



March 2013 News from the International Biochar Initiative

IBI Working to Identify Trends in Biochar Commercial and Project Activity

In February, IBI hired two interns to assist us in tracking and cataloging biochar-related commercial and project activity, respectively. Krish Homagain and Elaine Doyle will be working with us over the coming months to carry out web-based research, analyze data, and follow up with the diverse groups involved in developing a global biochar industry.

On the commercialization front, we have compiled a list of nearly 200 companies—in collaboration with colleagues in the biochar space—that purport to offer goods or services related to biochar. As a first step we are visiting company websites and collecting data including company location, focus and size; type, price and volume of biochar products; feedstocks and pyrolysis technologies; and other relevant data points. Using this information we will design further outreach methods to begin to close the gaps and identify emerging trends in this young industry. Ultimately we hope to produce a “state of the biochar industry” report to inform IBI members, investors, regulators and other stakeholders about the direction and evolution of biochar commercial activity. IBI feels that it is essential to provide accurate information, including trend information, on the state of the industry as a means to further the growth and development of this vibrant and growing field.

On the projects front, we are harmonizing existing IBI databases that collectively contain several hundred entries on biochar community, research, and other non-profit projects across the globe. We are initially mapping these out based on phase of project development, location, and scale. Subsequent activities will involve updating the database to track maturation of project activities and identifying projects that are replicable and economically viable.

Please feel free to contact us at info@biochar-international.org if you wish to include information on your biochar company or project or have ideas or contributions to help track activity in the biochar space.

IBI Biochar Certification Program Update

IBI is currently finalizing the *IBI Biochar Certification Program* materials and our internet-based certification system based on a final legal review of the Program. Pending internal testing of the *IBI Biochar Certification Program*’s online forms and processes, we will soon announce launch dates and associated webinars to roll out the Program to our members, stakeholders, and the biochar community. The webinars will be designed to educate stakeholders about the certification program and its requirements, and to answer relevant questions. Be watching for additional announcements regarding the webinars and the roll-out in the near future! For questions or further inquiries regarding the *IBI Biochar Certification Program*, please contact us at certification@biochar-international.org.

Biochar Carbon Market Offset Protocol Development Updates

The Biochar Carbon Offset Protocol being developed with our project partners The Climate Trust

and The Prasino Group has been completed in draft, and is being prepared for submission to the American Carbon Registry (ACR) to begin ACR's technical and scientific review and approval process. Once submitted to ACR, the protocol will undergo internal technical review for completeness, and pending any revisions, the draft protocol will be posted for public comment. During the public comment period ACR will coordinate and host a public webinar to review the protocol with all stakeholders in the biochar and carbon market community. IBI will widely circulate the draft protocol during the public comment period, and will advertise the ACR webinar through our website, press releases, and selected mailings. After the public comment period, the protocol will undergo an additional technical and scientific peer review according to established ACR protocols, prior to approval.

The Biochar Protocol includes a new standard test methodology for measuring the stable carbon component of biochar, defined as biochar that will remain in soil 100 years after its application. The test methodology was developed by an Expert Panel established and led by IBI. For questions or comments on the Biochar Carbon Market Offset Protocol effort, please contact IBI at biocharprotocol@biochar-international.org.

Business and Organization Member Updates

A listing of all current IBI [Business](#) and [Organization](#) Members can be found on our website. For more information on membership opportunities and benefits, or to join, please see: <http://www.biochar-international.org/join>. Please note, Business and Organization descriptions are submitted by each individual entity, and are not developed or written by IBI.

New Business Members

Carbon Gold

Carbon Gold is the world's leading biochar company. We supply value-added biochar products, biochar-making kilns and project expertise internationally. Sales of our biochar-based 'GroChar' products are growing year-on-year. Our expanding range of economical biochar-making kilns are designed for mobility, high efficiency and ease of use. Our unique low-temperature charring process can transform a wide variety of feedstocks into high-value biochar or charcoal with attractive yields. The kilns recycle and burn the charring gases so emissions are greatly reduced compared to ring or pit kilns. Please get in touch to discuss how we could help with your project. For more information, please contact Simon Manley or James Greyson on info@carbongold.com. Find us on www.carbongold.com. Follow us on Twitter @CarbonGold.



Earth Systems

Earth Systems is an international environmental consulting firm based in Australia. We develop effective solutions in diverse areas such as environmental management, carbon and bioenergy, and water quality. Our bioenergy team has recently developed a new mobile biochar technology for stick to log sized stranded woody biomass, where transport costs make recovery uneconomical. The CharMaker MPP (Mobile Pyrolysis Plant) is a simple to operate, safe and easily transportable batch pyrolysis furnace that goes to the biomass – not the other way around. The technology is based on a shipping container design making transport simple. The CharMaker is designed for standalone operation and includes on board power and ignition generation and controls, and it safely operates itself. The furnace creates excess energy that can be used for high grade heat.



EARTH SYSTEMS
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Electricity generation with the CharMaker is currently under development. The furnace meets stringent environmental emissions standards and the afterburner ensures minimal smoke emissions. Key specifications per batch: 17m³ internal volume; 5~9 tonne wood; 1~2 tonne biochar; takes stick and log sized wood (no chipping required); 4hrs batch time.

<http://www.esenergy.com.au/services/mobile-pyrolysis-plant> or contact Dr Adrian Morphett at adrian.morphett@earthsystems.com.au.

Frye Poultry

Frye Poultry is a 700,000 plus poultry broiler operation established in 1991, in Wardensville, WV, US. In 2006-2007, the company ventured into biomass energy using a fixed bed gasifier to convert the litter produced into energy, some 5 million btu per hour, per 1,000 lbs of litter. The gasifier also produces a poultry litter biochar onsite. It is sold in both large (by the ton) and small (5 gallon bucket) amounts and has been tested by labs in the US. For more information, please see: <http://www.fryepoultry.com/> or contact Josh Frye at: fryepoultry@frontiernet.net.



New Organization Members

The American Council on Renewable Energy (ACORE)

ACORE is a non-profit membership organization, dedicated to building a secure and prosperous America with clean, renewable energy. Mr. Bill Holmberg is the Biomass Coordinator at ACORE. States Mr. Holmberg, "There are two great threats to the planet—humans failing to deal with natural systems—collaboration instead of exploitation; and, humans failing to deal adequately with Climate Change. In both areas, food, feed, fuel, energy, fiber, natural fertilizers, feedstocks for chemicals and bio-based products, are all dependent on the quality and productivity of soils and adequate water supplies. We are also dependent on the good will of the people and the support of the political process. This is contingent on how we are perceived by environmental, public interest and wildlife groups. Consequently, we are most supportive of biochar. It deals with the natural systems, soil quality, and the better use of water." Additional information at www.ACORE.org; or contact Mr. Holmberg at: Biorefiner@aol.com.



Sonoma Biochar Initiative (SBI)

SBI's primary mission is to promote the ethical and sustainable production and use of biochar. The SBI educates a wide range of stakeholders on the advantages of biochar as a key tool in Sonoma County (CA, United States) to achieve both effective climate policy and program implementation and accelerated, sustainable agricultural productivity improvement. Biochar production and application holds great promise as a "fast mitigation technology" that, if utilized responsibly at scale, could decrease a significant percentage of atmospheric CO₂ while helping to build and maintain healthy soils.



In pursuit of these objectives, SBI actively promotes policies at local, state, and federal government levels to foster early adoption of biochar production and application through appropriate carbon valuation and funding; technology support; offset protocols; and clear ways to define and address regulatory hurdles. SBI seeks to develop ongoing Sonoma County biochar demonstration projects designed to show the usefulness and viability of this emerging technology. These include various components that together can link biochar production, GHG reduction, carbon sequestration, agricultural soil building, water filtration, pollution mitigation, and energy cogeneration. For more information please see: www.sonomabiocharinitiative.org.

Renewing Business Members:

We are very pleased to announce membership renewals from the following business and organization members. As renewing Business or Organization members, we thank you for your continued support of IBI and our mission and goals on behalf of the international biochar community.

CoolPlanetEnergySystems

CoolPlanetBioFuels, based in Camarillo, California, has developed a technology that converts low-grade biomass into high-grade fuel and carbon. CoolPlanets revolutionary BioFractionator takes in raw biomass such as woodchips, crop residues, and non-food fuel crops, and produces distinct gas streams for catalytic upgrading to conventional eBTX hydrocarbon fuel (renewable gasoline). This process also produces a type of biochar, which can be used to both sequester carbon and act as a soil conditioner. This makes the CoolPlanetBioFuels product a NEGATIVE CARBON FUEL. CoolPlanet's low-cost approach towards converting cellulosic plant material such as grass and wood into gasoline could increase rural economic development and job creation, reduce U.S. reliance on foreign oil, and improve domestic energy security. CoolPlanetBioFuels is backed by North Bridge Venture Partners, ETV (GE, ConocoPhillips, NRG), Google Ventures, BP, and Shea Ventures.



For more information on CoolPlanet, please see: www.coolplanet.com or contact [Mike Rocke](mailto:mike.rocke@coolplanet.com), Vice President of Business Development.

Dr. Rick Davies

Dr. Rick Davies is a Monitoring and Evaluation consultant, specializing in the evaluation of development aid programs in Africa and Asia. He is not directly engaged in biochar research but is supportive of research into its potential uses for carbon sequestration, soil enhancement and carbon negative energy. He is especially interested in experimental uses of biochar in developing countries and is available to provide technical advice on the evaluation of those initiatives, especially their social and economic impact. Dr. Davies has worked with development aid organizations since 1980 and has specialized in evaluation consultancy since 1990. He is based in Cambridge, UK but maintains strong connections with Australia, where he was born. For more information on his work, visit his [own personal website](http://www.rickdavies.com) and the [Monitoring and Evaluation NEWS website](http://www.monitoringandevaluationnews.com), which he manages. Rick can be contacted via email rick.davies@gmail.com and skype: rickjdavies.

Rainbow Bee Eater (RBE)

The RBE System aims to deliver cost competitive 'carbon negative' electricity in regional areas using renewable agricultural residues such as wheat straw. The RBE System converts biomass into a clean syngas and high quality biochar using a modern continuous pyrolysis process.



The RBE System integrates existing farming practice with renewable energy generation, carbon sequestration, and environmental remediation. RBE's research, development, and demonstration

plant commenced operations on a 25,000 ha wheat farm in the Western Australian wheat belt in January 2013. RBE works with independent researchers on the application and impact of biochar in agricultural and forestry practice.

For more information or to discuss biochar research and demonstration activity: info@rainbowbeeater.com.au or see the website at: <http://www.rainbowbeeater.com.au/>

Sonnenerde

Sonnenerde (or "sun-earth" in German) is an Austrian company which produces high quality soil from compost; selling about 30,000 tons annually. The company is looking to raise the carbon content of soils and is thus building a pyrolysis plant to use Terra Preta for this purpose and have been working with researchers at the University of Halle in Germany with 3 acres of test plots. They are looking to convert 4000 tons of wet paper fiber sludge into to 300 tons biochar per year. Starting in 2013, Sonnenerde will market this carbon-rich product in Austria. Sonnenerde was the winner of the climate saving award 2012 in Austria. On the webpage (www.sonnenerde.at) there is a movie (<http://www.youtube.com/watch?v=qNGbj3mRVa0&feature=youtu.be>) about the company, the new biochar plant, and recent experiments.



Biochar Briefs: News Roundup for March

We update the website daily with new articles on biochar. For more information, please see: <http://www.biochar-international.org/newsbriefs>.

Australia

Dr. Jane Sargison of the biochar company Rainbow Bee Eater is interviewed on the company's work at a demonstration project on a Western Australian wheat farm that is turning straw into biochar and into gas to generate electricity. "You could offset the emissions of the aluminum industry," she said of biochar (aluminum smelting emits 3 million tonnes of CO₂ in direct emissions a year in Australia). "The potential of these things, if you had them dotted around the country, is enormous." Link to: <http://www.womensagenda.com.au/talking-about/top-stories/driving-the-low-carbon-economy-dr-jane-sargison/201303051738>

A newly established joint research center at Curtin University in Perth Australia will help secure future energy supplies and reduce CO₂ emissions from both Australia and China. The Australia-China Joint Research Centre for Energy has been established to develop advanced energy technologies needed to fulfill the two top priorities of both governments: energy security and emission reductions—which includes the development of pyrolysis units to produce biochar. Link to: <http://www.pacetoday.com.au/news/australia-china-joint-centre-in-perth-to-secure-fu>.

Australia's Carbon Farming Initiative (CFI) allows farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land. The CFI has continued to expand and develop with more methodologies approved, more projects registered, and more Australian Carbon Credit Units (ACCUs) have been issued. There is a methodology in development to include biochar in the CFI. Link to: <http://www.lexology.com/library/detail.aspx?g=8300e20f-56a9-4a43-8006-8b5984a801e2>

Brazil/United States

Dr. Daniel Oerther and three of his students from the Missouri Institute of Science and Technology (United States) are conducting research and field work in Para, Brazil which partially focuses on understanding small-scale agriculture, terra preta, and linking these topics back to the local community gardens in Rolla, Missouri. Link to: <http://www.therolladailynews.com/article/20130314/NEWS/130319439/1004/NEWS>.

Jamaica

A group of researchers from the University of the West Indies (UWI) Biotechnology Centre are working with a local organization, the New Horizon Christian Outreach ministries, to demonstrate new biochar ovens that are 16 feet wide and 6 feet long used to both produce biochar and to dry herbs and spices in Jamaica. They plan to utilize the biochar in local field trials to improve soils.

Link to: <http://jamaica-gleaner.com/gleaner/20130316/business/business3.html>.

Germany

The waste management company Neckar-Odenwald-Kreis (AWN) is developing an innovative system to remove green waste from landfills. Starting in the city of Rosenberg and expanding into the larger city of Hardheim, residents use different recycling containers for waste—one of which is specifically for biomass wastes which are then turned into biochar and biogas. Link to:

http://www.rnz.de/zusammenbuchen2/00_20130301212505_103541088_In_wenigen_Wochen_kommt_die_neue_Tonne_.php

United Kingdom

Bar-Be-Quick, the UK's leading distributor of sustainable charcoal products, has been appointed as UK distributor of the Carbon Gold GroChar garden products range. Carbon Gold's GroChar products are a mix of biochar, mycorrhizal fungi, wormcasts and seaweed. The biochar is from Forestry Stewardship Council sources and the products are approved by the Soil Association for use by organic producers. Link to: <http://retailtimes.co.uk/bar-be-quick-appointed-uk-distributor-of-carbon-gold-grochar-garden-products/#>

Opportunities in Biochar

- The Academia Journal of Agricultural Research has a call for papers. For more information: <http://www.biochar-international.org/node/3988>.
- Submit a proposal for the Women in Climate Change and Food Security: Global fellowship program (due April 30, 2013). For more information: <http://www.biochar-international.org/node/3987>.
- Submit a Speaker Interest Form for the Biochar Session at the Biomass Asia Conference 2013 in Kuala Lumpur, Malaysia. For more information: <http://www.biochar-international.org/node/3929>.
- Submit an Expression of Interest for the Second International Biochar Training Course at Nanjing Agricultural University (NJAU), planned for October, 2013. For more information: <http://www.biochar-international.org/node/3845>.

New job postings at: <http://www.biochar-international.org/network/jobs>.

Upcoming Calendar Events

- April 4 – 5: 1st FOREBIOM Biochar Workshop. Location: Vienna, Austria. For more information: <http://www.biochar-international.org/node/3933>.
- April 5: Illinois Biochar Group Spring Meeting. Location: Urbana-Champaign, IL, USA. For more information: <http://www.biochar-international.org/node/3896>.
- April 6: Florida Biochar Regional Meeting. Location: Melbourne, FL, USA. For more information: <http://www.facebook.com/pages/Florida-biochar/438352616184448>.
- April 7 – 12: Biochar for soil remediation and global warming mitigation at EGU 2013. Location: Vienna, Austria. For more information: <http://www.biochar-international.org/node/3849>.
- April 8 – 10: International Biomass Conference and Expo. Location: Minneapolis, MN, USA. For more information: <http://www.biochar-international.org/node/3685>.

- April 17 – 18: National Conference on Philippine Biochar. Location: Quezon City, The Philippines. For more information: <http://www.biochar-international.org/node/3853>.
- April 20 – 21: Biochar Workshop on Caring for the Earth: Farmers and Gardeners Leading the Way. Location: Elmore, Australia. For more information: <http://www.biochar-international.org/node/3931>.
- May 5 – 8: Biochar: Waste to Wealth; a Special Session on Biochar. Location: Hong Kong. For more information: <http://www.biochar-international.org/node/3822>.
- May 13 – 14: WATER, FORESTS, AND PEOPLE: Innovations for a Sustainable Water Future. Location: Beijing, China. For more information: <http://www.biochar-international.org/node/3803>.
- May 20 – 22: Biochar Session at Biomass Asia 2013. Location: Kuala Lumpur, Malaysia. For more information: <http://www.biochar-international.org/node/3929>.

See the [IBI Calendar page](#) for more events. To add an event to the calendar, send the information to info@biochar-international.org.

Recently Published Biochar Research

IBI tracks all published research on biochar and includes it in our [online bibliography](#). The following articles were added in the last month. Please visit the website bibliography for more information on any of these articles. Due to copyright, we cannot provide full copies of articles unless we have permission from the publisher. If you have published work that is not included, [please email us](#).

Agrafioti, Evita; George Bouras; Dimitris Kalderis; Evan Diamadopoulos (2013). Biochar Production by Sewage Sludge Pyrolysis. *Journal of Analytical and Applied Pyrolysis*.

Carvalho, R. S. Jr; K. C. Lombardi; E. G. Pinheiro (2013). Physical Attributes of Soil Evaluated for 9 Months After Application of Biochar in Planting Eucalyptus benthamii. *Functions of Natural Organic Matter in Changing Environment*. pp 1013-1015.

Case, Sean D. C.; Niall P. McNamara; David S. Reay; Jeanette Whitaker (2013). Can biochar reduce soil greenhouse gas emissions from a Miscanthus bioenergy crop? *GCB Bioenergy*.

Devi, Parmila; Anil K. Saroha (2013). Effect Of Temperature On Biochar Properties During Paper Mill Sludge Pyrolysis. *International Journal of ChemTech Research*. Vol.5, No.2, pp 682-687; [http://sphinxsai.com/2013/conf/PDFS%20ICGSEE%202013/CT=21\(682-687\)ICGSEE.pdf](http://sphinxsai.com/2013/conf/PDFS%20ICGSEE%202013/CT=21(682-687)ICGSEE.pdf).

Hayes, M. H. B. (2013). *Functions of Natural Organic Matter in Changing Environment. Relationships Between Biochar and Soil Humic Substances*. pp 959-963.

Houben, David (2013). Heavy metal mobility in contaminated soils as affected by plants, amendments and biochar: Implications for phytostabilization. Thesis for PhD in Science; Earth and Life Institute.

Illingworth; James; Paul T. Williams; Brian Rand (2013). Characterisation of biochar porosity from pyrolysis of biomass flax fibre. *Journal of the Energy Institute*.

Jia, Mingyun; Fang Wang; Yongrong Bian; Xin Jin; Yang Song; Fredrick Orori Kengara; Renkou Xu; Xin Jiang (2013). Effects of pH and metal ions on oxytetracycline sorption to maize-straw-derived biochar. *Bioresource Technology*.

Kumar, Ajay; Kezhen Qian, Krushna N. Patil, Raymond L. Huhnke (2013). Effects of Biomass Feedstocks, Gasifier Design and Conditions on Physiochemical Properties of Biochar.

http://sungrant.tennessee.edu/NR/rdonlyres/DDF120E1-C312-4065-B095-6EC87BD11DA8/3646/313Kumar_Ajay.pdf.

Lashari, Muhammad Siddique; Liu Yuming; Li, Lianqing; Pan, Weinan; Fu, Jiaying; Genxing Pan, Jufeng Zheng, Jinwei Zheng, Xuhui Zhang, Xinyan Yu (2013). Effects of amendment of biochar-manure compost in conjunction with pyroligneous solution on soil quality and wheat yield of a salt-stressed cropland from Central China Great Plain. *Field Crops Research*. Volume 144, 20 March 2013, Pages 113–118.

Lou, Liping; Feixiang Liu; Qiankun Yu; Fang Chen; Qiang Yang; Baolan Hu; Yingxu Chen (2013). Influence of humic acid on the sorption of pentachlorophenol by aged sediment amended with rice-straw biochar. *Applied Geochemistry*.

Nguyen, Minh-Viet; Lee, Byeong-Kyu (2012). Improvement of Yields and Surface Areas of Biochar from Chicken Manure. *Journal of Biobased Materials and Bioenergy*, Volume 6, Number 6, pp. 714-716(3).

Rebitanim, Nur Zalikha; Wan Azlina Wan Ab Karim Ghani; Nur Akmal Rebitanim; Mohamad Amran Mohd Salleh (2013). Potential applications of wastes from energy generation particularly biochar in Malaysia. *Renewable and Sustainable Energy Reviews*. Volume 21, May 2013, Pages 694–702.

Singh, Anita; Rashmi Singhai; A.K.Biswas; Anil Kumar Dubey (2013). Production Of Biochar From Mustard For Agriculture Use And Carbon Sequestration. *International Journal of ChemTech Research*. Vol.5, No.2, pp 844-848;
[http://sphinxsai.com/2013/conf/PDFS%20ICGSEE%202013/CT=46\(844-848\)ICGSEE.pdf](http://sphinxsai.com/2013/conf/PDFS%20ICGSEE%202013/CT=46(844-848)ICGSEE.pdf).

Sopeña, Fatima; Gary D. Bending (2013). Impacts of biochar on bioavailability of the fungicide azoxystrobin: A comparison of the effect on biodegradation rate and toxicity to the fungal community. *Chemosphere*.

Stavi, Ilan (2013). Biochar use in forestry and tree-based agro-ecosystems for increasing climate change mitigation and adaptation. *International Journal of Sustainable Development & World Ecology*.

Suddick, Emma C; Johan Six (2013). An estimation of annual nitrous oxide emissions and soil quality following the amendment of high temperature walnut shell biochar and compost to a small scale vegetable crop rotation. *Science of The Total Environment*.

Tatarková, Veronika; Edgar Hiller; Marek Vaculík (2013). Impact of wheat straw biochar addition to soil on the sorption, leaching, dissipation of the herbicide (4-chloro-2-methylphenoxy)acetic acid and the growth of sunflower (*Helianthus annuus* L.). *Ecotoxicology and Environmental Safety*.

Xie, Zubin; Xu, Yanping; Liu, Gang; Qi Jianguo, Liu; Zhu, Cong Tu; James E. Amonette; Georg Cadisch; Jean W. H. Yong; Shuijin Hu (2013). Impact of biochar application on nitrogen nutrition of rice, greenhouse-gas emissions and soil organic carbon dynamics in two paddy soils of China. *Plant and Soil*.

Yachigo, Mieko; Shinjiro Sato (2013). Leachability and Vegetable Absorption of Heavy Metals from Sewage Sludge Biochar. Chapter 15. http://cdn.intechopen.com/pdfs/43245/InTech-Leachability_and_vegetable_absorption_of_heavy_metals_from_sewage_sludge_biochar.pdf.

Zheng, Hao; Zhengyu Wang; Xia Deng; Baoshan Xing (2013). Impact of Pyrolysis Temperature on Nutrient Properties of Biochar. *Functions of Natural Organic Matter in Changing Environment*. pp 975-978.