



Standard Practice for Evaluating Relative Sustainability Involving Energy or Chemicals from Biomass¹

This standard is issued under the fixed designation E3066; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard practice provides a science-based methodology for evaluating the relative sustainability of options involving energy or chemicals derived from biomass. Options may involve products, processes, or projects.

1.2 The methodology includes setting goals and objectives, identifying stakeholders, selecting appropriate indicators, and evaluating the relative sustainability of options where at least one option is available from biomass.

1.3 The objectives are to facilitate fair comparison of options, focus efforts on practical indicators reflecting stakeholder priorities, and support continual improvement for more sustainable outcomes.

1.4 The purpose of this standard practice is not to declare something as sustainable or not sustainable but to help users assess, compare, and rank options based on specific goals and objectives.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

E1705 Terminology Relating to Biotechnology

2.2 ISO Standards:³

ISO 14044 Environmental Management—Life Cycle Assessment—Principles and framework

¹ This practice is under the jurisdiction of ASTM Committee E48 on Bioenergy and Industrial Chemicals from Biomass and is the direct responsibility of Subcommittee E48.80 on Sustainability of Bioenergy and Industrial Chemicals from Biomass.

Current edition approved Dec. 1, 2016. Published January 2017. Originally approved in 2016. Last previous edition approved in 2016 as E3066–16. DOI: E3066–16A.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

ISO 14044 Life Cycle Assessment—Requirements and Guidelines

ISO 13065 Sustainability Criteria for Bioenergy

3. Terminology

3.1 For general terminology, refer to Terminology E1705.

NOTE 1—The user is advised that the definitions used by various industries, marketers, and regulatory bodies can differ from those in this standard. It is the responsibility of the user to ensure that the terms used in a particular context are clearly understood.

3.2 Definitions:

3.2.1 *biomass, n*—substance wholly comprised of living or recently living (nonfossil) material.

3.2.1.1 *Discussion*—Sometimes referred to as “renewable organic material,” examples of biomass include whole or parts of plants, trees, aquatic organisms, animals, algae, and micro-organisms.

3.2.2 *continual improvement, n*—a systematic, iterative process of identifying and evaluating options and selecting those that provide incremental improvements toward achieving defined goals and objectives.

3.2.3 *context, n*—the historical conditions, trends, and other forces that influence or define the measurement and interpretation of environmental, economic, and social indicators in a specific place and time.

3.2.4 *indicator, n*—specific, science-based, observable and measurable characteristic.

3.2.4.1 *Discussion*—Indicators can be used to assess conditions of a system, effects of activities on phenomena of concern, or to monitor trends in conditions over time. (1)⁴

3.2.5 *measure, v*—quantify the size, amount, or degree using a science-based approach and appropriate unit(s).

3.2.6 *science-based, adj*—applying principles and practices that employ the scientific method.

3.2.6.1 *Discussion*—The scientific method is a process of testing a hypothesis based on evidence and typically involves objective observation, experiment, critical analysis, verification, repetition, and induction.

⁴ The boldface numbers in parentheses refer to a list of references at the end of this standard.