

# **Low Cost - No Cost Char-Making Stoves**

## **ETHOS-20**

**KIRKLAND, WA.**

**JAN. 25, 2020**

**Ronal Larson  
Golden, CO**

**Kevin McLean  
Tampa, FL**

**Q #1 Can recent success in using church groups to improve stove efficiency be extended to charcoal making stoves (CMS's)?**

**On efficiency - See preceding ETHOS paper by McLean**

**Supporting data for CMS's - None; only questions**

## **Q #2 - WHAT STOVE MARKET NICHE?**

**Intent - markets considered least likely for commercial CMS's**

**Assumptions:**

**users would add this option to existing suite of cooking approaches**

**produced char will be used as biochar**

**a rural market - at first**

## **Q #3 - WHY NOT COMMERCIAL CMS's?**

**This a precursor - not a commercial replacement**

**We assume:**

**CMS's will have an initial cost less than \$5 (maybe \$1)**

**payback in weeks; local maintenance**

**churches will favor local manufacture - no imports**

**local materials: tin cans, clay, bricks, cement, char**

## **Q #4 - WHY “CMS’s” - WHY NOT “TLUD”?**

**Want to explore all options - such as**

- Capture from 3-stone fire left-overs**
- Intentional char-removal using “3-stone” (retorts)**
- Extension to I-TLUDs and H-TLUD (planchas)?**

**Emphasis on charcoal - as a money maker**

**“Charcoal” , “Making”, and “Stoves” are well known**

## **Q #5 - WHY CHURCHES ?**

**They are:**

- everywhere (second only to governments)**
- service-oriented.**
- experienced in training**
- motivated by both health and climate concerns.**

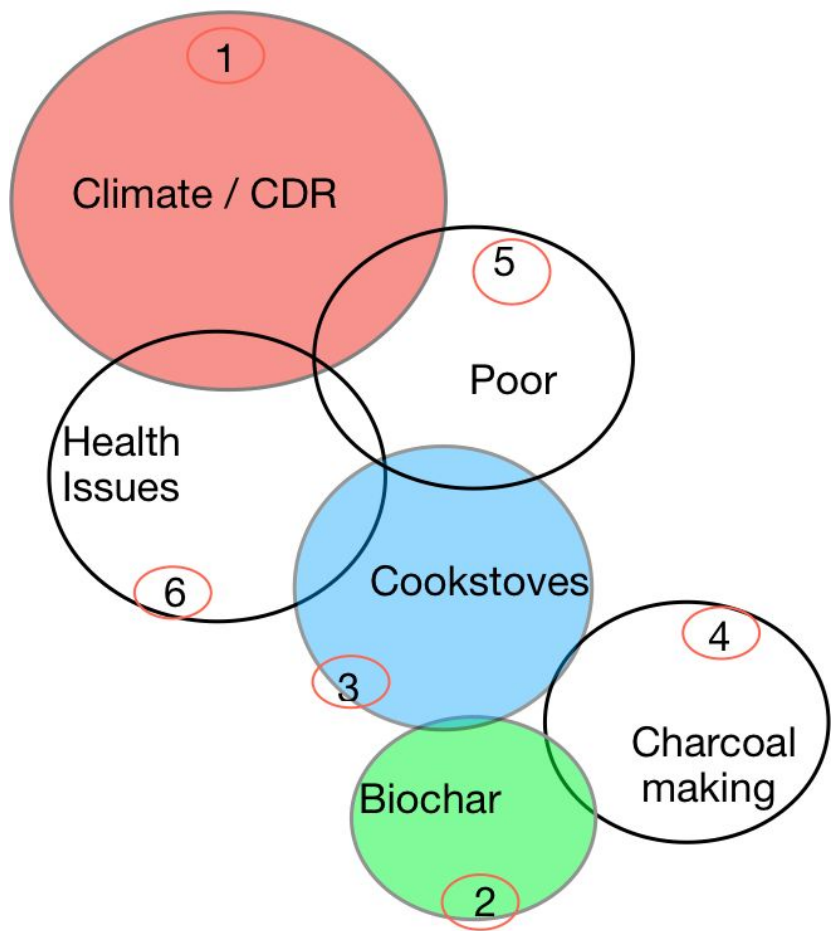
## **Q #6 - WHY EMPHASIS ON BIOCHAR ?**

**Only biochar can add the money-making feature**

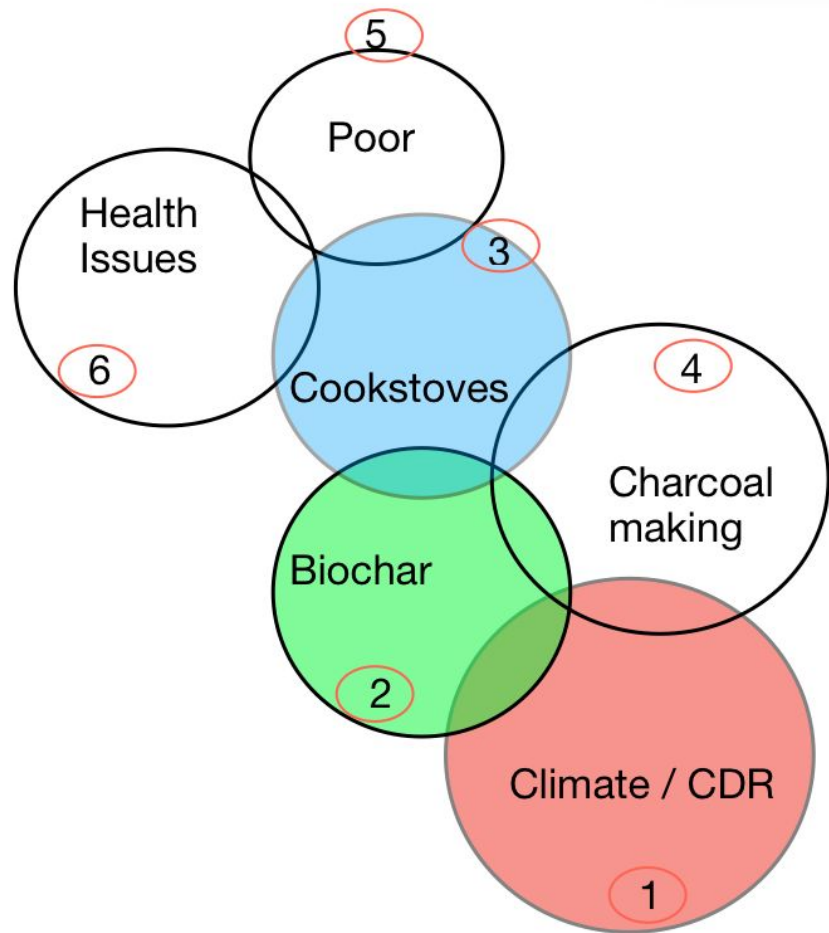
**Biochar can improve local ag-oriented economy**

**Strong potential for support from climate communities**

**Next slide shows a Venn diagram with emphasis shift from health - towards “Climate” topics (through biochar)**



Left: Today



Right- 5-10 years from now



## **Q #7 - CAN THIS WORK IN CITIES ?**

**Yes - but harder**

**intended for the poorest residents now using biomass**

**char could be sent to rural relatives**

**help from CDR (carbon dioxide removal) activists**

**help re air pollution and human waste disposal**

## **Q #8 - What about fuels?**

**Emphasis on:**

**wastes - corn cobs, pecan shells, etc**

**new plantings - coppicing and pollarding**

**pellets formed from newsprint, leaves - possibly hand produced.**

## **Q #9 - WHAT FIT TO ETHOS?**

**ETHOS has:**

- a service and development orientation**
- a valuable Web library**
- developing country commitment**
- relationships with Internet stove and biochar lists**

# **Q10 - Example contributors?**

**Norm Baker**

**Kirk Harris**

**Paul Olivier**

**Thomas Vincent**

**Bill Knauss/Gordon West**

**Julien Winter**

**(each volunteered after email request on  
“TLUDS”; to be continued there)**

# Norm Baker - #1

Norm made

All the char

used here -

in 55 gallon barrels

[ntbakerphd@gmail.com](mailto:ntbakerphd@gmail.com)



**Comparison of productivity between years;**

**In 2013, on the non-biochar side, a 25 foot row of potatoes produced 169 lbs of potatoes.**

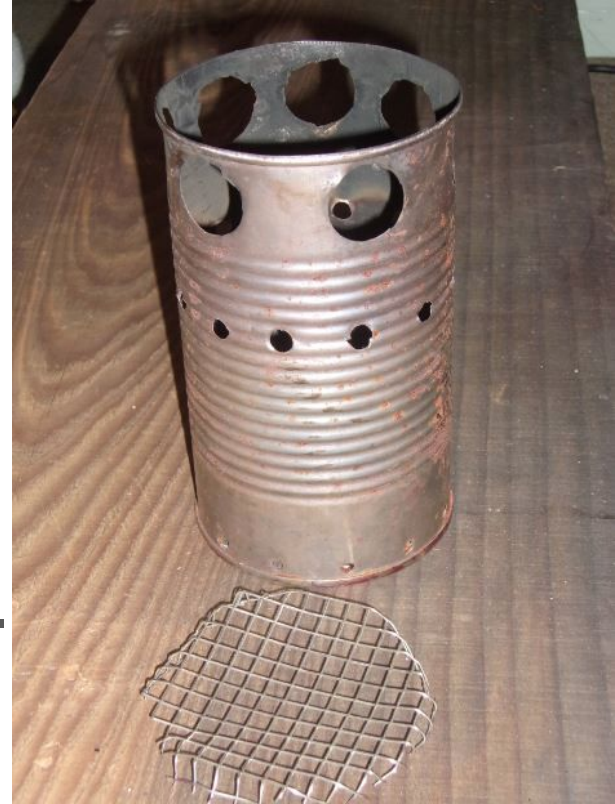
**Three Kombucha Squash plants produced 18 squash.**

**In 2014, on the biochar side, a 25 foot row of potatoes produced a little over 300 lbs of potatoes.**

**Three Kombucha Squash plants produced 53 squash.**

## **Kirk Harris #1**

**Kirk has developed this for his own personal use in camping. Possibly available in many developing countries for about \$1.**



# Paul Olivier #1

Active in South Viet Nam -  
especially using rice husks - with  
emphasis on poor and biochar.  
This is his latest unique new burner.

[paul.olivier@esrla.com](mailto:paul.olivier@esrla.com)

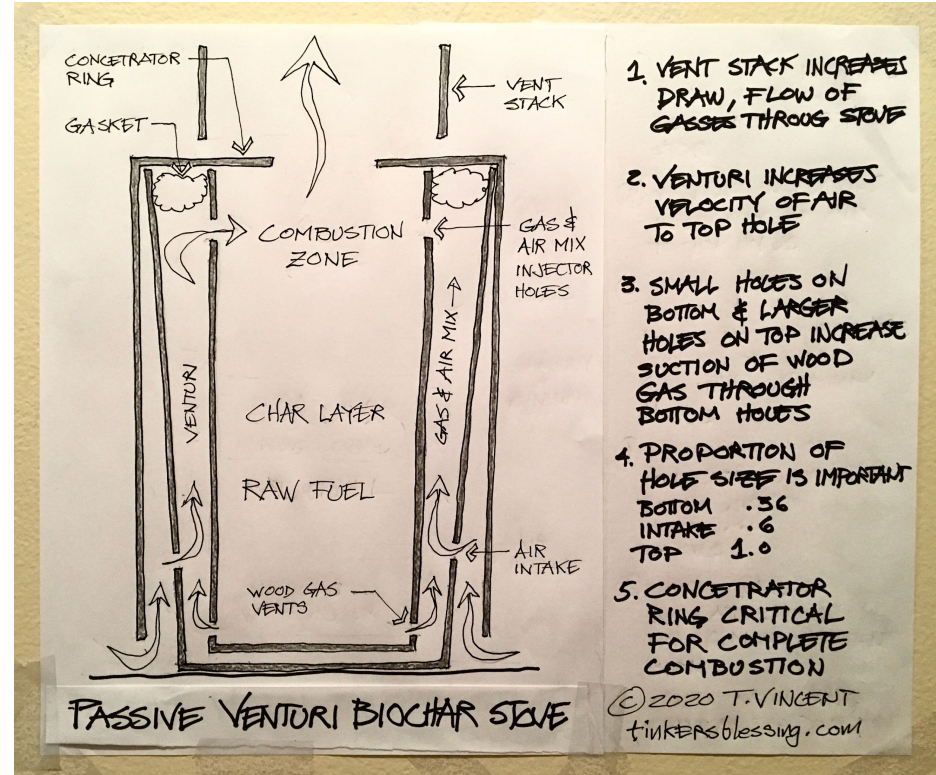


# Thomas Vincent - #1

Describes himself as a  
“tinkerer”.

Here emphasis on  
“Venturi” effect

singledoubt@gmail.com





# Gordon West and Bill Knauss - #1

Company Trollworks (Silver City, Nev)

Continuous Feed TLUD Heating Stove

[gordon.west@rtnewmexico.com](mailto:gordon.west@rtnewmexico.com)

wmknauss@gmail.com



# Julien Winter #1

A frame from a short  
You-Tube video. This  
TLUD locally built.

Note red-hot pellets.  
Char used as biochar.

winter.julien@gmail.com



# End of Slides

Thanks for getting this far.

Comments appreciated at:

**[rongretlarsen@comcast.net](mailto:rongretlarsen@comcast.net)**

**[kmclean56@gmail.com](mailto:kmclean56@gmail.com)**

6 additional example slides from the 6 volunteers follow

# Norm Baker - #2

Note large  
productivity  
improvement.

With and Without Biochar – 2015 German Butterball Potatoes

In 2015, we planted a small test plot on both the biochar and no-biochar side of our garden for a controlled experiment. Results obvious!

Notice there is no potato scab (*Streptomyces spp.*) on the biochar side.



## **Kirk Harris #2**

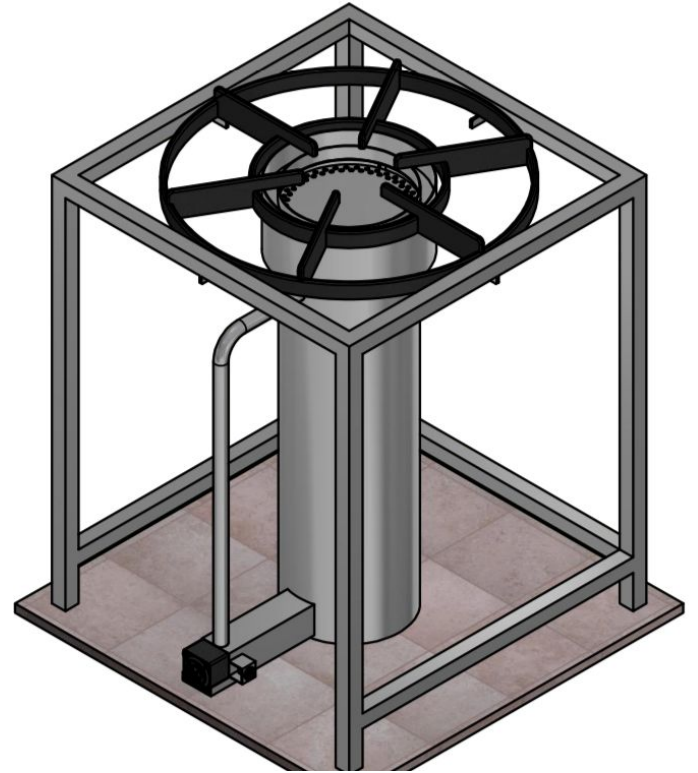
**This stove version is unique - a fancy outer covering produced in China. Possibly the highest tier rankings ever measured.**



## Paul Olivier - #2

Dr. Olivier emphasizes safety.

All of his stoves use stainless-  
and are designed for use by  
the poorest.



# Tom Vincent #2

Slides also available  
from Thomas showing  
operation with flames.  
Not yet a cook- stove.



## **Gordon West and Bill Knauss - #2**

Here - large heat transfer equipment. Trollworks has also made many char-making cook-stoves. Some have been installed in Mexico - a few hours from their New Mexico location. Many use pecan shells.





## Julien Winter #2

Dr. Winter has used data from tests like this to show the influence of different stove design parameters.

- Pot support →
- Riser, or Nozzle →
- Concentrator, or open →
- TLUD + pellet fuel →
- Fuel support mesh →
- Exchangeable grate →

