**The NORI-biochar plan – a discussion paper**

by Permachar, 16.10.2018

**Verification**

Issues with verification of Carbon content in biochar need to be addressed and NORI is working on it. Consultation begins in the first quarter of 2019. I would suggest using a portable near infrared (NIR) scanner to determine Carbon content of a biochar batch. This needs to be further researched and consulted on.

**Small batches**

In a small batch, the amount of biochar in that batch needed to make up 1 tonne of CO2 could be calculated and a partial Carbon Removal Certificate (CRC)(which could be exchanged for a partial token aka NORI) could be issued. However, this is not how the NORI system works at the moment but they are open to this possibility (Christophe Jospe).

**Many small batches = tonnes for verification**

In a co-op scenario, eg, a TLUD stove program, the amount of biochar produced collectively would be higher than individual small batches since biochar is collected via 'biochar collectors' and sold via the co-op. The co-op, essentially a stove manufacturing/biomass pellet/biochar hub becomes the 'supplier' of Carbon in the NORI system and receives CRCs (paid for by the 'buyer' with NORI which can then be exchanged for NORI). The same fuel would be used by most co-op members so the quality of biochar should be similar across batches as long as the stoves are operated in the correct way.

**Finance plans**

NORI could be purchased by an investor and ‘loaned’ to a co-op in order to purchase a 500W fibre optic laser cutter (possibly with NORI) that is used to produce the TLUD stoves and Flat-Tiki kilns Note that the laser cutter would need electricity to run – mains or possibly from a solar PV/storage system. The loan could be paid back over time to the investor as NORI is earned from CRCs generated from biochar production. Investor-philanthropists like Bill Gates (Microsoft) or Jeff Bezos (Amazon) could be willing to go for it! There are always Google, Apple and other tech giants as well who probably ‘get’ Carbon drawdown. Note that assuming the value of NORI increases over time, the investor might even make money once they get their NORI back from the co-op at a higher price than what was loaned.

**TLUDs**

Once the laser cutter is paid off, the cost of the stove/biomass pellets (fuel) could then be subsidised for stove users in the co-op in their stove/fuel finance plans. Eventually, when everything is paid off in the co-op, NORI earned could be redistributed back to stove users which could be used as an investment, traded for other cryptocurrenices or exchanged for cash at any time.

**Biochar kilns**

Less regular ‘pulses’ of biochar compared to the TLUDs would be produced but in larger volumes. When added together = tonnes of biochar for verification, CRC and NORI accumulation as well.

**-’Flat-Tiki’ Kilns**

Could be manufactured in the same hubs as the TLUD stoves using the laser cutter for production. Just need a press brake (nothing fancy) to do the top folds on the panels

Described in detail at permachar.net/links-resources

**-Cone shaped ‘Kon-Tiki’ kilns eg. The Kon-Tiki 1.2m, Kon-Tiki 1.6m**

Dr Paul Taylor describes these as the ‘Rolls Royce’ of biochar kilns (he did help invent them after all but seriously – think Rolls Royce – especially with an A-frame, heat shield and drain). Cleaner emissions during pyrolysis compared to Flat-Tiki. I’ve mentioned some of the strengths and weaknesses of Kon-Tiki V Flat-Tiki at permachar.net/links-resources

Since these kilns are made with rollers, cutters and welders, they wouldn’t need a laser cutter which avoids being dependent on a laser cutter finance plan (which is possibly difficult to secure). The kilns could possibly be financed via NORI loans as well. Otherwise funding from the usual sources: local savings/NFPs/Government/Embassy support to produce. These kilns could be made initially to generate interest in biochar and used over the long-term if the logistics of moving them around is worked out. Biochar produced from these kilns, as with the TLUDs and Flat-Tiki, could be added to the co-op generating CRCs and adding to the NORI supply for co-op members

-**Cone shaped pits** – based on the Hawaiian ‘Luau pit’

No metal, laser cutters, rollers, cutters, welders, benders required. Just hard work digging the pit and shovelling out the biochar. Biochar can be produced cleanly from these pits and also be used to generate CRCs and NORI

**Summary**

There are many more ways to produce biochar with strengths and weaknesses for all methods and technologies. Verification and auditing will be key for distributed biochar production. Co-ops will probably be the most efficient and transparent social and financial structures to integrate with the NORI system.

Any comments please send via the contact form at permachar.net/contact or directly via email to:

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Thanks for your support!!