

Viewpoints

An Interview with Paul 'Dr TLUD' Anderson

Boiling Point guest editor, Dr. Mike Clifford speaks to Prof. Paul Simon Anderson (a.k.a. Dr TLUD) about the current and future prospects of TLUD woodgas stoves.

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Some inventors lend their name to their creations – James Dyson for instance – but it is rare to meet someone who adopts the name of their invention. Can you tell me how you became Dr TLUD?

The two independent creative fathers of TLUD (pronounced 'TEE-lud') micro-gasification were Tom Reed and Paal Wendelbo. I am the third father, who adopted the technology in 2001, nursed and named it by 2005, and then expanded, challenged, defended, and advocated it for another decade, (as described in the 'Origins and History...' document at my website www.drTLUD.com). Finally, we have the joy of seeing TLUD stoves as a recognised and increasingly appreciated branch of the family of stove types. Around 2011, I started using the name 'Dr TLUD' as a form of 'self-branding.'

Improved cooking stoves (ICS) with biomass fuels have been around for a long time, but have great difficulty to actually resolve the many problems of stoves.

Correct. ICS is another name for stoves with standard combustion of solid fuels: dry biomass, charcoal and coal. Standard combustion is simply inadequate to cleanly solve the cookstove challenges. In contrast, TLUD stoves are gas-burners. And the 'woodgas' is produced a few centimetres away and milli-seconds earlier down inside the TLUD gasifier. Gasifiers are not standard combustion. That is why

the TLUD stoves, the 'woodgas stoves,' are so important.

Can you explain that in a different way?

Think about how biogas stoves burn gases that are created from solid wet biomass in anaerobic digester tanks. Solid biomass materials are used wet or dry to create either biogas or woodgas respectively. And then separately the gases are burned, leaving behind sludge or charcoal. Gases burn more cleanly than solid fuels. That is why TLUD stoves are in the 'Clean Cooking Solutions' section of the stoves classification by the GACC and ESMAP (World Bank) (The state of the global clean and improved cooking sector, Technical Report 007/15, figure 1.1).

We seem to be at a crossroads in the household energy sector, with the emergence of new terminology regarding 'clean stoves' and even talk of 'clean fuels'. So what do you see as the long-term future for biomass stoves?

Because of stove costs and fuel costs and the financial limitations of global society, the so-called 'modern fuels' (LPG, natural gas, electricity, solar, alcohols, biogas) and their stoves can at best reach maybe 40 per cent of the 500 million needy households maybe in 20 years. At least 300 million households will remain dependent on dry biomass fuels, and TLUD (woodgas) stoves can and should reach 80 per cent of those, or about 250 million households by 2027.

And what about charcoal burning stoves?

Traditional charcoal-making processes waste two-thirds (67%) of the thermal energy of wood, and should be banned (and are banned in many places, but not enforced). TLUD stoves cook with that 67 per cent of the energy and still leave the other 33 per cent inside the charcoal, which is a TLUD by-product. TLUD stoves are 'charcoal-producing' stoves.

But will people use TLUD stoves?

Definitely, yes, if the TLUD stoves are properly introduced and supported. The recent work in Deganga, India proves that households can and will accept woodgas stoves.

Could you tell us about the recent work in India?

The key document (<http://drTLUD.com/deganga2016>) for the work in India was released in September 2016 for discussion. It identifies key enablers:

- i. Critical mass: Keep the efforts concentrated in a small area to facilitate the introduction, user training, sales, easier fuel supply, monthly support, 'earn while you cook' income via charcoal production, and maintenance/service. These activities assure continued usage of TLUD stoves.
- ii. Financial issues: The stove price is subsidised to make it attractive and attainable by everyone in the area, even the poorest people. The project shows

that the stove truly pays for itself with carbon credits.

- iii. Carbon credits: Each stove in use generates carbon credits, each representing one tonne of CO₂ equivalent (CO₂e) emissions that did not go into the atmosphere. I call them 'TLUD Emission Reduction' (TER™) units because they are carbon credits specifically and only for TLUD woodgas stove projects. The 'Champion' design earns four TER™ carbon credits per year, bringing project self-sufficiency and income to participating communities.
- iv. Stove longevity with maintenance: Carbon credit financing requires that stoves are in use, so the business model assures that any damaged stove is quickly repaired or replaced, using some of the carbon credit funding. The Champion TLUDs are stainless steel and have remained in use for over four years, and should last beyond the seven-to-ten-year timetable of carbon credit projects.
- v. Separate the manufacturing of stoves (an up-front capital cost) from the stove use and support activities in the local communities (where the stove usage generates the TER carbon credits and other advantages.) The necessary profit requirement for stove production should not dominate the desired social benefits to the communities that can save money and earn income through usage of the stoves, as with charcoal sales, carbon credits, and biochar advantages.

We are interested in the cost model that makes the TLUD stove viable and possible for scale-up.

To initiate a project, at least 250 stoves are needed in a small area, and that means capital (about USD 40 each, or USD 10,000 total) to purchase them from a manufacturer. The TLUD project (not the manufacturer) sells the stoves to the households for USD 15 and uses that money to pay the sales commissions and a year of TLUD stove-user support so that the TER carbon credits are created. It is the sale of the carbon credits (4 x 10 = USD 40 per year) that reimburses the factory cost in two years while providing the next year's user support and administration

and certification of the carbon credit program. After the second year (when the initial capital of USD 40 per stove has been repaid), there is money each year for the community where the stoves are in use. This explanation is rather brief. A more complete explanation is at www.woodgas.com/tercc.

What about cooks/households at the bottom of the pyramid (BOP) in rural areas? Is there anything that will encourage people to move away from the three-stone fire in areas where poverty is acute?

The stainless-steel, clean-burning Champion TLUD stove that cuts fuel usage in half is an 'aspirational purchase' for the BOP families. The initial (first month's) payment to obtain the stove can be as low as USD 3, with four additional monthly payments that are covered by the value of the charcoal that each family produces. We are reaching very poor households in 'the last mile.'

How are you structuring financing of the TLUD stoves?

The TLUD woodgas stove efforts currently underway are based on sustainable and appropriately business-based projects, such as in West Bengal, India. With the one assumption that TER carbon credits for TLUD stove usage will be purchased, the business model is potentially quite profitable, and allows for financing with loans as well as grants and the sales of TER carbon credits. The TER credits are controlled by Juntos Energy Solutions NFP, a not for profit corporation registered in Illinois, USA, under the direction of myself (Paul Anderson, Dr TLUD). The Juntos NFP organization is focused solely on TLUD stove projects, and its methodology for supervising and verifying carbon credit issues already has a four-year stellar track record. The Juntos NFP operating framework does not allow trading or speculation in the value of the carbon credits. Details and case studies are being published at the Woodgas website (www.woodgas.com). Additional financial participation will accelerate the progress.

Where do you expect to get this financial participation?

The people in need of the stoves certainly do not have sufficient funds. Affluent stakeholders (such as businesses and NGOs and governments) need to initiate the work (with loans, donations or buying of carbon credits) to purchase stoves at USD 40 each, or USD 10,000 for a 250-household cluster. Based on (and secured by) carbon credits, the loans can be repaid in about two years. And major donors can help select the locations of the woodgas TLUD projects. India is the initial location because of established stove suppliers and project supervision. Additional TLUD woodgas stove projects in other locations are expected in multiple countries as soon as financial backing is available.

Evidence coming out of recent studies looking at the health impacts of switching to clean stoves (Malawi CAPS study for instance) suggests that changing the way people cook is not sufficient to have long-term health gains. Do you have any thoughts on this?

First, one study neither proves nor disproves such an important issue, especially when there are so many variables that were not and maybe could not be controlled, including the air quality outside of the homes where the stoves were tested. Second, there are many more reasons to advocate clean cookstoves than just long-term health gains. Greatly reduced household air pollution, fuel demand, forest harvesting, and financial concerns are also extremely important, and those benefits are being denied to impoverished households by the health-only advocates who would delay the installation of TLUD gasifier cookstoves. The 'perfect' (which might not be affordable without sustained subsidies of imported fossil fuels) should not be the enemy of the 'not quite so perfect' that lets people utilise local, renewable, job-creating fuels.