Appendix B.
General Explanation and Report Form

DEVELOPMENT OF THE REPORT FORM

The 2009 On-Farm Renewable Energy Production Survey report form was developed through input from other government agencies, special interest groups and each of NASS's field offices. Report form testing was conducted in several States and included various types of producers. Producers were asked to evaluate the report form through cognitive interviews.

TERMS AND DEFINITIONS

The following definitions and explanations provide a detailed description of specific items and terms used in this publication and on the report form. Copies of the 2009 On-Farm Renewable Energy Production Survey report form and instruction sheet are included in this appendix.

Biodiesel. A non-petroleum based diesel fuel consisting of long-chain alkyl esters. Biodiesel is typically made by chemically-reacting lipids (e.g., vegetable oil) and alcohol. It can be used (alone or blended with conventional petrodiesel) in unmodified diesel-engine vehicles.

Energy Audit. An audit conducted by a certified energy manager or professional engineer that focuses on potential capital-intensive projects and involves detailed gathering of field data and engineering analysis. The audit will provide detailed project costs and savings information with a high level of confidence sufficient for major capital investment decisions.

Ethanol. A fuel produced by converting crops such as corn, sugarcane, or wood into alcohol sugar (CH_3CH_2OH). This may then be blended with gasoline to enhance octane, reduce exhaust pollution, and reduce reliance on petroleum fuels.

Generating Capacity. The ability to generate electricity is measured in watts. Wind turbines currently manufactured have power ratings ranging from 250 watts to 5 megawatts (MW). A 10-kW wind turbine can generate about 10,000 kWh annually at a site with wind speeds averaging 12 miles per hour, or about enough to power a typical household. A 5-MW turbine can produce more than 15 million kWh in a year - enough to power more than 1,400 households. The average U.S. household consumes about 10,000 kWh of electricity each year.

Geothermal Energy. Energy, in the form of heat, stored in the earth, which originates from the original formation of the planet, from radioactive decay of minerals, and from solar energy absorbed at the surface.

The "Grid". The grid consists of two infrastructures: the high-voltage transmission systems, which carry electricity from the power plants and transmit it hundreds of miles away, and the lower-voltage distribution systems, which draw electricity from the transmission lines and distribute it to individual customers.

Hydroelectric Energy. Power produced through use of the gravitational force of falling or flowing water

Kilowatt. kW = 1,000 watts, megawatt (MW) = 1 million watts, and gigawatt (GW) = 1 billion watts.

Kilowatt Hour. One kilowatt (1,000 watts) of electricity produced or consumed for one hour. For example, one 50-watt light bulb left on for 20 hours consumes one kilowatt-hour of electricity (50 watts x 20 hours = 1,000 watt-hours = 1 kilowatt-hour).

Manure/Methane Digester. Anaerobic digestion involves the decomposition of manure and processing of by-products and other materials into effluent and biogas. Microorganisms perform the decomposition process in an anaerobic digester, which can be designed in several ways. Once biogas is harvested from the processed manure, it can be run through an engine to generate electricity, used in place of natural gas, or flared.

Methane. A chemical compound with the molecular formula CH_4. It is the simplest alkane, and the principal component of natural gas.

Outside Funding Sources. Federal, state, and local governments, universities, and private industries provide funds for renewable energy installation costs.

Solar Energy. Energy, in the form of heat, generated by the sun.

Solar Panel, Photovoltaic. Solar photovoltaic modules use solar cells to convert light from the sun into electricity.

Solar Panel, Thermal. Flat plate and evacuated tube solar collectors are typically used to collect heat for space heating or domestic hot water.

Wind Power. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and rotation of the earth. Wind flow patterns are modified by the earth's terrain, bodies of water, and vegetative cover. This wind flow, or motion energy, when "harvested" by modern wind turbines, can be used to generate electricity. The terms "wind energy" or "wind power" describe the process by which the wind is used to generate mechanical power or electricity.

The power available in the wind is proportional to the cube of its speed, which means that doubling the wind speed increases the available power by a factor of eight. A turbine operating at a site with an average wind speed of 12 mph could in theory generate about 33 percent more electricity than one at an 11-mph site, because the cube of 12 (1,768) is 33 percent larger than the cube of 11 (1,331).

Wind Powered Device. Usually wind turbines, but can also be windmills. If the energy created is used directly by machinery, such as a pump or grinding stones, the machine is a windmill. If the energy is converted to electricity, the machine is called a wind generator, wind turbine, wind power unit (WPU), wind energy converter (WEC), or aero generator. Wind turbines convert wind energy to electricity.

OMB No. 0535-0250: Approval Expires 04/30/2013

2009 ON-FARM RENEWABLE ENERGY PRODUCTION SURVEY

Form Number: 09-A629
(04/15/10)

USDA

National Agricultural Statistics Service

Please return your completed report to:

Census of Agriculture
1201 East 10th Street
Jeffersonville, IN 47132

OFFICE USE ONLY

0010	0011	0016

09-A629

Please make corrections to name, address, and ZIP code if necessary.

Everyone who receives a form **must complete and return** one by mail or via the Internet at **http://agcounts.usda.gov**. Your report is due by **May 24, 2010**. To fill out the paper form, use a black or blue ballpoint pen. **Duplicate forms?** If you received extra report forms for the SAME farming operation, return all report forms in the same envelope with this completed report. Questions? Call us toll-free at **1-888-424-7828**. Thank you for your cooperation.

NOTICE: Response to this inquiry is required by law (Title 7, U.S. Code). By the same law and the Confidential Information Protection and Statistical Efficiency Act of 2002 (Public Law 107-347), YOUR REPORT IS CONFIDENTIAL and it will only be used for statistical purposes. Your report CANNOT be used for purposes of taxation, investigation, or regulation. The law also provides that copies retained in your files are immune from legal process.

SECTION 1 INTRODUCTION

1. Did this operation produce any electricity, energy or fuel using **wind, solar, methane,** or any **other renewable energy production devices** during 2009? **Include** any on-farm renewable energy produced on land owned, rented, or used by you, your spouse, or by the partnership, corporation, or organization named on the label above.

101 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 6

SECTION 2 WIND TURBINES

1. Did this operation **own** any wind turbines that generated electricity during 2009? **Exclude** turbines on this operation under a wind rights lease agreement.

201 1 ☐ **Yes** – Complete this section 3 ☐ **No** – Go to SECTION 3

	Number
2. How many wind turbines were owned and used on this operation in 2009?	210

	Average per Turbine (Kilowatt hr)	OR	Total for All Turbines (Kilowatt hr)
a. What was the rated generating capacity of all turbines reported in question 2?	220		221

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3. When were the wind turbines reported in question 2 installed?

	Number of Turbines
a. prior to year 2000?	230
b. years 2000 – 2004?	231
c. years 2005 – 2009?	232

4. What was the total cost (the initial or start-up investment) for all wind turbines reported in question 2? **Include** outside funding.

	Dollars
	250 $ .00

a. Of this total cost, how much was received from outside funding? **Include** federal, state, local, and private funding. **Exclude** loans.

	Dollars
	251 $ .00

SECTION 3 SOLAR PANELS

1. Did this operation own any photovoltaic or thermal solar panels in 2009?

301 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to question 6 below

2. Were any of these solar panels **photovoltaic**? **Include** solar panels used to generate electricity to power buildings, pump water, etc.

310 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to question 3

a. What was the total maximum power rating of these photovoltaic solar panels?

Watts	OR	Kilowatts
311		312

3. Were any **thermal** solar panels used for heating buildings or water on this operation in 2009?

320 1 ☐ **Yes** 3 ☐ **No**

4. When were the photovoltaic or thermal solar panels reported in questions 2 and 3 installed?

	Number of Solar Panels
a. prior to year 2000?	341
b. years 2000 – 2004?	342
c. years 2005 – 2009?	343

5. What was the total cost (the initial or start-up investment) for the photovoltaic or thermal solar panels reported in questions 2 and 3? **Include** outside funding.

	Dollars
	350 $ .00

a. Of this total cost, how much was received from outside funding? **Include** federal, state, local, and private funding. **Exclude** loans.

	Dollars
	351 $ .00

6. Did this operation own any **other** solar powered devices not included above in 2009?

330 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to SECTION 4

a. Mark all other solar powered devices on this operation in 2009.

331 ☐ fence chargers

332 ☐ solar lights

334 ☐ other – *Specify* _____

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SECTION 4 MANURE/METHANE DIGESTERS

1. Did this operation own any manure/methane digesters in 2009?

401 1 ☐ **Yes** – Complete this section 3 ☐ **No** – Go to SECTION 5

	Number
2. How many manure/methane digesters did this operation own?	410

	Cubic Feet
a. How much methane was produced by these digesters in 2009?	411

3. Was any of the methane produced used to generate electricity in 2009?

420 1 ☐ **Yes** 3 ☐ **No**

4. Were there any sales to a natural gas pipeline in 2009?

430 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to question 5

	Dollars
a. What was the total payment received from sales to the pipeline in 2009?	431 $ .00

5. Was the methane produced used for any other purpose in 2009? **Include** heat, heating water, flaring, etc.

440 1 ☐ **Yes** – *Specify* _____

3 ☐ **No**

6. When were the methane digesters reported in question 2 installed?	Number of Methane Digesters
a. prior to year 2000?	451
b. years 2000 – 2004?	452
c. years 2005 – 2009?	453

	Dollars
7. What was the total cost (the initial or start-up investment) for all digester systems reported in question 2? **Include** outside funding.	460 $ .00
a. Of this total cost, how much was received from outside funding? **Include** federal, state, local, and private funding. **Exclude** loans.	461 $ .00

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SECTION 5 OTHER INFORMATION

1. Were other forms of energy or electricity produced or generated on this operation in 2009?

501 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to question 2

a. Mark all other forms of energy or electricity produced or generated on this operation in 2009.

511 ☐ Biodiesel
512 ☐ Ethanol
513 ☐ Geothermal
514 ☐ Hydroelectric
515 ☐ Mechanical (windmills, water wheels, etc.)
516 ☐ Other – *Specify* _____

2. Was any electricity produced on this operation in 2009 sold onto the grid?

520 1 ☐ **Yes** – Continue 3 ☐ **No** – Go to question 3

a. How many kilowatt hours were **sold** onto the grid in 2009? . . . . . Kilowatt Hours 521 ___,___

b. What was the total payment received for electricity sold onto the grid in 2009? . . . . . Average per Kilowatt Hour (Cents) 522 ___.___ ¢ **OR** Total Dollars 523 $ ___,___.00

3. What is your estimate of the amount saved on your 2009 utility bills by producing and using renewable energy? . . . . . Dollars 524 $ ___,___.00

4. Did you have an energy audit performed?

530 1 ☐ **Yes** 3 ☐ **No**

5. Did you receive any **federal funding** (grants, loans, etc.) for the installation of your on-farm renewable energy devices?

531 1 ☐ **Yes** 3 ☐ **No**

SECTION 6 CONCLUSION

COMMENTS

Name _____ Phone ( ) Date MM DD YYYY 9910 __ __ – __ __ – __ __ __ __

Thank you for your response

Response		Respondent		Mode		R Unit	Enum.	Eval.	Office Use for POID
1-Comp 2-R 3-Inac 4-Office Hold 5-R - Est 6-Inac -Est 7-Off Hold - Est 8-Known Zero	9901	1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth	9902	1-Mail 2-Tel 3-Face-to-Face 4-CATI 5-Web 6-e-mail 7-Fax 8-CAPI 19-Other	9903	921	0098	0100	789 __ __ __ – __ __ __ – __ __ __ __

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0535-0250. The time required to complete this information collection is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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Instruction Sheet
2009 On-Farm Renewable Energy Production (OREP) Survey

COMPLETING THE 2009 OREP REPORT FORM

Make all entries clear and easy to read. Use a **blue** or **black** ball point pen. Enter your answers in the proper spaces and in the units requested, i.e., number of acres, dollars, percent, etc. Mark all applicable Yes/No boxes with an "X."

Refer to the instructions below for completing your report form. The enclosed report form was mailed to agricultural producers and growers throughout the United States. Because it is meant for use in all parts of the country, it may contain items and inquiries which do not apply to your operation. In this case, mark the "No" or "None" box and go on to the next item or section.

If You Did Not Produce Any Renewable Energy On Your Operation In 2009

In Section 1, item 1, Select "No," then go to Section 6 on the back page and complete the remainder of the report form.

If You Did Not Operate Any Agricultural Land in 2009

Go to Section 6 on the back page and complete the remainder of the report form.

Partial Year Operation

If you stopped farming at any time during 2009, complete the report form for the portion of 2009 that you did farm. Write "Stopped farming in 2009" and the date you stopped farming below the address label on the report form and mail the completed report form in the return envelope.

If You Receive More Than One Report Form for the Same Operation

Return any duplicate report forms in the same envelope with the completed report form(s). In the address area of the report form(s) you complete, write the 11-digit ID number from the address label of the extra report form(s).

Partnership Operations

Complete only ONE report form for a partnership operation and include all partners' shares on the same report form. If two or more report forms were received for the partnership, see instruction on "If You Receive More Than One Report Form for the Same Operation" above.

INSTRUCTIONS BY SECTION

Section 1 RENEWABLE ENERGY PRODUCTION SCREENER

The operation must have **owned** the devices that produced the renewable energy. Operations that only leased out wind rights should respond "No" and skip to Section 6 on the back page.

Section 2 WIND TURBINES

Report for wind turbines, which are usually considered small, **owned** by this operation. The operation must have either used and/or sold the electricity generated.

Item 2 - Number of turbines owned and operated - Turbines installed under a wind rights lease agreement are not included in this survey, so do not report them here.

Item 2a - Generating capacity of wind turbines - Report either the average generating capacity per turbine or the total generating capacity of all turbines owned in kilowatts/hour. If you are reporting in a different unit, note this in the margin next to the answer cell.

Item 3 - Year(s) of installation - Items 3a, b, and c should total to the number of turbines reported in item 2. Report each turbine only once.

Item 4 - Installation cost - Report the total cost for all wind turbines installed, regardless of when they were installed. Include cost for turbines, labor, meters, wiring, batteries, new structures to protect batteries, remodeling of existing structures, concrete slabs, etc.

Item 4a - Outside funding - There are many sources of outside funding available to install renewable energy devices. Include funding received from the federal, state, or local government, utility companies, coops, etc. DO NOT include tax credits or loans.

Section 3 SOLAR PANELS

Report photovoltaic or thermal solar panels owned by this operation. These may be used to generate electricity to power a building or pump water; heat water or buildings; or electrify a fence.

Item 2 - Photovoltaic solar panels - Only report panels here if they **generated electricity** to power buildings, pump water, etc. Other types of solar powered devices should be reported in items 3 and 6.

Item 2a - Maximum power rating of photovoltaic solar panels - If you owned more than one panel, report total power rating for all panels combined. For example, if you owned 3 panels and two had power ratings of 50 watts and one was rated for 100 watts, enter 200 into answer cell 311.

Item 4 - Year(s) of installation - Items 4 a, b, and c should only include solar panels reported in items 2 and 3.

Item 5 - Installation cost - Report the total installation cost for all solar panels reported in items 2 and 3, regardless of when they were installed. Include cost for solar panels, labor, meters, wiring, batteries, new structures to protect batteries, remodeling of existing structures, etc.

Item 5a - Outside funding - There are many sources of outside funding available to install renewable energy devices. Report funding received from the federal, state, or local government, utility companies, coops, etc. DO NOT include tax credits or loans in this total.

Item 6 - All other solar powered devices - Complete this section if there were other solar powered devices on this operation not reported in items 2 and 3.

Item 6a - Stand alone solar powered devices - Check all that apply. If you had a solar powered device not listed, select the "other" option and specify what the device powered.

Section 4 MANURE/METHANE DIGESTERS

Item 2 - Number of digesters owned and operated - Report number of digesters owned and operated in 2009. All digesters reported need to be owned and operated by the operation named on the report form address label.

Item 2a - Methane produced - Record the amount of methane produced in cubic feet. If reporting in a different unit, note this in the margin of the report form next to answer cell 411.

Item 5 - Other uses of methane - If methane was flared, used for heating buildings or water, etc., specify other uses here.

Item 6 - Year(s) of installation - The number of methane digesters reported in items 6a, b, and c should total to the number of digesters reported in item 2.

Item 7 - Installation cost - Report the total cost for all digesters installed, regardless of when they were installed. Include cost for digesters, labor, meters, wiring, generators used to produce electricity, batteries, new structures to protect batteries, remodeling of existing structures, etc.

Item 7a - Outside funding - There are many sources of outside funding available to install renewable energy devices. Include funding received from the federal, state, or local government, utility companies, coops, etc. DO NOT include tax credits or loans.

Section 5 OTHER INFORMATION

Complete this section for all other types of energy producing devices, types of renewable energy produced, electricity sold onto the grid, savings, and federal funding.

Items 1 and 1a - Other forms of energy produced - If this operation produced any other forms of energy or used another type of energy producing device than those previously recorded, report those here

Mark all that apply in 1a. If you select answer cell 516 (other), specify what type of device was used. Be as detailed as possible. For example, if you used a wood-burning furnace to heat your shop, report this as "wood-burning furnace." If you are used the heat to heat your household and the household is not considered part of the operation, do not report the furnace on this report form.

Item 2 - Electricity sold onto the grid - If this operation had a net metering arrangement with the utility company, this is not considered sales to the grid and should not be reported.

Item 2a - Amount of electricity sold onto the grid - Report amount of electricity sold in kilowatt hours. If you are using a different magnitude (i.e. watts), write the amount and unit in the margin next to answer cell 521.

Item 2b - Payment received for electricity sold - If you had a contract with the utility company stating you cannot disclose amount received for electricity, please note this in the margin of the report form.

Item 3 - Utility bill savings - Dollar amount saved on utility bills may be an exact amount or a rough estimate, depending on the type and age of device. Savings is the amount the utility bill was reduced by producing and using renewable energy. If you are unsure, please give a range of how much you think was saved.

Item 4 - Energy audit - An energy audit is conducted by a certified energy manager or professional engineer and it focuses on potential capital-intensive projects and involves detailed gathering of field data and engineering analysis.

Item 5 - Federal funding - Tax credits are not considered federal funding.