



CBES

Center for BioEnergy
Sustainability

Bioenergy Sustainability Standards, Certification and Regulations

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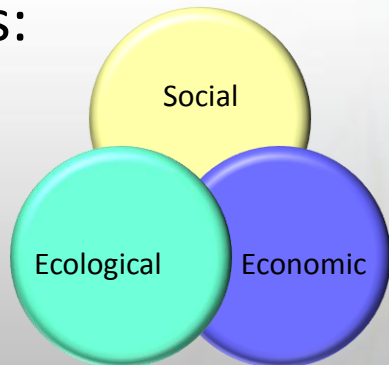
Center for BioEnergy Sustainability

Oak Ridge National Laboratory

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Key Points

- Sustainability is contextual, relative (more/less) and process based
- Sustainability implications of biofuel choices are large and complex
- There is an opportunity to design land use to optimize socioeconomic and ecologic benefits of bioenergy
- Scale(s) matter
- You can only manage what you can measure
- Must consider a suite of measures:



Review of biomass certification efforts (Van Dam et al. 2008)

- Major differences are in
 - Geographic extent
 - Whether the standards are voluntary or mandatory.
- Urgent need for criteria
- Some categories can use existing certification systems
- GHG emissions, energy balance, and changing land-use require new approaches
- Use adaptive management to develop certification systems (i.e., learn from pilot studies and research) and expand over time.
- Improved coordination between certification activities is necessary
 - to improve coherence and efficiency in certification of sustainable biomass
 - to avoid proliferation of redundant or nonaligned standards
 - to provide direction in the appropriate approach



Advantages of certification system for biofuel

- Policy advantages (Kaditi 2009)
 - may lead to
 - Reduction or elimination of trade barriers
 - Phasing out of trade-distorting support measures
 - Development of a global sustainable bioenergy market.
- Sustainability advantages
 - Promotion of sustainable bioenergy systems



Ongoing efforts to select sustainability indicators for bioenergy.

- Roundtable on Sustainable Biofuels

<http://energycenter.epfl.ch/webdav/site/cgse/shared/Biofuels/Version%20One/Version%201.0/09-11-17%20RSB%20PCs%20Version%201%20%28clean%29.pdf>.

- U.S. Biomass Research and Development Board

- Global Bioenergy Partnership

http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/partners_only/sust_docs/2nd_DRAFT_of_GBEP_Criteria_Indicators_with_TEMPLATES.doc.

- Council on Sustainable Biomass Production

http://www.csbp.org/files/survey/CSBP_Provisional_Standard.pdf.



COUNCIL ON SUSTAINABLE BIOMASS PRODUCTION

- Initiated in 2007 to develop a voluntary sustainability standard for biomass growers and bioenergy producers.
- The CSBP definition of certifiable biomass includes:
 - dedicated fuel crops
 - crop residues
 - purpose-grown wood
- It does not include food crops or traditional forestry materials
 - Certified under existing programs (FSC or SFI)



CSBP Stakeholders

- ArborGen, LLC
- Assoc. of Fish and Wildlife Agencies
- Prairie Lands Bio-Products, Inc.
- Show Me Energy Cooperative
- Center for Bioenergy Sustainability at ORNL
- Ceres, Inc.
- Chevron Corporation
- Duke Energy
- DuPont Danisco Cellulosic Ethanol LLC
- Energy Biosciences Initiative
- Texas A & M University
- The Nature Conservancy
- Theodore Roosevelt Conservation Partnership
- USDA/NRCS
- USDA/USFS
- US Department of Energy Office of Biomass Program
- Environmental Defense Fund
- Genera Biomass, LLC
- Mendel Biotechnology, Inc
- Monona Farms
- National Wildlife Federation
- Natural Resources Defense Council
- Verenum Corporation
- Technical Consultants
 - Meridian Institute
 - Heissenbuttel Natural Resource Consulting



CSBP Vision and Goals

- **Vision:**
 - To ensure that biomass feedstocks and bioenergy (both fuel and electricity) in the United States are produced in a sustainable manner, balancing economic, environmental and social imperatives.
- **Goal:**
 - To generate broad multi-stakeholder consensus on sustainability guidelines to continually improve this emerging industry with full support from growers, germplasm providers, social and environmental interest groups, refineries and other biomass end-users.



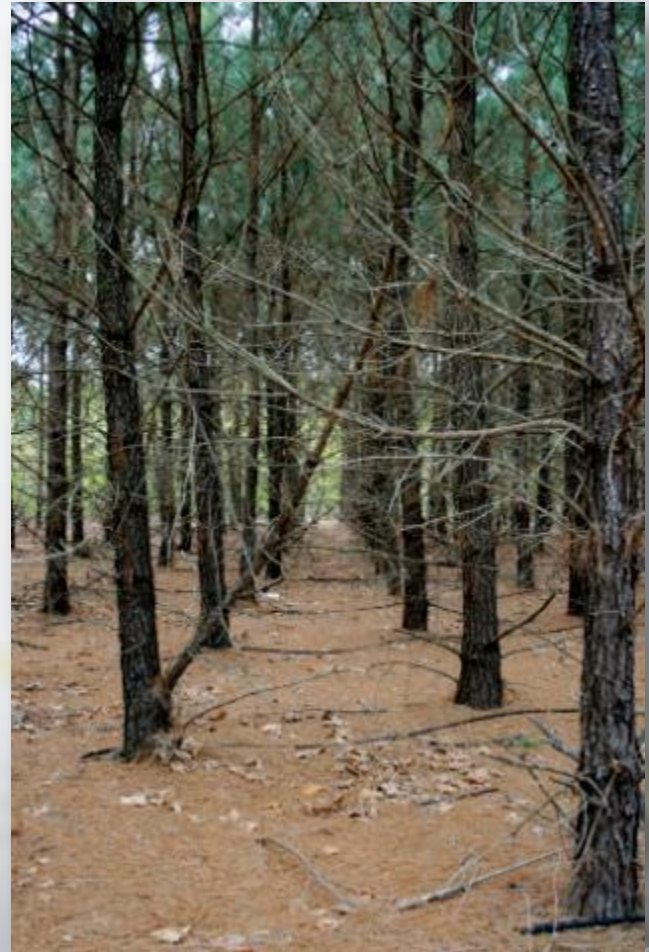
Define Sustainability



“Adopting practices and developing products that are environmentally, socially and economically sound, and that can meet present needs without compromising the ability of future generations to meet their needs.”

Issues Addressed

- The CSBP Standard addresses the full complement of sustainability issues through principles, criteria, and indicators applicable to both agriculture and silviculture.
- The key categories of criteria include:
 - Climate Change
 - Biological Diversity
 - Water Quality and Quantity
 - Soil quality
 - Socio-Economic Well-Being
 - Integrated Resources Management Planning



CSBP Objectives

- Develop and promote a voluntary certification system and corresponding verification mechanism for the sustainable production of biomass and bioenergy from the farm to the bioenergy facility.
- Promote production of energy from biomass produced with a low carbon cost, including dedicated energy crops, crop residues, and native vegetation.
- Ensure that the expansion of biomass production is protective of the ecosystem and biological diversity.
- Maintain a credible program in which growers achieve and are recognized in the market for environmental, social, and economic sustainability through a certification process that incorporates verification and reporting mechanisms.



CSBP Objectives (Cont)

- Establish a science-based standard for sustainable production of biomass and bioenergy that considers all relevant land use, water use, climate change, feedstock, biological diversity, and socio-economic impacts.
- Develop and promote a voluntary certification system and corresponding verification mechanism for the sustainable production of biomass and bioenergy from the farm to the bioenergy facility.
- Encourage continuous improvement of program participants' operations, as technological improvements allow and while maintaining the economic viability of the industry. The Council will also seek to continuously improve the standard, the certification program, and its own operations.
- Ensure that the standard is feasible and auditable and that all requirements are clearly linked to demonstrating the sustainability of biomass production and are not overly costly to meet.



Criteria Development

PRINCIPLE 2 – SOIL

Principle 2 - SOIL

Biomass production shall maintain or improve soil quality by minimizing erosion, enhancing carbon sequestration, and promoting healthy biological systems and chemical and physical properties.

Criterion 2.1 Maintain or improve soil health

Minimize erosion and maintain soil carbon and nutrients at appropriate levels, as well as the overall physical, chemical and biological properties of the soil.

SILVER LEVEL INDICATORS

Indicator 2.1.S1 Soil assessment and monitoring

Program participant assesses and monitors nutrient levels of the soil or plants and soil capabilities guide management decisions.

(Component of Principle 1: Integrated Resource Management Planning, 1.1 Assessment, 1.2 Objectives, and 1.3 Management Plan.)

IMPLEMENTATION:

Soil assessment shall be conducted at the level of the area proposed for certification and include use of data from soils maps where available. Soils shall be tested annually for organic matter and for nitrogen, phosphorus and other nutrients relevant to local resource concerns. Management decisions shall be based on soil capabilities in selection of species or crops, appropriate cultural practices, expected yields, and erosion

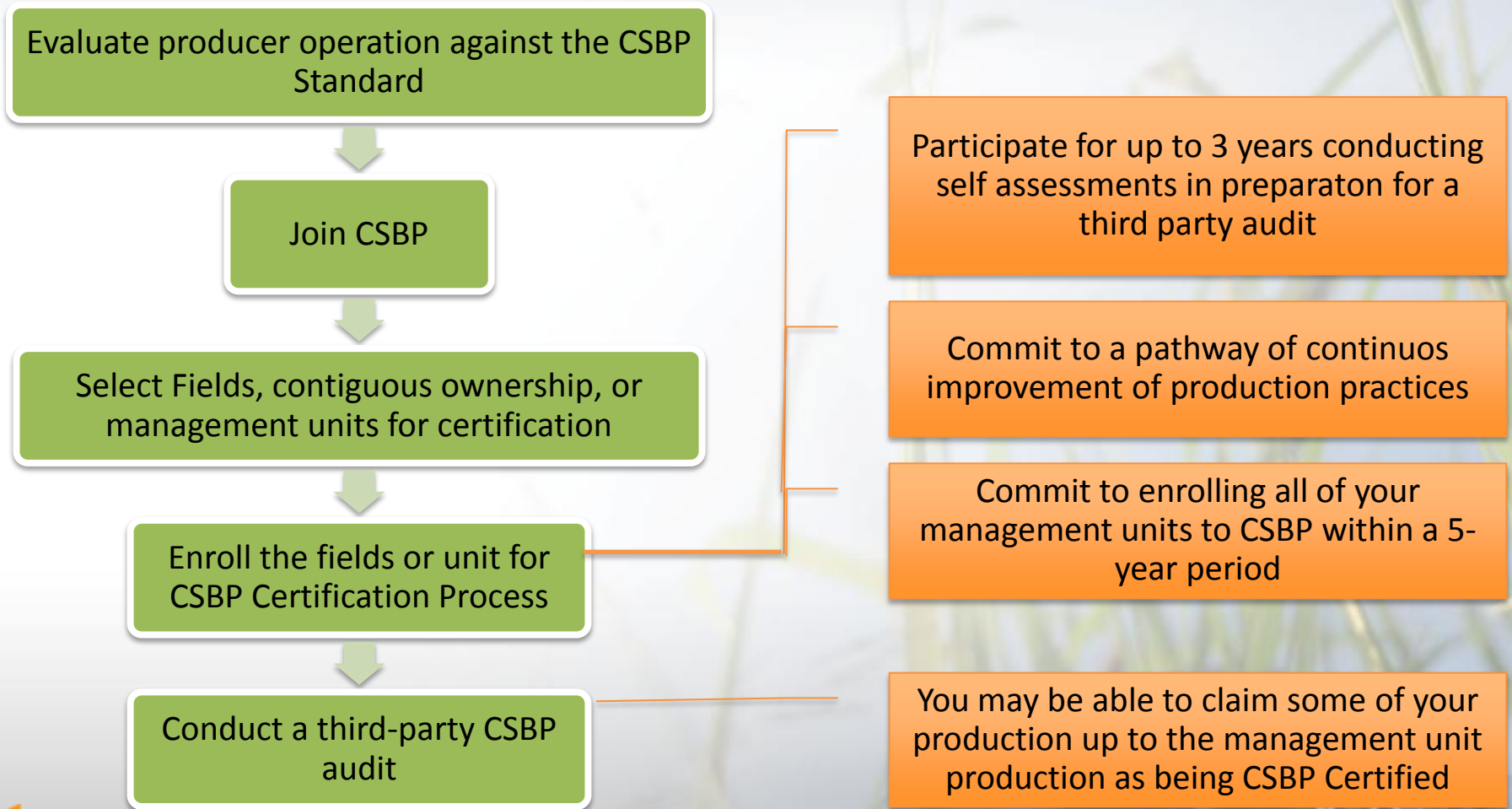
Indicator 2.1.S2 Soil nutrient and conservation planning

Program participant conserves soil and maintains its productivity through an integrated resource management plan.

(Component of Principle 1: Integrated Resource Management Planning, 1.1 Assessment, 1.2 Objectives, and 1.3 Management Plan.)

IMPLEMENTATION: Agricultural program participants shall use planning protocols supported by the Natural Resource Conservation Service (NRCS) Conservation Planning process. Nutrients shall be managed to reduce loss to air and water.

Certification Process



Producer Checklist

COUNCIL ON SUSTAINABLE
BIOMASS PRODUCTION



Self-Assessment Checklist

CSBP Draft Standard

INSTRUCTIONS:

This booklet is used by both growers and auditors.
Complete all questions and tables in Worksheets 1-9.
Please include supporting documentation as requested and
whenever appropriate. List document or file name in Column
E.
Additional information is found on the Instructions tab.

WORKSHEETS:

	# pages
Farm Input	1
Field	1
1 Integrated Resource Management Plan	2
2 Soil	2
2a Soil - Tables	2
3 Biological Diversity	4
3a Biological Diversity - Tables	2

SIGNATURE:

As an authorized A
that all statements

Company:

Producer Checklist

Ger
Nutrient Inputs

Name of organization:

Description of operation:

LOCATION

State:

County:

Upcoming growing season:

Total farm acreage:

ENERGY SOURCES

What does your tractor burn?

Do you dry your own biomass?

How do you dry biomass?

What fuel do you dry with?

Do you store your own biomass?

Manure fertilizer

		% moisture	kg/ha/year
<input type="text" value="None"/>	<input type="text" value="Broadcast"/>	0%	0 Kgs
<input type="text" value="None"/>	<input type="text" value="Broadcast"/>	0%	0 Kgs
<input type="text" value="None"/>	<input type="text" value="Broadcast"/>	0%	0 Kgs
<input type="text" value="None"/>	<input type="text" value="Broadcast"/>	0%	0 Kgs

[Nutrient mixes \(kg /ha/year\)](#)

		N	P ₂ O ₅	K ₂ O
<input type="text" value="0"/>	<input type="text" value="Injected"/>	0%	0%	0%
<input type="text" value="0"/>	<input type="text" value="Injected"/>	0%	0%	0%
<input type="text" value="0"/>	<input type="text" value="Injected"/>	0%	0%	0%

[Singly-applied nutrients \(kg /ha/year\)](#)

Nitrogen

Nitrogen application timing

Phosphorus (P₂O₅)

Potassium (K₂O)

Lime kg/ha/year

Lime application frequency #/year

Biochar kg/ha/year

Other Agrochemical Inputs

Herbicides kg ai/ha/year

Pesticides kg ai/ha/year

Yes



Producer/Auditor Checklist

Criterion / Indicator	SOIL		Yes	No / P/C	N/A
2.1	Maintain or improve soil health				
	<i>Minimize erosion and maintain soil carbon and nutrients at appropriate levels, as well as the overall physical, chemical and biological properties of the soil.</i>				
2.1.S1.	Soil assessment and monitoring				
	Do you assess and monitor nutrient levels of the soil or plants and soil capabilities to guide management decisions?	Silver			
2.1.S2.	Soil nutrient and conservation planning				
	Do you conserve soil and maintain its productivity through an integrated resource management plan?	Silver			
	Do you use planning protocols supported by the Natural Resource Conservation Service (NRCS) Conservation Planning process?	Silver			
	Are nutrients managed to reduce loss to air and water?				
2.1.S3.	Residue removal				
	Do you retain biomass materials required for erosion control and soil fertility?	Silver			
2.1.S4	Compaction				
	Do you identify soils vulnerable to compaction?	Silver			
	Do you use appropriate methods to reduce compaction if necessary and maintain site productivity?	Silver			
2.1.S5	Road construction	Silver			
	Do you limit field travel zones or paths as needed to meet management objectives?	Silver			
	Are temporary field travel zones or paths used when practical and consistent with management objectives to be				

Where are we now?

- Rolling out the CSBP Provisional Standard
- Already begun work to revise standard
- Working to address land conversion issues
- Seeking producer and landowner views on the work to date
- Getting input from producers and landowners on the impacts this standard might make on the decision making process on the land
- Testing producer acceptance of the CSBP standard
- Evaluate producer/landowner costs associated with implementation of the CSBP Standard
- Assessing available & needed tools to aide the process



Thank you!

www.csbp.org

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