MACCY BIOCHAR MEMBER BULLETIN

No. 8 - May 2020
Auspiced by the Macclesfield Community Association Inc.
Email: maccybiochar@adam.com.au
Website: www.maccybiochar.com

HELLO ALL.
Welcome to our 8th Member Bulletin.

This bulletin celebrates the commissioning of our new kiln and describes the methodology we use to claim the amount of carbon dioxide we are capturing.

NEW KILN GOING WELL!

Maccy Biochar's new kiln got its first chance to make biochar for Macclesfield recently.

Funded by a community grant from Mt. Barker Council in late 2019 it was made for us by Macclesfield fabricator Firth Engineering. Now we can really get serious about taking action against climate change by making biochar to capture carbon and improve local soils. The carbon captured can be offset against your emissions and so help move Macclesfield to carbon neutrality.

SMALL KILNS NOW AVAILABLE

Now that our large new kiln is operational the 2 small kilns are available to members to borrow to make biochar on their property for their own use. In return we simply ask for written advice of the quantity of biochar made (in litres); confirmation that it was made in our flame-capped kiln; and an estimate of the number of litres of petrol (if any) consumed by the process (eg vehicle use; water pump etc). Then we will add the production volumes by members to our group total.

MOBILE KILN

Our application for a $5000 environment grant for a new mobile trailer-mounted kiln was unsuccessful. So if bushfire victims with excess burn heaps want our help we will consider going on to their property and simply collecting wood for biochar production at Shady Grove road.

NEW MEMBERS

Welcome to new members Dean Hewlett and John Agnew of Macclesfield.

BIOCHAR SCOREBOARD

The scoreboard below shows the score as at 18 May 2020.

MACCYBIOCHAR	SCOREBOARD			
at		18-May		
YEAR	2019 *	2020	TOTAL	Units
BIOCHAR PRODUCED	1720	1735	3455	Litres
CARBON CAPTURED	222	225	447	Kg
NET CO2 CAPTURED	0.775	0.709	1.484	Tonnes
TOTAL KWHR OFFSET	1.520	1.390	2.910	MWHr

* Re-calculated based on 3rd party biochar analysis dated 19/4/20

These values are based on the analysis of our biochar by Bygen Pty Ltd; a calculation of dry bulk density of the biochar inferred from these results; plus a measurement of the actual bulk density as packed.

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BULK DENSITY, CARBON & CO_2

Bulk density is defined as weight per unit volume. Eg. kg/m³. The bulk density will depend on material density; particle size; and packing density.

Material density will depend on material content and the density of each of the materials making up the whole. In the case of biochar the materials will be water, char, ash and residual volatiles.

Particle size will depend on size of wood used, extent of breakdown during the process; and extent of intentional crushing.

Packing density (number of particles per unit volume) will depend on particle size and mechanical factors (eg tamping down; shaking; settling over time, etc.

Actual bulk density:

Actual bulk density is the bulk density of the material as made; as bagged; as is. It can be measured directly by sampling the finished biochar, collecting in a container of known volume and weighing the full and empty container to obtain the weight of the biochar for that volume. Of course the value will vary according to moisture content.

Recent measurements of our biochar using 4 samples of 15 litres each (taken from a batch produced last year and stored over summer) gave us an actual bulk density of 333 kg/m³. So 1 tonne of that biochar would occupy a volume of 3 m³.

Dry bulk density*:*

Dry bulk density is the bulk density with all moisture removed. In practice this is rarely the case. But dry bulk density is a necessary measurement to have in order to calculate the weight of carbon inherent to a quantity of biochar AND therefore the weight of atmospheric CO_2 avoided by the biochar.

Dry bulk density needs to be measured by heating a known volume of biochar at 100C until all the moisture is removed. (NOTE: Drying it in a hot atmosphere will evaporate most but not all of the moisture).

Dry bulk density can also be derived from the actual bulk density AND the measured % moisture content of the biochar. The latter measurement was recently carried out by Bygen Pty Ltd on the samples we supplied and was found to be 51%. This was NOT loose moisture. It was inherent moisture.

If we use the actual bulk density value of 333kg/m³ and take 49% of that it will give us the dry bulk density.

So the dry bulk density (by inference) = 49% x 333kg/m³ = 163kg/m³.

Carbon captured per m³ of biochar:

The Bygen analysis tells us that our biochar is comprised of 79.4% carbon in its perfectly dry state.

Then the weight of carbon per m³ of biochar = 79.4% x 163kg = **129.4kg.**

Assuming that the particle size distribution and packing density are the same for actual and dry biochar then we can use this value for actual biochar as bagged.

Carbon dioxide avoided per m³ of biochar:

CO_2 is 3.66 times heavier than Carbon so the gross weight of CO_2 avoided per m³ of biochar = 129.4 x 3.66 = **473.7kg per m³ of biochar.** In practice we need to subtract from this value the weight of CO_2 we have generated in the process of making that biochar to obtain the net weight of CO2 avoided.

Summary:

So you can see the importance of tracking the value of dry bulk density of our biochar as we make it. This is something that someone with a suitable oven and weigh scales could do periodically (say once per 1000 litres). Any volunteers for this task? If so please call Kelvin on 0423 198 345 .

2020 JOB CAMPAIGN

Wood collection will continue through to the end of November. We are currently doing about 1 collection per week alternating between Tuesdays and Fridays.

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Tuesday Collection (once per fortnight). Team leader is Geoff Brockhouse. Mob: 0418 800 691.

Friday Collection (once per fortnight). Team leader is Kelvin Williams. Mob: 0423 198 345.

If you feel like having a day out in the fresh air picking up sticks just give Geoff or Kelvin a call to enlist for any given day.

Biochar production is usually each Wednesday weather permitting.

If you can volunteer your time once a fortnight for either wood collection or kiln operation please call the team leader for the day that would suit you best and advise him of your availability.

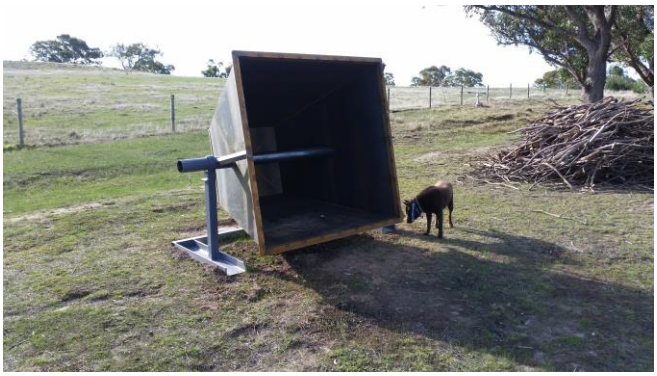
BUSINESS PLAN

The sales & marketing aspect of the business plan is on-going. Tony Huppatz has agreed to help with investigating sales prospects in our first target market – local councils. Thanks Tony!

FROM THE CAMERA

Kelvin will need a ladder!

Kelvin levels the kiln



Ready for first load but Buster is not so sure.

Loading for the first time

First burn

COMMITTEE MEMBERS at present are:

Brian Lewis – Chairman.
Kelvin Williams – Site coordinator; team leader.
Geoff Brockhouse – Team Leader
Kath Thurmer – Community Liaison.
Greg Marlu – Technical advisor.
Stephen Heading – Technical advisor.
Ivars Eglitis – Operator.
Meegan Semple – Viticulture liaison.
NB: All members are welcome to attend meetings.
Enquiries: Brian Lewis Mob: 041 148 0935

Making Maccy Carbon Neutral
Making Biochar for carbon capture and soil improvement