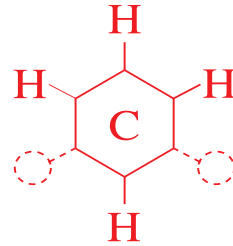


**Venture Goals:**

An Adequate **Energy Supply**





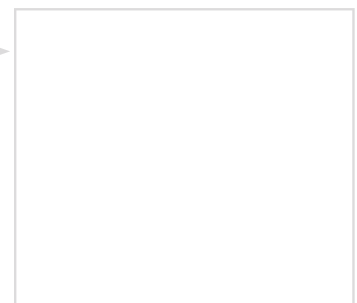
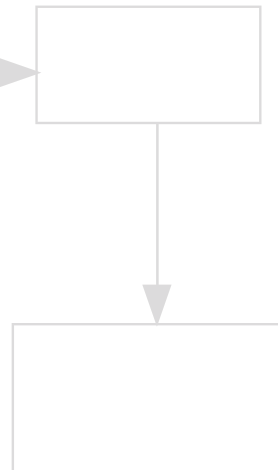
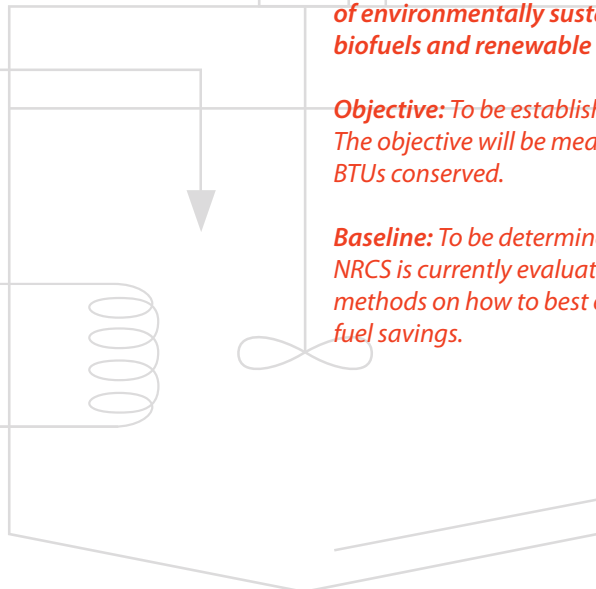
**Introduction**

As a result of increasing demand, the reliability, affordability, and sustainability of energy supplies will be continuing concerns in the years ahead. Agriculture's long-term energy strategy will include efforts to reduce demand through energy conservation and to develop alternative or renewable energy supplies and technologies. On-farm energy conservation and development also can reduce producers' operating costs. Agriculture has significant potential to contribute to the Nation's energy supply through production of energy from renewable sources and biofuels. Development of conservation systems for the sustainable production of energy crops is a priority.

**Outcome:** *Agricultural activities conserve energy and agricultural lands are a source of environmentally sustainable biofuels and renewable energy.*

**Objective:** *To be established. The objective will be measured by BTUs conserved.*

**Baseline:** *To be determined. NRCS is currently evaluating several methods on how to best evaluate fuel savings.*





## Situation

The Nation's energy consumption is expected to increase by 30 percent over the next 20 years. Improving energy management on farms and ranches could improve the environment, lower farm and ranch production costs, and decrease consumption of fossil fuels. Improving energy management includes energy conservation and energy production.

## Energy Conservation

Energy-related costs are a significant farm operating expense. Depending on the region of the country and

type of farming enterprise, energy related expenses can range from 10 to 30 percent of operating costs for producing major crops. In addition to reducing operating costs, energy conservation can reduce air pollutants and greenhouse gas emissions.

Farmers and ranchers have opportunities to conserve energy through many on-farm activities. For example, completing scheduled equipment maintenance ensures systems work at optimal levels; using legumes in crop rotations reduces energy needs by eliminating applications of fertilizer and other farm chemicals; and using efficient

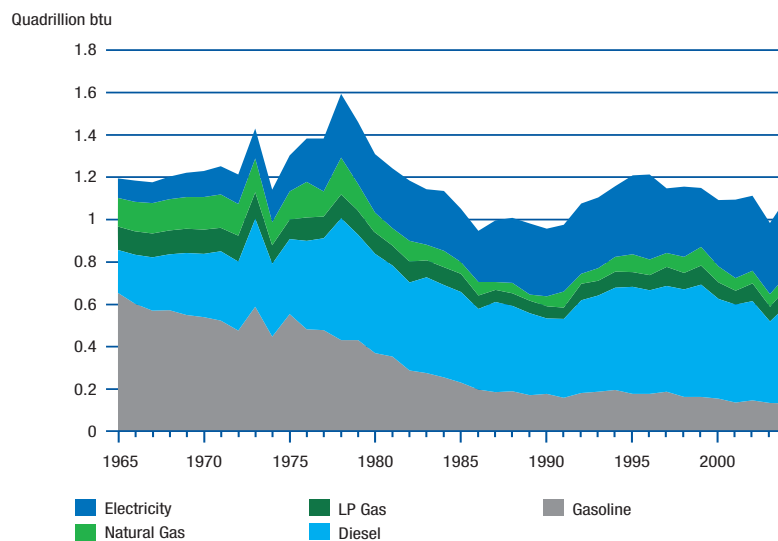
irrigation systems, such as micro-irrigation and low-pressure spray sprinkler systems, can reduce energy needs.

## Renewable Energy and Biofuels

Currently, about 6 percent of the total energy consumption in the United States comes from renewable resources. The increasing demand for energy will encourage further development of renewable energy sources. Environmentally sound production of renewable energy and biomass may provide a significant economic opportunity for agriculture.

Solar, wind, biogas (methane generation), and, in some instances, geothermal or hydropower energy, can be generated and used on or off the farm. Wind, the source of only a very small part of the renewable energy used, is the fastest growing form of renewable energy generation. Biomass—energy crops and trees and animal wastes—accounts for about one-half of the current renewable energy consumed and has significant potential for expansion. Corn is currently the most widely used biomass energy crop. Native prairie grasses and fast-growing trees like poplar and willow are likely to surpass corn because they are cheaper to produce.

**Figure 6. Energy Use in Agriculture by Source, 1965 – 2004.**



Source: USDA, Office of the Chief Economist, 2004

## Key Tasks

As concerns increase about energy costs and air quality, we expect the need for conservation technical assistance to increase. While we are not yet ready to set Agency targets for energy, we are increasing cooperative efforts with many agencies and private sector entities to develop information and technology to address energy issues.

## Current Conservation Management

Increasing concerns about the affordability and reliability of the energy supply led to the inclusion of an Energy Title in the 2002 Farm Bill. The legislation promotes the development of bio-based fuel products by encouraging Federal procurement of the

products, providing grants and loans for renewable energy, and funding research and development on bioenergy.

Many of the conservation practices that NRCS helps producers adopt reduce on-farm energy needs. Such practices include conservation tillage, precision farming, and fuel-efficient irrigation methods. In addition, NRCS provides technical and financial assistance to help farmers and ranchers reduce their dependence on fossil fuels by developing solar or wind energy to generate electricity or methane digesters. We are also providing grants to multi-farm, biomass utilization production facilities and community-wide biomass projects.

NRCS encourages producers to conduct an energy audit as the first step toward successful energy management. A whole-farm energy audit assesses the energy use of an operation and identifies cost-effective changes that could be adopted.

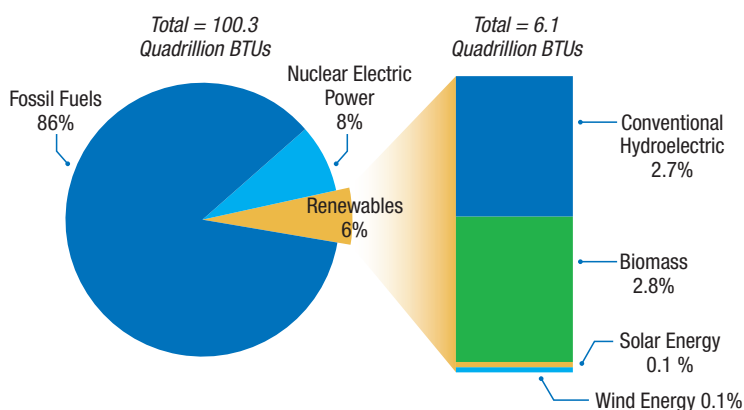
## Cooperative Action to Advance Biomass Development

NRCS Plant Materials Centers evaluate plant materials for biomass production. Proven species are released to the private sector for commercial production.

The Mississippi Plant Materials Center, working with the U.S. Department of Energy's Biomass Power and Biofuel Feedstock Development Program, evaluated biomass crops and management techniques for plants that thrive in the Southeast. Switchgrass was determined to be the most productive with one cutting.

Information and technologies related to the use of renewable energy will be widely shared through the Biobased Products and Bioenergy Coordination Council. Recent expanded partnerships with the Department of Energy and Department of Interior will allow us to coordinate and share information on biomass research and climate change.

**Figure 7. U.S. Energy Consumption by Energy Source, 2004.**



Source: Energy Information Administration, 2005



### Strategic Emphases

To encourage farmers to maximize fuel efficiency and produce environmentally sustainable renewable energy sources, NRCS will integrate energy-related resource concerns into our planning and technical consultation assistance, technology development, and financial assistance programs.

We will cooperate in the development of information and technology to promote energy management. Actions include:

- Work collaboratively with appropriate Federal,

Tribal, Alaskan Native, State agencies, and non-governmental organizations to develop a comprehensive energy audit standard;

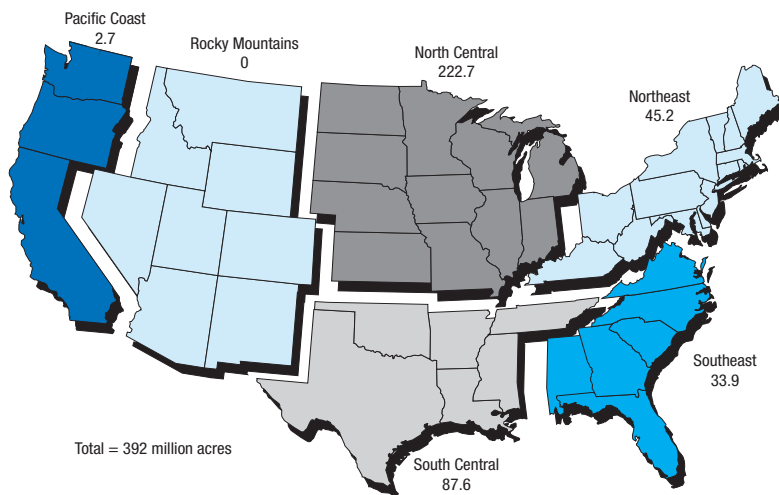
- Develop technical tools and provide training to staff and private sector providers to enhance agriculture’s ability to evaluate and reduce energy consumption;
- Partner with the private sector to encourage development of energy-efficient farm equipment;
- Design and develop tools for farmers and ranchers to assess their direct and indirect energy use;

- Increase testing of plants that show promise for biofuel production; and
- Explore the integration of energy management strategies with ongoing NRCS environmental outcomes projects.

We will integrate energy concerns into our planning assistance and programs, providing information to:

- Encourage producers to use plants better suited to local soil and climate conditions to reduce energy inputs; and
- Encourage livestock producers to adopt forage-based systems to extend and maximize the grazing season.

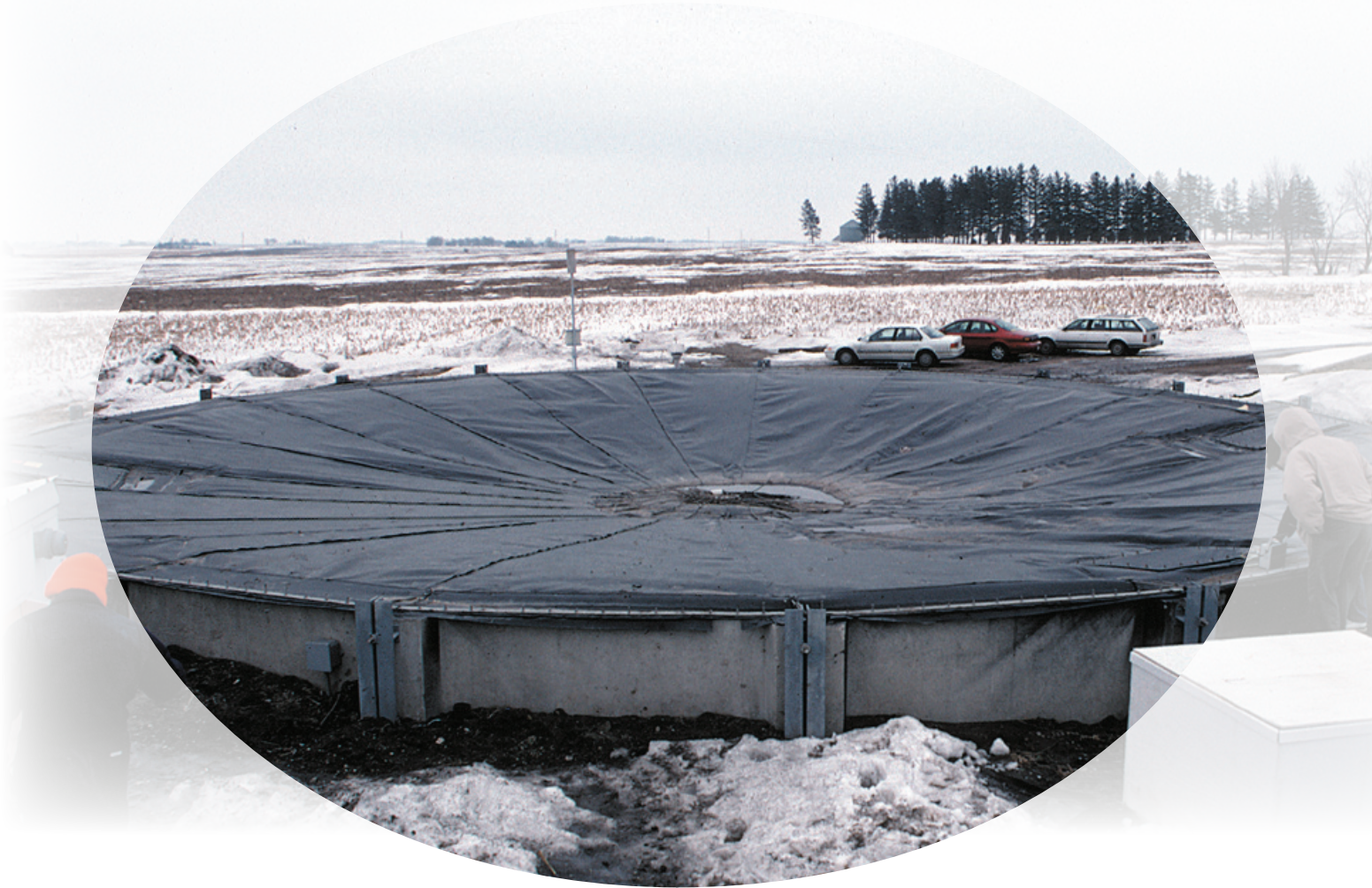
Map 5. Land Capable of Producing Energy Crops Without Irrigation (Million Acres).



Source: U.S. Department of Energy, Oak Ridge Laboratory, 1999

We will encourage increased use of biofuels by:

- Encouraging on-farm production;
- Providing incentives for expanding on-farm energy conservation and renewable energy production and use;
- Developing and executing an energy management communication campaign; and
- Increasing biofuel use by the NRCS fleet.



*Manure management for methane recovery is an on-farm source of biogas fuel.*