



Sneak Peek to the 2016 Billion-Ton Report

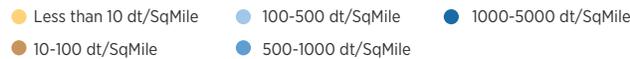
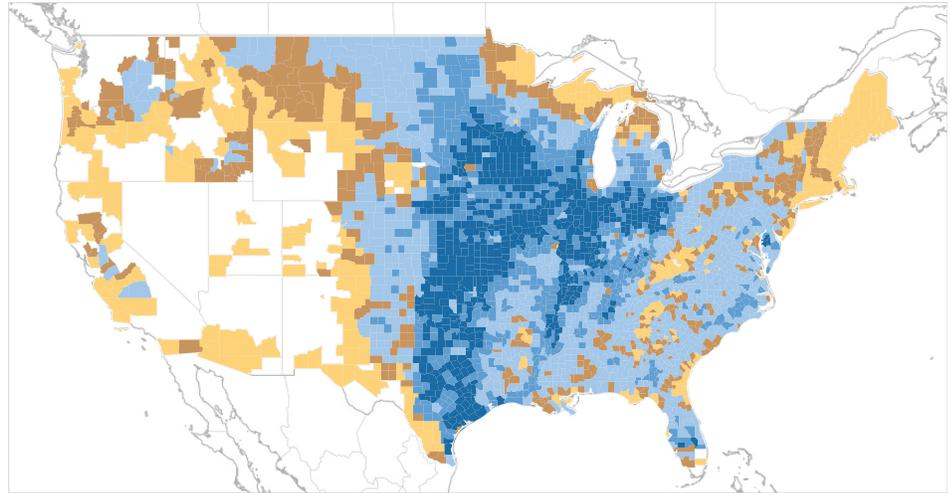
The 2005 *Billion-Ton Study* became a landmark resource for bioenergy stakeholders, detailing for the first time the potential to produce at least one billion dry tons of biomass annually in a sustainable manner from U.S. agriculture and forest resources. The 2011 *U.S. Billion-Ton Update* expanded and updated the analysis, and in 2016, the U.S. Department of Energy's Bioenergy Technologies Office plans to release the *2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy*.

This new edition in the Billion-Ton series will improve and expand upon the previous studies' broad assessment of biomass resources. For the first time, the report will include algae and municipal solid waste resources, provide greater detail of dedicated energy crop systems, and incorporate logistics costs related to delivering biomass to the biorefinery. An added feature will be links to online dynamic visualizations and data delivery via the Bioenergy Knowledge Discovery Framework (KDF).

The updated assessment will be released in two volumes, with the second focused exclusively on assessing the environmental effects of potential agricultural and forest biomass produced in select scenarios generated and discussed in volume 1.



Production of residues and energy crops at an offered farmgate price of ≤\$60 in 2040 under a high-yield (3%) scenario



Volume 1

Resource Analysis

- Potential economic availability of biomass feedstocks under specified market scenarios, including currently used resources
- Cost of production, harvesting, and transportation; potential yield range, and economic supply for 30 candidate feedstocks (>1 billion dry tons/year)

Resource Commercialization

- Advanced feedstock supply system simulation, expansion of feedstock production over time in response to simulated markets.

Volume 2

Environmental Sustainability Analysis of Select Scenarios

- Collection of analyses on the potential environmental sustainability effects for a subset of agricultural and forestry biomass production scenarios presented in volume 1

- Discussion of algae sustainability, land use and land management changes, and strategies to enhance environmental sustainability
- Analysis of climate change impacts on agricultural feedstock productivity.

One Billion-Tons of Biomass

The 2005 *Billion-Ton Study*, was the U.S. Department of Energy's first national strategic assessment of biomass resources. It provided a starting point for the evaluation of underlying data and methods for the supply of biomass feedstocks for the production of biofuels. The study was designed to provide a conservative estimate of national biomass resource potential and identified more than one billion tons of feedstocks from agricultural land and forestland. One billion tons of biomass is enough to produce biofuels to meet more than 30% of 2005 U.S. petroleum consumption.^{1,2}

¹ "U.S. Department of Energy. 2011. U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry. R.D. Perlack and B.J. Stokes (Leads), ORNL/TM-2011/224. Oak Ridge National Laboratory, Oak Ridge, TN. 227p."

² "U.S. Department of Energy. 2005. Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply. R.D. Perlack and B.J. Stokes (Leads), ORNL/TM-/66. Oak Ridge National Laboratory, Oak Ridge, TN. 78p."



New Features in the 2016 Billion-Ton Report

Extended Timeline 2017–2040 & Updated Sources

The 2011 *U.S. Billion-Ton Update* projected the economic availability modeling to 2030, while the 2016 *U.S. Billion-Ton Report* will extend this to 2040. Key underlying assumptions of the analyses include prices, start year of energy crop contracts, and scenarios. Analyses will include the latest agricultural projections from the U.S. Department of Agriculture (USDA) and the 2012 USDA Census of Agriculture, updated from 2007 and 2010 data in the 2011 report.

More Detailed Cost Analysis (volume 1)

The 2011 *U.S. Billion-Ton Update* added cost analyses—with supply curves by feedstock and county—to the quantities projected in the 2005 *Billion-Ton Study*. The 2016 *Billion-Ton Report* will model logistics costs including production, storage, handling, and preprocessing, as well as both time and distance transportation costs.

Algae Analysis & Additional Energy Crops

For the first time, algal biomass will be included as a feedstock in the

national biomass resource assessment. Also included in the 2016 report will be distinct modeling for energy crops such as miscanthus, poplar, energy cane, and eucalyptus.

Regional Analysis

The 2011 update included spatial information with county-level biomass feedstock availability estimates. The 2016 report will expand the county-level estimates with regional analysis of potential delivered supply.

Environmental Sustainability Analyses (volume 2)

The 2005 and 2011 reports included environmental constraints based on soil and forest types, and residues retention rates for erosion and productivity management.



The 2016 report will have a second volume with analyses on the potential environmental implications of agricultural and forestry biomass production based on select scenarios from volume 1. Scenarios were selected to assess and compare effects of near-term potential biomass production in 2017 and, in 2040, significantly expanded potential biomass production. Key environmental indicators investigated include soil carbon, greenhouse gas emissions, water quality, water quantity, biodiversity, and air quality. Sustainability of algal biomass production will be considered qualitatively. Climate change impacts on agricultural feedstock productivity, land use and land management changes, and strategies to enhance environmental sustainability will also be discussed. Volume 2 seeks to help identify possible environmental sustainability benefits, opportunities, and challenges related to increasing biomass production at the local, regional, and national level.

Conclusion

The 2016 *Billion-Ton Report* will advance the existing analyses of biomass resources and expand upon previous studies to estimate the potential economic availability of biomass resources as delivered to biorefineries. Like previous reports in the Billion-Ton series, the aim is to inform national bioenergy and biofuels policies and research, development, and deployment strategies.

How to Use the Billion-Ton Data

Download the reports online and explore the Billion-Ton data on the Bioenergy KDF (bioenergykdf.net), pictured to the left. Through the Data Explorer, you can add layers of Billion-Ton raw data to the map and sort and query for different factors, including price, scenario, year, and feedstock type.