Forest Service Energy Investment Categories for 2010

June 2, 2009

Commercialization

- Renewable Energy Investments
  - **Solid Fuel**
    - **Development of bioenergy facilities**
    - **Local feedstock availability**
    - **Silviculture prescription development integrating biomass energy**
    - **Work associated with biomass energy for**
      - **Stewardship contracts**
      - **Free use (e.g., firewood)**
      - **Timber sales**
      - **Service contracts (e.g., hazardous fuels reduction, restoration work)**
  - **Other Renewables (solar, wind, geothermal)**
    - **Permitting and Leasing**
      - **Rights-of-way**
      - **Land use**
      - **Special use**

Commercialization (cont.)

- Traditional Energy Investments
  - Permits and Leasing for:
    - Rights-of-way
    - land use
    - special use

Research & Development

- **Sustainable and economical forest biomass management and production systems**
  - forestry best management practices for sustainable expanded biomass removal
  - new varieties of woody crops that are fast growing, high-yielding, pest-resistant, and water- and nutrient-use efficient
  - synthesis of environmental outcomes of forest biomass production approaches
  - forest biomass management systems and technologies to offset impacts and enhance environmental outcomes
  - improved harvest, collection, handling, and transportation systems for woody biomass
  - cost and equipment information and options for field processing to improve efficiency and mitigate impacts
  - strategies to integrate forest systems into agricultural landscapes to provide services as well as income
  - sustainable management and utilization systems that integrate bioenergy feedstcok production with biomass and residue managemetn, forest health and fuels reduction treatments, and production forestry.

Research & Development (cont.)

- **Competitive biofuels and biopower conversion technologies and bioproducts that reduce greenhouse gas emissions and fossil fuel use**
  - feedstock characteristic database, feedstock selection, sorting, and preprocessing technology optimized for various biofuels conversion technology platforms
  - integrated bioenergy and biofuels production processes to diversify product lines, expand markets, and provide value-added energy options for conventional wood-processing facilities
  - establish research programs in developing green chemical products from forest biomass
  - efficient biomass deconstruction techniques for chemical and fuels production through fermentation
  - lignin characterization and value-added products from lignin
  - increased fermentation rate, yield and inhibitor tolerance of fermenting organisms;
  - quantifying the rate-limiting factors and biochemistry of five-carbon sugar transformation
  - robust biorefining technologies that can utilize a variety of lignocellulosic feedstocks
  - value-added chemicals and fuels from thermochemical platforms including pyrolysis and gasification.

Research & Development (cont.)

Information and tools for decision-making and policy analysis

- higher resolution, consistent national and regional tools for more accurate assessment of forest bioenergy resources
- mapping products to identify potential sites for short-rotation woody energy crops
- models to assist with identification of opportunity zones and site selection for bioenergy facilities considering supply, transportation, water, and infrastructure
- Science-based sustainability criteria for forest bioenergy feedstocks
- life cycle analysis and assessment tools for all aspects of forest bioenergy/bioproducts, including carbon and greenhouse gas accounting
- integrated models of future land use patterns, goods and services delivery, and markets as influenced by expanded bioenergy production
- logistics and decision support tools to reduce costs of treatments involving biomass removal and improve harvest and transport efficiency.