Power and Trade-Offs

Weigh the effects of wind technology in Indiana.

IS.4.4 "Analyze the economic, social, and environmental impact of technologies on the state."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline economic effects, circle social effects, and write E beside environmental effects in the passage; find at least one benefit and one cost in each category.

Wind Turbines on Indiana Farmland

1 On a windy day in northwest Indiana, turbines turn above farm fields. Their blades drive generators, which send electricity into the power grid. A turbine does not make power when the wind is too weak, so grid operators must match changing supply with demand. Building a wind farm requires roads, concrete foundations, electrical lines, and skilled crews. Once it operates, the project can pay farmers to lease small parts of their land while they continue growing crops nearby. These payments may steady farm income, but a turbine does not guarantee that local customers will pay less for electricity.

2 Wind projects can change more than household budgets. Construction creates temporary work for equipment operators and electricians, while maintenance offers a smaller number of ongoing jobs. Property tax revenue from a project may help pay for local public services, depending on state and local tax rules. Some residents welcome the income and tax base. Others object to turbine noise or the way tall towers change the view. A county must decide where turbines may stand, including how far they must be from homes. Those rules shape who receives benefits and who lives near the machines.

3 Wind turbines generate electricity without burning fuel at the site, which can reduce air pollution when their output replaces electricity from fossil fuels. However, making steel and concrete for towers and foundations uses materials and energy. Turbines can also kill birds and bats, especially where flight paths overlap with spinning blades. Careful siting and temporary shutdowns during high-risk periods can reduce some of those deaths, although they may also reduce electricity production. Evaluating a wind project means weighing these changes together: cleaner power, landowner payments, public revenue, neighborhood concerns, and harm to wildlife do not fall on the same people or places.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why could a wind project increase local income without lowering local electricity bills?

2. How could a wind project help a community while also causing a social conflict? Use two details from the passage.

3. Compare one environmental benefit of wind turbines with one environmental harm. What could reduce the harm?

4. Would you support approving a wind farm if the county required careful siting and temporary shutdowns during high-risk periods? Explain using one economic, one social, and one environmental effect from the passage.

3 YOUR TURN

Your own words

Imagine Indiana school districts replacing diesel school buses with electric buses. In 4 to 5 sentences, predict an economic, a social, and an environmental effect, then explain one condition that could change your judgment of the plan.

Power and Trade-Offs

PART 1 · READ AND MARK

Underline economic effects, circle social effects, and write E beside environmental effects in the passage; find at least one benefit and one cost in each category. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why could a wind project increase local income without lowering local electricity bills?	**Farmers can receive lease payments, and the project can create jobs, but it does not guarantee lower electricity prices for local customers.**
2	How could a wind project help a community while also causing a social conflict? Use two details from the passage.	**Project tax revenue may help pay for public services, but some residents object to turbine noise or the changed view.**
3	Compare one environmental benefit of wind turbines with one environmental harm. What could reduce the harm?	**Wind power can reduce air pollution when it replaces fossil-fuel electricity, but turbines can kill birds and bats. Careful siting or temporary shutdowns can reduce some deaths.**
4	Would you support approving a wind farm if the county required careful siting and temporary shutdowns during high-risk periods? Explain using one economic, one social, and one environmental effect from the passage.	**Answers may vary. A supported yes could cite lease payments or jobs, the need to address residents' noise concerns, and reduced air pollution alongside measures to limit bird and bat deaths.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Buying electric buses would cost Indiana districts money up front, though lower fuel and maintenance costs could offset some of that expense. Students and neighbors might experience quieter rides and streets. Replacing diesel buses would eliminate tailpipe emissions on their routes, but charging the buses could still produce pollution at power plants. I would support a pilot first, because winter range and charging access could affect whether the benefits outweigh the costs.

Accept different judgments when students support them with the requested types of effects. For Part 3, accept plausible predictions rather than requiring exact costs or emissions figures.