Improved Charcoal Productions Systems (ICPS)

Gordon Hirst
Chief Engineer
Laos Institute for Renewable Energy
gordon@lao-ire.org

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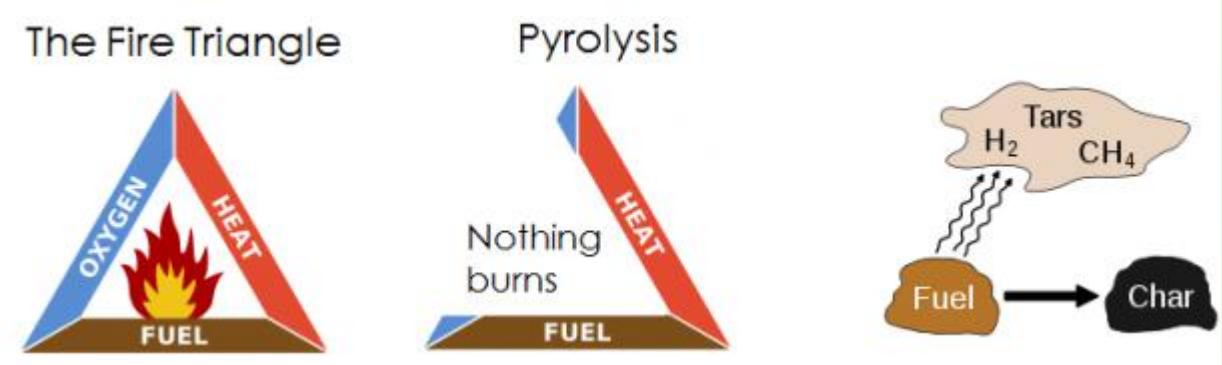
Charcoal produced by pyrolysis or carbonisation of Biomass



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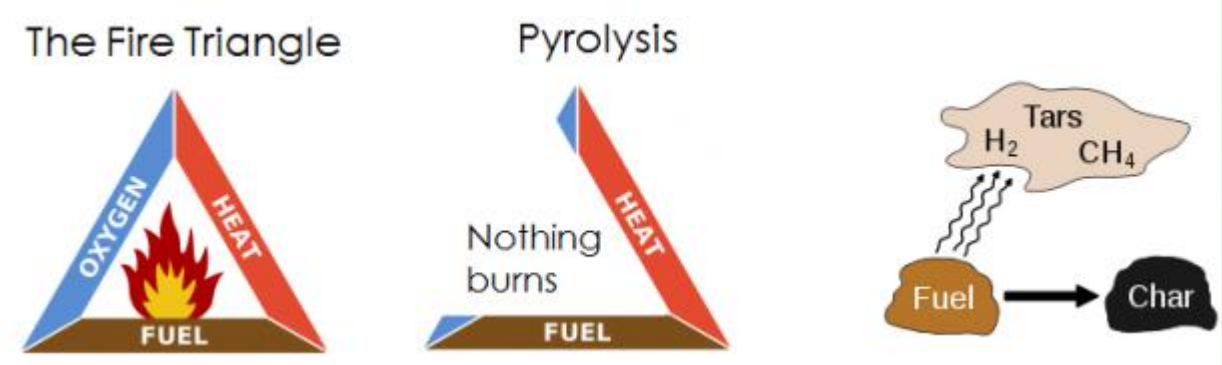

Three Phase Process

- Drying
- Carbonization (pyrolysis)
- Cooling

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Traditional charcoal making methods

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Traditional Charcoal Production

Inefficient - Gravimetric yield (12% - 18%)
- waste of potential bi products

Slow: 4 – 7 days

Release of Green House Gases (GHG): Methane (CH_4)

NB: CH_4 has a GWP 21

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Data on usage Charcoal Lao PDR

25 kg – 40 kg per household per month
30,000 - 60,000 tons per annum

90% on fuel used in Laos Biomass

fNRB = 85%
Contributing to Global warming and deforestation

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Gases and other emissions from charcoal making

- Methane CH_4 : *GWP 21*
- Water vapor H_20
- Carbon Monoxide CO
- Carbon Dioxide CO_2
- Oxygen O_2
- Hydrogen H_2
- Nitrogen N_2
- Nitrogen Oxides NOx
- Ethane C_2H_6
- Particulate matter PM
- tar, formaldehyde, phenols, hydrocarbons, and volatile
- organic compounds (VOCs).

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Charcoal production can be improved by using ‘Retort’ technology

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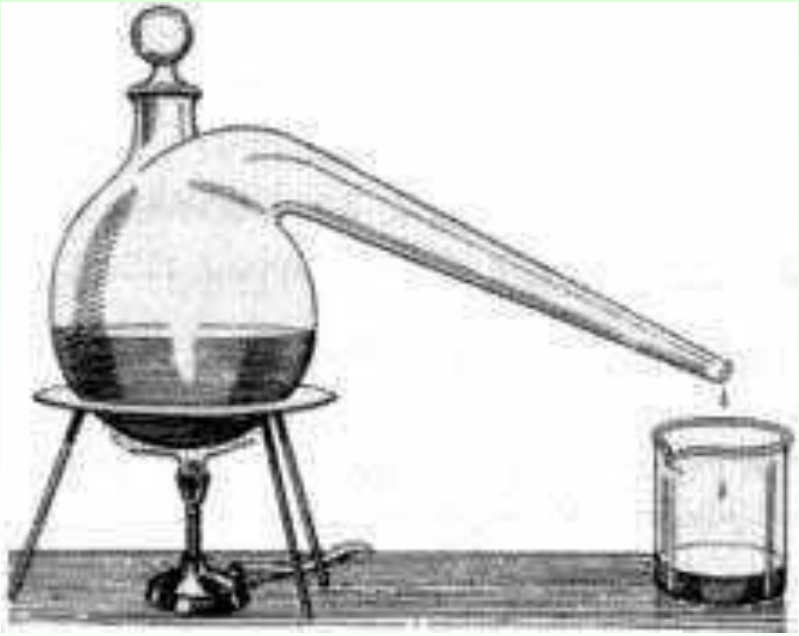

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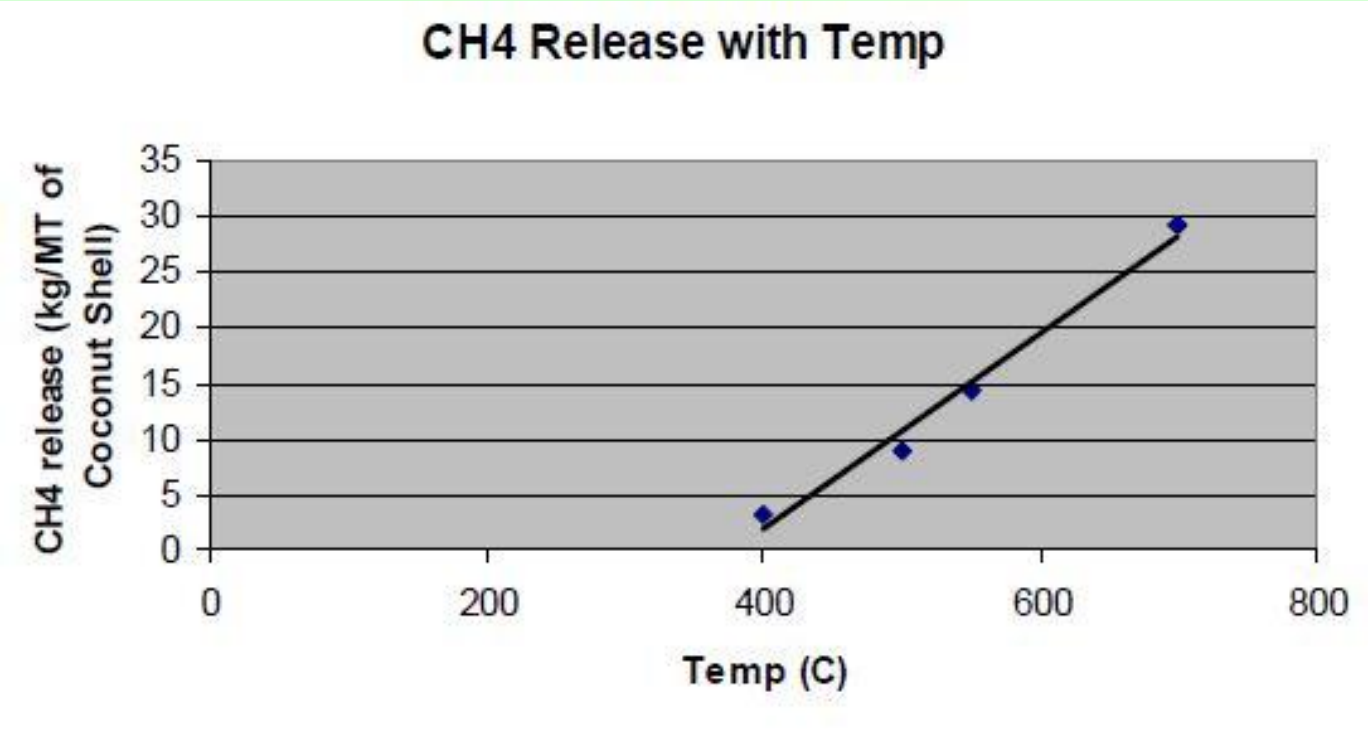

Source: methane release study of coconut shell charcoaling in Sri Lanka

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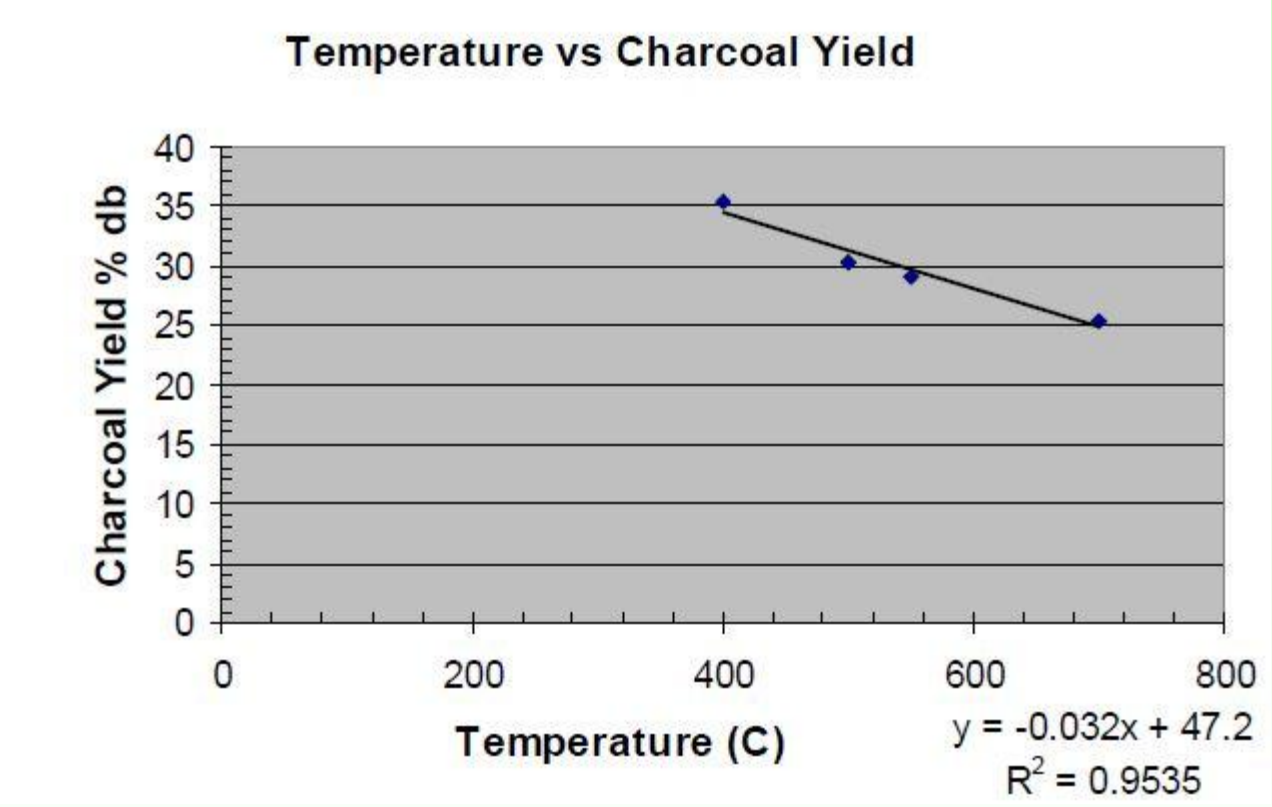

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ADAM Retort

Low cost technology that can be used for rural production of charchol

Not seasonally dependant

More efficient Charcoal Production

Increases gravemetric yield by up to 30%

Reduces greenhouse gas emmissions

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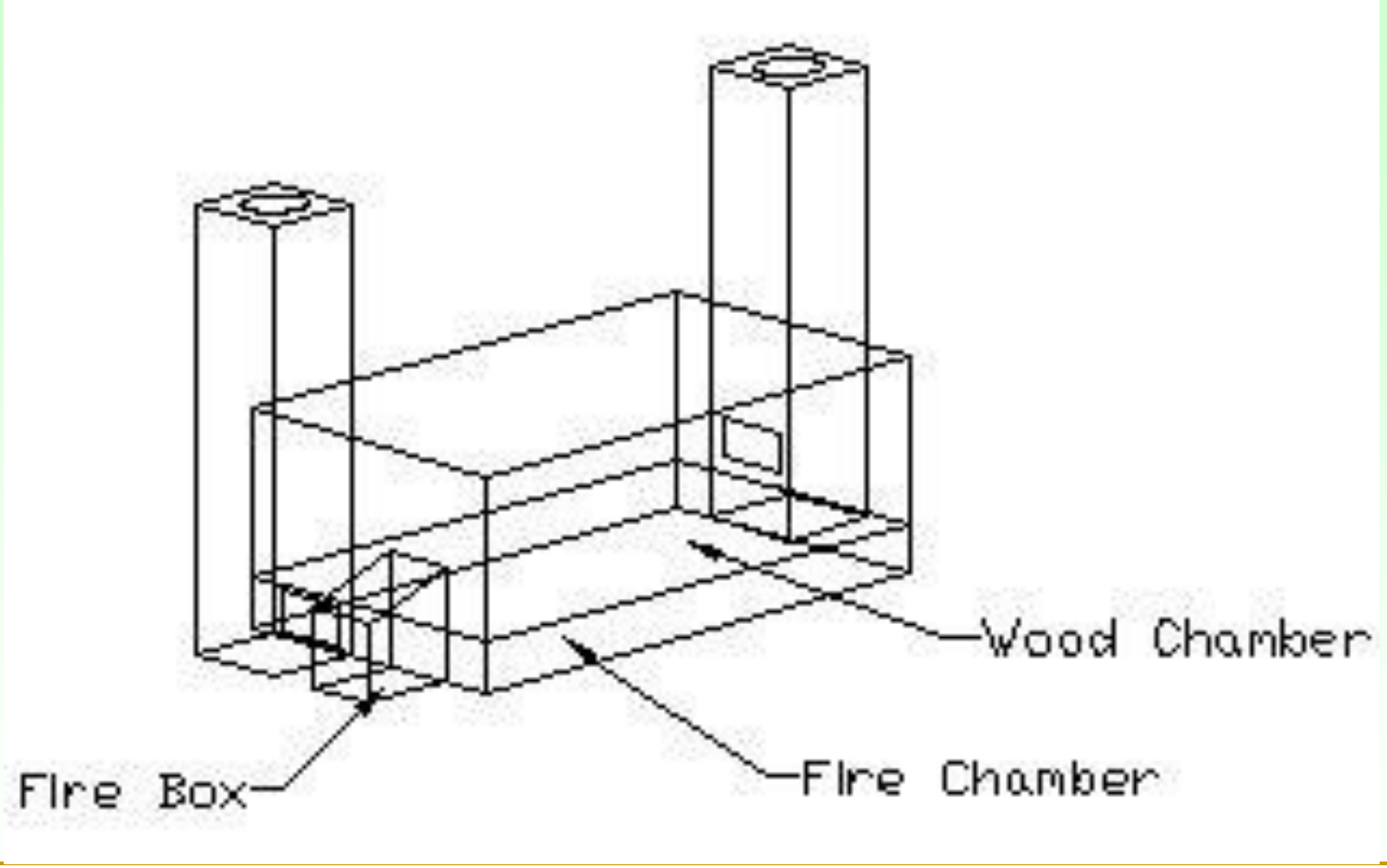

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Lire ICPS Program

- Supply side
  - Build of a pilot ADAM retort to test functionality and comparative tests with traditional charcoal making
- Demand side
  - Quantity and demographics of charcoal making and possible future projection
  - Value adding possibilities

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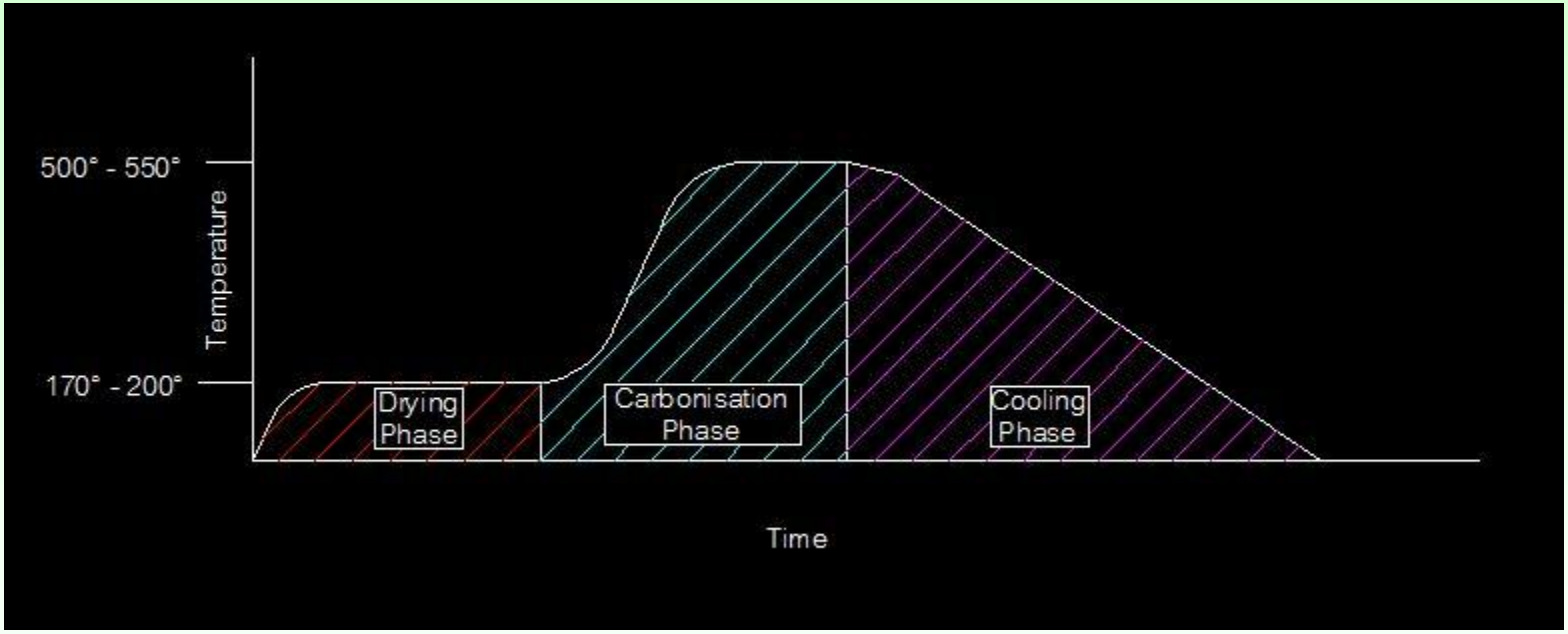

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Value adding to charcoal

- Briquetting char into usable charcoal briquettes
- Activated charcoal
- White charcoal
- Wood vinegar
- Wood tar
- ‘Piggy backing’ using methane to ‘pre dry’ next batch

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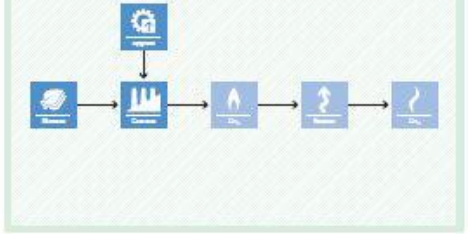
Carbon Credits ?

UNFCCC CLEAN DEVELOPMENT MECHANISM AM0041
METHODOLOGY BOOKLET NOVEMBER 2010 (up to EB 56)

AM0041 Mitigation of methane emissions in the wood carbonization activity for charcoal production

Typical project(s)	Existing carbonization kilns are improved with new kiln design and changes in operational practices that reduce the CH_4 emissions in the production of charcoal.
Type of GHG emissions mitigation action	• GHG emission avoidance. Avoidance or reduction of CH_4 emissions in charcoal production process.
Important conditions under which the methodology is applicable	• Regulation for CH_4 emissions in charcoal production either doesn't exist, or is less stringent than the project, or lacks of enforcement; • The project does not affect GHG emissions other than methane; • The project does not change the type and sources for input for charcoal production.
Important parameters	Monitored: • Quantity and moisture content of charcoal produced in the project; • Quantity and moisture content of wood used in the carbonization process in the project.
BASELINE SCENARIO High CH_4 emissions associated with the production of charcoal.	
PROJECT SCENARIO Decreased or avoided CH_4 emissions associated with production of charcoal.	

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Summary

- Reduction in GHG emissions
- More efficient charcoal production
  - Quicker from 4 – 6 days to 30 hours
  - 30% increase in gravimetric yield

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Next steps:

- Minor modifications of pilot retort
- Comparison tests with traditional charcoal making
- Calculate/ estimate GHG reduction
- Value adding – Briquetting
- Demand side study

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Questions ?

www.facebook.com/adamretortlaos

gordon@lao-ire.org