

The Role of Commercial Energy Payments in Agricultural Producer Income

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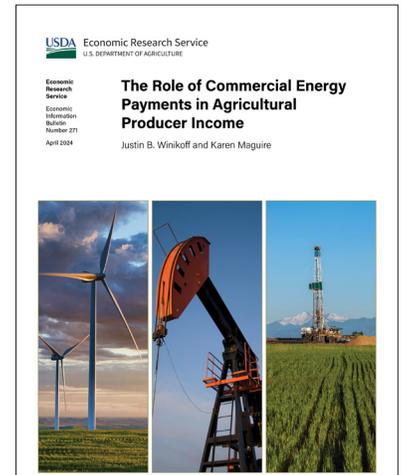
What Is the Issue?

Historically, payments from businesses for energy development, particularly oil and natural gas, have been an important source of income for farmers who hosted energy production on their land. Since the early 2000s, energy markets experienced marked shifts: Price increases and technological improvements led to a dramatic increase in oil and gas production, and wind energy development experienced significant growth, leading to a new source of income for farmers. Information about who has benefited from energy income and how the income was distributed to agricultural producers, regionally and demographically, may help stakeholders understand the costs and benefits of a changing energy mix as leases for new types of energy production become common among farm households.

What Did the Study Find?

High crude oil prices through 2014 led to increases in the size of energy payments to farm operators with oil or natural gas resources. Wind projects were also widespread over this period and continued to expand through 2020, the end of the study's sample period. Wind development provided opportunities for energy payments to producers outside of areas with oil and gas resources. For agricultural producers over the sample period of 2011–20, this report found:

- Approximately 3.5 percent of farm operators reported receiving payments for energy production on their operation between 2011 and 2020. The share of farmers receiving payments did not dramatically differ from year to year.
- For those who received energy payments, the average annual payment (in 2020 dollars) over the period was \$30,482, but it varied significantly from year to year. Average annual payments were as high as \$62,944 in 2013 and as low as \$14,032 in 2020. Payment amounts tracked closely over time with the price of oil.
- Average annual energy payments were the most common (7.4 percent received payments) and largest (\$39,087) in the Plains region (Kansas, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas), where energy production is most abundant. They were least common (1.45 percent received payments) in the South (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, and South Carolina) and smallest (\$10,953) in the Midwest (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin).



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- Farm operators were between an estimated 4.5 and 5.6 percent more likely to receive energy payments if located in oil and natural gas-producing counties than in counties with only wind energy production.
- On average, payments were higher in counties with only oil and natural gas production (\$32,167) than in those with only wind energy production (\$17,303). However, the median payment in wind counties was larger than the median payment in oil and gas counties. This difference is due to an uneven distribution of oil and gas payments, which included a large number of small payments and a small number of very large payments. This report did not find a statistically significant difference in the size of energy payments after accounting for farm size, location, and the asymmetric distribution of oil and gas payments.
- Both the likelihood of and size of energy payments increased with the size of the farm. Midsize family farms (with gross cash farm income between \$350,000 and \$999,999) were more likely to receive energy payments; nonfamily farms were less likely. Controlling for other factors, payments were larger for midsize and large-scale family farms (with gross cash farm income of \$1 million or more).
- Although the average payment size varies by farm operator demographic groups, this report did not find a statistically significant difference in energy payments after accounting for farm size and geography. This suggests that location, farm size, and energy market conditions were the key determinants of payment size. The likelihood of receiving energy payments was lower for Hispanic operators and those with less education, even after accounting for other farm characteristics and location.

How Was the Study Conducted?

This study performed descriptive and regression analyses using data from the USDA's Agricultural Resource Management Survey (ARMS), a national survey of farm operators conducted by the USDA's National Agricultural Statistics Service (NASS) and USDA, Economic Research Service (ERS). Specifically, this report uses data from the Costs and Returns Report (CRR), ARMS Phase III, for 2011 through 2020. In the survey, farm operators were asked how much income they received from "royalties from or leases associated with energy production (e.g., natural gas, oil, and wind turbines)." For this analysis, energy income information was combined with additional ARMS data on farm characteristics, size and type, and farm operator demographics, race/ethnicity, and educational attainment.

This report merges ARMS data with two external sources: the USDA, ERS County-Level Oil and Gas Production in the United States dataset, which includes oil and natural gas production from 2000 to 2011, and the U.S. Wind Turbine Database (USWTD), a quarterly database of all utility-scale wind turbines in the United States (USDA, ERS, 2014; Hoen et al., 2018). These two data sources were used to determine if operators surveyed in ARMS were in counties with oil or natural gas production or wind development.