

Bringing Biochar Projects into the Carbon Marketplace

Biochar Protocol Development
 Presented by Keith Driver – Blue Source
 Moderated by John Gaunt – Carbon Consulting LLC
 8 a.m. PDT Tuesday, June 8, 2010

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Thank you for joining us.



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Bringing Biochar Projects into the Carbon Marketplace

Introduction – Background – Carbon Policy and Markets – Considerations for Protocol Development – Proposed Path Forward

Outline

Carbon policy and markets, project design and implications for biochar protocols.

Introduction

Background

Carbon Policy and Markets

- Carbon Policy Frameworks
- Carbon Markets
- Market Access Mechanisms and Protocols

Considerations for Protocol Development

- Scope of Biochar Projects
- Project configuration and Platforms

- Sources of Emission Reduction and Carbon Sequestration
- Baseline Assessment
- Additionality and Leakage
- Aggregation
- Measurement and Monitoring

Proposed Path Forward



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Introduction

A Multi-Stakeholder Effort

- Comprehensive GHG emission reduction and sequestration protocol development process
- Provide guidance and market infrastructure to biochar protocol developers
- Voluntary Carbon Standard (VCS) and Alberta Offset System (AOS) protocol submission
- Set stage for CDM protocol

Our goal is simple: to open carbon markets to biochar and pyrolysis technologies.



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Background

Biochar

- Growing plants remove atmospheric CO₂.
- Prevents decomposition-release of CO₂ and CH₄ to the atmosphere from decaying plant matter.
- Pyrolysis process locks in and stabilizes carbon, creating biochar through a thermal decomposition process.
- By-products may be used for energy production (liquid fuels, heat and electricity), as well as soil amendments.

Gigaton Offset Opportunity

Different "Platform" configurations possible:

- Small-scale domestic pyrolysis stoves
- Medium-scale on-site logging-waste management
- Large-scale bio-energy or manure waste management



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Background

Biochar's Fit with Carbon Markets and Policy

- Great potential for GHG emission reductions and CO_{2e} sequestration
- One of few opportunities to take CO_{2e} from the atmosphere
- Incredible opportunity for expanding climate change mitigation strategies
- Alternate source of revenue and industrial opportunity for agriculture and waste management
- Platforms approach provides linear view of potential
 - biomass feedstocks,
 - pyrolysis technologies,
 - biochar and energy products

An approved GHG emission reduction protocol must be developed to enable this opportunity.



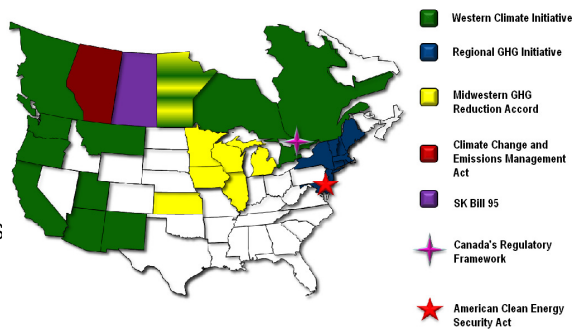
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Carbon Policy

Carbon Policy Frameworks: US Policy

- Western Climate Initiative (WCI)
- Regional Greenhouse Gas Initiative (RGGI)
- Midwestern Greenhouse Gas Reduction Accord (MWGA)
- United States Federal Legislation (ACES, APA, EPA, USDA)
- California



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Carbon Policy

Carbon Policy Frameworks:

Canadian Policy

- Alberta (Climate Change and Emissions Management Act)
- Saskatchewan (Bill 95)
- British Columbia (PCT, C&T)
- Ontario (WCI, RGGI, MWGA)
- Canadian Federal Legislation

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Carbon Markets

Alberta Offset System (AOS)

Key points:

- Compliance system accepting verified emission reduction offset credits from Alberta-based projects.
- Four-stage protocol review and approval process, largely industry-led.
- Broad technical, stakeholder and public comment periods are all integral.

Voluntary Carbon Standard (VCS)

Key points:

- Voluntary reserve accepting global projects based on objective criteria.
- Based on ISO 14064-2:2006, 14064-3:2006 and 14065:2007 requirements.
- Has approved UNFCCC CDM, JI and CAR programs for implementation.
- Industry-led protocol development with double-validation process and public comment period.

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Carbon Markets

American Carbon Registry (ACR)

Key points:

- Non-profit voluntary and pre-compliance market accepting worldwide projects.
- Accepts CDM and ACR methodologies from the USEPA Climate Leaders Program and VCS.
- Allows for modifications to ACR-approved methodologies and tools.

Climate Action Reserve (CAR)

Key points:

- California-based USA national voluntary offset program accepting projects from any US jurisdiction.
- Internally-approved offset project protocols following ISO 14064-2 and WRI/WBCSD GHG Protocol for Project Accounting.
- Projects developed internally through stakeholder engagement process, and assessed on legal and performance basis.



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Carbon Markets

Clean Development Mechanism (CDM) Gold Standard

Key points:

- Following the UNFCCC and Kyoto Protocol to encourage the private sector and developing nations to become involved.
- Developing nation Certified Emission Reduction (CER) credits can be traded and sold for industrialized nations' use to meet Kyoto Protocol requirements.
- Stimulates sustainable development and emissions reductions with a wide variety of methodologies.

Key points:

- Best practice methodology and high-quality carbon credit label for Kyoto and voluntary markets.
- WWF, SSN and Helio International involved in development.
- Positioned to cover both CDM and VCS certified emission reductions as an additional review layer.
- Projects may follow Gold Standard protocols or seek approval status via CDM publication.



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Market Access Mechanisms and Protocols



Market Participation

- Projects must be verified relative to an applicable GHG emission reduction quantification protocol
- Protocols provide specific quantification guidance and serve as market access mechanism.
- Various policies and markets call for different protocol contents and, development and/or review framework.
- Evolution towards ISO 14064-2 approach.
- Grounding in peer-reviewed literature and best practice guidance.

Approved quantification protocols form the basic carbon market access mechanism.

Combined AOS / VCS protocol development process provides broad access for North American compliance/pre-compliance markets and global voluntary markets.

Follow-on work for CDM protocol development facilitated by up-front efforts.

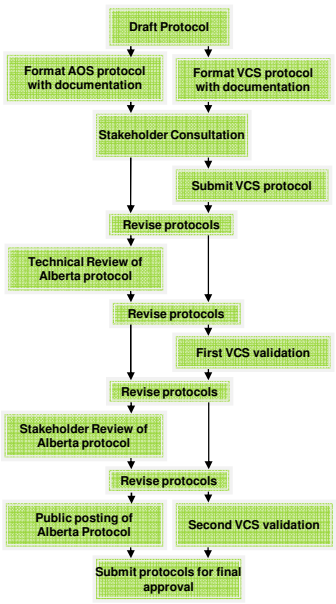

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Protocol Development and Review Framework

AOS and VCS Review Processes

- Program differences relating to issues like biology, framework, market, policy and content reviews.
- Review process map well to ensure consistency.
- In-depth rationale required to address protocol differences between systems.

Protocol development is a targeted exercise requiring project-specific scientific knowledge and GHG quantification expertise.

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Scope of Biochar Projects

Project Scale can affect Protocol Development

- Measurement and monitoring thresholds can vary with project size category
 - Must ensure continued rigour
 - Recognize practical considerations
- Seeking to include small repeatable and large-scale projects
- Manage bias around small projects by facilitative aggregation

Transformational Change	<ul style="list-style-type: none"> • Feel good projects • Typically low yield
Small One of a Kind Projects	<ul style="list-style-type: none"> • Site-specific solutions • < 10 kt/yr per project
Small Repeatable Projects	<ul style="list-style-type: none"> • Small but scalable projects • 5 t/yr – 10 kt/yr per project
Large Scale Project	<ul style="list-style-type: none"> • Stand alone offset projects • Typically > 20,000 t/yr

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Project Configurations and Platforms

Conceptual Framework

- Structured approach to emission reduction assessment
- Streamline protocol design process
- Providing flexibility between feedstocks and outputs
- Fit with IBI Resources such as the "Biochar Pathways Matrix"

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Emission Reductions & Carbon Sequestration

Mechanisms	Description	Key issues
Waste Diversion	Organic materials diverted from landfills would otherwise degrade anaerobically, producing methane emissions.	Various models exist for predicting the methane emissions from these sources. However, proving diversion can be challenging in some circumstances, thus adding complexity to establishing the baseline.
Avoided Waste Combustion	Organic materials that would otherwise have been combusted, producing carbon dioxide emissions.	Various models exist for predicting the GHG emissions from these sources. Emissions from the combustion of organic materials are considered as a biogenic source of emissions.
Soil Carbon Accumulation	Conversion of biomass to biochar sequesters carbon. Incorporation of biochar within the soil matrix can lead to the enhanced sequestration of soil carbon.	Concerns that carbon sequestration within the soil is not permanent are being applied to biochar, where risks are significantly lower. Soil carbon sequestration is difficult to measure.
Fertilizer Efficiency	Biochar may 1) improve the efficiency of fertilizer usage relative to yield, and 2) alter processes that lead to emissions, resulting in lower N ₂ O emissions from fertilizers and reduced CH ₄ production.	Difficult to measure changes in CH ₄ and N ₂ O emissions at a field scale. Modelling of N ₂ O can be resource intensive and requires a significant research and field data.
Electricity Displacement	Electricity produced from biochar projects may offset electricity produced from fossil fuels.	This is an indirect emission reduction and may not be considered under all programs.
Fossil Fuel Displacement	The heat, power, and biofuels produced from the biochar projects may offset fossil fuel usage downstream.	This is an indirect emission reduction and may not be considered under all programs. There may be difficulties in direct measurement given the downstream nature of the emission reduction and conversions between equivalent units of energy.

Most mechanisms have analogies into other markets/protocols



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Baseline Assessment

Project Specific vs Performance Standard

Project Specific Baseline

- Establish baseline on project-specific basis

Pros

- Flexibility for project developers
- Limited up-front development costs
- Broader protocol applicability

Cons

- Higher project documentation/approval risks
- May limit project claims that combine multiple feedstocks/outputs

Performance Standard Baseline

- Establish baseline on sector, practice and technology basis

Pros

- Greater certainty of protocol applicability
- Streamlining of verification process

Cons

- Greater up-front investment required for protocol development
- May limit project eligibility given broad approach

Hybrid approach may be most reasonable.



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Additionality and Leakage

Approaches for AOS and VCS

<p>Alberta Offset System</p> <ul style="list-style-type: none"> - The AOS embeds additionality within the protocols and program guidance documents, - Temporal, regulatory and common practice test are applied <ul style="list-style-type: none"> - Determination is largely government responsibility - Project specific baseline approach is utilized in most cases - Leakage addressed within protocols <ul style="list-style-type: none"> - Market base and activity shifting - Functional equivalence 	<p>Voluntary Carbon Standard</p> <ul style="list-style-type: none"> - Traditional and more complex approach to additionality - Interlinked, structured and prescriptive process: <ul style="list-style-type: none"> - Listing of baselines scenarios - Barriers and/or investment analysis - Common practise test - New protocols can bundle process under a project, performance, and/or technology tests - Additional AFOLU guidance provided
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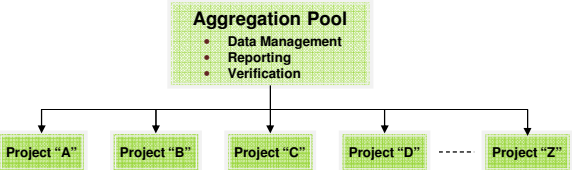







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Aggregation

Bringing smaller projects into the market place

<ul style="list-style-type: none"> - Opportunity to bring multiple projects together at achieve suitable economies of scale <ul style="list-style-type: none"> - Data management - Documentation / reporting - Verification - Transaction costs 	<ul style="list-style-type: none"> - Incorporation of aggregation supports within protocol document <ul style="list-style-type: none"> - Ensure continued rigour of offset claims - Conservative assumptions for exclusion of some SSRs - Support verification across multiple projects/sites
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Measurement and Monitoring

Balance of Rigour and Practicality

Measurement and Monitoring






- Specific guidance provided in the protocol
- Accounting done matching various tiers as per IPCC
 - Direct measurement not always the best means of assessment
 - Seeking to improve accuracy and precision
 - Address risks of false-positive and false-negative results

Rigour

- Detailed assessment of each SSR
- Lower bounds of uncertainty
- Ensure conservative emission reduction claims

Practicality

- Limit user inputs to manage measurement and verification costs
- Exclude emission reduction mechanisms where conservative and uneconomic
- Tier approach to signal need for continual improvement
- Contingent data capture methodologies

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Proposed Path Forward

Protocol Development Process

- Webinar on technical and science issues June 15th at 8am PDT
- Launch protocol development at Biochar 2010 Conference
 - Clarify issues from webinars
 - Seek further stakeholder input
 - Outline work plan and confirm project timeline
- Discussion draft to be prepared for 2010 IBI conference in Rio De Janeiro (Sept, 2010)
- Link to CDM activity as key technical, science and protocol issues resolved

\$100,000 to \$120,000 being sought to support protocol development initiative (includes VCS double validation)

Planning: Carbon policy/markets and project design

Planning: Science, technology and feedstocks

Phase I Underway

Vetting workshop (US Biochar Initiative)

Strategic and focused science process

GHG quantification protocol development

Technical science document development

Technical stakeholder review workshop






Pursue approval of biochar protocol in VCS

Pursue approval of biochar protocol in Alberta

May/June 2010

July to Sept 2010

Oct to Dec 2010

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Protocol Initiative Sponsorship

Project-Level Sponsors

Silver Sponsorship (\$5,000)

- Project review based on draft protocol
- Project-specific updates during protocol development and review period

Gold Sponsorship (\$7,500)

All Silver level benefits plus:

- Consultations with development team on implementation of approved protocol
- Can be offset against future consultancy costs

Sustaining Sponsors

Platinum Sponsorship (\$15,000+)

- Direct access to protocol development team
- Participation in briefing calls
- Direct access to protocol development team in "real-time"
- Valuable insight into biochar evolution in the carbon markets relevant to your interests
- Recognition in all protocol materials

Offset against future consultancy costs



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Questions and Contact

Protocol Initiative Sponsorship

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