To realize national biofuel production goals to produce 60 billion gallons annually by the year 2030, feedstock supply systems must be developed that can sustainably and cost-effectively provide biomass to biorefineries.

Establishing Biomass Commodity Feedstock Supply Systems

A uniform-format feedstock supply system to produce 60 billion gallons of fuel by 2030

For biomass to be manageable as a commodity, it needs to have qualities that are compatible with existing commodity-scale solids handling infrastructures, such as high density, bulk-flowability, and aerobic stability. Biomass preprocessing depots are central to achieving these characteristics by transforming diverse biomass feedstocks into uniform-format products that enable commodity-scale distribution and use.

Idaho National Laboratory's Bioenergy Program has developed an engineering design, analysis model, and conceptual strategy for a feedstock supply system that can sustainably provide uniform-format lignocellulosic biomass at a commodity scale within national cost targets. The Uniform-Format system consists of modularized harvesting and preprocessing systems that can be adapted to the diversity of feedstocks and yet be infrastructure-compatible with existing grain handling equipment and systems.

INL Bioenergy Program

The goal of INL's Bioenergy Program is to overcome key technical barriers facing the U.S. bioenergy industry by systematically researching, characterizing, modeling, demonstrating, and harnessing the physical and chemical characteristics of the nation's diverse lignocellulosic biomass resources to more cost-effec-

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The Energy of Innovation

Idaho National Laboratory

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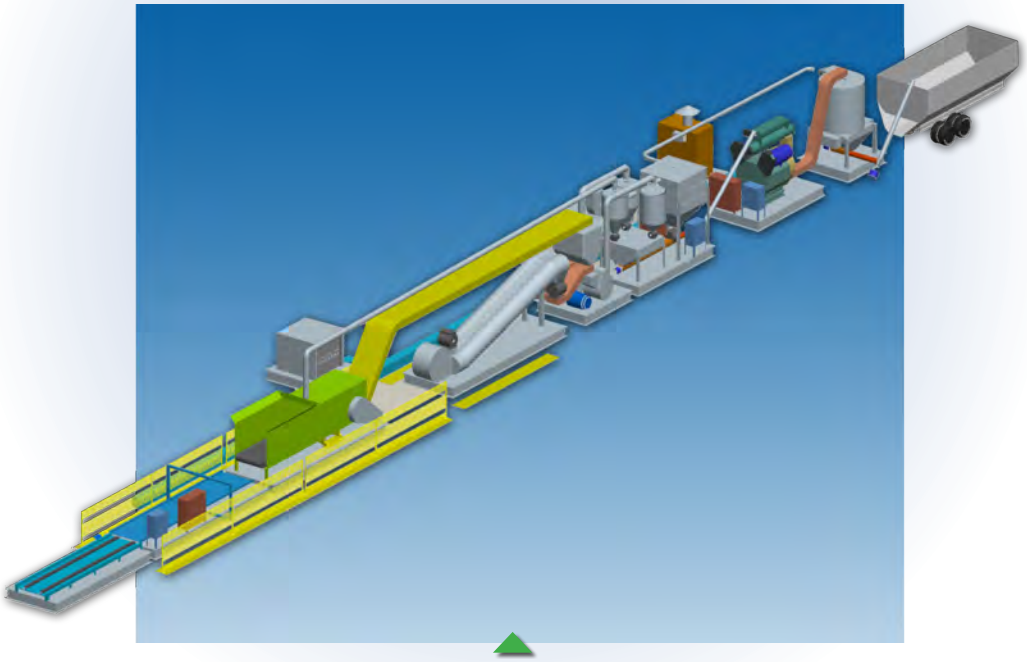
tively produce biofuels and other value-added products.

Research Laboratories and Capabilities

Four major INL research laboratories are employed to research, develop, and demonstrate the systems and technologies needed to meet DOE's biomass program requirements: (1) Biomaterials Deconstruction and Flowability, (2) Computational Engineering and Simulation, (3) Biomass Stabilizing and Upgrading, and (4) the Feedstock Process Demonstration Unit. Together, their research functions address each unit operation within the feedstock supply system, from the field to the biorefinery, including:

- Identifying sufficient, sustainable lignocellulosic biomass supplies
- Documenting and updating feedstock agronomic and physical characteristics data for all significant agricultural residue resources
- Developing technologies and methods to harvest and collect sufficient quantities of agricultural residues on an annual basis
- Developing and demonstrating innovative feedstock storage and queuing methods
- Demonstrating feedstock transportation and handling cost reductions
- Demonstrating preprocessing technologies that produce feedstock materials with critical bulk materials handling properties, such as high density, bulk-flowability, and aerobic stability
- Developing and validating optimum process and cost models for sustainable feedstock supply systems
- Demonstrating that lignocellulosic biomass feedstocks could be sustainably supplied to biorefineries within target cost and volume ranges.



Idaho National Laboratory's deployable Process Demonstration Unit (PDU) is used to model the Preprocessing Depot infrastructure and house the basic bioenergy feedstock preprocessing operation components. The goal of INL's PDU system is to process as large a variety of input materials as possible while providing a flexible interface that allows the introduction of emerging and novel processing technologies. The input material will ultimately consist of materials such as wheat straw, barley straw, rice straw, corn stover, switchgrass, miscanthus, wood products, and biowaste.

For more information

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