



2014 Agricultural Outlook and Policy
Conference Presentation
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Agenda

- ▶ Origination of MEA agriculture energy efficiency programs
 - ▶ Maryland Statewide Farm Energy Audit Program
- ▶ Current MEA agriculture programs
 - ▶ Mathias Ag Programs 2012-13, 2014
 - ▶ Mathias Ag Program 2015
- ▶ Observations
- ▶ Programmatic Considerations
- ▶ Programs and Policy
- ▶ Lessons Learned
- ▶ Funding Resources
- ▶ Questions

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Origination of MEA agriculture energy efficiency programs

- ▶ Energy Costs continue to Increase
 - ▶ According to the U.S. Department of Agriculture (USDA) 2007 Census of Agriculture, Maryland's farms increased in number, fossil fuel consumption, and energy use between 2002 and 2007.
 - ▶ Maryland's approximately 12,000 farms spent about \$26 million on electricity in 2008.
 - ▶ For a decadal perspective,
 - ▶ Maryland farms spent about \$33 million on petroleum products, gasoline, diesel fuel, natural gas, LP gas, kerosene, fuel oil, and other fuels in 1997;
 - ▶ in 2007, Maryland farms spent about \$67 million on "gasoline, fuels, and oils."
 - ▶ In 1997 the average retail rate for electricity in Maryland was 7 cents per kilowatt hour (kWh); in 2007 it was 11.4 cents per kWh.
- ▶ Maryland Energy Administration's Mission
 - ▶ "to promote affordable, reliable, clean energy"

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Origination of MEA agriculture energy efficiency programs continued

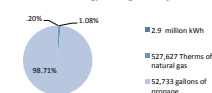
- ▶ A coalition of government agencies, trade groups, and private sector participants came together in 2006 to establish a process by which the agriculture sector could reduce its energy consumption in the state.
- ▶ The program designed to establish a process by which the agriculture sector could reduce its energy consumption in Maryland was entitled the *Maryland Statewide Farm Energy Audit Program*.
- ▶ Audits were used to identify and quantify energy consumption and to make cost-effective efficiency recommendations

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Maryland Statewide Farm Energy Audit Program

- ▶ Program was run in three phases
 - ▶ Phase I: 25 energy audits on the Eastern Shore
 - ▶ Annual energy savings of 471,700 kWh and 46,000 gallons of propane identified
 - ▶ Phase II: 51 energy audits in Western Maryland
 - ▶ Annual energy savings of 1.6 million kWh and 22,808 gallons of propane identified
 - ▶ Phase III: 42 additional energy audits, and the implementation of some of the measures recommended by the previous audits
- ▶ Program total: 118 audits and 129 implemented projects with an estimated annual savings of:
 - ▶ 2.9 million kWh
 - ▶ 52,733 gallons of propane
 - ▶ 527,627 Therms of natural gas

*Farm Energy Audit Program Outcomes
where did the energy savings come from?*



In 2010, the American Council for an Energy-Efficient Economy (ACEEE) awarded the Phase III program with Exceptional State-led Energy Efficiency Program.

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2012-13 Kathleen A. P. Mathias Agriculture Energy Efficiency Program

- ▶ American Recovery and Reinvestment Act (ARRA) Program funding source - Better Buildings Neighborhood Program
 - ▶ Competitive program
 - ▶ Program sought to leverage utility programs wherever possible
 - ▶ Program was for 15% **energy** savings per building or in some cases per measure
 - ▶ 16 farms/businesses
 - ▶ Estimated electricity savings = 800,000 annual kWh
 - ▶ <http://energy.maryland.gov/Business/mathiasag/>

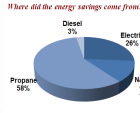
Locations



Estimated Costs, Savings, and Payback

Estimated Annual Energy	\$233,471
Cost Savings	\$1,968,735
Estimated Payback in Years	8.4
Building Info	
Average Savings per Building	23.6%
Square Footage	754,138
Number of Buildings Retrofitted	48
Greenhouse Gases (estimated values)	
CO ₂ (Metric Tons)	969,857,800

Mathias Ag Program Outcomes



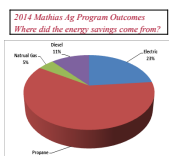
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2014 Kathleen A. P. Mathias Agriculture Energy Efficiency Program

► Strategic Energy Investment Fund (SEIF) Program funding source

- Competitive program
- Energy efficiency only projects
- Program sought to leverage utility programs wherever possible
- Program was for 20% **energy** saving per building or in some cases per measure
- 13 farms/businesses
- Estimated electricity savings = 800,000 annual kWh
- <http://energy.maryland.gov/Business/MathiasAg14.htm>

Estimated Annual Energy Cost Savings	\$250,717
Estimated Installed Cost	\$1,930,112
Estimated Payback in Years	7.7
CO2 (Metric Tons)	939.74



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2015 Kathleen A. P. Mathias Agriculture Energy Efficiency Program

► Strategic Energy Investment Fund (SEIF) Program funding source

- Competitive program
- Energy efficiency **AND** renewable energy projects
 - Program is seeking out cost-effective deeper-retrofit upgrades in the agriculture sector
 - To be eligible for renewable energy upgrades a project must incorporate significant energy savings
- Renewable energy proposal must be best practices
 - Wind (consider capacity factor), Biomass (location and access to wood/fuel), Solar PV (factoring in orientation, location, and siting—i. e., not on usable farmland), Methane digester (is the fuel on site? How much can it burn?)
- Program seeks to leverage utility programs wherever possible
 - Subject to funding availability - \$550,000 is available for FY15
 - \$300,000 for energy efficiency projects
 - \$250,000 for renewable energy projects
- We anticipate giving 8-16 awards
- Award amounts will be between \$15,000 and \$60,000
 - Minimum project size of at least \$30,000 no maximum size – however, maximum award amount will be \$60,000

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Observations

- **Propane consumption reduction opportunities**
 - Propane is the fuel used in many farms/farm businesses
 - There are no programs specifically for propane reduction
- **Whole building savings opportunities**
 - 15-20% energy reduction can be done in many buildings
 - Can be done cost effectively
- **Many opportunities exist for saving energy on the farm**
 - Early retirement
 - Cost effective
 - Best practices
- **Need exists for programs to drive this change**
 - Share information for farmers, policy stakeholders, utilities

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Programmatic Considerations for Ag Measures

- ▶ MEA observations from running agriculture efficiency programs
 - ▶ Farms/Ag. businesses require additional outreach and technical assistance
 - ▶ Farmers and small farm businesses generally seemed to be unaware of utility programs and how to leverage utility programs
 - Measures must be pre-approved
 - ▶ Uncertain about how to qualify for custom measures
 - Work is often time sensitive
 - Difficult to build custom-measure leveraged funds into the agriculture business model
 - ▶ Not energy experts – no engineer on staff to help develop energy projects
 - ▶ “Farms” are not one size fits all and can be on residential or commercial meters
 - ▶ Farms/Ag. businesses benefit from audits that identify and confirm savings
 - ▶ Audits useful for custom measures
 - ▶ Audits allow for aggregated costs/savings for multiple measures
 - ▶ Audits can be done remotely (desk audits)
 - ▶ Farms/Ag. businesses may have specific energy efficiency project considerations that are unique to their sector
 - ▶ Many of the energy efficiency measure opportunities require specialized knowledge of agriculture




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Programs and Policy

- ▶ Programs are an opportunity to influence policy
 - ▶ Farming best practices
 - ▶ Utility programs
 - ▶ PSC
 - ▶ Federal
 - ▶ Other states
 - ▶ Other countries
- ▶ Information learned needs to be shared
 - ▶ Farms/businesses
 - ▶ State
 - ▶ Others

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Programs and Policy Continued

- Use media to encourage viewers to “dig deeper”
 
- Include case studies and other relevant information
 
- Graphs, charts showing savings and costs
 

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Programs and Policy continued

- ▶ Programs are an opportunity to influence policy
 - ▶ Old Way – get the money, spend the money
 - ▶ New Way:
 - ▶ Make it easy to understand what the program achieved
 - ▶ Provide information for others to consider
 - ▶ Influence behavior
- ▶ Information learned needs to be shared
 - ▶ Example of actual project from FY2014 Mathias Ag Program
 - ▶ Dairy Farm – case study



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Programs and Policy case study

- ▶ Choptank Service Territory
- ▶ Recommended Measures: LEDs, Fans, chiller, plate cooler and compressors

1. **West Barn**
 - a. Lighting: Replace 61-400 watt metal halide fixtures with 61-185 watt LED high bay fixtures.
 - b. Ventilation: Replace 130-36", 1/2 hp direct drive fans with 24-72", 3 hp fans with deflectors and variable speed drive units.
2. **East Barn**
 - a. Lighting: replace 26-400 watt metal halide and 6-400 watt high pressure sodium lights with 32-185 watt LED high bay fixtures.
 - b. Ventilation: replace 64-36", 1/2 hp fans with 12-72", 3 hp fans with deflectors and variable speed drive units.
3. **Calving and Sort Areas – Lighting:**
 - a. Replace 44-150 watt metal halide fixtures with 44-55 watt LED high bay fixtures. This includes re-wiring for 12 fixtures.
 - b. Replace 8-8 foot T12 fixtures with 4-55 watt LED high bay fixtures.
 - c. Modify 14-8 foot T12 fixtures by removing ballasts and installing 40 watt LED lamps.
4. **Parlor and Holding Area:**
 - a. Refrigeration: Replace existing chiller, plate cooler and compressors with; new chiller consisting of a glycol unit with 5 hp pump and two 10 hp refrigeration compressor units, and 132 plate two-stage plate cooler.
 - b. Lighting:
 - i. Replace 12 of existing 16-400 watt metal halide fixtures with 185 watt LED fixtures.
 - ii. Remove remaining 4 existing 400 watt metal halide fixtures.
 - iii. Install 5 vapor-tight, water proof, 8 foot, 80 watt LED fixtures

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Programs and Policy – case study

- ▶ Estimated Savings of Energy Efficiency Project (from audit)

Recommended Measure/ Measures Considered	Electric Savings (kWh)	Energy Savings (MMBtu)	Estimated Annual Energy Cost Savings	Estimated Installed Cost	Estimated Payback in Years
West Barn	118,493	404	\$12,880	\$93,185	7.2
East Barn	58,883	201	\$6,401	\$47,320	7.4
Calving and Sort Areas	12,964	44	\$1,409	\$12,128	8.6
Parlor and Holding area	143,165	488	\$15,562	\$91,749	5.9
Totals	333,505	1,138	\$36,252	\$244,382	6.7



Posssst... We like the new fans and lights!

- ▶ Saves estimated 300+ AMWh, \$36,000+/yr
 - ▶ Electricity Demand Reduction = 44.3 kW
 - ▶ Payback 6.7 years
- Cost effective, early retirement, increases productivity, helps a farmer in Maryland (4th generation) keep competitive*

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Lessons Learned From Running Ag Programs

- › Farmers are very leveraged. Often they are unable to take out additional loans. Grant programs help to enable energy efficiency upgrades that will help them stay competitive.
- › Many of the buildings/measures that were upgraded were measures or upgrades that would not have occurred without the grant program.
- › Many of the farmers served under the ag programs are multi-generational farmers striving to stay competitive in today's market.
 - › In today's globalized and "agri-business" market this helps Maryland's small farmers.
 - › This helps Maryland keep its agricultural heritage intact and helps with sustainability.
- › MEA Ag Programs have provided information to utility programs
 - › Many farmers are on residential meters and the utility programs are unavailable to help them utilize the appropriate commercial-type upgrades

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Agriculture Energy Project Funding Resources through MEA

- › A new Mathias Ag program will be announced soon. The program will look for ways to blend energy efficiency and renewable energy together in a cost effective way on farms/businesses in Maryland -- keep an eye out for it!
- › It will have the new, updated "Other Potential Funding Sources for Farms and Businesses"
 - Based on feedback at the Better Buildings Case Competition... a "one stop shopping" list of funding opportunities
- › On the bottom of our webpage for this year's (2014) program we have a list of alternative funding options for agricultural measures:
 - › <http://energy.maryland.gov/Business/MathiasAg14.htm>
 - › <http://energy.maryland.gov/Business/documents/2014MathiasAgAlternativeFundingSources.pdf>
- › You can sign up for our newsletter here: <http://energy.maryland.gov/News/index.html>
- › We also announce grant programs on our Facebook page: <https://www.facebook.com/MDEnergyAdministration>
- › The MEA has a webpage where we post grants rebates, loans and tax incentives: <http://energy.maryland.gov/allincentives.html>
 - › Jane E. Lawton Conservation Loan Program
 - <http://energy.maryland.gov/Govt/janeelawton.html>

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Questions and Answers



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