

# Land Use Conversion to Solar Facilities

## Key Takeaways

- The demand for solar energy is increasing exponentially which means more solar production facilities will be built across Tennessee.
- Solar energy requires large amounts of land to produce electricity.
- Photovoltaic solar energy requires an average of 8.1 acres of land per megawatt capacity of electrical generation.
- Solar facilities can be a major income source for landowners.
- Very few laws exist to protect landowners from exploitation, damages and unexpected monetary losses.
- issues in other states have surfaced regarding eminent domain authority to run transmission lines from the solar facilities to the electrical grid.

## Questions

1. Should regulation of Solar Facilities be on the state level, local level, or both?
2. Are solar facilities a long-term financial benefit to landowners?
3. Should farmers be concerned over the conversion of farmland to solar facilities?
4. How should Farm Bureau balance property rights with the proliferation of solar facilities?

## Background

This type of solar energy requires an average of 8.1 acres of land per megawatt capacity of electrical generation.

**The concept of manmade climate change is driving business, industry, and government to move away from conventional electrical energy sources to reduce carbon emissions.** Solar energy production is one of two primary sources of renewable electricity with the other being wind power generation. Industry, state and local government, and electric power generation companies want to achieve a certain level of electrical energy supply from sources that do not emit carbon. As a result, the demand for solar energy is increasing exponentially which means the more solar production facilities will be built across Tennessee. These facilities could utilize thousands of acres of farmland for the siting of solar panels and for easements to run transmission lines.

**Solar energy requires large amounts of land to produce electricity.** There are two types of solar energy: 1. Photovoltaics and; 2. Concentrated. Photovoltaics (PV) convert sunlight into electricity through PV panels in the same manner plants convert sunlight into energy through photosynthesis. Concentrated solar systems use mirrors to heat water for the purpose of driving turbines to generate electricity. Photovoltaics is the primary source used to meet renewable energy goals in Tennessee. **This type of solar energy requires an average of 8.1 acres of land per megawatt capacity of electrical generation. This amount of land use does not include the acreage used by transmission lines.**

The popularity of renewable energy has created goals, mandates, and government subsidies to develop and consume solar energy. In the latest Tennessee Valley Authority (TVA) renewable energy report, the Authority's growth in operating and contracted solar capacity was 70% in FY 2020. TVA has over 1,600 megawatts of solar capacity across 4,271 installations in 7 states.

Google, Facebook, General Motors, Knoxville Utilities Board, and Vanderbilt are examples of large scale electric consumers attempting to meet sustainability goals using TVA programs for renewable energy. **The long term goals of TVA include adding 7,000 to 10,000 megawatts of electricity by 2040.** The Solar Energy Industries Association estimates 1,740 megawatts of solar energy growth in Tennessee over the next five years. Political influence will drive a major increase in solar power production. President Biden's administration has set a goal to reach 100% carbon pollution free electricity by 2035. **To achieve this goal it is estimated to require the installation of 500 million solar panels nationwide.**

**Solar facilities can be a major income source for landowners.** To this point, many electricity providers are contracting with private companies to install and operate solar facilities and contract with the electrical provider. In many cases, the land is leased for a period of time to locate the solar panels and distribution lines. Nationwide, lease rates range from \$300 to \$2,000 per acre per year. Factors that can affect the lease rate include: project size, land prices and substitute uses, and regional supply and demand of solar sites. Regardless of the lease rate, the return per acre annually for a long term lease can exceed income from other uses.

**Even though solar facilities can appear to be a source of income for landowners, there are many unknowns.** Very few laws exist to protect landowners from exploitation, damages and unexpected monetary losses. Concerns include decommissioning, long term effects to the land, liability for clean-up after a natural disaster, and long-term financial stability of solar facility companies. **Many communities in Tennessee do not have adequate zoning regulations regarding these facilities and property owners in rural communities believe large scale electrical production facilities covering thousands of acres should be sited through zoning just as any other industrial facility.** In 2021 the Louisiana state legislature passed a one-year moratorium on solar facilities to give the state time to adopt laws and regulations to govern solar facilities and protect landowners. **Also, issues in other states have surfaced regarding eminent domain authority to run transmission lines from the solar facilities to the electrical grid.**

## Policy

### *Energy*

Environmental concerns, land area and lack of technology are just a few of the shortcomings preventing coal, solar and wind energy from being the reliable sources of energy this country will demand if we are to remain a world industrial leader. The United States should be aggressive in research and development and expansion of our nuclear energy capabilities.

### *Renewable Fuels*

More promotion and research should be placed into alternative energy sources. Farmers have the potential to provide clean, abundant, renewable energy sources for our state and nation. The same visionary ambition and technology that advanced our nation as the leader in food and fiber production can place our state and nation to the forefront of renewable energy production and use.

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