institute of Science, Bangalore 560 012
mukunda@cgpl.iisc.ernet.in
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The points from my vantage…

- A large mix of issues
  - Concern for ICS penetration (dissemination is a word used often) (- Efficiency is a primary feature)
  - Improved indoor air quality (- emissions)
  - Number of designs, pottery/mud stoves occupying greater interest.
  - Poor and deprived to be helped as much as possible
    - Seek large donor inputs to direct or indirect subsidy
  - **Commercialization**, charcoal vs. wood, Other bio-Fuels (to increase the basket of fuels, employment opportunity)
  - Partnership with NGOs, Governments, etc

Missing or weakly emphasized points.

- Whether obtaining better understanding of the process leading to better stove efficiency is essential at all is not of concern (science)
- Fuel quality is not of serious concern (science)
- Metal stoves of not great importance
- Commercialization in the simple sense of the word
- Standard approaches to product development, technology transfer to private industry and R & D support during the transition phase to full commercialization

On the science

- There is no shared information in the network on what constitutes better design and why
- There is no serious motivation to pursue better designs and ensure suitable tech transfer where needed – an example from India

All stoves better than η = 20 %, qualify for subsidy. If a stove design promised 35 %, it enjoys no preferential treatment. Others may not even know, and even if they know, treat such results with disdain.

What is the result – India will take pride in developing a hundred designs with a mean eff. of 20 %, burying better designs and for over thirty years – too embarrassing!

Should we not think about what is happening in the rest of the world (outside of stoves) – Even if small incremental benefits are seen, they are promoted through patents and commercialization, ultimate beneficiaries being the people

……On the science

- Every new design is hailed and every person who has created a new stove design thinks he has a done a great art work and others let him think so.
- Creating a design by science is not understood as even a greater art that is within the constraint of a precise understanding of nature
- The choice of the fuel is left to the user. Very little science inputs on the enhancement of the quality of the fuel by pelletizing or briquetting for a variety of fuel combinations, particularly agro-residues.

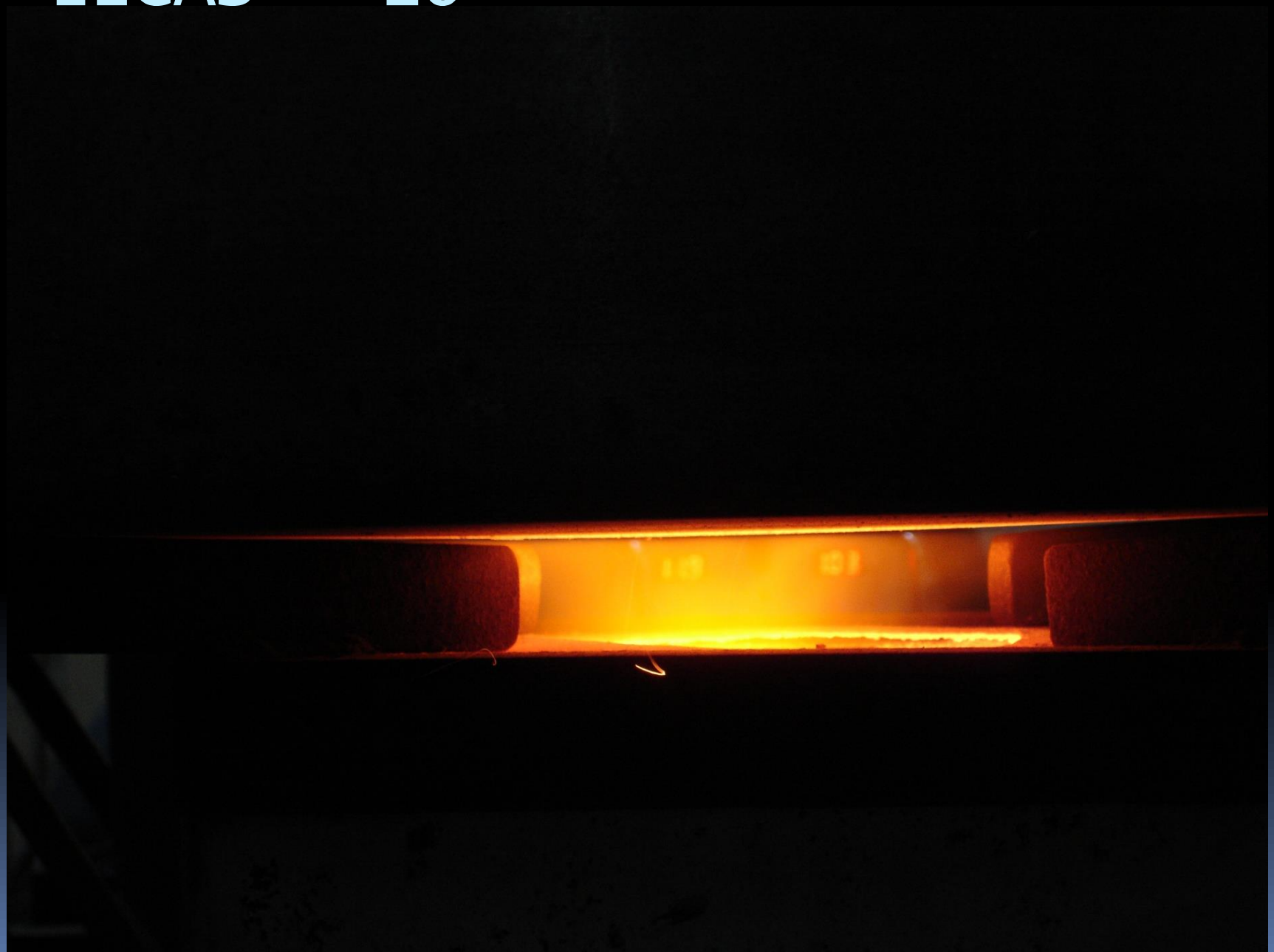
……On the science from a recent workshop

- The key points on high stove efficiency and emissions :

1. Design the combustion space to obtain as high an area averaged maximum temperature as possible – typically 1250 to 1350 C – this is obtained by carefully mixing fuel vapors and air in stoichiometric proportions locally with near adiabatic thermal environment, using a fan to serve this purpose.
2. Prepare the fuel by reducing the moisture to an acceptable limit, densify it, if it is of low density.
3. Both high efficiency and low emissions will result. These can be made to occur better in a gasification mode.
4. These lead to the era of modern gasifier stoves of a variety.

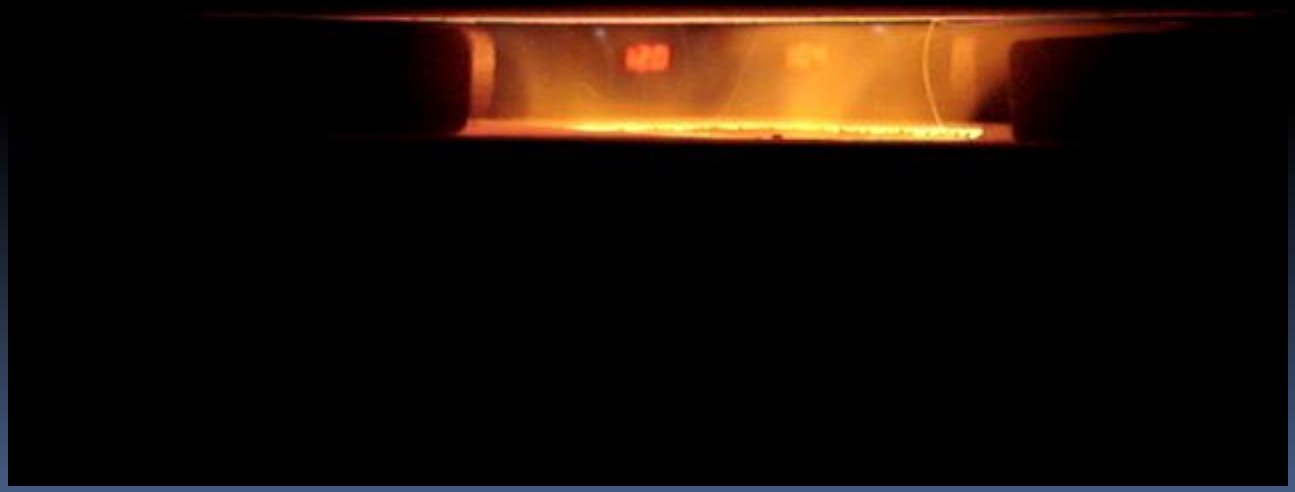
….From a very recent research and development that is based on a new concept called “Flameless combustion” (r & d is still continuing)”….

EIGAS - 10

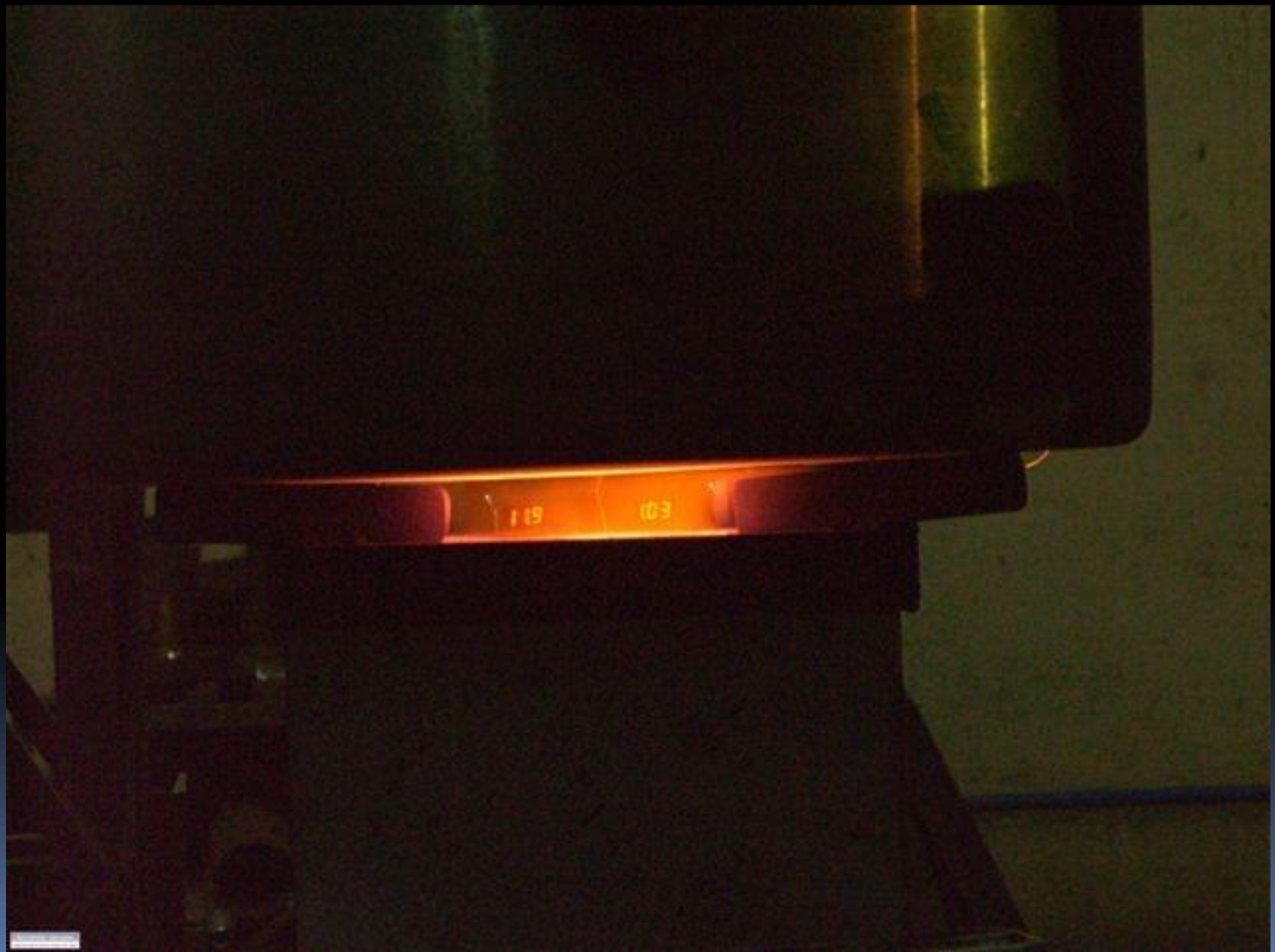


The stove on a balance…

The movie….



Ejector induced gasifier stove – 10 kg/hr



Poor and deprived to be helped as much as possible through subsidies -

- The value by this approach is very limited and should be used in a very clearly defined way in a transitional mode. If not, what might happen will be like the kerosene in India.
- Kerosene is provided on subsidy to poor for cooking. 10 million tonnes are allocated. Open documentation (TERI report) shows that about 5 million tonnes is sold as fuel for transport – why? The poor will make money, that is why?

What could be a sustainable solution strategy?

- There appears no escape from a commercial strategy.
- Find "one man" who wants to make money by producing and selling stoves.
- Remember: this is possible, only if there is a good product or technology.
- Then, the next man will find out if "one man" has made money and if he has truly made money, he will also want to make money likewise.
- And likewise, a third man. Then one of these persons will start reducing prices to make more money by selling more units than others, and the prices will start tumbling down to realistic levels
- Also better services will be a natural result.
- And all of our efforts should be (a) to produce a good product and if there is already one good product elsewhere, make a better one, (b) to locate a private individual who wants to make money by this means.

…What could be a sustainable solution strategy?

- Would poor be deprived of their access to what they need if commercialization takes place?
- One cannot say, No.
- Take the case of mobile telephones. Rich will possess the better variety and will benefit in many ways. It is not as though poor are deprived. I believe most poor who want to work and earn and improve their livelihood have benefitted substantially through possession of mobile phones, even of the low cost variety – to get more jobs, to manage existing ones, to perform and be seen as performing.
- Likewise, perhaps, the better of the poor will have access to better stoves that maintain their health in better conditions and allow more time to do other things.
- The lowliest of the lowliest will still suffer. But the environment will have more of much less poor and the lowliest will benefit by that over a short time. Slowly, he will also join the bracket of better of the poor.
- And these changes take time – for the society to absorb what the interventions imply and how they can benefit from them.
- All in all, they will begin to shift the probability distribution towards better living conditions for most people. I think this is all that science will do and should do. Other improvements people will need to undertake by other ways.

…a sustainable solution strategy?

- One downside perceived by NGO's is that good commercial activity may make them loose business.
- This is not going to be true.
- It will be as true as bank clerks and others in service sector feared computerization as attempting to play a displacing role.
- Yes, to a very limited extent it is true. But most of them will end up doing different class of jobs – keying in instead of writing, keying in once instead of writing several times, analyzing instead of compiling.
- They will act at higher level on behalf of the community like taking care of air quality, quality of the devices and their true performance, CDM benefits in the coming period, etc, etc.

What other new activities…?

- Charcoal is a subject of importance identified by all of you.
- What is not clear whether the charcoal use is really for the most appropriate use.
- If not, thermal treatment and utilization processes will be too expensive financially and environmentally.
- One should really determine where all one can genuinely replace charcoal by biomass.
- If not, there is another intermediate stage: An attractive means of producing "grey charcoal" that eliminates undesired volatiles to varying extents, but retains most of the energy – a process known as "torrification" – but really should be called the exact opposite – "de-torrification"
- In this process, one can retain 80 to 90 % energy with a loss of weight up to 30 to 40 %.
- While most basic information is internet accessible, the critical information required for a variety of biomass – wood, bamboo or other species needs careful research, because the process involves pyrolisis process that is sensitive to the species.
- Identifying applications where charcoal is replaced by grey charcoal is environmentally benign, and commercially more attractive than charcoal.
- I believe this can be a very attractive area for all participants.

Final Remarks

- I think to convert ICS program into a commercially relevant one should be the common objective.
- Other aspects, whatever, must be dovetailed to this broad approach.
- More relevant research, higher quality research will emerge slowly.
- Better quality products, lower cost devices will also emerge.
- Some things that we have done at IISc in recent times could not have been done even one year ago with all understanding at our command. New technological devices – high performance have entered the market and we have done what I had not dreamt could be achieved like the flameless combustion device (that began as a subject of international combustion meetings for gaseous fuels only about eight years ago for a different objective – to bring down NOx).
- The world is changing benefitting from science significantly.
- I think the field of stove development has not benefited by science adequately.
- Time has come for benefitting the society by using science and technology and commercial approaches.

Thank you