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Bioeconomy: One Billion Tons of Biomass

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The federal agencies that provide the muscle for energy policy are finalizing plans to harness the energy from one billion tons of biomass per year. The "Bioeconomy Vision" is an effort to move biomass out of the laboratory and into the market. The goal, within the next 15 years, is production and commercialization of biofuels, renewable chemicals and similar organic products. The target is a 30 percent penetration of biomass carbon into the U.S. transportation market by 2030 to create jobs, reduce greenhouse gas impacts, and enhance national security.

The Vision results from work started in 2013 by the Biomass Research & Development Board, created by the Biomass R&D Act of 2000. The Board is co-chaired by leadership from the U.S. Department of Energy (DOE) and the Department of Agriculture. Six other agencies participate, including the U.S. Environmental Protection Agency (EPA) and the Executive Office. In July, at the annual meeting of DOE's Bioenergy Technology Office (BETO), the Board will present an implementation plan for the Vision.

This is not cookbook stuff. In a February report — Federal Activities Report on the Bioeconomy — the Board outlines four main challenges:

- Sustainably producing and accessing adequate, affordable feedstocks
- Developing and applying innovative, cost-competitive conversion technologies
- Optimizing distribution and supply chain infrastructure
- Consumer education

The production of adequate and affordable feedstocks means plants grown specifically for energy use — and not just any plants grown anywhere. Planners do not want to impact the agricultural space necessary for food, fiber and livestock. Right now, plant science is focusing on perennial grasses, such as switchgrass and mixed native grasses and woody biomass from fast-growth trees. In the future, such crops would grow on marginal and otherwise unused landscapes.

Potentially, one billion tons of biomass could yield "50 billion gallons of fuel — gasoline, jet fuel, kerosene, diesel, about 25 percent of the market, for 2030," commented Alison Goss Eng, a Program Manager with BETO who serves as liaison between DOE and the R&D Board.

That success, though, is dependent on the right biomass. Researchers need feedstock plants with high sugar, low fiber. New kinds of plants will likely be needed.
"The importance of new energy crop varieties with increased yield and higher tolerance to a variety of biotic and abiotic stresses is critical to realizing mandated biofuel goals," BETO wrote in its March 2016 "Multi-Year Program Plan." This scope goes beyond just plants. Board advisers speak of a "synthetic biological foundry" to hasten R&D and create "industrially relevant organisms."

Goss Eng is confident that the Board is sufficiently out front on potentially contentious issues. The Board has a collaborative inter-agency process providing checks and balances to vet how or whether programs should roll out. Goss Eng said it is EPA's "mission space" to evaluate safety regarding genetically modified plants. She said the July BETO meeting will suggest areas for continued federal research priorities. She stressed that the Board and its advisors also seek and encourage private sector participation and interest. She noted that if there is no commercial side to biofuel development, these good ideas will remain static.

For a closer look at the draft timeline for the Bioeconomy Vision, see the **Multi-Year Plan**

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