

CHAPTER 1

Purpose of and Need for the Proposed Action

1.1 Proposed Action

The Tennessee Valley Authority (TVA) proposes to acquire 20 megawatts (MW) of electricity generated by harnessing wind power at a windfarm at one of two alternative sites in eastern Tennessee. The electricity generated by the windfarm would be marketed through TVA's Green Power Switch™ program. TVA also proposes to construct and operate an associated Regenesys™ Energy Storage Facility to temporarily store the electricity generated by the windfarm and release it onto the TVA power grid at times of high energy demand.

The two locations under consideration for the windfarm are Buffalo Mountain in Anderson County, Tennessee, and Stone Mountain in Johnson County, Tennessee. A range of sites in the vicinity of each windfarm location is being considered for the Regenesys™ facility.

1.2 Background and Need for Action

In April, 2000, TVA initiated Green Power Switch, a program designed to offer TVA customers the option of purchasing electricity generated from renewable sources with relatively low environmental impacts. These renewable sources are wind, solar, and methane gas from landfills and wastewater treatment plants. During the first 18 months of the program, customers of 12 local distributors across the TVA power service area had the option to purchase green power. Evaluations of the program during this initial pilot phase showed that it was successful and the amount of participation exceeded early projections. On February 28, 2002, the program had about 4900 residential customers and 222 commercial customers. These customers purchased about 4,500,000 kilowatt-hours of renewable electricity during January and February, 2002. From the initiation of the program through February, 2002, about 3 percent of this electricity was generated by solar-powered photovoltaic generators, about 28 percent by wind-powered generators, and about 68 percent by landfill gas-powered generators.

TVA began generating electricity from wind in October, 2000 at a small windfarm on Buffalo Mountain in Anderson County, Tennessee. This windfarm was the first commercial wind generation facility in the southeastern United States. It consists of three wind turbines with a maximum generation capacity of 2 MW.

In order to make Green Power Switch available to more customers, TVA needs to increase its electricity generated from renewable sources. Because the operation of the existing Buffalo Mountain Windfarm has been satisfactory, TVA proposes to add about 20 MW of wind generation to its system.

In the southeastern U.S., as in some other parts of the country, wind has proven to be an intermittent source of energy. In the TVA region, the wind resource is most available at night during much of the year. In contrast, TVA's greatest needs for intermittent or peaking energy are during the morning in the winter, and during the afternoon and early evening in the summer. TVA, therefore, needs to find a method of economically storing energy generated during off-peak times by intermittent sources such as wind, and releasing it during peak times. Based on TVA's evaluations, including those in a recent Environmental Assessment (TVA, 2001), the Regenesys™ Energy Storage System should meet this need. TVA is presently constructing a Regenesys™ facility at Columbus, Mississippi to demonstrate its use in meeting peaking needs, in improving power quality and reliability, and in providing rapid response to changing power demand.

1.3 Related Environmental Documents

TVA prepared an Environmental Assessment on the three-turbine, 2-MW Buffalo Mountain Windfarm in March 2000 (TVA, 2000). This document concluded that the construction and operation of the windfarm would not result in significant environmental impacts. It did note, however, that some impacts could not be accurately predicted, and TVA committed to a program to monitor bird mortality. The preliminary results of this monitoring program are included in this assessment.

In August 2001, TVA completed an Environmental Assessment for the construction and operation of a Regenesys™ Energy Storage Facility at Columbus, Mississippi (TVA, 2001). This assessment is incorporated by reference.

1.4 Decisions to be Made

The decisions to be made by TVA are: 1) whether to construct and operate the windfarm at one of two alternative sites; and 2) whether to construct and operate the associated Regenesys™ energy storage facility at one of the sites in the vicinity of each windfarm location. The decision to construct and operate the windfarm will be made independently from the decision on the Regenesys™ facility. By contrast, the Regenesys™ facility would not be constructed if the windfarm is not constructed.

1.5 Issues Studied in Detail

Internal TVA scoping meetings and a public meeting held in Mountain City, Tennessee on December, 3, 2001, resulted in the identification of the following environmental issues:

- Meteorology and air quality
- Socioeconomic resources including population, housing, employment, and property taxes
- Groundwater and geological resources
- Wetlands
- Floodplains
- Managed areas and ecologically significant sites
- Cultural resources, including archaeology and historic sites
- Terrestrial ecology, including vegetation and wildlife
- Aquatic ecology
- Threatened and endangered species
- Visual resources
- Noise
- Solid and hazardous waste management
- Land use
- Transportation
- Environmental justice
- Water supply and wastewater