TLUD Gasifier Highlights of 2008:
Designs, Low Emissions, and Applications

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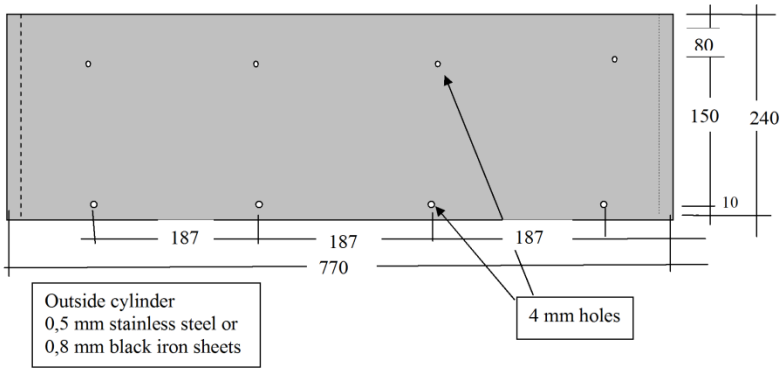
The Six Parts of the Presentation

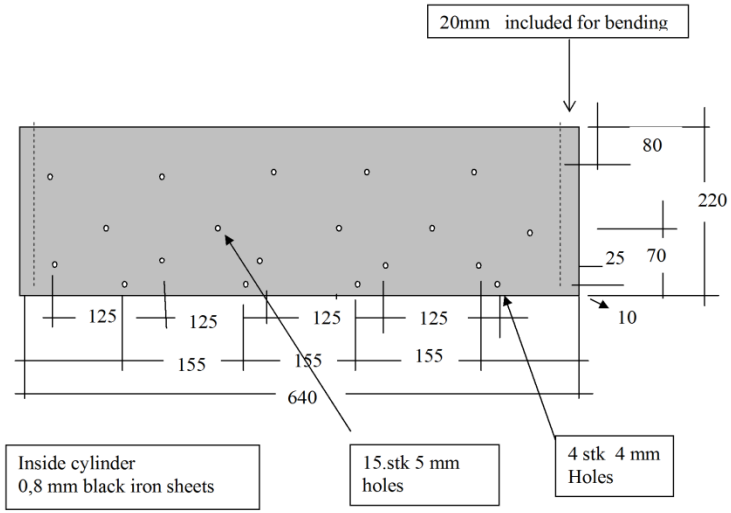
1. Paal Wendelbo, TLUD Pioneer
2. TLUD Data for Extremely Clean Combustion (Low Emissions)
3. Favorable Performances of “Stem Fuels”
4. Rolex Award for Entrepreneurship: Alexis Belonio
5. TLUD Commercial Production reaches approx 400,000
6. Other Meaningful TLUD Experimentation & Prototypes

Paal Wendelbo with the first TLUD stove he brought to Africa in 1988.

Side and top views of Wendelbo's Peko Pe gasifier cookstoves in 2008.

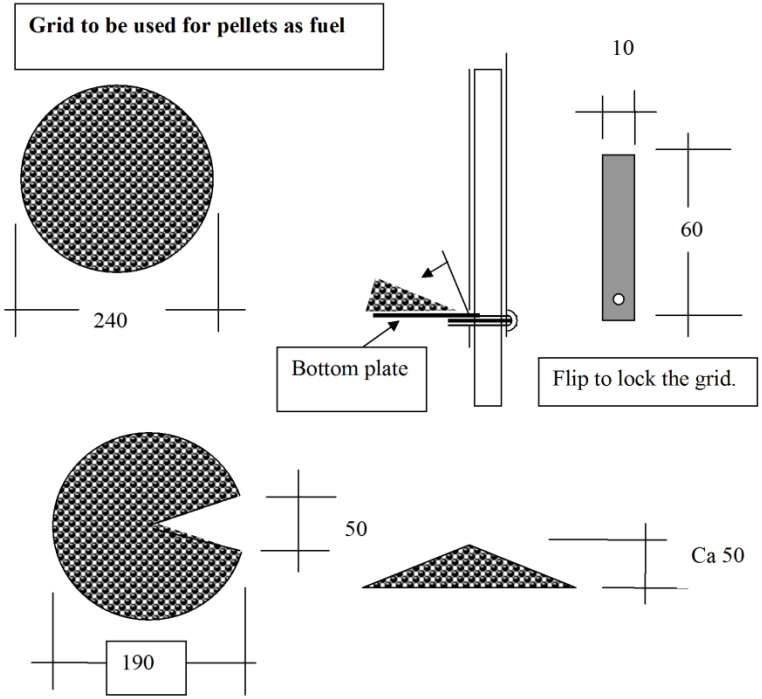
Sample Diagrams and Specifications for Paal Wendelbo's 2008 Version of the Peko Pe TLUD Gasifier Cookstove





Attention. The drawings are not in scale.

The Peko Pe stove 08/05/08
Outside and inside cylinder
Drawing no. 02
P W Copyright: Lowtech Household Energy



Attention. The drawings are not in scale.

The Peko Pe Stove 08.05.08
Grid for pellets fuel
Drawing no. 09
P W Copyright: Lowtech Household Energy

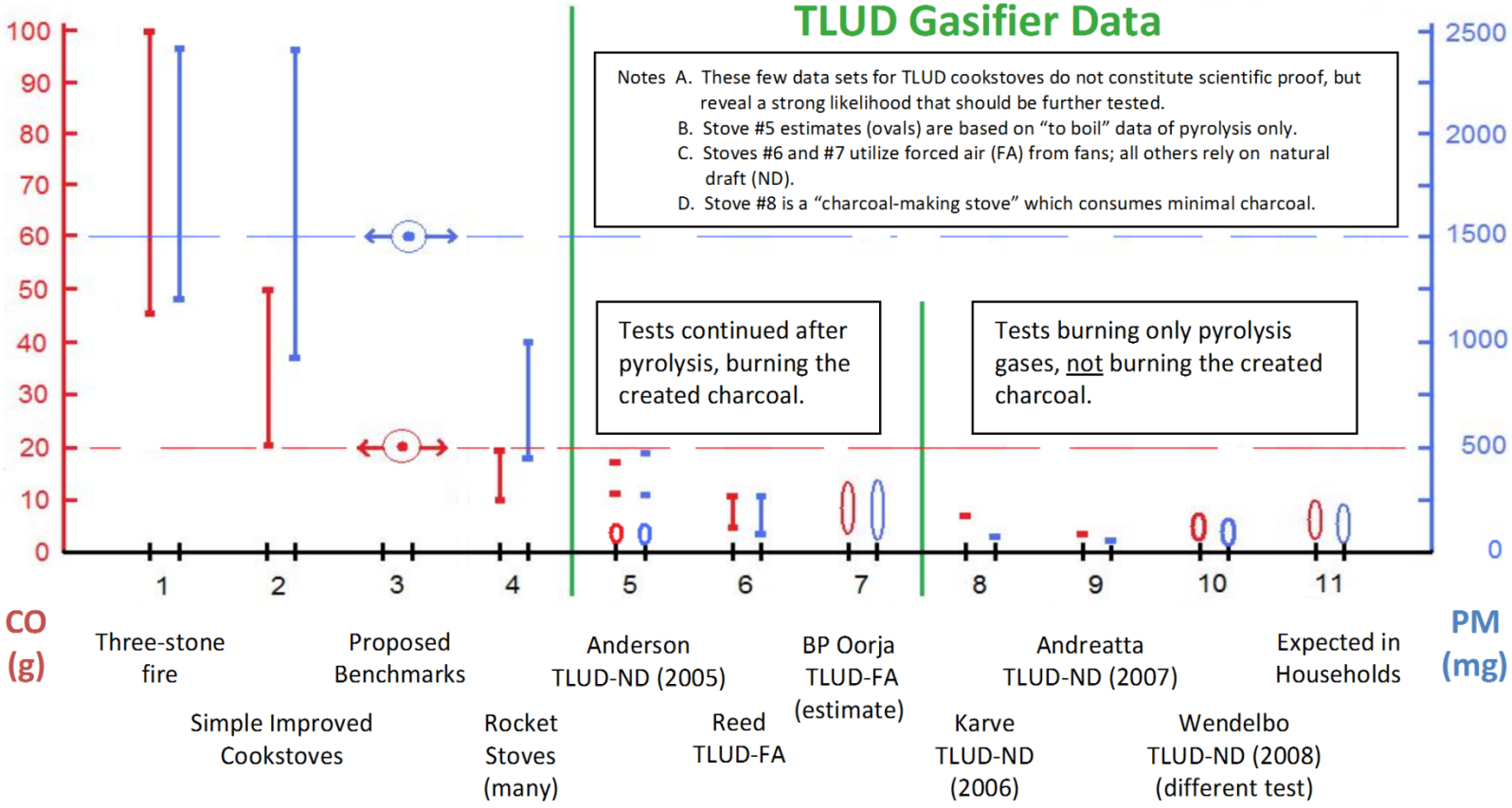
Further information available:

- A full paper with narrative, photos, and technical drawings about Paal Wendelbo and his Peko Pe TLUD is available on-line at: http://www.bioenergylists.org/wendelbopekope

- A full paper about TLUD emissions is at: http://www.bioenergylists.org/andersontludcopm

Emissions of Carbon Monoxide (CO) & Particulate Matter (PM) from TLUD (Top-Lit UpDraft) Gasifiers and Other Cookstoves

(Measured by the Standard 5-Liter Water Boiling Test (WBT))



Prepared by: Anderson, Wendelbo, Reed, and Belonio (2008) for the "Beyond Firewood" Conference. (Revised for ETHOS 2009)

Acknowledgement: The authors thank the Aprovecho Research Center, Cottage Grove, Oregon, USA where the vast majority of these tests were conducted with financial assistance from The Shell Foundation and others.

Favorable performances of "stem fuels" (reeds, corn stalks, stranded bagasse, bamboo, *etc*.) are observed.

(Left) Reeds cut and bundled in Uganda in 1990s for burning in Wendelbo's Peko Pe TLUD gasifier.

Corn stalks cut at the desired length to be inserted vertically in the fuel chamber.

Alexis Belonio
received a prestigious
Rolex Award
for Enterprise
for his
work on TLUD
gasifiers of rice husks
(US$50,000).

http://rolexawards.com/en/the-laureates/alexisbelonio-home.jsp

Known production now includes:

Reed Campstove in America,

Chip Energy Biomass Grill in America,

Daxu in China, Belonio in Indonesia,

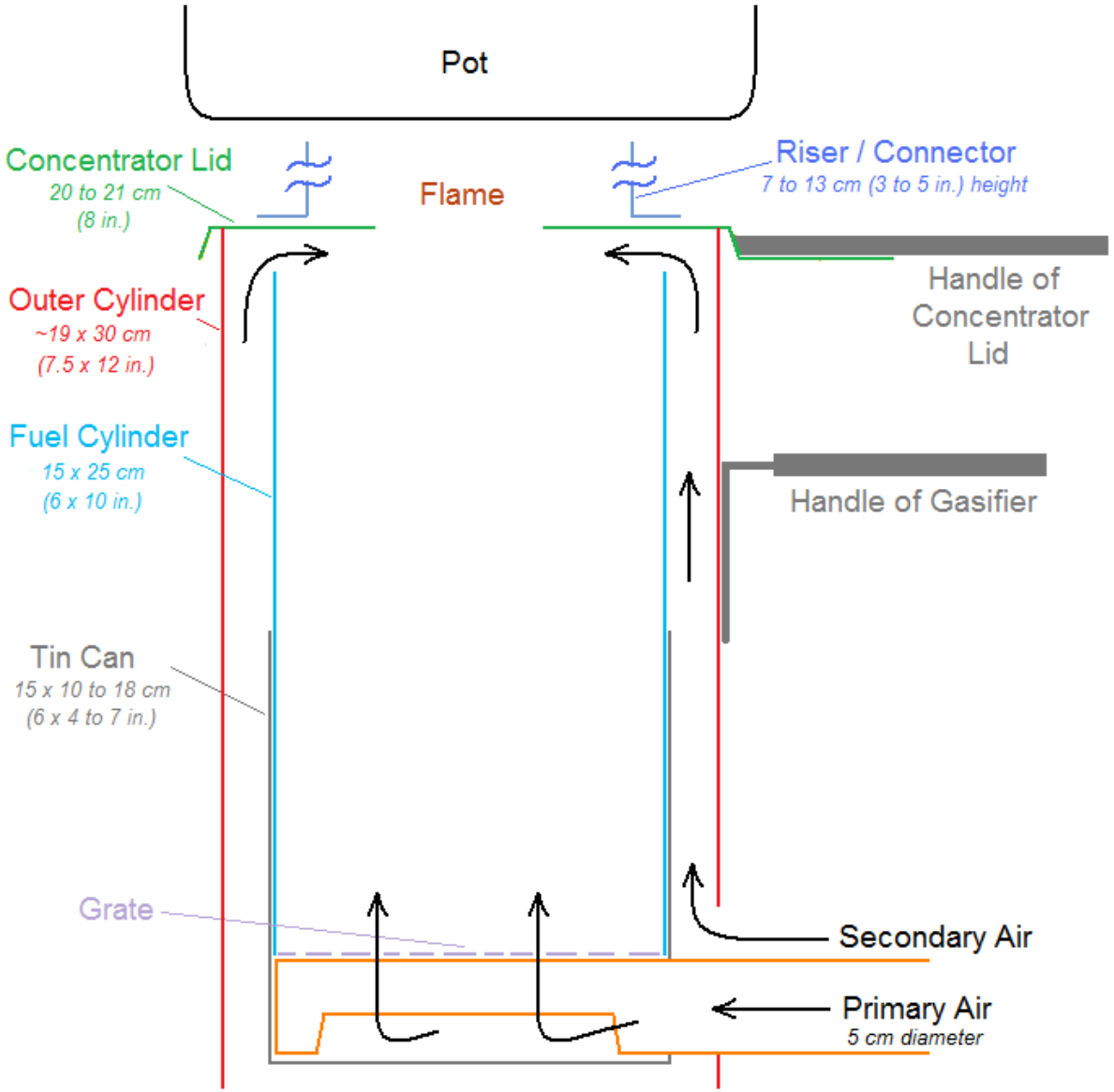
BP Orrja in India,

ARTI in India, and

Servals in India. (Producing the "PP-Plus" TLUD by Anderson and Wendelbo)

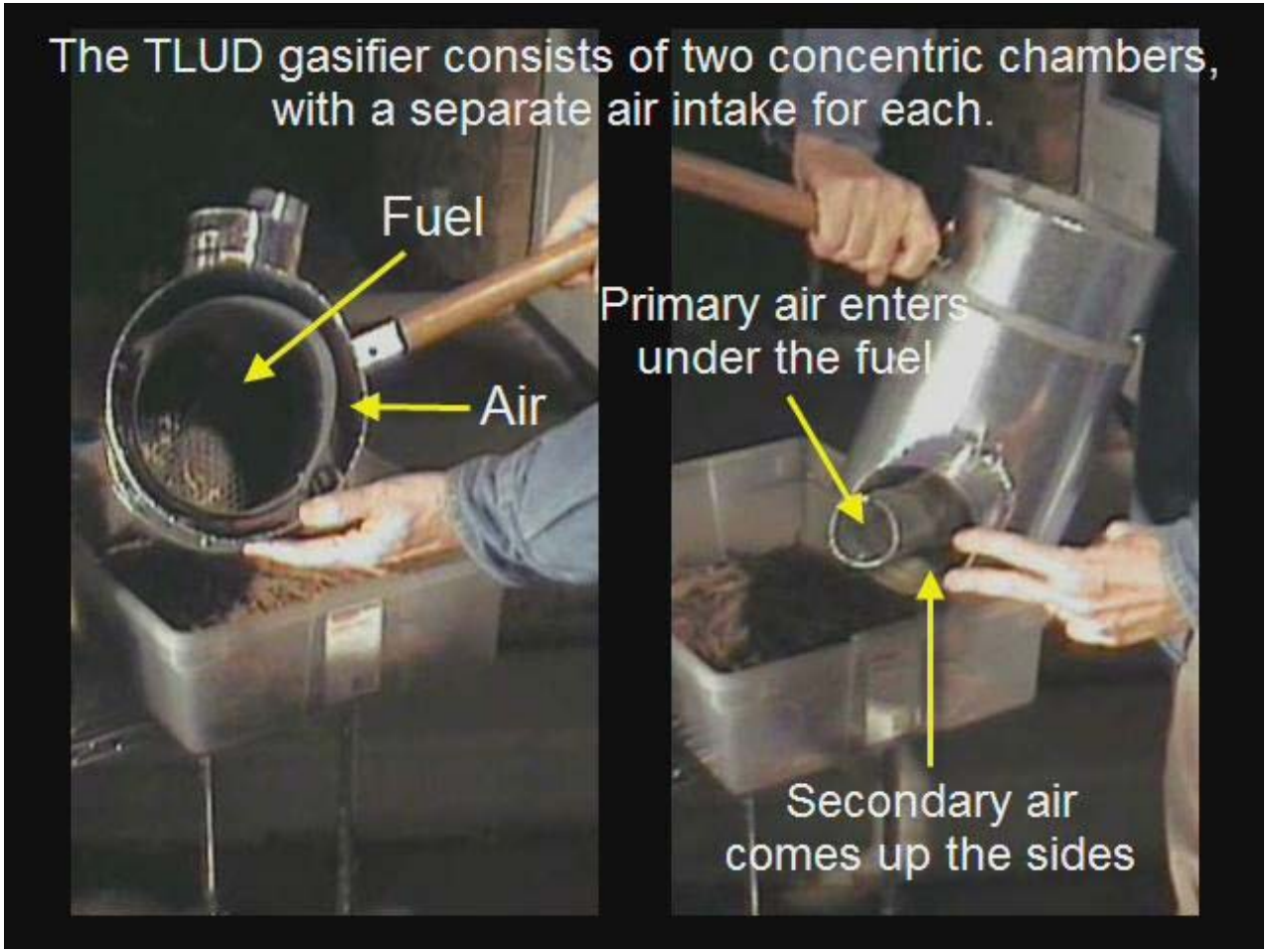
Estimate: over 400,000 TLUDs commercially produced and distributed as of December 2008.

“PP-Plus” TLUD by Anderson and Wendelbo



Refugee version of the PP-Plus TLUD

Hobbyist version of PP-Plus
See a video on YouTube



Artisan version of PP-Plus

The number of additional persons with meaningful TLUD experimentation and prototypes is significantly increasing, including:

Sai Bhaskar Reddy in India,

Robert Flanagan in China,

Andrew Heggie in the UK,

Stephen Brown in the USA,

Alec Drummond and Jonathan Cedar in the USA,

and probably others to be added at the ETHOS presentation.






TLUD gasifier cookstoves. [Clockwise from upper-left corner.]

1. Reed Campstove *#6
2. BP Oorja *#7
3. Reddy Magh-CM1
4. Anderson Juntos B
5. Drummond-Cedar
6. Flanagan Biochar
7. A&W Servals PP-Plus
8. Wendelbo Peko Pe *#10
9. Anderson Champion *#5
10. ARTI Agni (based on Champion)
11. Karve Sampada Charcoal Maker *#8
12. Daxu (China)

1 – 5 have Forced Air. 6, 9, 12 have a chimney.
1, 2, 7, 8, 10, 11, 12 have or had commercial production.
*#__ indicates emissions data in table/graph (some models vary).