



Biochar & Local Self-Sufficiency



learning about (y)our
community through Biochar



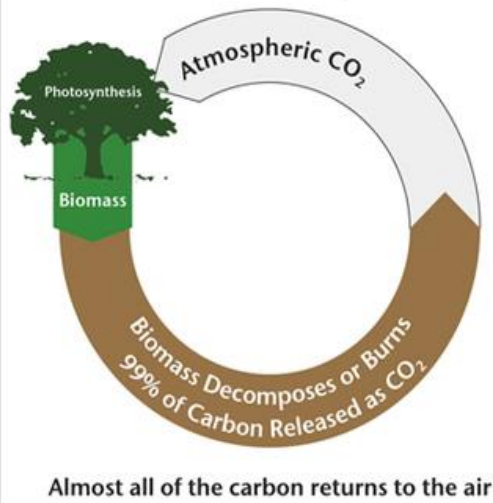
Paul Wildman paul@kalgrove.com The Kalgrove Institute Brisbane <http://www.kal.net.au/in>
in conjunction with Phil Vardy BOGI (Brisbane Organic Growers Inc.) <http://bogi.org.au/>
V6; 04-09-2014 Brisbane

What is biochar?

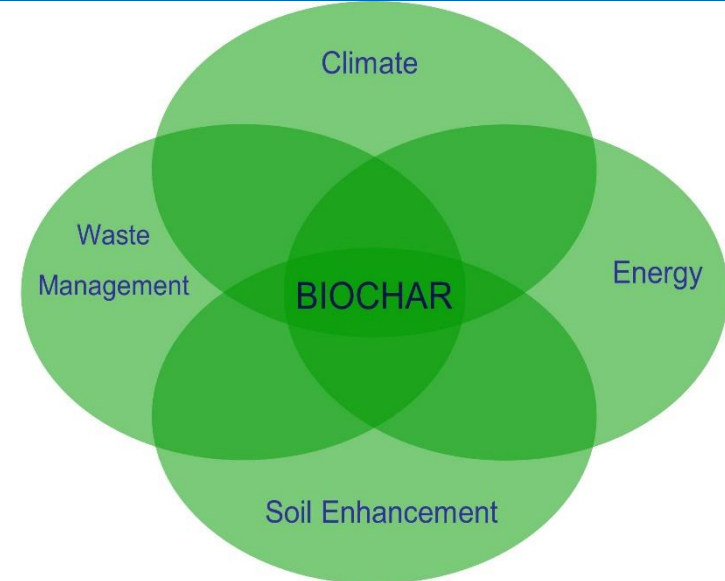
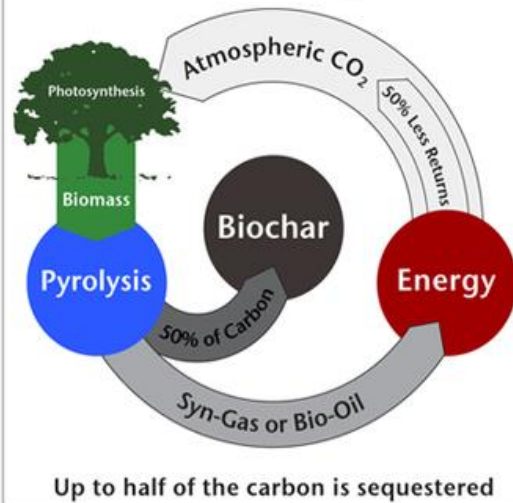
First coined by Peter Read, biochar refers to charcoals which are prepared for carbon storage while potentially allowing soil improvement [14, 15]. A more technical definition is that biochar is a “porous carbonaceous solid produced by thermochemical conversion of organic materials in an oxygen depleted atmosphere which has physiochemical properties suitable for the safe and long-term storage of carbon in the environment and, potentially, soil improvement” page 9, [16].



The Carbon Cycle



The Biochar Cycle



Professor Tim Flannery has said that even if we shut down every coal plant and stop all emissions of greenhouse gases from industry worldwide, the dangerous warming of our planet would continue for centuries. “That is the point at which we realise that Biochar is really, really important,” he said.

Flannery suggested that 8 percent of CO₂ is currently going into terrestrial vegetation, but if we could double that, we could buy ourselves time to work on moving away from coal and oil. Flannery said that we have to be mindful of the historic debt incurred by the one billion people who made the industrial revolution. (Yes the earth's population was less than a billion when the IR was in full swing 10% of what it is now – PW) “That carbon debt to the other 6 billion could be repaid at 5 percent per year with Biochar,” he said.

➤ <http://peaksurfer.blogspot.com.au/2008/10/biochars-fractal-dimension.html> 29-10-2008

Big Picture

Biochar (term coined by Peter Read in 2009) then in summary is ... *plant biomass contained within the black carbon (BC) continuum. This definition includes chars and charcoal, and excludes fossil fuel products or soil carbon.* Biochar also called Biomass and Agri-Char

Soil/Geogenic/Composting Charcoal is formed at around 3-500°C, Biochar 5-750° (depending on weather and wood type) and Crematoriums 750° + (often around 1200°)

With pyrolysis (burning in a low oxygen environment) we get: (1) Biochar we also get, (2) Biogrow - Biogardening, (3) Biogas, (4) Bioheat (heating and cooking) and (5) Biobliss (Biochar yummi~2p, tahina~3p, ginger~1p and honey~2p + Biochar smoothie + Biochar detox) and (6) Biolearning, Biochar lets us: Grow things, Run things, Cook things, Eat things and Learn things. With Biogas the volatiles from the wood can be captured and used to power tractors, cars and make medicines etc.

Here we focus on (1), (2), (5) & (6)
Make, Grow, Eat & Learn

Victorian fires Black Sat Feb 09 – volatiles plume
(Story)



Technically speaking then Biochar is charcoal: pyrolysed at around 500° in an oxygen depleted environment which means it is activated (volatiles removed) but not yet charged (addition of organic compounds inc. bacteria needed e.g. for gardening = charging/inoculation)

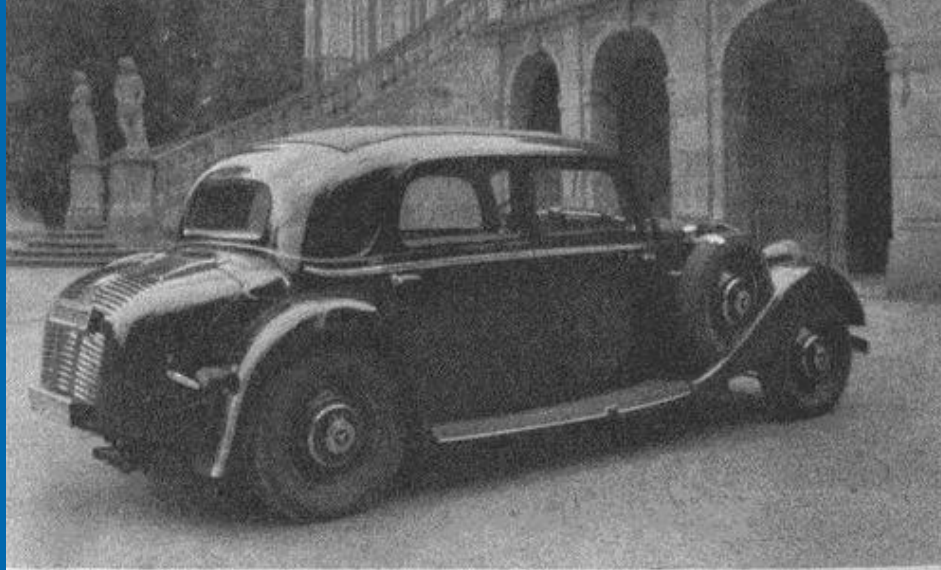


Abb. 8. Mercedes-Benz Typ 230 mit Sauggasanlage

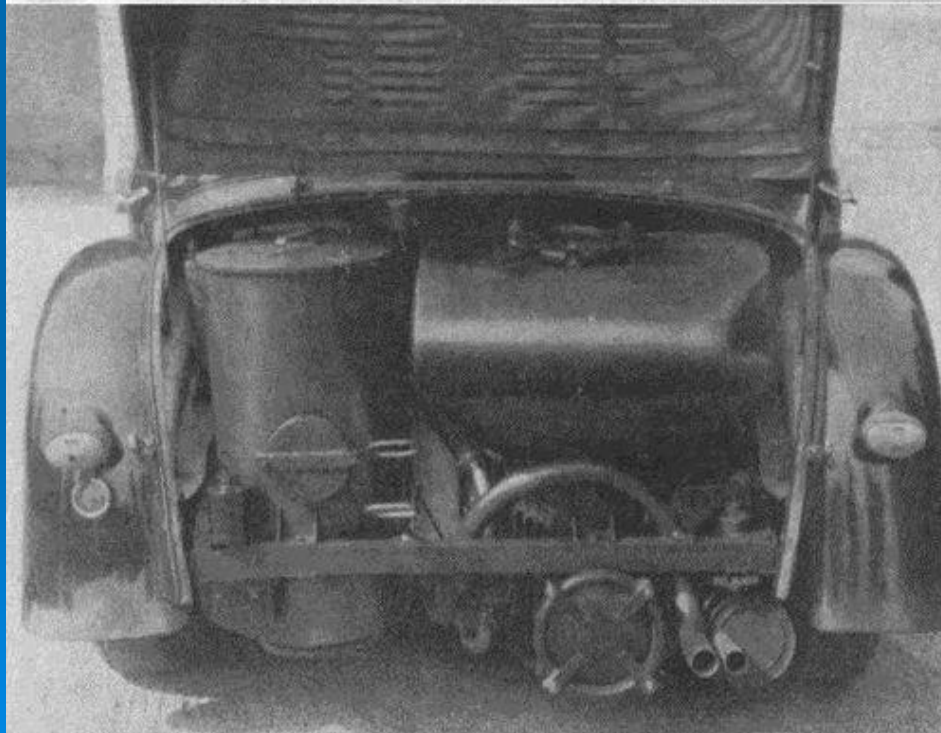


Abb. 9. Mercedes-Benz
„Generator-Kofferraum“
geöffnet



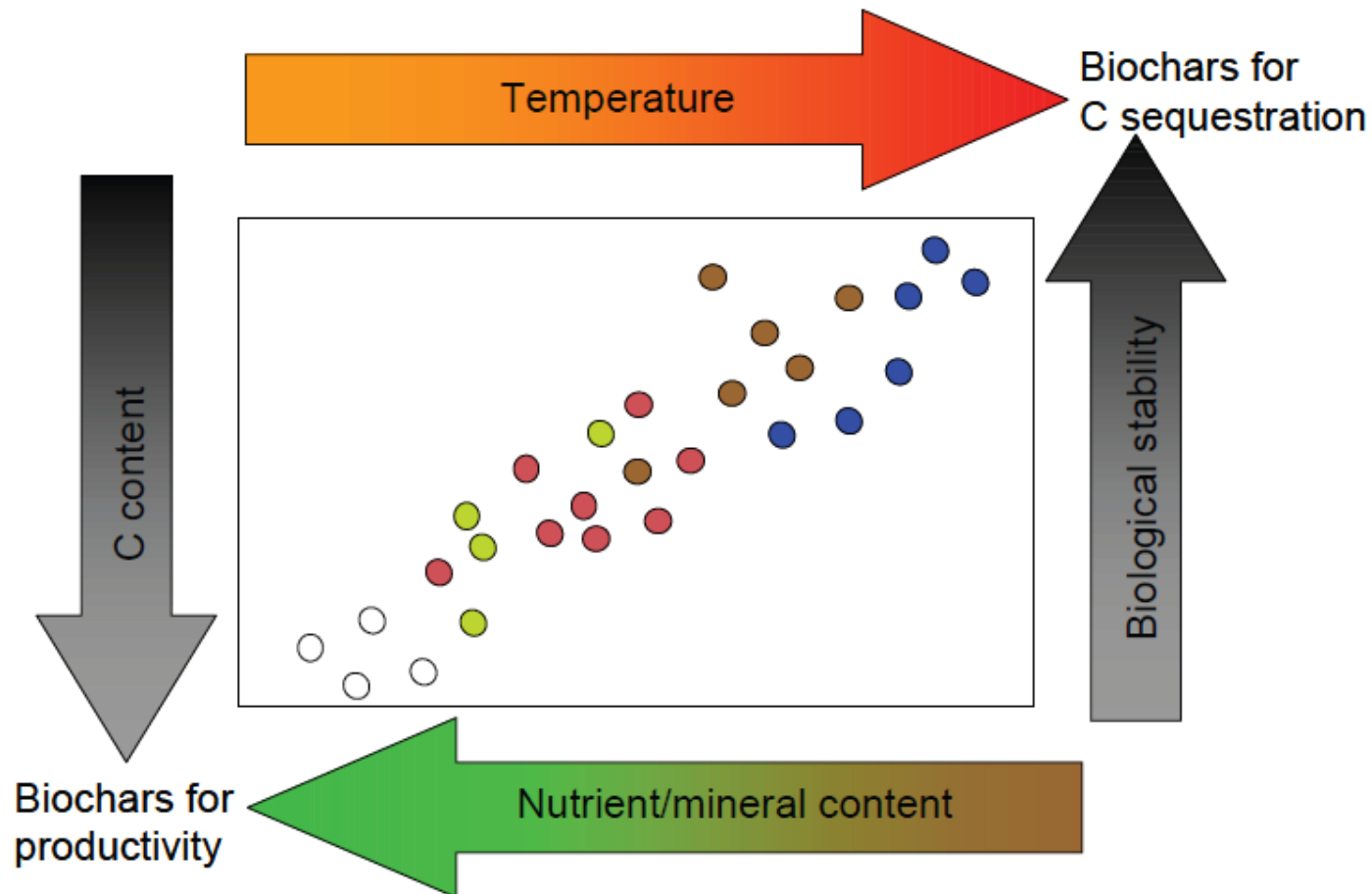




Terra Preta 2500BP



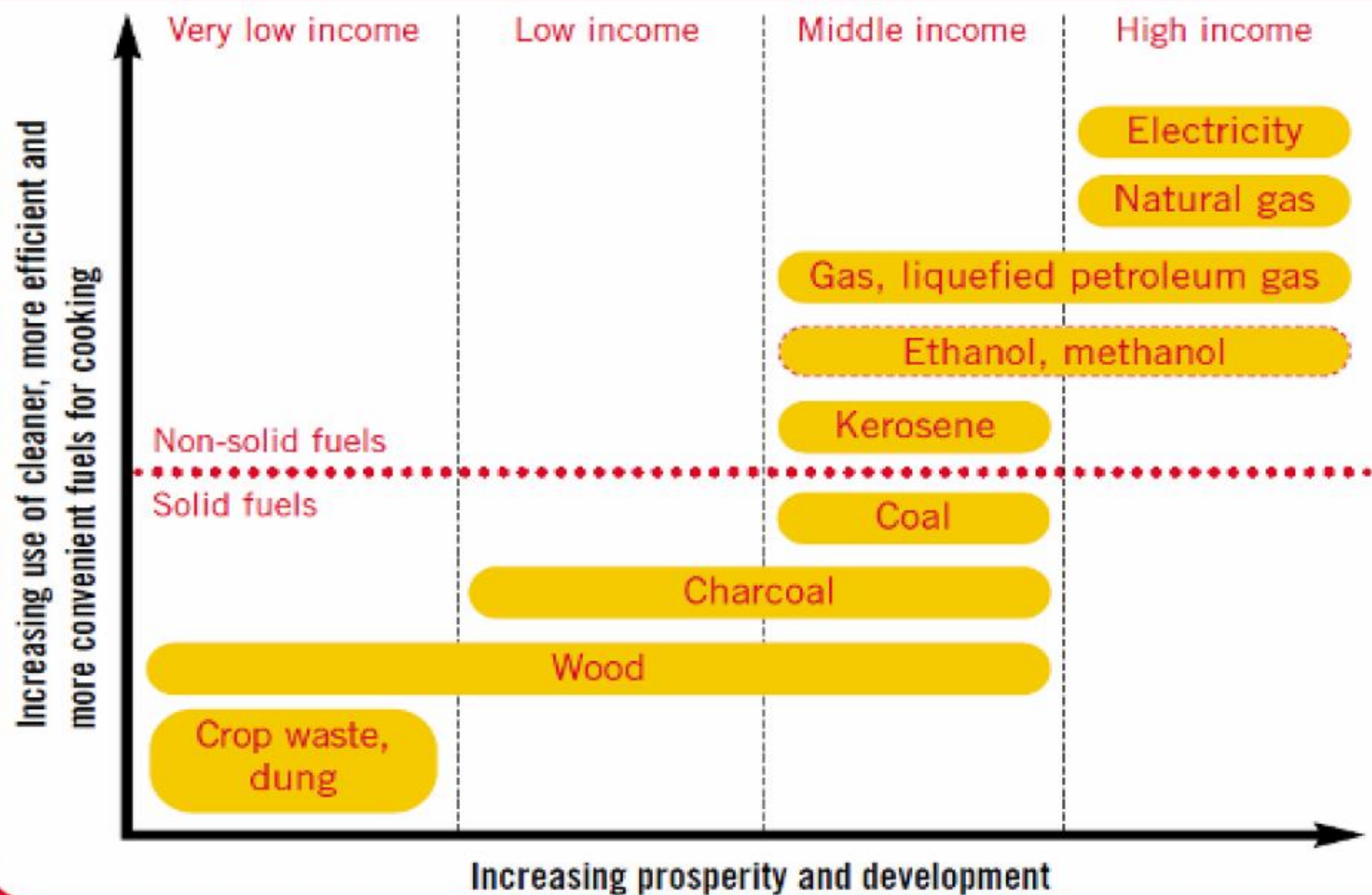
Biochar's high absorption potential of organic molecules (and of water) is due to its porous structure. Terra preta's great quantity of charcoal supports a high concentration of organic matter (on average three times more than in the surrounding poor soils) of up to 150 g/kg up to 2 metres depth. (**Source:** Wiki)



> Figure 1: Biochars produced from different feedstocks (coloured circles) and at different temperature vary in their properties.

- **Source:** CSIRO - Krull, E. (2010). Biochar for Agronomic Improvement and Greenhouse Gas Mitigation. *CSIRO Sustainable Agriculture Flagship*: 6pgs.

Figure 2: The energy ladder: household energy and development inextricably linked



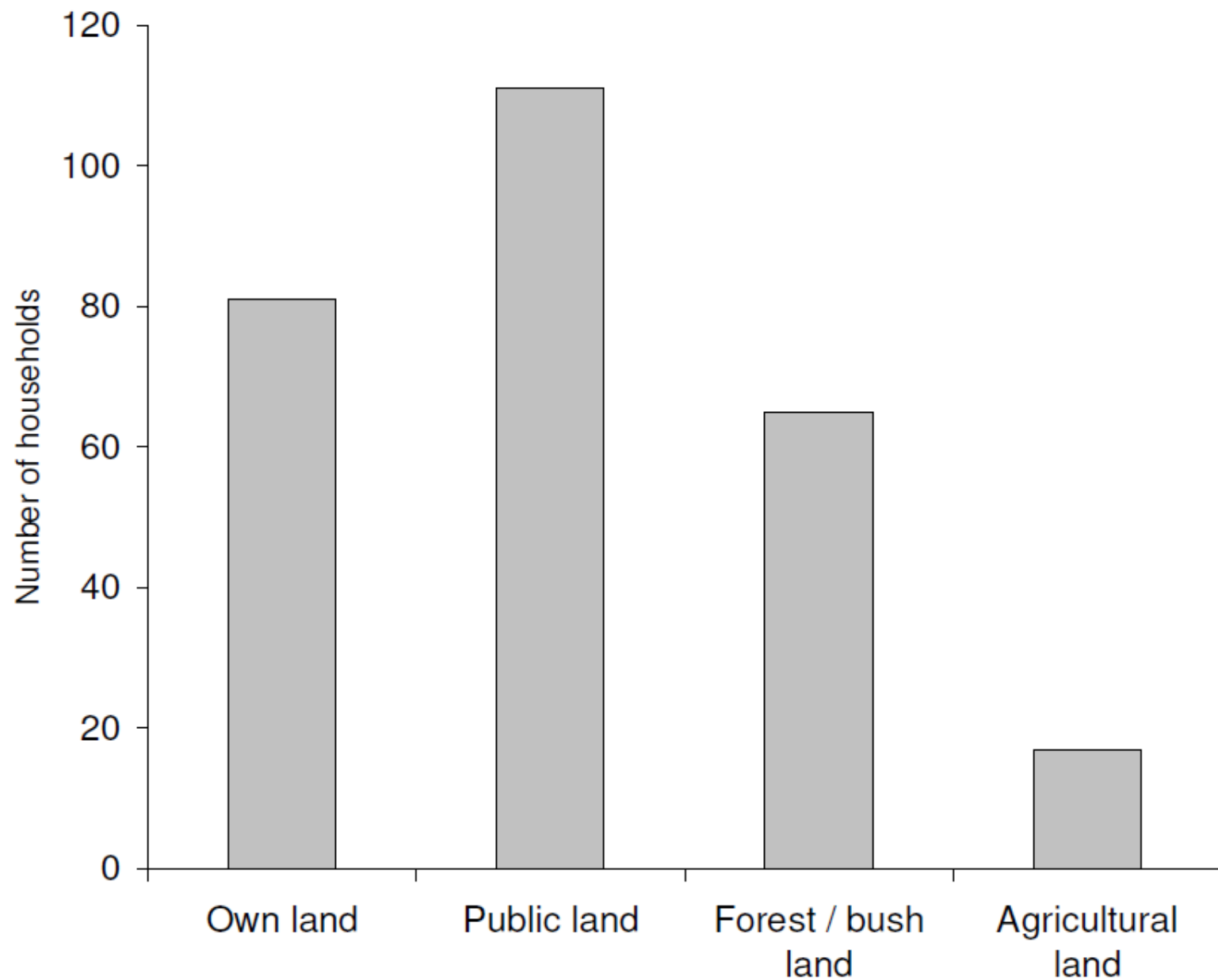


Figure 26: The source of gathered fuel



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 #65
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).



Figure 4: A range of top-lit updraft (TLUD) stoves, source [11]



Figure 7: Charcoal briquettes, ARTI India (Picture by Harry Thompson)

Biochar 'Cone' <https://www.youtube.com/watch?v=-AebWIpGu4I> KonTiki Retort – Switzerland Carbon IQ
<http://www.ithaka-institut.org/en/home> Hans-Peter Schmidt **Biochar Mechanic:** Marcus Koller

Carter & Shackley (2011) Biochar Stoves: an innovation studies perspective. UK Biochar Research centre.
 School of GeoSciences, Univ of Edinburgh, UK
<http://www.geos.ed.ac.uk/homes/sshackle/BiocharStovesInnovation.pdf>





**Biochar meets Steampunk?
A Rocket stove converted to
make Biochar**

issue1 home

Because our future is in our hands

Issue 1: Biochar

December 2011

CRAFTy content



External Relevant Material



Get CRAFTed

You can view the first issue of CRAFT using the [issue reader](#).

CRAFT INFORMATION

About CRAFT

CRAFT Tank

Introducing the Founders

Introducing the Advisory Editorial Team

Introducing the Webmaster

Endorsements

CRAFT COLUMNS

Word of the Issue - Sauvage

Green design

A Word from the Webmaster

Featured Link of the Issue: Post Pressed

CRAFT HOUSEKEEPING

About CRAFT's Format and Editorial Guidelines

CRAFT Copyright, Disclaimer and Acknowledgements

TO BE ARRANGED

Publications

Speaking

Workshops, Learning Circles, Exemplar Projects and Sauvage craft

Social Horizons

Links

NEWS

Dr. Paul Wildman, CRAFT founder, speaks at the Woodford Folk Festival. Hear from the former Australian Chair of the Millennium Project and learn about the state of the future. You can catch him at the following times:

Tuesday, 27th December 2011, 4:00pm at the Greenhouse; and,

Wednesday, 28th December 2011, 4:00pm at the Greenhouse.

Click [here](#) to access his power point presentation for the talk.

CRAFT in its big picture is about engendering *Community Resilience through Action for Futures Transitions*: this led to the advent of www.crafters-circle.com Our first issue was on Biochar – three years ago now. Issue in beta now is ‘Disability Accessibility’





A Rocket Stove burns wood efficiently to provide the most amount of Flame and heat it leaves only ash due to the mixing with Oxygen.

A Biochar producing stove tries to exclude the mixing with air and makes use of human intervention to allow the charcol to be retained for other uses.

The **new Stumpy** we have created together is in actual fact a Combination TLUD and Rocket stove -----→ *(Story)*

If you fill the container light it at the top and empty it out when the flame dies down you are using it as a Biochar TLUD stove

If you fill the container light it at the top and when there is sufficient fire you place stick in the air inlet it converts to a rocket stove.

<https://www.youtube.com/watch?v=4pWG3YUQogM>





By lighting at the top we ensure a: low temp burn/pyrolysis &, a gasification atmosphere *within* the inner retort, whereby when the gasses below pass through the burnt/charcoal layer on the top it cracks the H_2O so we get: (1) little if any smoke, (2) a low tar wood-gas with (3) a high heating value and (4) a clean burn ~ **SHOW STUMPY**



A few of us want to help Rassel get Biochar happening in Zim and thus we need to get some Stumpies to Zim – let us know if you are interested in helping this happen.







►► Hydrochar experiment comm. March 2011

Design parameters: No Dig, No Bend, No Bugs, No Weeds, No Watering, No space use, No Pump, No light, No electricity, Setup <\$300. Medium: 50/50 Perlite and Carbon8 – chunky and fine mixed + 32% shadecloth. Nutrients: Ionic @ \$0.60/charge (which lasts 4-6weeks) + \$3 for plants = \$5 all up. Australian AutoPot system. First harvest 2.5wks at \$4.00ea. Total harvests from this AP system: 40 salad greens for two people. An innovation I have not tried is heating the water the plants are in. Like lights in a cooks roost the plants grow in warmth/lay in light so its worth a try – potential doubling of growth rates cp. here. <https://www.youtube.com/watch?v=jsgHP1VgFXc>
<http://www.truth-out.org/news/item/25438-open-source-farming-a-renaissance-man-tackles-the-food-crisis>



Hydrochar experiment 03-03-2011



Hydrochar experiment 10-03-2011



Hydrochar experiment 17-03-2011



Hydrochar experiment 23-03-2011



Hydrochar experiment 23-03-2011



Hydrochar experiment 27-03-2011



Biochar Increases Lettuce Biomass

(23 Days After Germination)



Control 0% Biochar

40% Biochar (v/v)



New soil + Keyline water harvesting → Urban Food Forests



Les and Jamie Spencer's Action Research Lab – their home Melbourne <http://livyon.com/>

Integration of Action Research, Agricultural Research, Permaculture and Microbiology. Les calls the putty material 'Life Colloid' – magic pudding developed by his son Jamie and when you visit their home in Melbourne, you have to 'eat some' in a 'if its good for the plants its good for you' rationale – a self sustaining - soil yoghurt 'Life Colloid' – soil 'pro-biotics'.

(Story) Upon inspection of the roots along the growth timeline we had indications of the roots seeking out the colloid! <http://www.laceweb.org.au/enlp.htm>
<http://www.abc.net.au/catalyst/stories/4067184.htm>





~~~Black Magic Wonder-our bio-garden within~~~

BioCarbon is:

- (1) **Highly alkaline and is spinning with electrons making the substance highly electrical.**
Carbon's negative ionic charge attracts positive ionic charges (of toxins and poisons) causing them to bind & then escorts them out of the body via through the intestines
- (2) A great tooth whitener plus plaque remover
- (3) Carbon can help absorb poisons esp. internally & thus can also help Drug addictions & detox
- (4) As an antacid smoothie
- (5) Along with the soil organisms in the 'life colloid' were 1000s of species of micro-flora – the good gut probiotics that live in the human intestines and that transmute digesting material into the chemicals our bodies need.

I use a mortar and pestle and also our electric blender to make my edible BC powder

<http://foodmatters.tv/articles-1/black-magic-the-benefits-and-uses-of-activated-charcoal>



Activated Charcoal is neither absorbed nor metabolised by the body

It helps to Eliminate the Body of:
Toxins, Heavy Metals, Pesticides
Parasites

Nicotine/Alcohol, Chlorine etc ...

Lowers Cholesterol

Hangover Cure

Flu Symptoms

Bloating/Flatulence/Colic

Stomach/Bowel Problems inc. Bali Belly

Liver/Kidney Problems

Heart Burn

Nausea/Vomiting

Whitens Teeth/Removes Plaque

Bites & Stings

Candida/Thrush/UTI

Mouth Ulcers/Cold Sores

Cuts/ Infections, Eye Infections

Skin Irritations, Acne

Cysts/Ulcers/Abscess

Arthritis

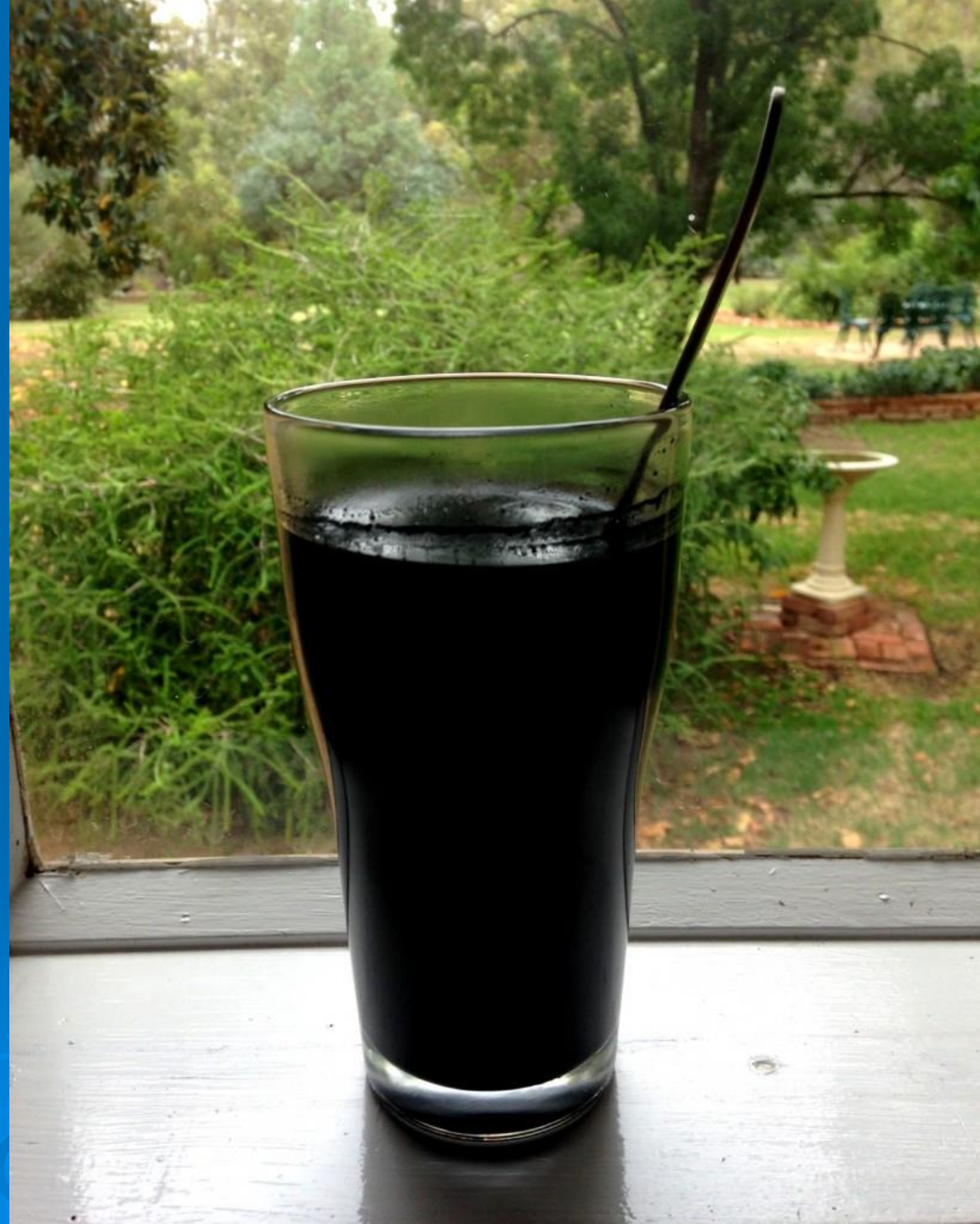
Neutralizes Odours

Purifies Water

Freshens Breath

Safe for Children & Pets

<http://melbournestreetorganics.com.au/activate-d-charcoal-body-cleanse-and-detox/>



Now we ask: How then can we spread the word about Biochar? I.e. the **L** in Social as in Learning. For me I use and recommend Learning Circles.....



**“A circle is not just a meeting
with the chairs rearranged...”**

A circle is a way of doing things differently than we have become accustomed to. It is a return to our original form of community as well as a leap forward to create a new form of community. In circle, we rediscover an ancient process of consultation and communion that, for tens of thousands of years, has held the human community together and shaped its course."

"Calling the Circle, The First and Future Culture"

Christina Baldwin, PeerSpirit Inc. • <http://www.peerspirit.com>

The Learning Circle Preschool

<http://www.thelearningcirclepreschool.com/> USA



Welcome to the Power of Moms's new look. We're still working on a few things, so please look around and let us know your thoughts as well as any glitches you happen to run into. [close]

Home About Us Friends April's Blog Saren's Blog Contact Us Join for Free SEARCH

EMPOWERING OPPORTUNITIES v LEARNING TOOLS v POWER OF THE MONTH v FAMILY-BUILDING RESOURCES

Learning Circles



According to a recent study, *"joining a meaningful group that meets just once a month produces the same happiness gain as doubling your income"* (New York Times, David Brooks, March 29, 2010).

And you can start your own amazing Learning Circle for just \$20. Read on for details.

What is a Power of Moms Learning Circle?

- part **girls' night out** (with a meaningful purpose – in addition to having a great time)
- part **book group** (with a lot less pages to read...yep, you can complete the reading for each month in about 30 minutes)
- part **support group** (we all need more opportunities to learn from, encourage, and even sometimes commiserate with other moms)
- part **motherhood course** (because you deserve a monthly class to help you grow yourself, build your fellow mothers, and shape the future that starts right in your own home)

A Learning Circle involves 5-12 mothers who gather each month for great conversation centered on an excellent in-depth article. For a list of the monthly topics and a sample article, [click HERE](#).

FOLLOW US!



JOIN US FOR A FREE TELECLASS



Join our free email list so we can tell you the details.

[Click here to register](#)

LOGIN

Username:

Password:

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[Lost your password?](#)



Biochar Industries ~ Our Dream

To create a holistic new
paradigm, balanced Industry
that will help the **environment**
help **community**
and help **educate**

by being P2P, open source, local, participative and democratic

dolph@biocharproject.org www.biocharproject.org



Helping the environment

Building organic carbon in our soils

Removing fire hazards and weeds from the forest

Removing atmospheric carbon dioxide

Removing pollutants from our waterways

Creating carbon neutral alternative fuels

Helping Nature and Human Nature synergise not conflict

Sustainable waste management



Helping our community

Creating jobs for the local people

Working with those marginalised by society

Providing fresh natural produce

Helping to create artisan, bespoke, boutique 'hands on' cottage industries

Secondary employment multiplier effects of spending money locally

Eco-tourism

Lower cost housing project



Helping educate

Bush Mechanics = Hands on = Something for everyone

Research Centre to lead the way forward

Learning by example / Exemplar Projects

Environmental Education

Bringing back the Wisdom of the Elders

Encourage *Learning* to be re-linked to *doing*



Complementary Currency ~ Community Exchange System

- It's not money its energy so it's not subject to scarcity
- Think of it as an addition to your income
- It is reigniting closer community ties
- Fostering sustainability at a local community level
- Its free to get involved
- Will not effect your “**sponsored by Centerlink**” status
- No need to pay TAX if using the CES as a hobby
- Use Biochar as your currency and or product
- You can start now <http://brislets.com/>



The Learning Circle's Global presence: originating in Sweden ~ they cover 'kids AND adults learning'

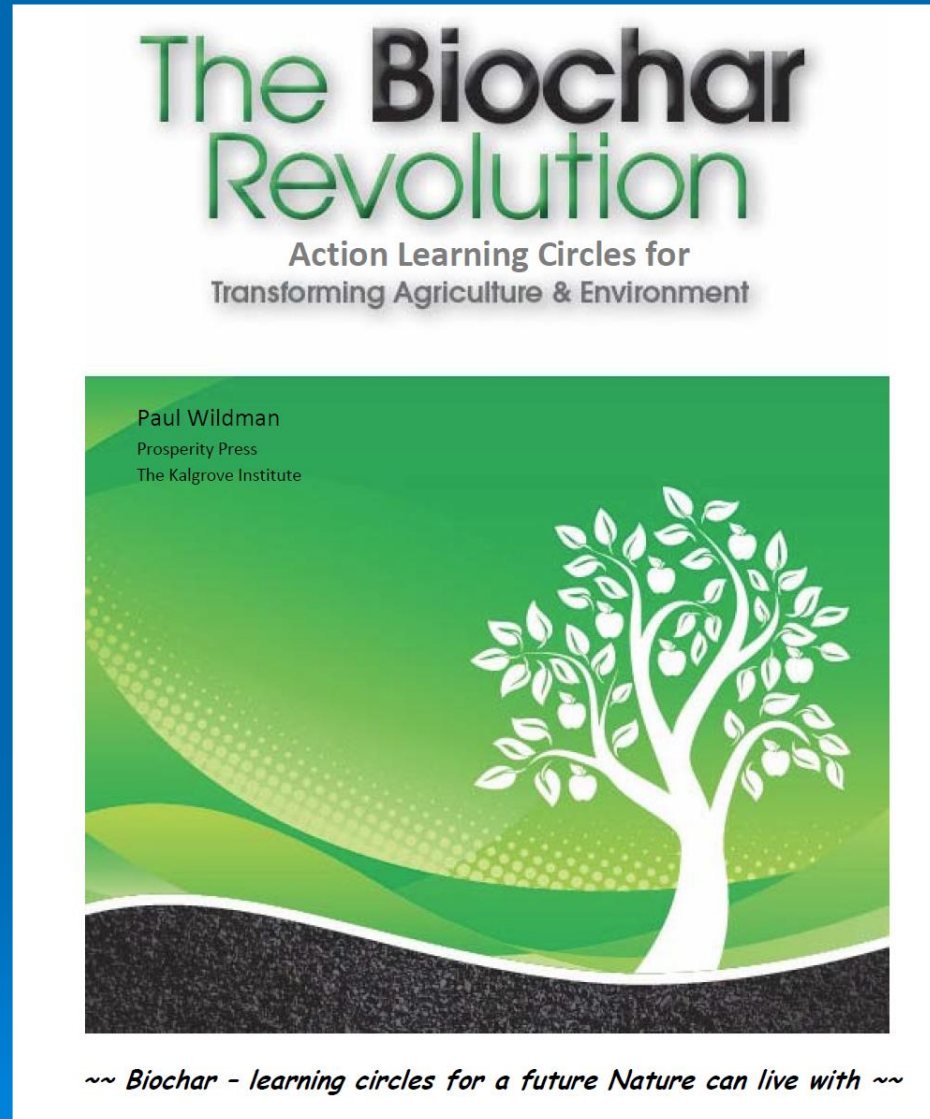
- ***Extended Study Circles as a Means of Facilitating Sustainable Management*** of Ecosystems: Is there a new role for agricultural universities? *Magnus Ljung, Anna Richert and David Gibbon* 1990
- ***Roots of Change***: 2010 Study Circle Program ISEC for ***Local Futures*** (International Society for Ecology and Society) and the movie *Economics of Happiness* about the Ladakh on the Indian Tibet border <http://www.localfutures.org/study-circle-program>
- ***Study Circles: Schools For Life Long Learning***: Cooperative learning, democratic participation, respect for individual views, and learning from the collective wisdom of the group *by Cecile Andrews*. 2000
- ***Eight aspects of democracy can be developed through study circles.*** International Journal of ***Lifelong Education*** Eight qualitatively different aspects of democracy are thus highlighted: equal participation, horizontal power relations, deliberations, critical knowledge that recognises standpoints, recognition of diverse identities, internal democratic decision-making, self-organising, and action to form society. 2001
- Civicus uses learning circles for ***global democracy***
- ***Sweden*** has had >300,000 LC's since 1970
- ***Originated in the 1870's in Sweden*** and in the 900's in Islamic Madrasa and subsequently in the 1200's in the Medieval European Universities



**A Community Economy Development Resource –
Action Learning Circles example 1**



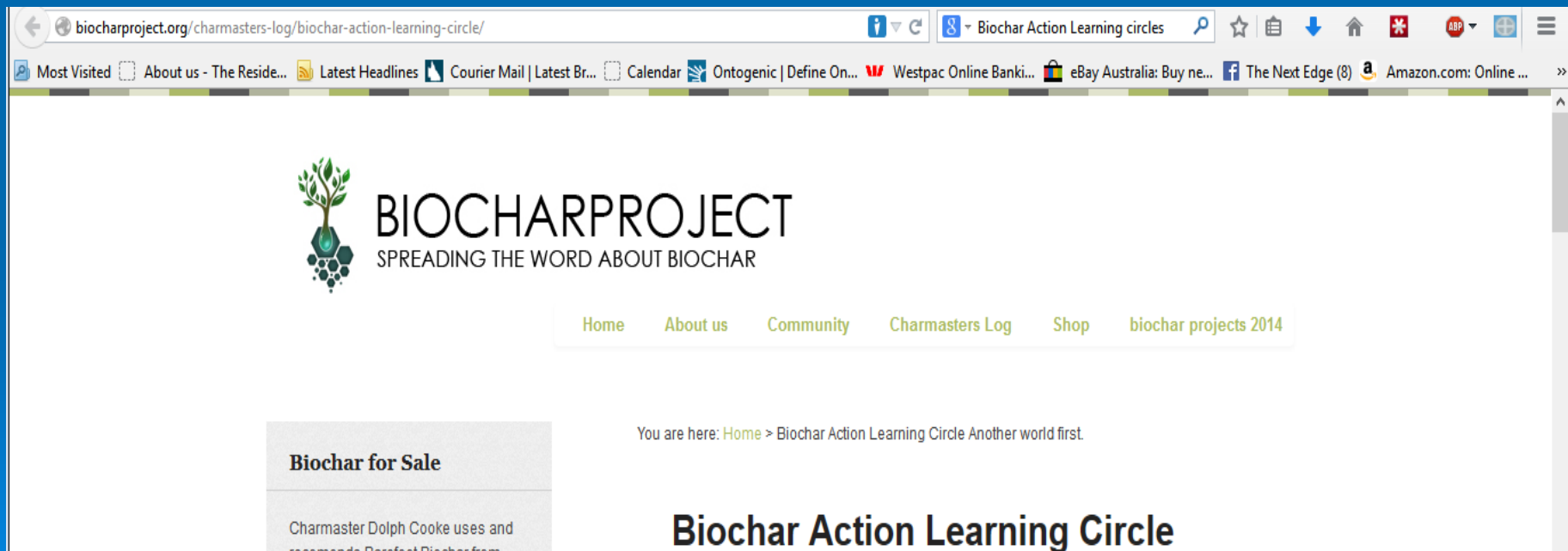
A Biochar Revolution Resource – Action Learning Circles example 1



Based on the book by Paul Taylor: Biochar Revolution (2010)

▶▶▶ *The Learning Circle's Global presence: originating in Sweden ~ they now cover 'kids AND adults learning' These are a few shots of the recent Kunghur Biochar Action Learning Circles*

www.biocharproject.org



The screenshot shows a web browser window with the address bar displaying biocharproject.org/charmasters-log/biochar-action-learning-circle/. The browser's address bar also shows a search for "Biochar Action Learning circles". The website's header features the Biochar Project logo, which consists of a stylized tree with green leaves and a blue hexagonal base, and the text "BIOCHARPROJECT" in large, bold, black letters, with "SPREADING THE WORD ABOUT BIOCHAR" in smaller, black letters below it. A navigation menu is located below the header, with links for "Home", "About us", "Community", "Charmasters Log", "Shop", and "biochar projects 2014". The main content area displays the text "You are here: [Home](#) > Biochar Action Learning Circle Another world first." Below this, the title "Biochar Action Learning Circle" is prominently displayed in large, bold, black letters. On the left side of the page, there is a sidebar with a section titled "Biochar for Sale" and a sub-section titled "Charmaster Dolph Cooke uses and recomends Perfect Biochar from".

DISCOVER BIOCHAR

With Biochar Action Learning Circles

You will learn all about Biochar in a fun environment with practical theoretical and visual displays, working in a team like mode to assimilate all the latest knowledge available on this subject.

Who should attend:

This offering is most suitable for Permaculture students, Agriculture students, environmental sustainable folks, market gardeners and anybody who would like to learn more about how to use Biochar in their daily life

**Only 10 Places
available so please
ACT NOW!**

www.biocharproject.org

What you will receive:

- Biochar Revolution Book by Paul Taylor
- 4 Biochar DVD's
- Biochar Learning Circles Manual

If you already have any of these resources the price will be reduced

Cost is \$135, this includes resource materials.

Payment plans available with deposit \$75 with \$10 paid at each meeting

Contact:

dolph@biocharproject.org

Or call Paul Wildman

On: 0412027818

Sunflowers grown
using Biochar



Time: 2pm – 4pm

Date: 23rd July 2011

Place: Blue Knob Hall.

**Held on 6 Saturdays
over 12 weeks**

- 23rd July, 2pm-4pm
- 6th August, 2pm-4pm
- 20th August, 2pm-4pm
- 3rd September, 2pm-4pm
- 17th September, 2pm-4pm
- 1st October, 2pm-4pm









Nature our Model



Action Learning Circle Manual contents

Contents

<u>About Biochar?</u>	<u>12</u>
<u>What are the benefits of Biochar?</u>	<u>12</u>
<u>How is Biochar made?</u>	<u>12</u>
<u>How does Biochar help with climate change?</u>	<u>12</u>
<u>About learning circles</u>	<u>14</u>
<u>Organising, facilitating and participating in a learning circle</u>	<u>14</u>
<u>Scheduling your learning circle topics and meetings</u>	<u>16</u>
<u>Expressing the outcomes from your action learning circle</u>	<u>16</u>
<u>Choosing your LC topic</u>	<u>18</u>
<u>Your Biochar stories and experiences - Yarnswapping</u>	<u>20</u>
<u>(Y)our Biochar: action learning circle evaluation</u>	<u>21</u>



The Action Learning Circle topics

- Learning circles Topics
- T1 ~ Understanding Biochar – Black is the new Green
- T2 ~ Unlocking the Potential of Biochar
- T3 ~ Understanding Community Biochar Development
- T4 ~ DIY Biochar Retort
- T5 ~ DIY Biochar Right Livelihood Enterprise
- T6 ~ ‘Ecochar’ – changing our world through the sustainable use of Biochar
- T7 ~ Biochar - Improving Australian farming practices
- Start at any topic and work through them in any order your LC decides
- Each topic divided into the same sections: learning objective, topic guide, background (this relates each topic to sections of Paul’s book), task/action & evaluation
- This is called *structured informal learning*.
- Here we seek to tread a third path. One between Education and Training, between School and TAFE, in Australia both are heavily ‘top down’. This third path is the path of ‘Adult Learning’, here ‘bottom-up’ DIY Learning Circles
- LC’s are a recognised form of Life Long Learning within ACE – Adult and Community Education. They sit along side yet are largely distinct from: Affinity Groups, and Communities of Practice <http://studycircles.net.au/Content/2011/07/biochar-action-learning->



Putting 'Stumpy' to work

Nundah Men's Shed Biochar Burn 06-2014





Resources: Here's to ~ (y)our Stumpy Gasbottle TLUD
Biochar Retort may it have many happy re-burns of the
day!! (**show**)

We don't use old
growth forests
Too much BC (>50%)
can make your garden
alkaline and plants
like mildly acidic
conditions
Finally while BC is
not a 'silver bullet', I
reckon it sure can be
part of a 'black magic
pudding' that Nature
can live with.



Re-Greening

Gardening With Biochar FAQ

Compost Toolbox

Other Useful

Web Sites

(IBI) International Biochar Initiative

Australia NZ Biochar
European Biochar Certificate
Japan Biochar Association
SE Asia Biochar
US Biochar Initiative
PNW Biochar

UC Davis Online Biochar Database
Green your Head
Biochar.info
Biochar.org
Biochar Farms
Biochar Project
Cornell University Biochar
Biochar Inoculants Project
Gardening with Biochar FAQ
GEO TP Rooftop
Mushroom Compost
Open Source Ecology Biochar Pages
Organic Biochar Development
Planet Biochar (Wiser Earth Network)
Renew-the-Earth.org
Soil Quality

Biochar Fest Mullumbimby Australia

Submitted by Erin Rasmussen on July 24, 2014 - 1:59pm



September 5, 6 and 7, 2014

Mullum Civic Hall and Mullum Community Gardens, Mullumbimby Australia

Bio-char Fest is in it's second year after a successful launch last year at the Mullumbimby Community Gardens Living Earth Festival where over 6000 people attended the day. This year the event aims to link the Bio-char, Carbon Farming (Hemp and Bamboo) and 3D printing industries with the view of capturing carbon in our soils, housing, consumer products and thus being one of the solutions to global warming whilst developing a more sustainable economy.

More info: <http://www.bio-charfest.org>

Lukas Van Zweiten of NSW DPI and Stephen Joseph from AnthroTerra and one of the original founders of the International Bio-char Initiative are heading up the bill.

Bio-Charfest Mullum - September 5, 6 and 7, 2014 Mullum Civic Hall and Mullum Community Gardens, Mullumbimby Australia
<http://biochar.bioenergylists.org/>



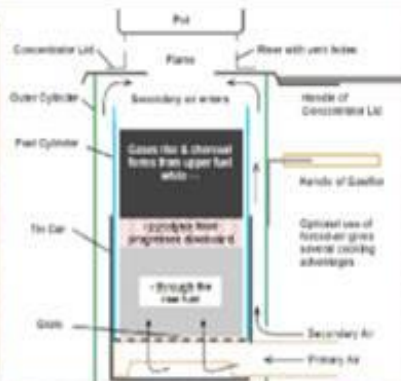
Paul Taylor PHD

Technically, biochar science is complex and evolving but its essence is straightforward. If you heat any biological material to a certain temperature & restrict or exclude oxygen, a process called **pyrolysis** occurs. The material changes form and we get 2 useful end products, charcoal & gas which can be used to generate electricity.

The charcoal end-product has remarkable qualities. When added to soil the charcoal is called **Biochar**. It amends and improves the soil for the long term, increasing crop yields.



copyright: Gaia Films



Paul Wildman PHD Economic & Adult Learning-

Places Biochar within the context of a sustainable and resilient community economy by integrating learning centres, giving ourselves permission to realise we can change things.



Biochar Seminar & Workshop

Paul Wildman PHD
Paul Taylor PHD

Biochar Seminar. Workshop & Lectures

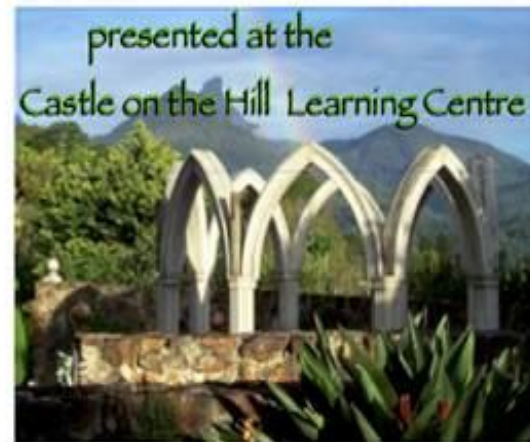
Paul Wildman PHD presents
"Designing a Resilient Community Economy
Incorporating BioChar" 1.Hr.09 min.

Paul Taylor PHD.
Describes & demonstrates fully the process of creating
quality BioChar and it's agricultural and planetary benefits.
1.Hr.57 min.

"Biochar may represent the single most important initiative
for humanity's environmental and agricultural future."
-Tim Flannery, 2007 Australian of the Year, Scientist, Explorer
Author of the Weather Makers.



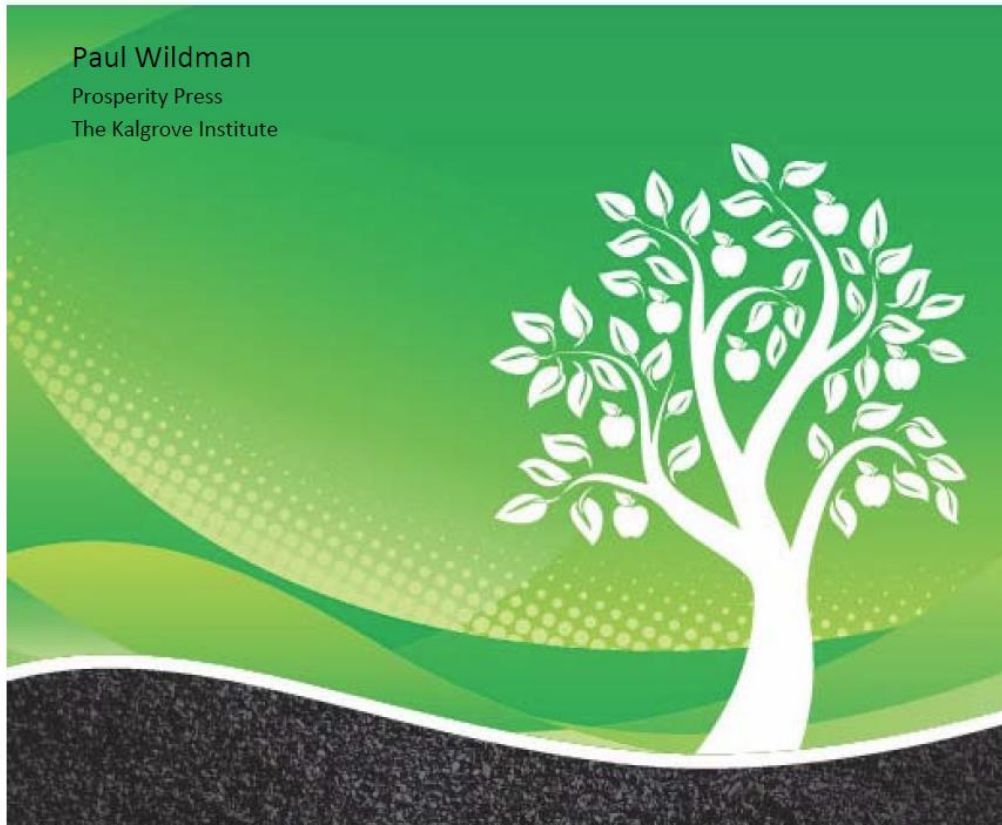
presented at the
Castle on the Hill Learning Centre



The Biochar Revolution

Action Learning Circles for
Transforming Agriculture & Environment

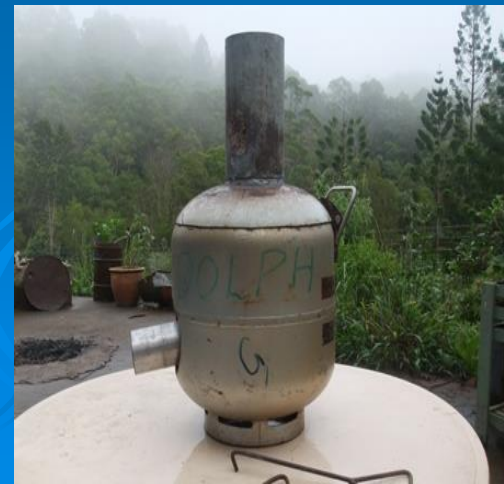
Paul Wildman
Prosperity Press
The Kalgrove Institute



~~ Biochar - learning circles for a future Nature can live with ~~

Biochar linking to the big picture

- **Immediate use** – litany – gardening, smoothies
- **Socio-economic issues** – has not been captured (yet) by the corporates
- **Paradigm** of thinking – localism – DIY learning circles – bottom up development
- **Story** – Tim Flannery, as I mentioned earlier, The Biochar way is another way of seeing the world and helping Gaia
- We can also look at Craft this way - in four layers
- OK now we have nearly finished please take a couple of minutes to chat to the person next to you about Biochar – something you have learnt tonight, something you have tried with Biochar, something you would like to try. In the US these are called 'pack and takes'. Then try it over the next month and at your next BOGI meeting see if you can find that person and compare notes.



A systems perspective on our Men's Shed 'Old Mate Stumpy' Gasbottle TLUD

- Technical System
- Socio-technical system Emery, F. (1993). Participative Design for Participative Democracy. Canberra, Australian National University.
- Social system
- Eco System – green stuff (black is the new black!)
- Eco-Socio-Techno system =???
- Biochar then is.....
- For me once 'social' is mentioned 'learning' is implied as in SocialLearning
- CRAFT in its big picture is also such and thus the advent of www.crafters-circle.com
Our first issue was on Biochar three years ago.



Thx and contacts:

~~phil varyd~~ (BOGI - science of Biochar): phil.vardy@hotmail.com

<http://bogi.org.au/>

~~dolph cooke~~ (Biochar): dolph@biocharproject.org <http://biocharproject.org/>

Stumpies can be purchased through www.biocharindustries.com

~~jamie & les spencer~~ (Keyline & Yoghurt Soil) lspencre@gmail.com

<http://www.laceweb.org.au/lns.htm>

~~rassel chisango~~ (Biochar in Zim): royalyouthorg@yahoo.co.uk

<https://www.facebook.com/pages/International-Young-Professionals-Foundation/204584276243007>

~~paul wildman~~ (Biochar Action Learning Circles & Adult Learning): Mob 0412017818 paul@kalgrove.com <http://www.kal.net.au/home/> top left click Adult Learning, & (y)our CRAFT eZine www.crafters-circle.com Issue 1 was on Biochar

Finally: a poem I developed from Dr. Ian Lowe's 'Biochar Poem' he read at the 1st Asia-Pacific Biochar Conference Gold Coast, May 2009, <http://www.biochar-international.org/node/565>



Ode to Biochar I call it an *Bi'O'de'Char*

- Phil's got a summary of my talk
In case you slept or took a walk
We know our civilisation's through
Unless we suck back on our CO₂.
- It won't matter how we toil
If we don't put carbon black in our soil
And so our future's deeply marred
Unless, you've guessed it, we all get Biocharred!
- May I remind you, that climate changes
Threaten with many clear and present dangers
We know we have no future here
Unless we fix our atmosphere.
- Sure clean energy will have a role
Yet fixing carbon will be our main goal
So no matter who you are
Let's raise our glass to Biochar!
- ~~*thank you*~~



Dear Reader: End (following are Appendices not included
in the Original BOGI presentation



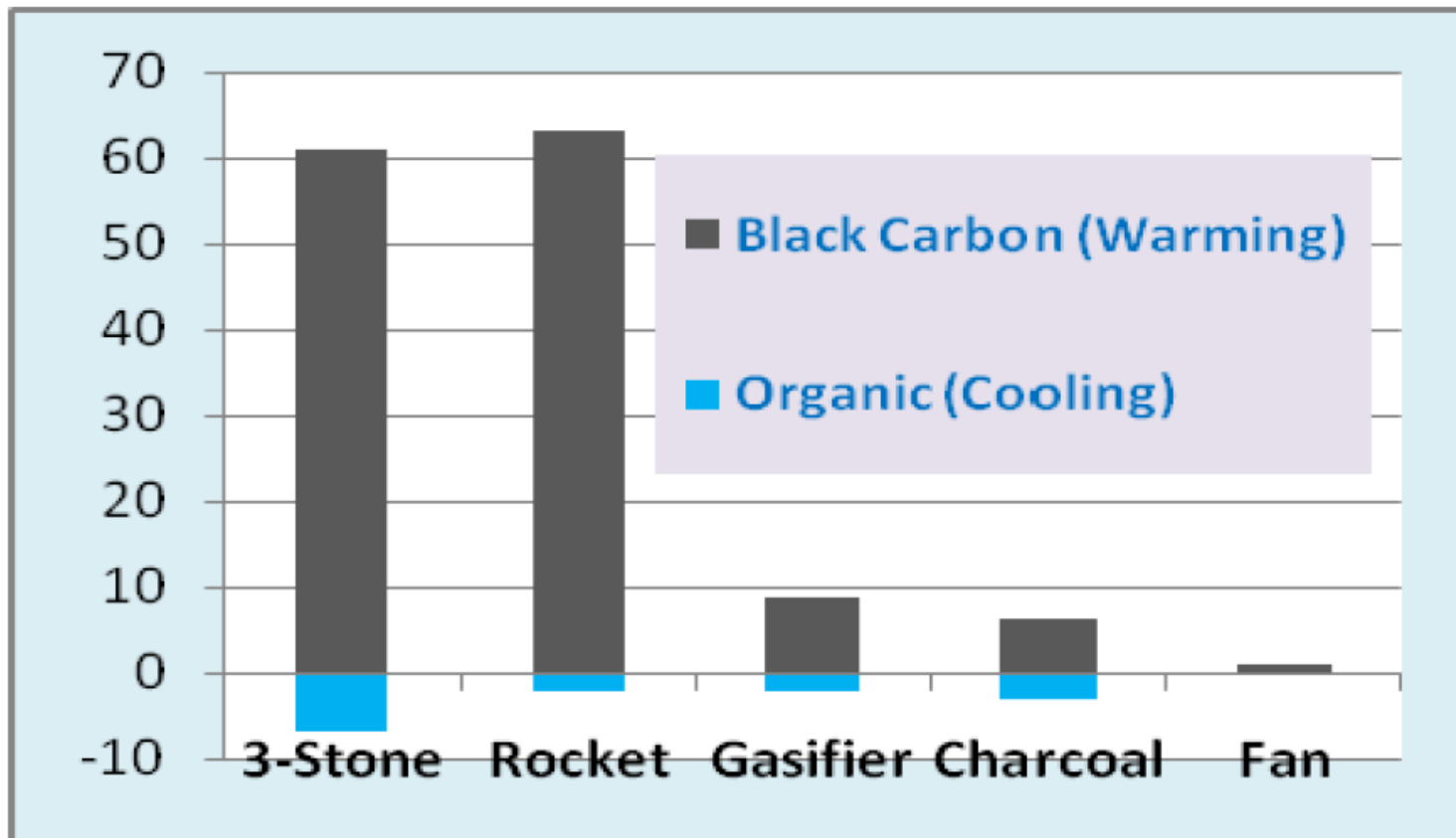


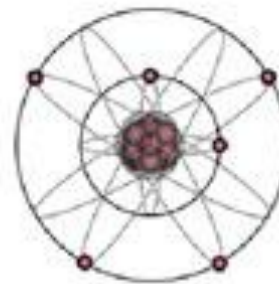
Figure 2. Grams of CO₂ equivalent per liter of water boiled and simmered for 30 minutes for five different stoves. The black carbon (soot) warms the atmosphere and the organic carbon has an atmospheric cooling effect. The fan stove also reduced the time to reach boiling. This graph is adapted from a report on measurements made at the Aprovecho Research Center 2007. The conclusions have been confirmed and expanded in a series

Black carbon is atmospheric (soot - global warming) whereas organic or **soil** carbon is terrestrial (**Bio**char in effect – carbon sequestration in soil which thus helps cool the planet)

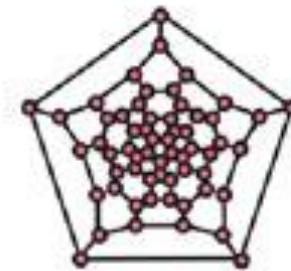
- Organic molecules also resonate into pentagonal and hexagonal forms at the mesoscopic level.

- Carbon-12
(12% of body)

Carbon-12 Geometry



^{12}C Fullerene Connectivity Map

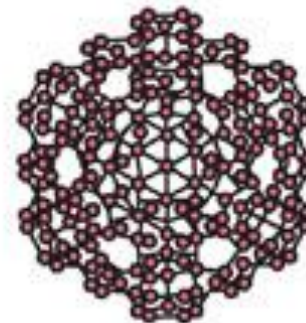


- Water
(87% of body)

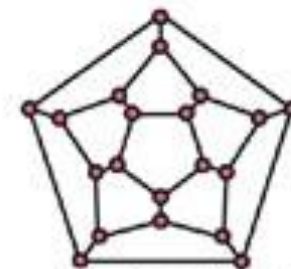
Tetrahedral Groups



Icosahedral Clusters



Pentagonal Superclusters



Credit: M. Chaplin

BioChar ALC Overall Guide V10 01-02-2011 - Microsoft Word

Table Tools

File Home Insert Page Layout References Mailings Review View EndNote X4 Acrobat Design Layout

Clipboard Font Paragraph Styles

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BioChar Action Learning Circles

~~ BioChar - learning circles for a future Nature can live with ~~



Paul Wildman
Because learning can be fun
paul@kalgrove.com
<http://www.kalgrove.com/adultlearning/>



Paul Taylor
Transforming Agriculture & Environment
potaylor@bigpond.com
http://biochar-books.com/The_Biochar_Revolution



Dolph Cooke
The planet is our canvas
dolph@biocharproject.org
<http://biocharproject.org/>
[\(Y\)our BIO CHAR Project...](#)

Page: 2 of 22 Words: 7,098

100%



The Millennium Project

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15 Global Challenges

15 Ways You can Participate

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(Global and National SOFIs)

Real-Time Delphi(RTD)

Global Lookout

Environmental Security

Futures Matrix

Internships

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The Millennium Project was founded in 1996 after a three-year feasibility study with the United Nations University, Smithsonian Institution, Futures Group International, and the American Council for the UNU. It is now an independent non-profit global participatory futures research think tank of futurists, scholars, business planners, and policy makers who work for international organizations, governments, corporations, NGOs, and universities. The Millennium Project manages a coherent and cumulative process that collects and assesses judgments from over 2,500 people since the beginning of the project selected by its 40 [Nodes](#) around the world. The work is distilled in its annual "State of the Future", "Futures Research Methodology" series, and special studies.



MP participants in Millennia2015

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1. Latin America 2030 Scenarios Study
2. Global Climate change Situation Room
3. Millennia 2015
4. UN World Water Scenarios
5. Prime Minister of Kuwait's Early Warning System
6. Monthly International Environmental Security Reports
7. Online course "Azerbaijan Foresight"
8. Updating and Improving 15 Global Challenges

MP Publications

Millennium Project reports provide context for global thinking and potential for better understanding how humanity could work together to improve the human condition.

2010 State of the Future



"Invaluable insights into the future for the United Nations, its Member States, and civil society."

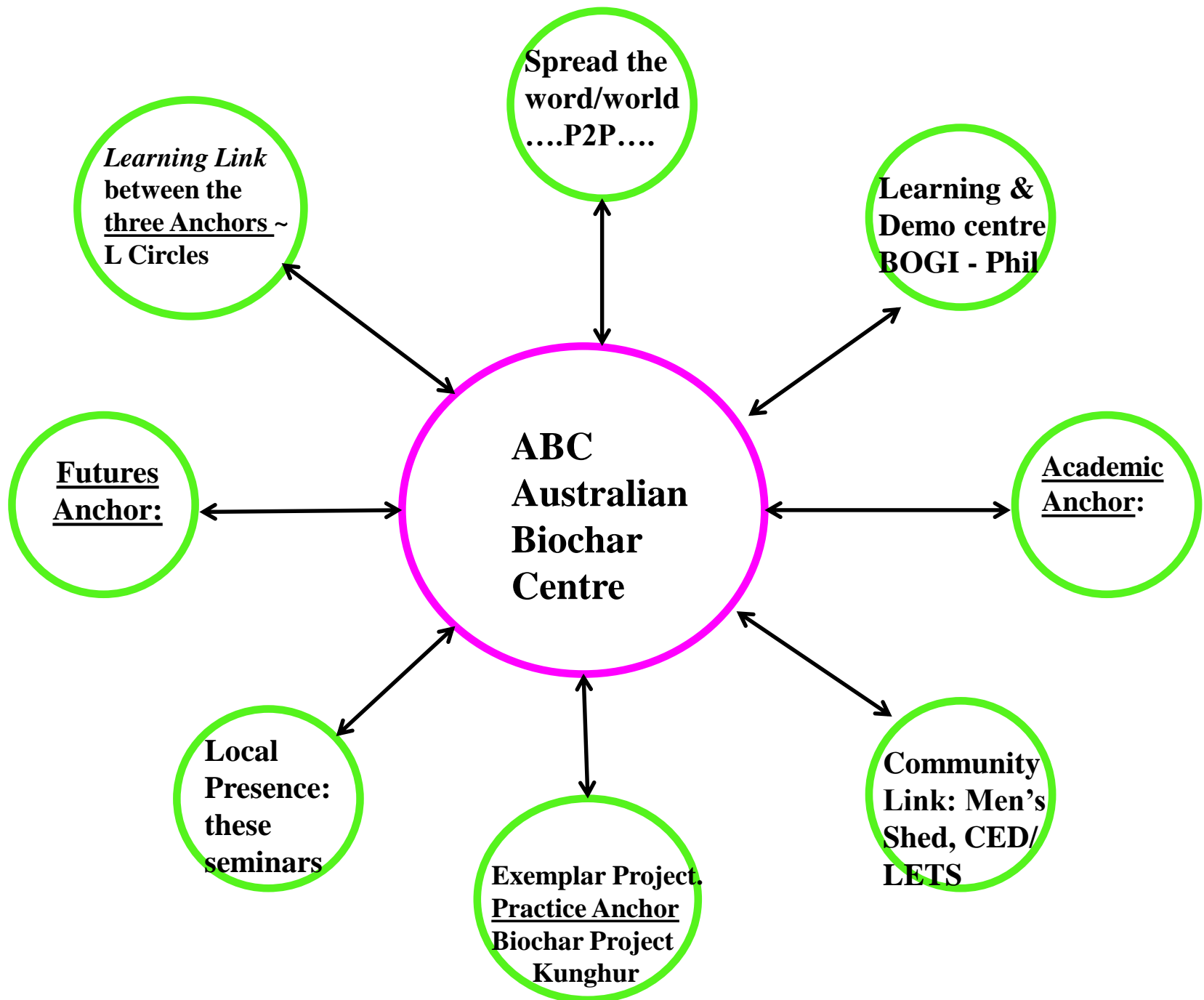
Ban Ki-moon, Secretary-General, U.N.

Futures Research Methodology Version 3.0



Some key Learning Circle links

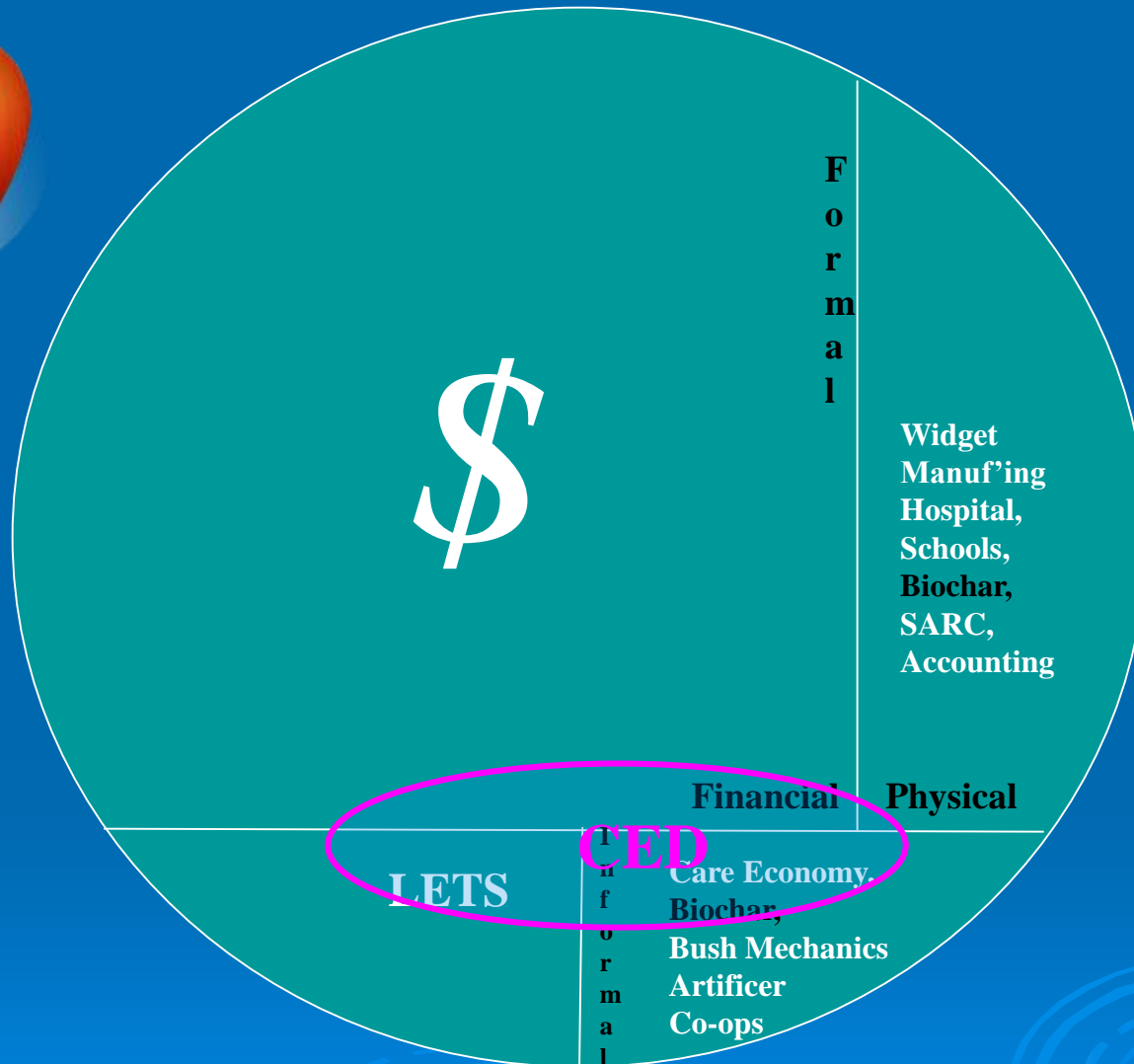
- **[5] About Learning circles**
- Around 10 people
- Who meet regularly 'around' a particular topic much like our ancestors did around a campfire
- To discuss and learn about a topic of interest to them and their community
- Generally there are around 5 meetings over a period up to 3 months
- Each meeting is around 2 hrs with food 3 hrs
- The first couple of meetings are facilitated then the **LC** members take over this role and it rotates from meeting to meeting
- (Y)our Biochar **LC's** meet fortnightly with some BC actions/homework/actions in between – that's why we call them BC Action Learning Circles as we learn collectively from our individual actions
- A LC is not a lecture, seminar or tutorial there are NO experts and no one controls the show or sets the agenda – no one is in charge, or sets and exam or marks your work this is something you do P2P
- LC's are BIG in Europe esp. Scandinavian countries where the stream up into community colleges – this is called associationalism and is crucial in a democracy
- Technically this is called *structured informal learning*



Some key CED insights a 4 sector model



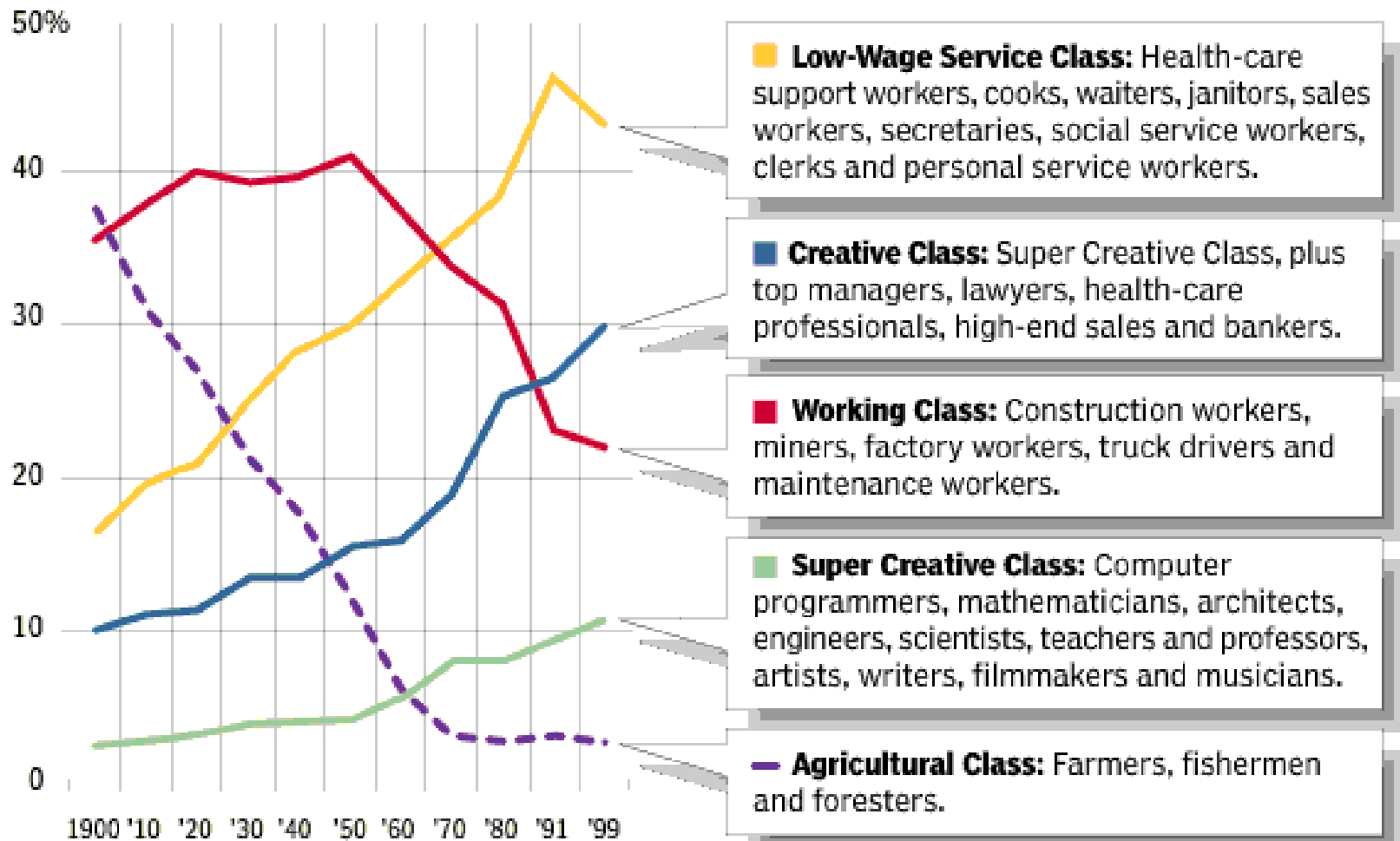
Some key CED insights a 4 sector model- how it is



Growth in Creativity Employment

The growth of the Creative Class in America, 1900-99

Percent of total work force by year, 1900-99



Source: "The Rise of the Creative Class," by Richard Florida/Kevin Stolarick/Bureau of Labor Statistics/U.S. Census

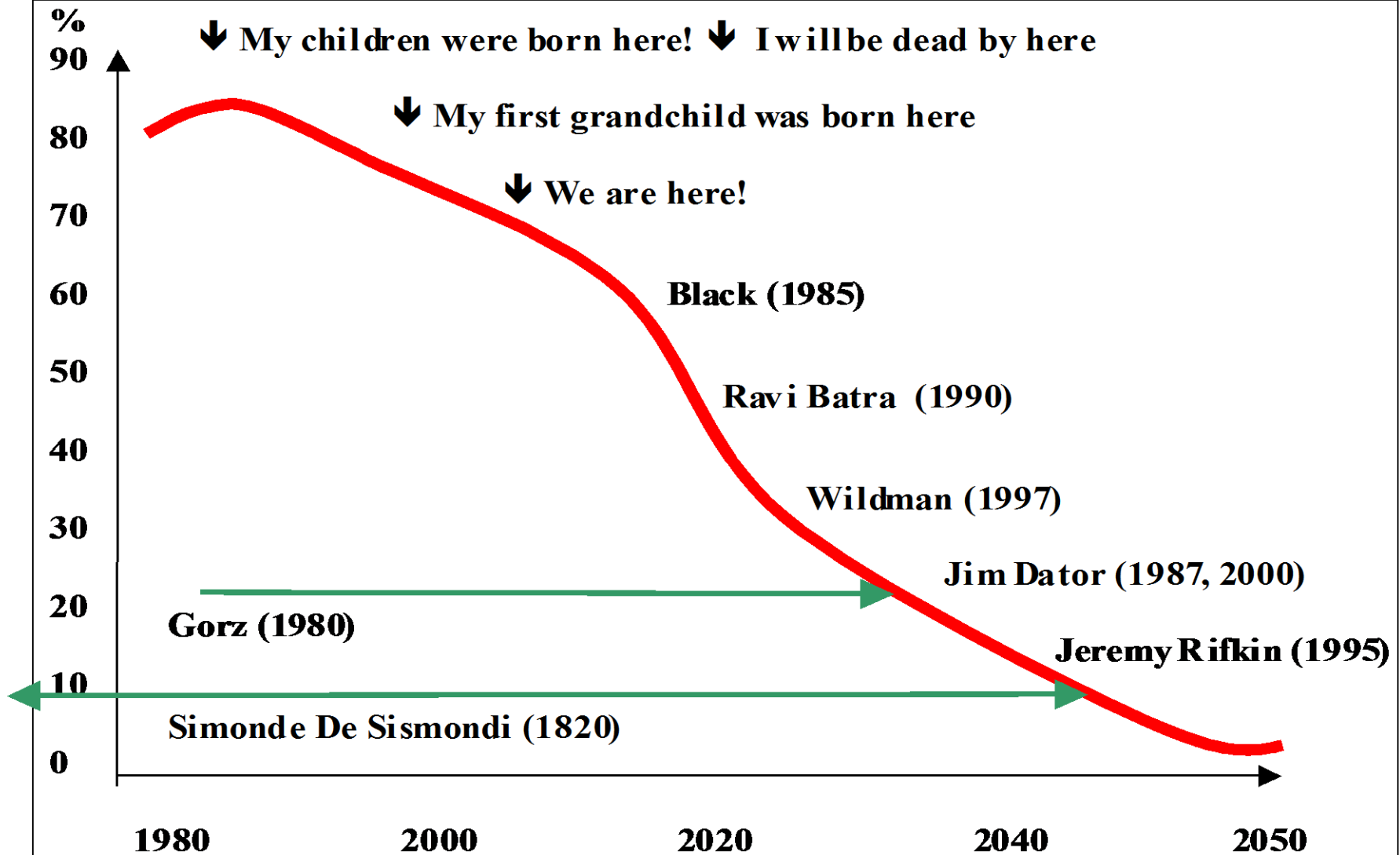
The jobs future as an automated crank

As far back as 1819 the famous British economist David Ricardo wrote that the amount of employment in an economy was of no consequence, as long as rent and profits, out of which flowed its new investment were undiminished.

Indeed? Replied Simonde de Sismondi a well-known Swiss critic of the times, 'Wealth is everything? men are absolutely nothing? What? In truth then, there is nothing more needed than that the king, remaining alone on your island, by constantly turning a crank, might produce, through automata, all the output of England.'

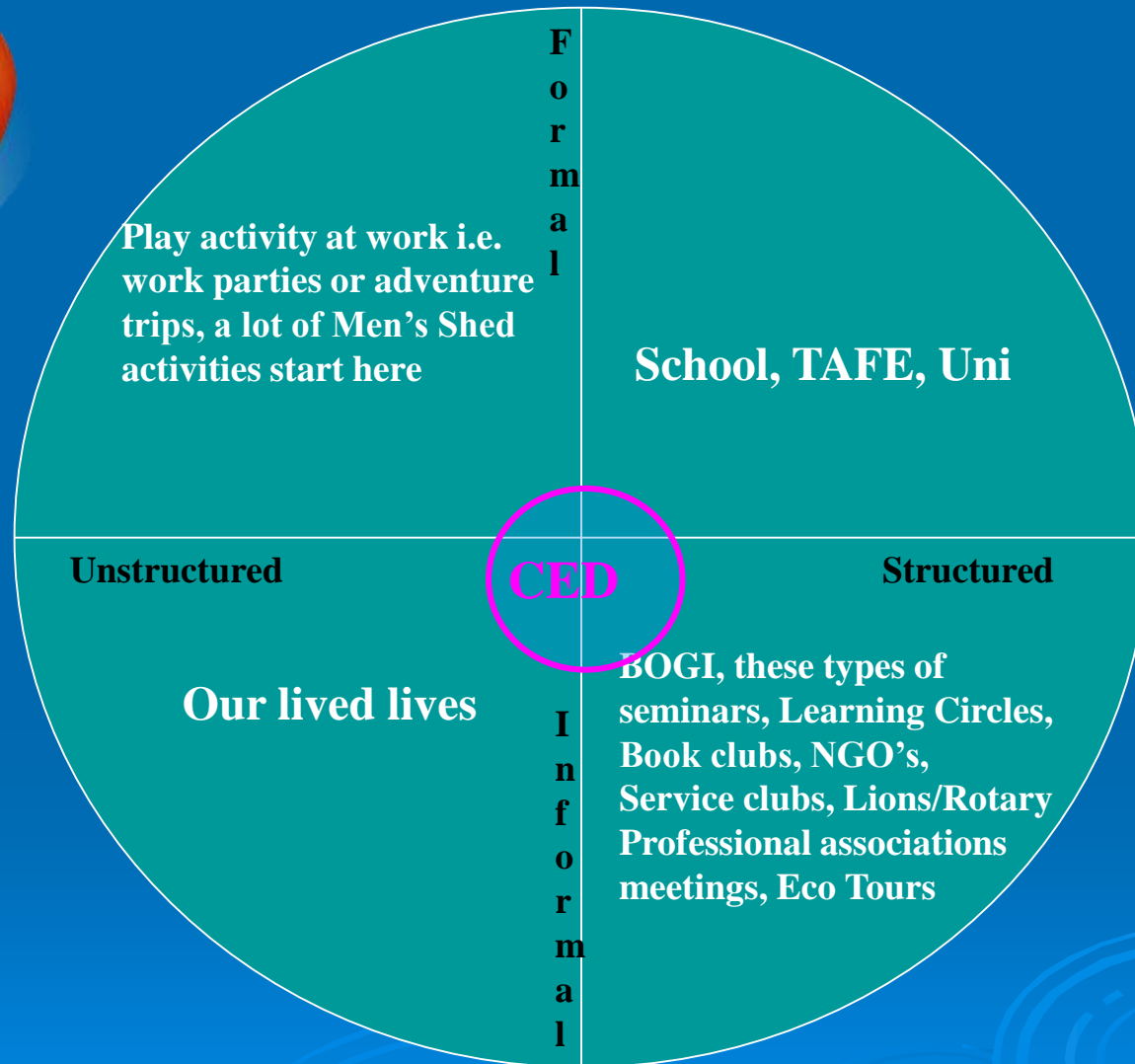
When this is combined with the emergence of sentient technology by 2035 we see the potential for massive dislocation, even in stable economic times, for our grandchildren (as the next graph shows)

% Employment 1980-2050
[M+F; F/T Equiv; Western Industrialised world]

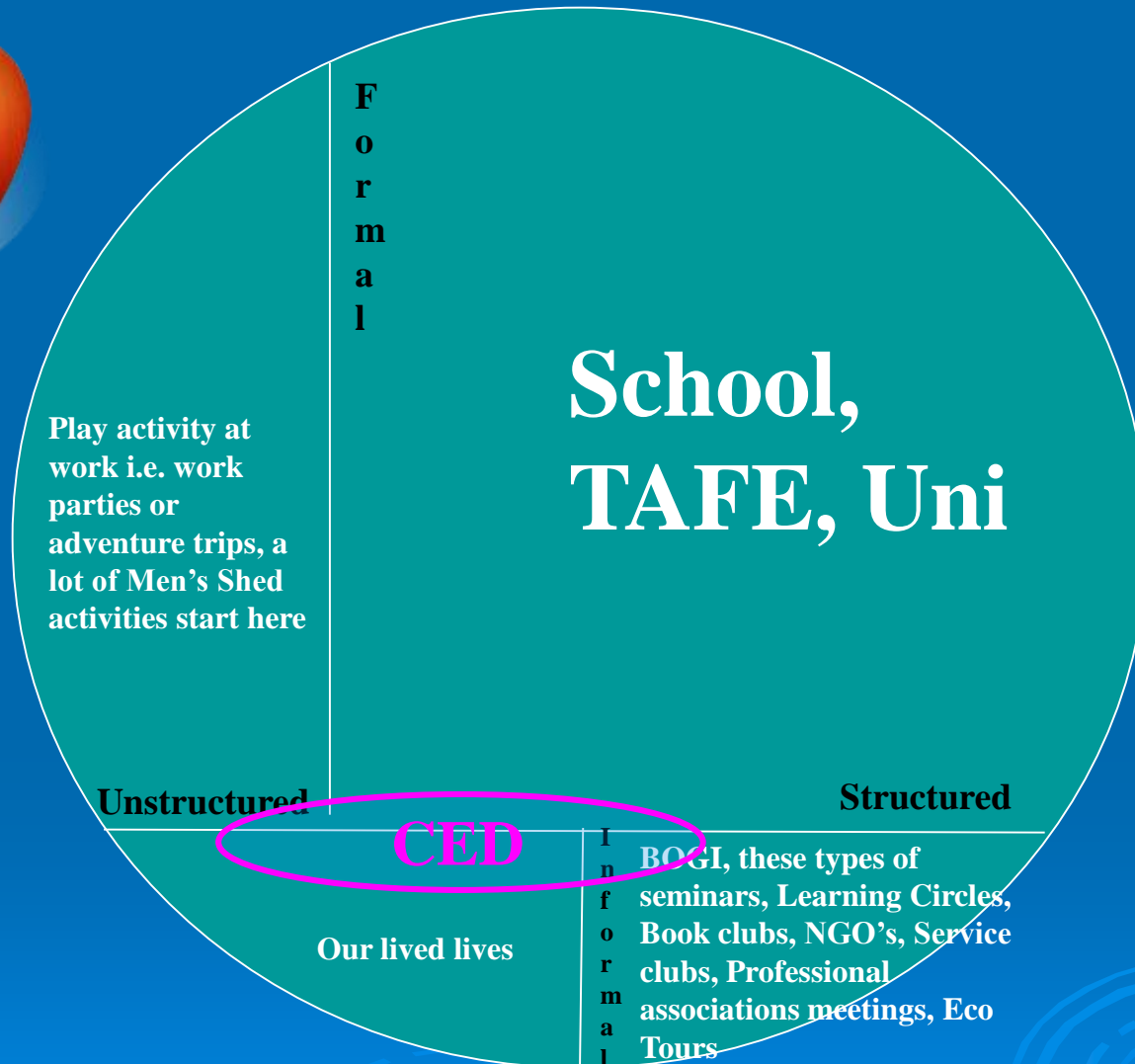


Source: P Wildman 9-02 drawn from my research & the various authors indicated

Some key L'Circle insights a 4 sector model



Some key L'Circle insights ~ how it is



Some key Learning Circle links

- Key resources in this region for the community economy are: LETS & Learning
- So as I say 'buy the bank' to 'build the school'
- Kindly put, these days we are told what to learn and education is one thing that is pre-digested for us
- This means we are seldom active in resisting, critiquing and building alternatives to these what I call 'GM' Governmentally Modified messages. Tragically education, esp. at Uni, has allowed itself to become complicit in this 'mushrom-ing' of reassurance, platitudes and hyper-consumption
- We passionately believe that Learning circles have a big role to play in addressing this global predicament we find ourselves bogged down in
- Learning circles can form the basis of eco-social activism both individually and collectively – and the Biochar **Learning Circles** is a great place to start

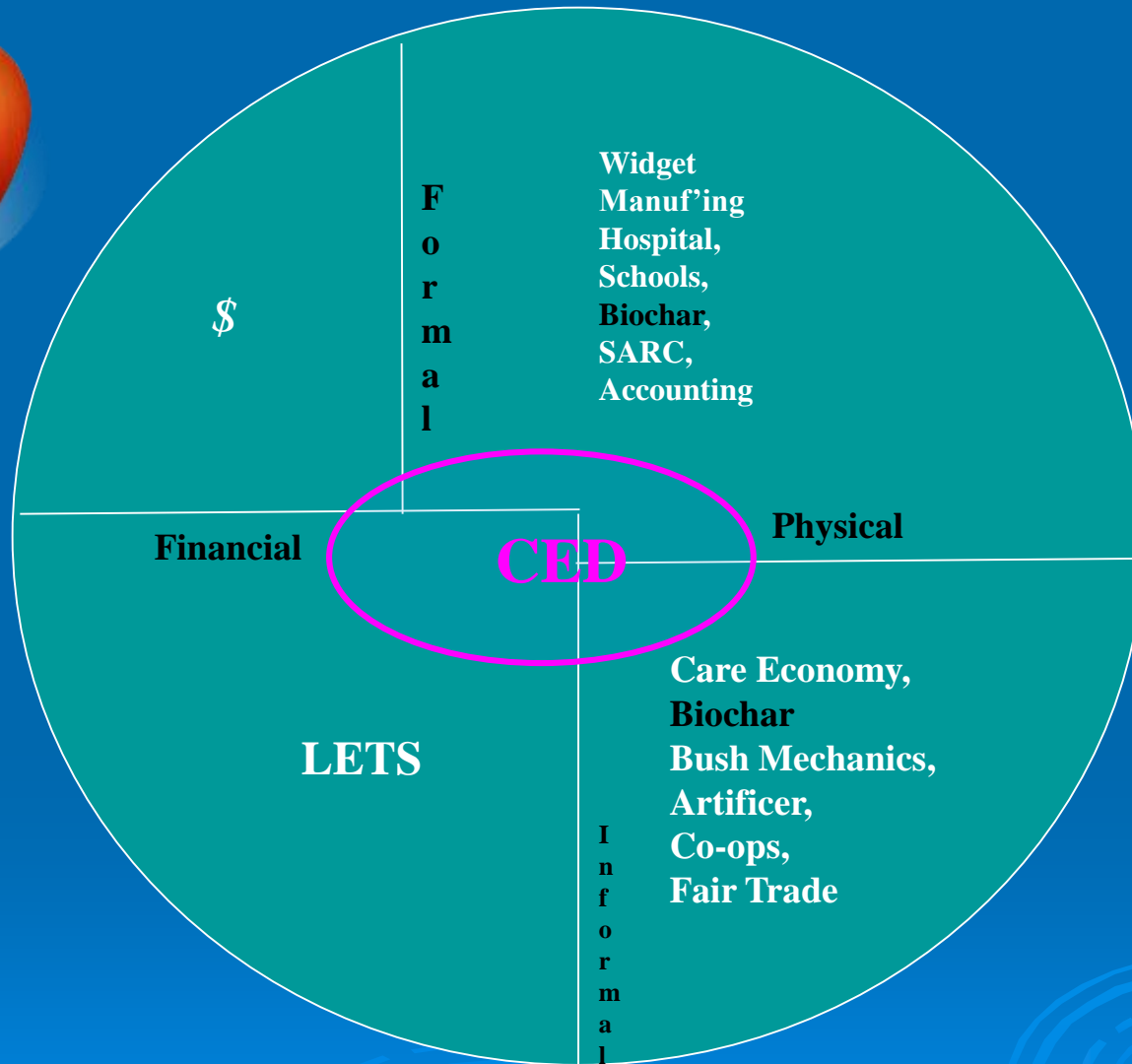
CED Biochar L'Circles – 'Pack and Takes'

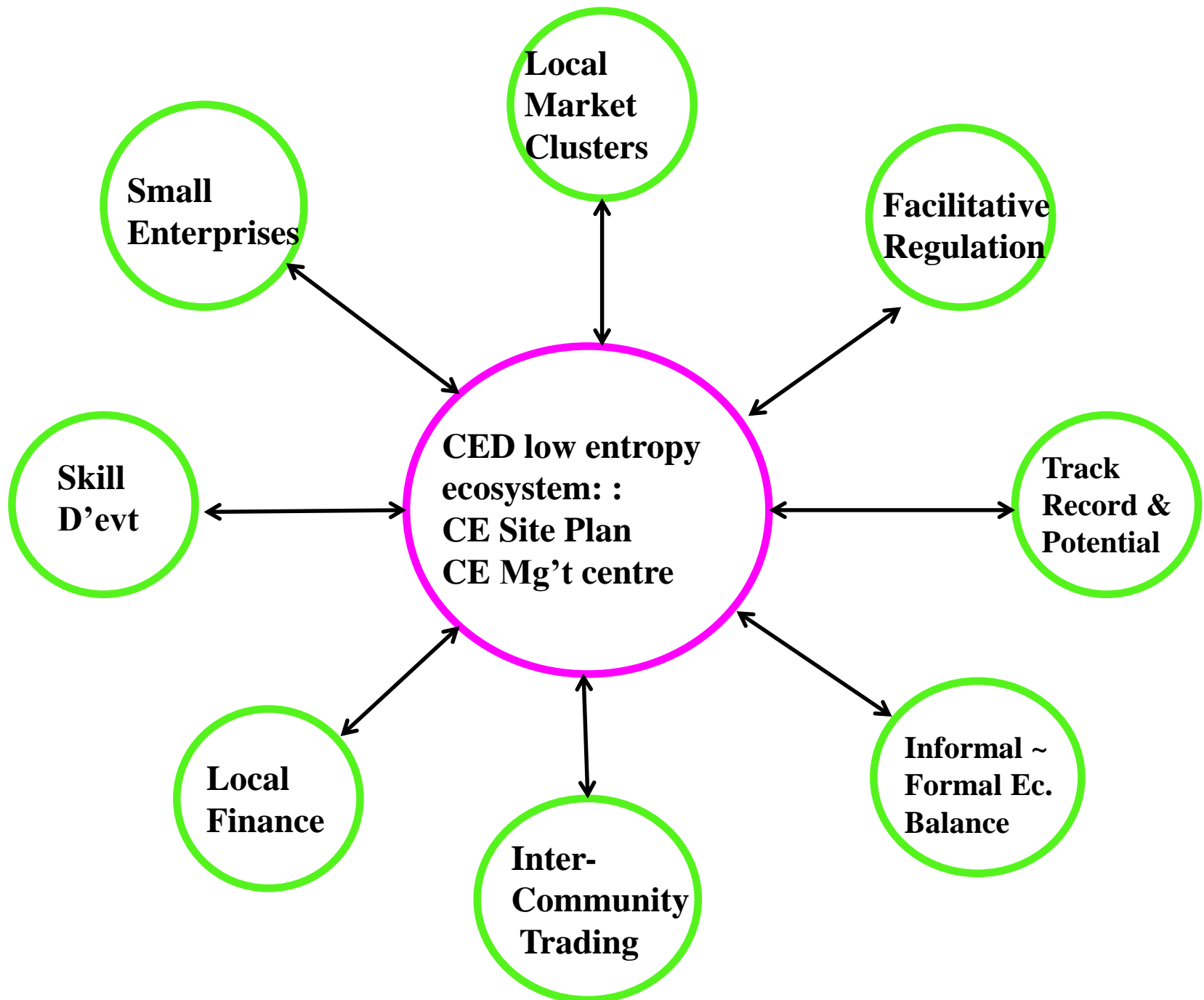
- Pack and Takes: 1 Small steps count e.g. *Hydrochar*
- 2 **CED** is about more than co-ops it is based on economic cooperation & balancing the **Green Circles**
- 2 Take a local economy systems approach **Green Circles** → **Green Wheel**
- 3 **Biochar** can be the new economic black so to speak
- 5 **Biochar Learning Circles** can help you get up close and personal on your own private date with Paul's book and **Biochar**
- 6 let us know if you would like to form a circle
- Questions – **CED**, Learning Circles
- Examples e.g. *Hydrochar*, your examples.....
- Links – you your work, our work, and the SARC
- Next Step??
- Thanks - paul@kalgrove.com

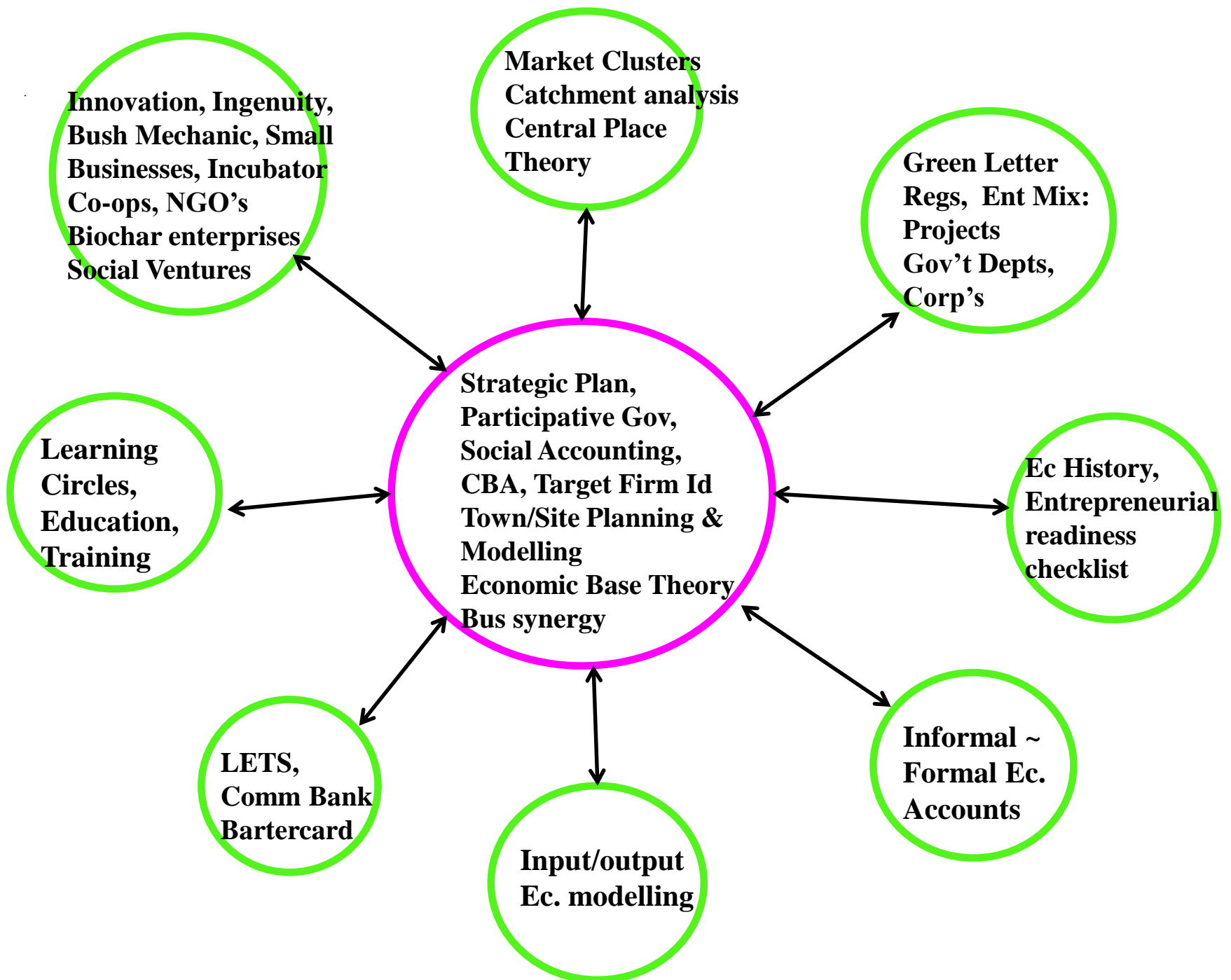
CED ~ Biochar ~ Learning Circle Refs

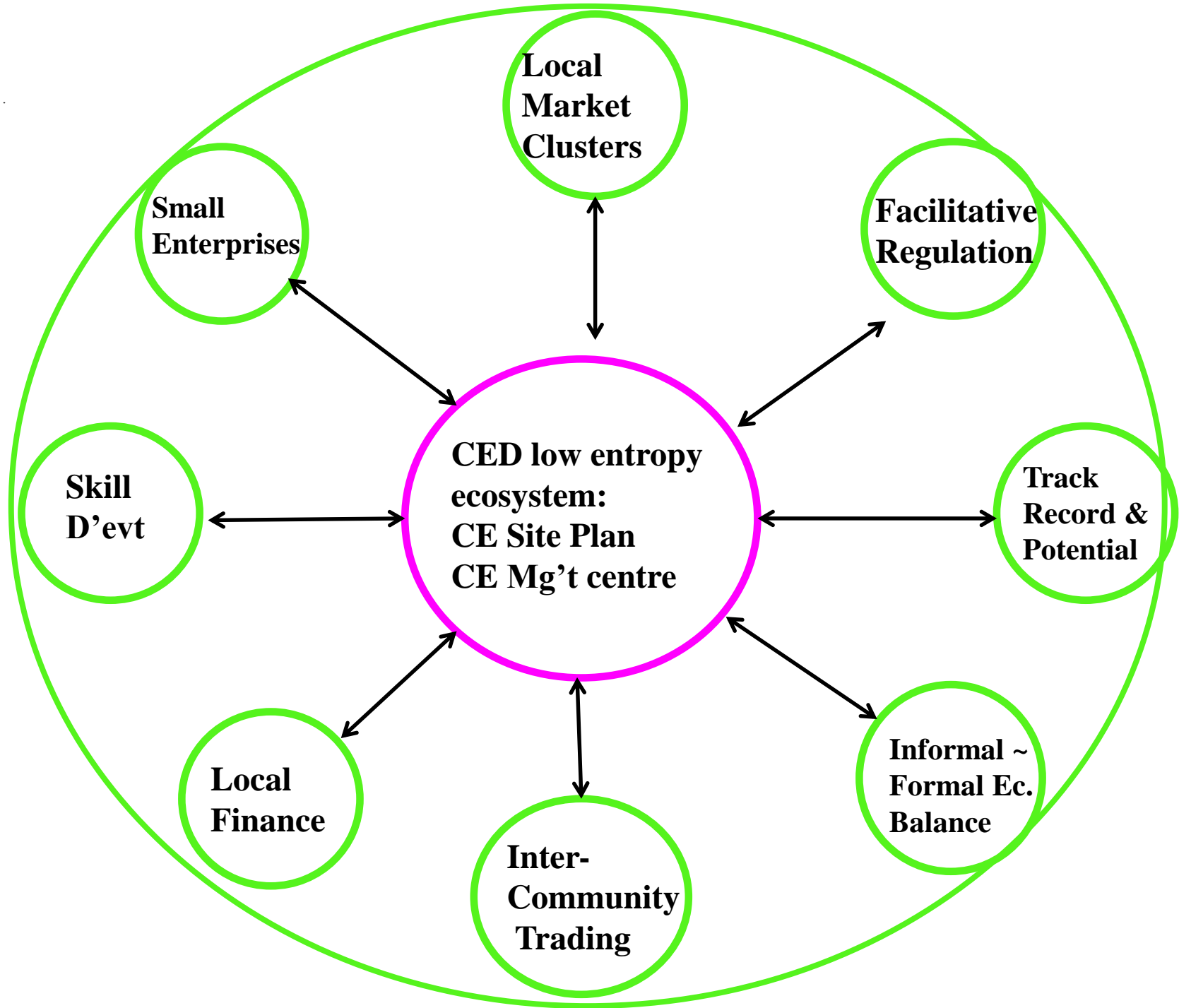
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Some key CED insights a 4 sector model- how we want it











Some key CED insights a 4 sector model- how we want it

