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Terminology and Definitions for Biomass Production, Harvesting and Collection, Storage, Processing, Conversion and Utilization



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1 Purpose and Scope

1.1 The purpose of this Standard is to provide uniform terminology and definitions in the general area of biomass production and utilization.

1.2 This includes all the terminologies that are used in biomass feedstock production, harvesting, collecting, handling, storage, pre-processing and conversion, bioenergy, biofuels, biopower and biobased products.

2 Introduction

The role of biomass in society has increased dramatically recently due to the high cost of fossil-based fuel, the burden of removal of excessive biomass in resource management, concerns over climate change, and the desire of governments of various countries to reduce their dependence on imported fossil-based fuel. Despite the effort that is being put into biomass production and utilization, the definitions and terminologies that are used sometimes differ. This has often caused confusion in the biomass production and utilization industry.

3 Definitions

The following is a list of the definitions for the terms related to this standard.

3.1 Agricultural residue: Agricultural crop residues are the plant parts, primarily stalks and leaves, not removed from the fields with the primary food or fiber product. Examples include corn stover (stalks, leaves, husks, and cobs); wheat straw, and rice straw.

3.2 Ash: The inorganic, non-combustible residue left after complete combustion of a material at minimum temperature of 575°C.

3.3 Ash fusion test: A procedure used to determine the softening and melting behavior of ash. Ash of a material is formed into a cone and heated under prescribed conditions in a testing laboratory (ASTM D 1857). The temperature points that are observed are initial deformation temperature, softening temperature, hemispherical temperature and fluid temperature. The higher the fusion temperatures of the ash of a material are, the lower the tendency of that material to slag in a combustion chamber.

3.4 Biobased product (biobased industrial product, bioproduct): Fuels, food, feed, chemicals, or industrial materials (e.g. pharmaceuticals, building materials, inks, coatings, paper etc.) commercially produced in whole or in-part from biomass materials.

3.5 Bio-char: See the definition of Char.

3.6 Biodiesel: Mono-alkyl esters of fatty acids derived from vegetable oils or animal fats when chemically or biochemically reacted with an alcohol.

3.7 Bioenergy: Energy derived from biomass. This includes biopower (see definition below), energy from biobased transportation fuels, and energy from biomass that is used for process or space heating.

3.8 Bioethanol: Ethanol produced from biomass.

3.9 Biofuel: A fuel derived from biomass.

3.10 Biogas: A mixture primarily consisting of methane and carbon dioxide produced by the bacterial decomposition of biomass. It is used as a fuel, industrial intermediate or feedstock.

3.11 Bioheat: Heat energy generated from biomass sources.

3.12 Biomass: Organic materials that are plant or animal based, including but not limited to dedicated energy crops, agricultural crops and trees, food, feed and fiber crop residues, aquatic plants, forestry and wood residues, agricultural wastes, biobased segments of industrial and municipal wastes, processing by-products and other non-fossil organic materials. Three main categories of biomass are primary, secondary and tertiary biomass (see definitions below).

3.13 Biomass conversion: Transformation of biomass into bioenergy or biobased products.

3.14 Bio-oil: A product of pyrolysis or liquefaction of biomass. It is a dark brown, partially water miscible liquid which contains oxygenated organic compounds.

3.15 Biopower: Electricity from biomass or intermediate bioproducts.

3.16 Bioproduct: See Biobased product.

3.17 Biorefinery: A facility that uses mechanical, thermal, chemical, and/or biochemical processes to convert biomass into several value-added biobased products or key intermediates for the production of chemicals and other materials.

3.18 Biosolids: Nutrient-rich organic material resulting from the treatment of wastewater and from anaerobic digestion of animal manures (see section 3.61 for additional information on animal manures).

3.19 Black liquor: Solution of lignin-residue and the pulping chemicals used to extract lignin during the manufacture of paper.

3.20 Bone dry material: A material having zero percent moisture content.

3.21 Byproduct: A secondary or incidental product that is derived from a manufacturing process or chemical reaction, and is not the primary product or service being produced.

3.22 Carbonization: A process similar in nature to pyrolysis, but which uses lower temperature and longer residence time in the reactor. The resulting products include approximately equal amounts of liquid, tar, and gas products.

3.23 Char: A residue resulting from pyrolysis, carbonization, and gasification of biomass.