

Frontiers in Biorefining 2024

4A: Metrics for Measuring Sustainability

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Evaluating tradeoffs between environmental and socioeconomic indicators of sustainability

Which bioenergy crops can be grown across the diverse regions of the United States to improve water quality, sequester carbon, and/or create new jobs and rural income? What types of information should be gathered in order to achieve the multiple environmental and socioeconomic sustainability goals of local communities while avoiding adverse impacts? These are the types of questions we have been exploring for the US Department of Energy's BioEnergy Technologies Office (DOE BETO) since 2010. I will describe a set of environmental, social, and economic sustainability indicators and an assessment approach established for evaluating and visualizing the potential benefits and tradeoffs of different bioenergy systems at landscape scales. I will also introduce a list of energy and environmental justice (EEJ) indicators developed for siting new and repurposed bioenergy facilities in ways that increase benefits and decrease adverse effects to underserved communities. These EEJ indicators can be modified with communities to guide siting and permitting decisions by drawing early attention to key problems, concerns, or priorities and then tracking progress toward justice-related targets.