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# LANDOWNER'S GUIDE

To Renewable Energy

# INTRODUCTION

Clean energy is on the rise and quickly becoming a competitive alternative to fossil fuels. Wind power is the 4th largest source of electricity in the United States, providing 9% of the country's electricity<sup>[1]</sup>. Solar ranks 3rd for renewable energy generation and is currently the fastest-growing electricity source in the nation, as prices for solar panels have plummeted 89% in the past 10 years<sup>[2]</sup>. Battery storage combined with wind or solar produces electricity even when the wind is not blowing, and the sun is not shining. This type of "hybrid" project creates a much more reliable and resilient energy source. Combined, wind and solar projects avoid 100s of millions of metric tons of CO<sub>2</sub> emissions each year, while also serving as an attractive long-term investment.

Leasing your land to a project developer for a solar or wind farm is one of the easiest ways to generate steady income on your farm for generations to come. Project

developers handle all aspects of the clean energy project, such as evaluating the site for ample solar/wind resources and transmission capacity, securing financing, performing environmental studies, obtaining buyers for the electricity, applying for permits, and engaging with the local stakeholders. The project owner handles construction and the operations and maintenance for the system's entire lifecycle.

The relationship between a project developer/owner and a landowner will last for years, so landowners must choose wisely and pick a developer who is realistic, fair, easy to communicate with, and does not overpromise. Selecting a reputable and knowledgeable developer with an extensive portfolio of completed projects makes the process run smoothly, helping ensure a profitable investment for the landowner and all those involved.



# WHO IS THIS GUIDE FOR?

This *Landowner's Guide to Renewable Energy* is primarily for large-scale ranchers or farmers who desire one or more of the following:

**Returns:** 20-80 years of an additional revenue stream is enticing to farmers looking to retire without any other family members who want to stay and run the farm.

**Clout:** Help your fellow community, such as schools, hospitals, and non-profits, with an ad valorem taxable infrastructure, which brings the community more revenue from increased property taxes (paid by the project owner).

**Change:** Feel good by producing clean, renewable, and affordable electricity for your community. Wind and solar energy do not emit air or water pollution and, subsequently, avoid 100s of millions of metric tons of CO<sub>2</sub> emissions that fossil fuel generators would create.



## Wind

Wind is a more efficient renewable energy than solar, as the turbines take up a smaller footprint. A minimal adjustment is required to existing operations as a wind turbine only has a  $\frac{1}{4}$  acre footprint. Thus, wind energy is the more popular choice for ranchers and farmers as this clean energy source is less intrusive to farming and cattle operations. The development timeline of a wind project is 3-7 years, with construction taking anywhere from 12-18 months. The wind lease term can last up to 50 years or longer when the existing system is repowered.

# WIND

# VS

# SOLAR FARMS

## Solar

Solar is one of the most popular forms of clean energy – and for good reason. Solar is cheap and scalable, and the sun's energy is abundant. Solar projects typically provide more \$/acre than wind; however, these projects consume a substantial footprint and are therefore more intrusive to farming. Still, solar is a sensible option for vacant land that does not serve any other purpose, such as land without water access. The development time of solar is slightly less than wind at 3-5 years, and the construction timeline is the same as wind at 12-18 months. When repowering is considered, the solar lease term can last up to 80 years.



## Batteries

Batteries are a perfect pairing with renewables. The energy can be stored and used later when the sun is not shining, or the wind is not blowing. Storage is becoming more popular with renewable energy projects as there are many benefits, such as reduced curtailment, improved reliability, and increased revenue streams from additional energy production. Including batteries in the project is suggested by the developer and operator, if suitable for the specific project and power purchaser's needs.

## BENEFITS TO THE LANDOWNER

By investing in clean energy with a project developer, a landowner receives a plethora of benefits such as:

**Long-term, meaningful income:** Keep the farm in the family for generations to come with steady royalty payments.

**Income diversification:** Through sustainable land use, renewable energy helps diversify your income streams for improved security. This stable income could play a more important role as climate change is expected to cause droughts and extreme weather that may affect crop production.

**Benefit your community:** Create taxable assets with your solar or wind farm that provide extra tax revenue for your community.

**Job creation:** About 1-3 local, long-term jobs are established with every solar project and 10-15 jobs with a wind project.

**Improved country roads:** As the access roads must meet specific criteria for construction, expect your local roads to get repaved and feeder roads built on your property for necessary maintenance.

**Constant support from an experienced developer:** By partnering with a well-respected developer, the site will be properly managed from start to finish with a turnkey approach that requires minimal interruption to your life and existing operations. The ideal developer will care deeply about the project to deliver the best and most optimized energy system so that you reap the maximum rewards for leasing your land.

# PHASES of the RENEWABLE ENERGY PROJECT

## Land Evaluation: 2-3 years


During this initial phase, the developer conducts a site assessment for ideal, targeted sites that are open, flat, and have high voltage transmission lines nearby. Once an Available Transmission Capacity analysis is complete, energy yield and revenue forecasting reports can then be made, based on several years of solar or wind data at the specific location<sup>[3]</sup>. A project planning and strategy session is then held with the landowner. Other project due diligence, such as interconnection studies, wildlife and environmental testing, confirming tax entities' willingness to consider tax reductions, and risk assessment, is administered prior to moving forward.

## Development: 1-4 years

The site is secured during the development stage with negotiated leases, easements, and permitting. Clean power buyers (such as a utility or independent power producer) are obtained, and project financing is applied for. The local operator and regulatory committee are involved with the interconnection and any additional transmission lines that must be built. At this point, the surrounding community is included in a full-transparency town hall-style meeting where all stakeholders' input is welcome and encouraged. Tax abatement negotiations are discussed with the community as well as all other legislative affairs are overseen.

## Construction: 1-1.5 years

After the permits are issued, the construction phase officially begins. Requests for proposals are sent out, and contractors are selected with their contracts negotiated. All equipment is procured and delivered, and on-site crews are mobilized and managed by the developer's construction project managers. Financing and construction loans are then finalized and obtained. Access roads to the site are built, and the solar/wind farms are constructed according to the specifications determined in the development stage.



## Operations & Maintenance (O&M): 20-80 years

After construction, the project is fully operational. The O&M stage is the value creation stage in which the revenue begins to generate, and the project's performance (and thus landowner's payments) are optimized. The project owners are fully responsible for maintenance, improvements, repairs, and security for the full lease term, which can be anywhere from 20 to 80 years. Solar systems do not include any moving parts; hence, maintenance is minimal with a simple cleaning of the panels and vegetation management. The maintenance for wind is more laborious than solar as the system is mechanical with advanced control systems that require routine preventative maintenance 2-3 times per year, blade cleaning, oil changes, and more frequent part replacements.

## Decommissioning or Repowering: 1-2 years

At the end of the project's life (20-25 years), there is the option to repower the existing system for another 20-25 years or decommission the solar/wind farm from further use. Decommissioning involves removing the infrastructure to return the land to its original state, or better, and then either recycling or properly disposing of the materials. Choosing to repower the power plant is typically the most economical choice as the upfront work is already complete, and the project only needs new permits and parts. The project owner is responsible for decommissioning and/or repowering the plant, per the lease terms.

# FREQUENTLY ASKED QUESTIONS



## How much will I get paid?

Payment is challenging to estimate because the amount is typically based on the projected revenue, land value, crop value, specific region, size of turbines/solar arrays, acreage used, and more.

## How much acreage will the solar/wind farm take up?

Solar depends on the size of the suitable land and is easy to scale, with about 10 acres per megawatt. For wind, one turbine is placed approximately every 160 acres (a quarter section) with rows one mile apart due to the wake effect. Each turbine takes up  $\frac{1}{4}$  acre. For example, with 10,000-15,000 acres, only a 200-acre footprint may be used.

## How long does the project take until fully constructed?

The land evaluation and development phases take 3-7 years, with solar taking slightly less time with a maximum of 5 years. Construction for both takes an additional 12-18 months.

## How long is the lease term?

For wind, the lease term is up to 50 years. Solar projects can last up to 80 years with little operational maintenance without moving parts.

## What happens if the project owner goes bankrupt?

A bankruptcy court will likely assign the project to the largest shareholder/lender, who will be motivated to continue operation and production.

## How will the county and schools benefit?

The project investment creates additional property tax revenue for the tax entities in the community.

## Am I responsible for insurance?

No, the project owner must maintain insurance coverage for damage or injuries during the project's life and lease.

### **Will my property value or my neighbor's property value diminish?**

There are few examples of diminished property value. Most will maintain a normal increase in value similar to the surrounding properties.

### **Will my property taxes increase?**

No, the infrastructure and equipment are taxed and paid by the project owner, not the landowner.

### **Is there a tax abatement?**

Yes, a property tax reduction or payment in lieu of taxes is normally negotiated with the county and school district. The agreement typically lasts for about 10 years. This tax structure is common to aid the project's economics.

### **How are aerial applicators/crop dusters affected?**

If aerial crop dusters are unable to continue operations, surface-based crop sprayers can be used instead.

### **What is the setback from homes and neighbors?**

State and local ordinances, WECS, AIMA, and good faith negotiations are used to establish setback guidelines.

### **Will there be any damage to the crops (such as turning radius)?**

Possibly, but if so, there will be reimbursement. Agreements typically state that crop damage must be repaired or compensated for.

### **Will there be eminent domain?**

No, there will not be eminent domain. The landowner chooses whether or not to move forward with the proposed renewable energy project.

### **How are wind turbines winterized?**

Wind turbines less than 5 years old usually have heaters that keep the hydraulics and lubricants at the proper operating temperatures.

### **How do we protect/repair drain tiles and other drainage features such as terraces?**

Proper siting and setbacks are used to mitigate drainage feature impact. If damage happens, it will be repaired upon incident.

### **Is there additional compensation for compaction damage?**

Compaction damage is corrected upon incident and compensated for.

### **What happens to the infrastructure if the project owner decides to tear it down?**

This is called decommissioning, and the project infrastructure is removed, recycled, and/or disposed of properly. The surface is then reclaimed to its original condition or better.

### **How will inflation/CPI (consumer price index) affect our payments?**

Lease terms typically have escalation rates to deal with unpredictable inflation to scale royalty rates over the time of operation.

### **Are coal mines and sinkholes a concern?**

Proper siting and setbacks are used to address these formations.

### **Will there be any subsidies or tax incentives for the project?**

Tax reductions are usually negotiated with taxing entities, and tax equity investments are generally part of construction financing.

# TOP 5 MYTHS

## About Wind & Solar Debunked

### 1. How are birds protected from fatalities?

In the United States, 15 million birds die annually from fossil fuel plants, with only 1 million yearly bird deaths from wind turbines<sup>[4]</sup>. In comparison, 80 million birds are killed every year from cars, 90 million from pesticides, and up to 1 billion by cats<sup>[5]</sup>. During wind turbine projects, proper siting and setbacks are used to mitigate bird fatalities.

#### Estimated number of birds killed by hazards in the US each year (millions)



\*Based on EIA Annual Energy Outlook 2021

Source: A. Manville, US Fish and Wildlife Services / American Bird Conservancy / Cornell Lab of Ornithology / EIA

Figure 1: Wind turbines kill far fewer birds than other hazards<sup>[5]</sup>



## 2. Is shadow flicker a problem?

Shadow flicker is the effect of a wind turbine's moving shadow as the blades rotate. Proper site selection, setbacks, and advanced computer modeling that considers the terrain, sun's movement, and wind sectors are used to mitigate flicker. Landscaping can also block the shadows and stop the wind turbines during times of noticeable effects, such as at sunrise/sunset when the casted shadows are long. The general guideline is to limit shadow flicker to 30 hours per year or a maximum of 30 minutes per day<sup>[6]</sup>.

## 3. How loud are the wind turbines?

Much care and proper siting are considered so that the sound from wind turbines is barely noticeable to nearby residences. Terrain and turbine type are used to model appropriate noise levels in relation to homes within 2 km. At 40 dB, the sound from a wind turbine is about the same as a refrigerator<sup>[7]</sup>. Even while standing underneath a wind turbine, two people can hold a conversation at normal voice levels.

## 4. Do wind turbines cause cancer?

"To date, no peer-reviewed scientific journal articles demonstrate a causal link between people living in proximity to modern wind turbines, the noise (audible, low-frequency noise, or infrasound) they emit and resulting physiological health effects..." – Iowa Environmental Council<sup>[8]</sup>.

## 5. Will endangered species be protected?

18% to 30% of all 9 million animal species on the planet are at risk of extinction due to climate change<sup>[9]</sup>. For every gigawatt of renewable energy capacity installed, 42 species are saved from extinction. Also, proper siting and setbacks are used in clean energy projects to conserve wildlife.

## ABOUT AMSHORE

Amshore® Renewable Energy develops sustainable energy solutions for utility companies and independent power producers looking to expand their renewable energy projects throughout North America. Our team of developers, with 100+ years of combined experience, help clients find, evaluate, and create projects that reduce climate change risk, increase energy independence, and provide cleaner air for future generations. To date, Amshore has developed 2.9 gigawatts of renewable power covering 500,000+ acres leased. More than \$4 billion have been invested in Amshore-originated projects. Learn more about Amshore Renewable Energy at [www.amshore.com](http://www.amshore.com).

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### References

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