



# FREQUENTLY ASKED QUESTIONS

## RICHARD G. LUGAR CENTER FOR RENEWABLE ENERGY

RENEWABLE ENERGY		
Question	Keyword	Contents of a Good Response
<b>ECONOMIC</b>		
Will jobs be created? How many?	<b>Employment</b>	The project should be able to: <ul style="list-style-type: none"> <li>• Identify and describe the short-term, immediate jobs</li> <li>• Identify and describe the long-term jobs</li> <li>• Address the proportion of jobs provided locally</li> </ul>
Are there income opportunities for the landowner?	<b>Leasing Payments</b>	<b>Yes.</b> Numbers vary based on location and the type of equipment used. On average, landowners who lease out the land under solar or wind can receive about \$200 to \$1600 per acre per year.
Will property values be affected?	<b>Property Values</b>	Research have shown that solar or wind farms tend to have either <b>no effect</b> , or a small <b>positive effect</b> on nearby property values.
Is a tax break/deduction available, and how does this work?	<b>Tax Deduction</b>	Yes. Both the landowners and developers can apply for a property tax deduction for a specified amount of time (a few months to few years). A tax professional can be consulted in this regard.
Does electricity produced and supplied to the grid lower utility bills? How do consumers use the sustainably generated electricity?	<b>Utility Bills</b>	<b>Sometimes.</b> Utility scale projects have no impact on the utility bills as the electricity is directly supplied to the grid. The utility company distributes this to the households at their set price. On the other hand, commercial and residential projects (i.e rooftop solar) can contribute to reduction of utility bills. The consumers are automatically using this electricity that the utility company has purchased from the developers/operators.
Is electricity generated from renewables more expensive?	<b>Utility Bills</b>	No. Even subject to fluctuations the price of renewable energy has been dropping and is quite competitive compared to other fuel options.
<b>GENERAL</b>		
What happens to the project when it reaches the end of life?	<b>Decommissioning</b>	As a part of the contract with the landowner, the project developer should provide a decommissioning bond as insurance. Should the developer not physically decommission the project after its useful life, this bond serves to pay for removal of equipment and any other steps needed to return the land to its original state, like removing concrete from wind turbine bases.
Will construction damage drainage or roads?	<b>Construction</b>	<b>Rarely.</b> Developers can easily work around existing structures and drainage systems as to not damage them. If drainage is damaged during construction, its often repaired by the developers.
Can the electrical grid remain stable with renewable energy penetration?	<b>Grid Stability</b>	<b>Yes.</b> It's true that a high percentage of renewable contribution to the grid can affect grid stability. However, modifications already being made to the existing grid system help to mitigate these effects.
Where is the locally generated solar power being used?	<b>Local Energy</b>	Power from a solar farm is routed to the power grid, the system that supplies the town/province with electricity. The power grid is owned/operated by the local utility companies. Electricity can travel 300 miles or more from a power plant, meaning the electricity generated could travel that far but it will take care of the closest needs first.
How much power is produced? How many homes can be provided for?	<b>Power Output</b>	Depending on size and technology one acre of land can be used to install 50-100 kW of wind and 200-250 kW of solar power. Considering the US average household electricity consumption of 882 kwh/month, around 20-25 acres of land can energize 1000 households.
Is Indiana a good place for renewable energy?	<b>Why Indiana?</b>	<b>Yes.</b> Indiana has always been a good state for wind turbine installations. Indiana is ranked 12 <sup>th</sup> for wind power in the US. For solar, Indiana has 75% as much sunshine as the sunniest state in the US. In 2021, Indiana ranked 6 <sup>th</sup> in the country for solar project developments.



# FREQUENTLY ASKED QUESTIONS

## RICHARD G. LUGAR CENTER FOR RENEWABLE ENERGY

SOLAR ENERGY		
Question	Keyword	Answer
<b>GENERAL</b>		
Will solar panels be damaged by weather events?	<b>Damage</b>	<b>Sometimes.</b> Most solar panels can withstand winds of 140-160 mph, and hail/debris falling up to 50 mph. Solar panel damage during weather events is rare with proper installation and maintenance.
Will traditional energy sources (gas, coal) still be used besides solar?	<b>Efficiency</b>	The major portion of the energy still comes from fossil fuels. Conventional fossil fuels are polluting and the use of renewable energy sources like solar is expanding due to reduced cost of producing electricity.
What will farmers do if they're not farming that land anymore?	<b>Employment</b>	A project will only take an agreed-upon amount of land, and this is rarely all the land. Other plots will still be left to farm, and many landowners use this to diversify their income.
Are solar panels noisy?	<b>Noise</b>	<b>No.</b> Inverters used in solar panels can generate a quiet low buzzing sound as they convert DC current to AC current. The noise generated is generally not audible over ambient noise (rustling wind, birds, traffic, etc.)
Will solar panels produce a bad glare?	<b>Glare</b>	<b>No.</b> PV modules use non-reflective glass and are designed to absorb sunlight, not reflect it. PV modules are less reflective than windows.
<b>LAND USE &amp; MANAGEMENT</b>		
Will the solar farm take away from scenic country views?	<b>Aesthetics</b>	<b>It depends.</b> Many contracts require developers to leave a certain amount of land between an installation and a road/home, and may require a natural visual barrier (like a row of trees) to be planted.
Can farmland be restored back to agricultural use after solar farm decommission?	<b>Decommissioning</b>	<b>Yes.</b> Land can be converted back to agricultural use at the end of life of an installation. Giving the soil 20-25 years of rest, or switching to a low-height crop rotation, can also maintain or improve soil quality.
Can farmers raise livestock in a solar farm?	<b>Dual-Use, Sheep</b>	<b>Yes.</b> Sheep are commonly used for grazing vegetation control at solar facilities because they do not climb on or harm the modules. This can reduce mowing, herbicide, and other vegetation management needs.
Who owns the solar farm and who owns the land? Can utility companies take away the land from the landowners if they have rights to the solar farm?	<b>Land Rights</b>	The rights of the landowners and lessee is well defined in the leasing document. The lease is legally binding but does not give the lessee eminent domain rights to take the land after the lease period ends. Since the lease is complex, detail and lengthy, it is always wise to consult an attorney before signing the lease.
What happens to the tenant farmers of leased solar land?	<b>Leasing</b>	If the landowners choose to lease the land for the lifetime of the solar farm (20-30 years), operations and maintenance of the land shifts from the farmer to the solar company. Land leases typically generate more revenue than traditional crops, diversifies your income, and removes the risk of poor yield years.
Do solar farms have to be installed in high quality soil?	<b>Soil Quality</b>	<b>No.</b> Solar farms can be installed in rich or poor soil. They can be installed in non-farmable land, or in active farming sites. There is no "one size fits all" option.
How is vegetation managed under the panels?	<b>Vegetation</b>	With leased land, <b>the leasing party (i.e. utility company/developer) is usually responsible for upkeep.</b> Many options are available for weed control including herbicides, grazing animals, mowing, and weed control sheets. In non-farmable land, ground cover under the PV installations helps prevent erosion. Many native plant species and partial-sun crops (strawberries, melons, vegetables) can grow well under PV panels. In dry areas, some crops even grow better in the shade of PV than in an open field.
Are solar panels toxic?	<b>Toxicity</b>	<b>No.</b> Solar panels will not harm people, water, or soil. In fact, studies confirm that soil under PV panels holds more moisture than the surrounding soil. PV cells do contain metals and some toxic compounds, but research shows though that industrial incineration temperatures (way higher than natural events) are required to release these compounds and pose any sort of significant risk.



# FREQUENTLY ASKED QUESTIONS

## RICHARD G. LUGAR CENTER FOR RENEWABLE ENERGY

WIND ENERGY		
Question	Keyword	Answer
<b>GENERAL</b>		
How long do the turbines last?	<b>Life Expectancy</b>	Blades and turbines last between <b>20-30 years</b> with proper operation and maintenance.
Why do turbines stop spinning, are they broken?	<b>Stopped Turbine</b>	Wind turbines stop when winds become too high for safe operation, when power demand is low, and for scheduled maintenance.
Will storms damage wind turbines?	<b>Storm Survival</b>	<b>Sometimes.</b> Turbines have a lock mechanism when wind speeds exceed about 55 mph. This reduces risk of damage in storms, like tornadoes.
<b>SAFETY &amp; PUBLIC HEALTH</b>		
What is shadow flicker and can it be prevented?	<b>Aesthetics</b>	<b>Yes.</b> The shadow flicker from sun shining through rotating blades can be irritating to some people. Shadow flicker protection systems are available for turbine farms. This add-on technology tracks the sun and will shut down the blades when the sun is in a position to cast a shadow flicker on nearby homes.
Do wind turbines catch on fire?	<b>Fire Hazard</b>	<b>Rarely.</b> It's estimated that 0.05% of wind turbines will catch fire in their lifetime. This is less than the chances of a car catching fire, which is 0.07%.
How a wind turbine fire can be put out?	<b>Fire Safety</b>	Turbine fires can absolutely be extinguished. Fire suppression systems are available in the nacelle (a 'nacelle' is the large box at the top of the mast) to put out fires as soon as they happen.
Are wind turbines noisy?	<b>Noise</b>	<b>No.</b> Passing air across turbine blades does create a wind-whoosh noise. Newer turbine designs have managed to minimize this noise, and the sound becomes inaudible 1000 ft from the turbine, which is the recommended minimum distance between turbines and nearby dwellings.
Do wind turbines throw ice?	<b>Projectiles</b>	<b>Sometimes.</b> Ice can dislodge from wind turbines. Turbines sensing ice accumulation can be shut down autonomously or manually. Additional risk mitigation is in place by ensuring turbines are placed far enough away from inhabited dwellings and roadways.
<b>ENVIRONMENTAL</b>		
Are bat and bird populations affected?	<b>Wildlife</b>	A project should detail the environmental review processes and permits undertaken and received, and how impacts to wildlife has been avoided, reduced, and/or mitigated.