U.S. BILLION-TON UPDATE

Summary Comparison with the 2005 Billion-Ton Study*

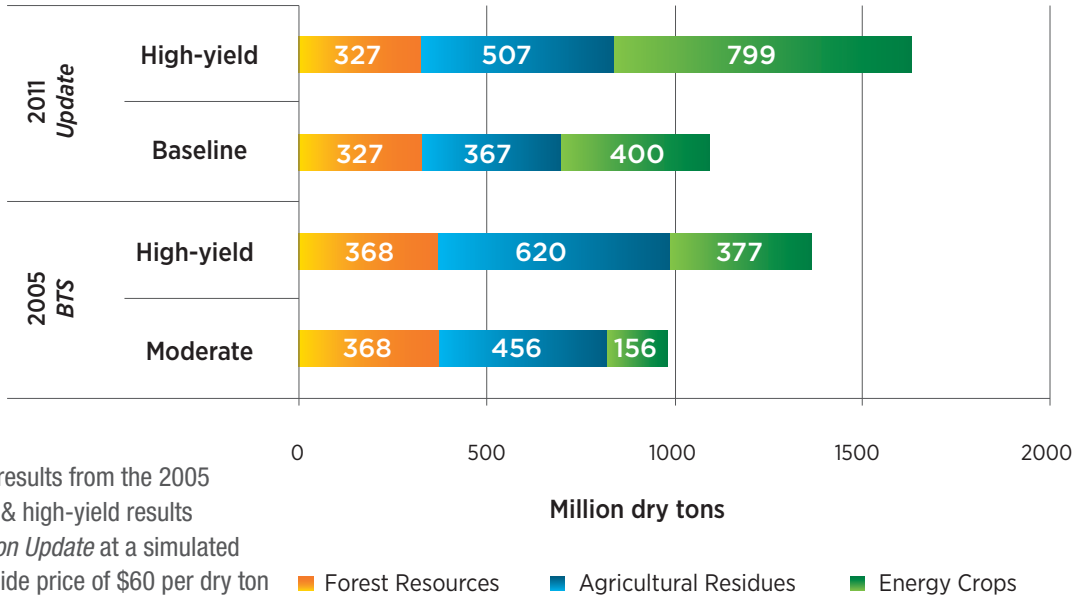
Illustration courtesy of BCS Inc.

Summary

Overall, results of the *U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry* (*Billion-Ton Update*) are consistent with the 2005 report, *Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply* (generally referred to as the *Billion-Ton Study* or 2005 *BTS*), in terms of the magnitude of the resource potential. However, the forest residue biomass potential is somewhat less than the 2005 *BTS* due to the removal of unused resources and the decline in pulpwood and sawlog markets. The crop residue potential is also less than the 2005 *BTS* due to the consideration of managing for soil carbon during crop residue removal and not allowing the removal of residue from conventionally tilled acres. The energy crop potential is much greater owing to the inclusion of additional pasture land and explicit land-use change modeling. In the baseline, energy crops provide more than a third of the total biomass available and become even more significant in the high-yield scenario—providing nearly half of the available biomass.

Background

The 2005 *BTS* was a strategic analysis undertaken to determine if U.S. agriculture and forest resources have the capability to produce at least one billion dry tons of biomass annually in a sustainable manner—enough to produce biofuels to meet more than 30% of current U.S. oil consumption. The results of the *Billion-Ton Update* are consistent with the 2005 *BTS* in terms of overall magnitude. In fact, the scenario assumptions required to show a



High & moderate results from the 2005 *BTS* and baseline & high-yield results from the *Billion-Ton Update* at a simulated farmgate or roadside price of $60 per dry ton

Illustration courtesy of BCS Inc.

*This fact sheet refers to the following document: 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. Download the full report at eere.energy.gov/biomass/pdfs/billion_ton_update.pdf. View the report, explore its data, and discover additional resources at bioenergykdf.net.

"billion-ton" resource are much more plausible. The forest resources take into account sawlog and pulpwood demands, and they factor in a more explicit accounting of resource sustainability.

The agricultural resources now take into account soil organic matter in the assessment of crop residue potential and require less significant shifts of land into no-till cultivation. The energy crop potential is formally modeled and accounts for competition among various competing uses of the land. Although the focus is more on the biomass supply and prices, the assumptions used to derive these estimates are tempered from the sustainability perspective. The *Billion-Ton Update* is not a quantitative environmental assessment or a comprehensive sustainability analysis, which means that the study does not evaluate a whole suite of sustainability criteria nor assess changes in the indicators as a function of production scenarios.

The *Billion-Ton Update* shows supply curves for major primary biomass resources; however, it is not an economic assessment of the potential impact large-scale collection, growing, and harvesting of bioenergy feedstocks might have on forestry and agricultural (both commodity crops and livestock) sectors of the economy. For the baseline scenario, simulated results do show a loss of commodity crop acres to energy crops and higher commodity crop prices. The higher crop prices more than compensate for the loss in crop acres, reflecting greater net crop returns. The large-scale deployment of energy crops will require the displacement of millions of acres of cropland and pasture, especially under the high-yield scenario. However, the projected changes in pasture acres to energy crops may require additional forage. This can only happen if there is more forage production through one or more approaches to pasture intensification.

As with the 2005 *BTS*, the feedstock potential identified in this report can be realized, provided there is more of an investment in research, not only in crop yields, but in new, innovative management and production systems, harvesting and collection technology, and the science for sustainable management.

Additional Information

The 2011 *Billion-Ton Update* is organized similarly to the 2005 *BTS*, with separate chapters for forest and agricultural biomass resources. It still excludes Alaska, Hawaii, and U.S. territories. Although energy crops are part of agricultural resources, they are treated in a separate chapter because of their potential importance. The 2005 *BTS* combined resources that are currently used for energy production with unused and prospective resources because they all counted toward the billion-ton goal. In the *Billion-Ton Update*, a clearer distinction is made between currently used resources (e.g., corn grain, soybeans, pulping liquors, mill residues, and fuelwood) and unused and prospective resources available for additional energy (e.g., feedstock needed to meet the 16 billion gallons per year (BGY) of cellulosic biofuels and 4 BGY of advanced biofuels). In addition to updating the 2005 *BTS*, the *Billion-Ton Update* addresses a number of its shortcomings by providing a county-by-county inventory of primary feedstocks, prices and quantities for the primary feedstocks, and a more rigorous treatment and modeling of resource sustainability. The *Billion-Ton Update* stresses the 2010 through 2030 time period and how it corresponds with the implementation of the Renewable Fuels Standard and other initiatives.

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

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