

# Michigan Farm Energy Program (MFEP)

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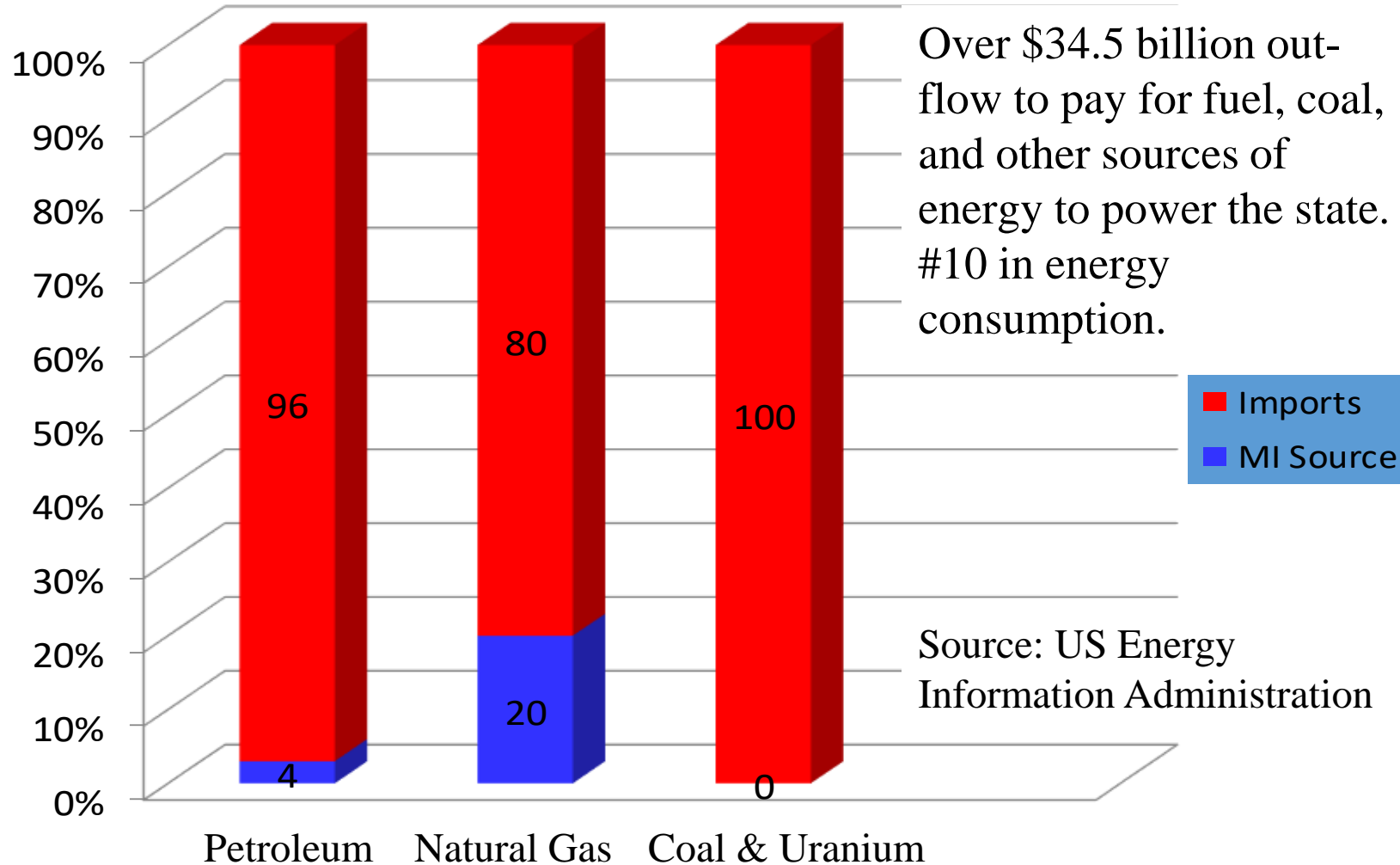
Department of Biosystems and Agricultural  
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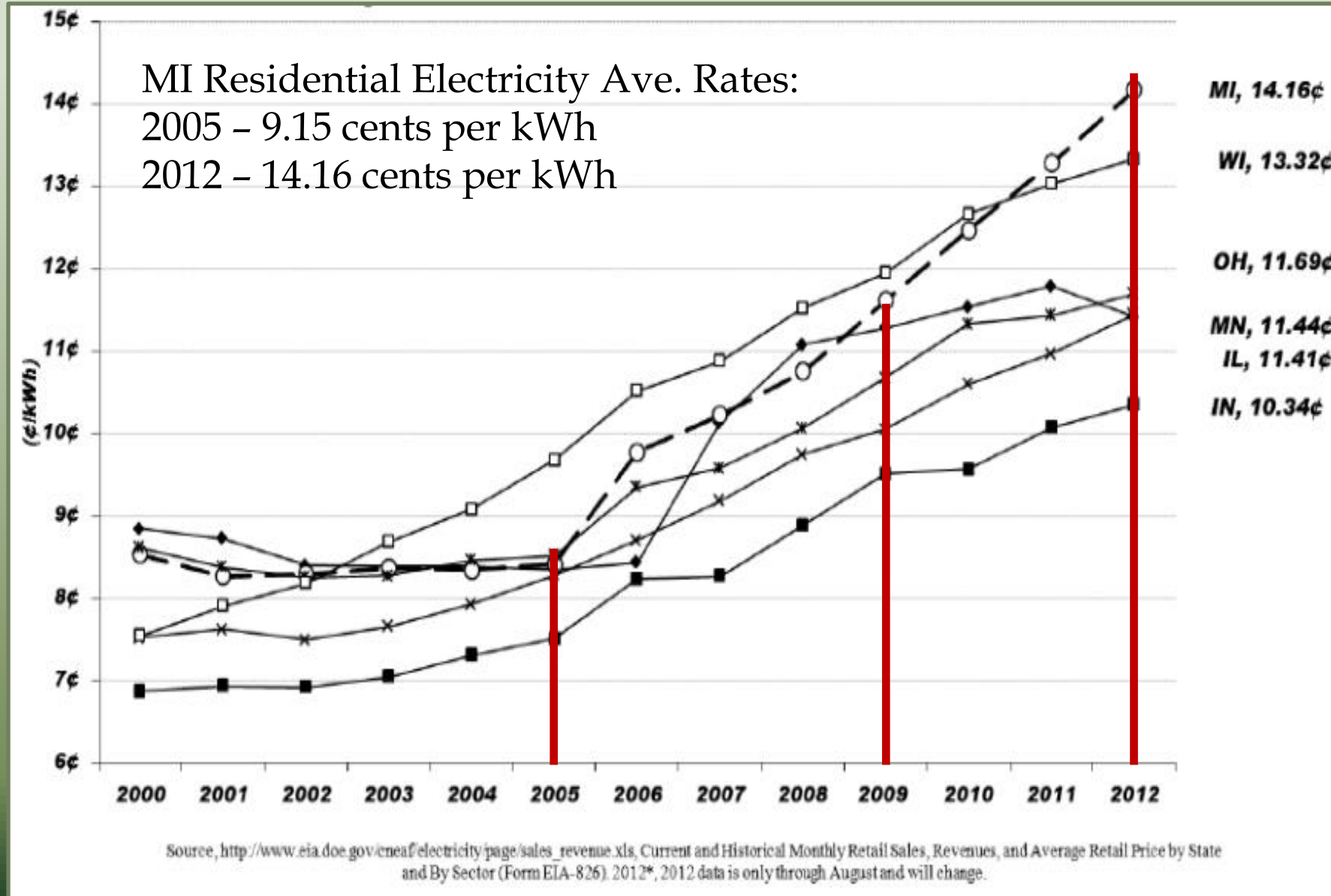


# Michigan Energy Sources

Major Net Energy Importer



# Rising Energy Costs—Midwest



# Michigan's Low Rankings

## USDA Energy Efficiency Project State Rankings

State	2003-2009	2012-2013	2014
Iowa	1 <sup>st</sup>		
Nebraska	2 <sup>nd</sup>		
Minnesota	3 <sup>rd</sup>		
Illinois	4 <sup>th</sup>		
North Carolina	5 <sup>th</sup>		
Michigan	46 <sup>th</sup>		

# MICHIGAN'S LEADING INDUSTRIES

Manufacturing

Food & Agriculture (\$102B, 22%  
state employment)

Tourism

Services

Forestry & Lumber

# **MFEP Program Details:**

**Initial Hurdles**

**Auditor Training**

**Program Credibility**

**Energy Audit Details**

**Results**

# Initial Hurdles

- Lack of energy auditors that were qualified or capable of performing audits on agricultural operations
- There was no standard or guidelines for farm energy audits
- Distinct uniqueness of agricultural energy efficiency and energy conservation measures (ECMs) compared to commercial/industrial operations
- Questions about the competency of the auditors and the validity of the energy audits

# Initial Hurdles

To overcome these some of these problems:

- MSU's Department of Biosystems and Agricultural Engineering (BAE) and Department of Agricultural, Food, and Resource Economics (AFRE) partnered to develop training curriculum for farm energy auditors, initially focusing on dairy farms.
- BAE also developed a state based certification process that follows the recommendations of ASABE S612 energy audit standard, which states: "Ideally, there would be a process in-place, provided by non-profit, State or National entities for certification of on-farm energy auditors."



# Auditor Training

Michigan is the only state that has a training and certification program for agricultural energy auditors. Frequency of training is based on demand from commodity associations and there is no charge to the trainees. Trainees can only be certified in one type of operation at a time.

Training lasts for 6 months and occurs in 4 phases:

- Phase 1: three-day in class training
- Phase 2: trainees study real audit reports with certified energy auditors and perform and energy audit under the direct supervision of certified auditors.

# Auditor Training

- Phase 3: small groups defend their ECMs in front of a panel of USDA, Michigan Energy Office, and utility company grant technical analysts.
- Phase 4: trainees do a real energy audit on an operation of their specialty, and then submit it to MFEP.
- Yearly Continuing Education: required to maintain certification

# Program Credibility

- 3 USDA-REAP energy audit projects were evaluated by USDA and each attained a 100% performance score
- MFEP audit samples were submitted to USDA-NRCS' technical committee for energy audits and were deemed acceptable
- MFEP audit samples were submitted to Michigan energy utility providers, which resulted in all MI utility providers offering energy audit rebates of \$500 exclusively for MFEP audits
- Russell H. Hahn, P.E, former Director of Standards Development for ASABE and oversaw the development of ASABE S612 in 2009 stated: "I believe MI Farm Energy Auditor Certification meets the intent of statements in (ASABE/ANSI) S612 regarding certification"

# Program Credibility

- Michigan Energy Office and USDA REAP recommend MFEP audits and renewable energy assessments conducted by MFEP auditors
- Original MFEP dairy technical guide was cited in the ASABE/ANSI S612 standard

**3 protocols from MFEP have been adopted by USDA for its energy audit guidelines:**

- Conduct audits ‘with eyes on site’
- 3 years of historical energy use data
- Operational knowledge or familiarity with the facility being audited

# Energy Audit Details

- Establish a baseline inventory of energy use, source, costs, duration & production numbers
- Identify areas for reducing energy costs, improving energy efficiency, improving operational efficiency, and potential for renewable energy applications
- Identify in partnership with management priorities and plans for improving efficiency
- Prioritize implementation of projects based on energy saved, payback period/ROI, capital outlay, or implementation duration and complexity
- Identify funding and assistance options from State, Federal, University and Utility energy efficiency programs/sources
- ASABE/ANSI S612 Type 2 energy audits are the only audits conducted by MFEP

# Results

## USDA Energy Efficiency Project State Rankings

State	2003-2009	2012-2013	2014
Iowa	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>
Nebraska	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>
Minnesota	3 <sup>rd</sup>	4 <sup>th</sup>	3 <sup>rd</sup>
Illinois	4 <sup>th</sup>	7 <sup>th</sup>	4 <sup>th</sup>
North Carolina	5 <sup>th</sup>	3 <sup>rd</sup>	5 <sup>th</sup>
Michigan	46 <sup>th</sup>	5 <sup>th</sup>	10 <sup>th</sup>

# Results

## 2010-2016 Energy Efficiency Savings

No.	Operation	Savings (kWh)	% Savings	Total Annual Savings (\$)	Total Owner Cost to Implement (\$)	Payback Time (years)	Potential Average Annual Savings (\$)
133	Dairy Farms	11,190,946	35	1,214,725	2,741,579	2.3	9,133
57	Grain Drying	14,302,450	28	999,482	6,836,135	6.8	17,535
35	Greenhouse	27,762,764	34	1,106,753	4,917,592	4.4	31,622
27	Food/Fruit Process	2,371,934	38	338,023	1,347,791	4.0	12,519
19	Irrigation	4,433,969	51	418,839	1,560,736	3.7	22,044
12	Crops	375,529	4	53,583	130,250	2.4	4,465
5	Beef	69,076	14	9,913	19,476	2.0	1,983
4	Hogs	198,264	14	18,002	59,718	3.3	4,501
2	Poultry	12,618,901	62	567,365	2,053,625	3.6	283,683
36	Rural Business	13,706,260	36	768,458	1,916,983	2.5	21,346
1	Integrated Farm	11,358	94	1,693	3,480	2.1	1,693
3	Fish Hatcheries	2,085,817	13	93,610	206,775	2.2	31,203
<b>334</b>	<b>Audit Total</b>	<b>89,127,267</b>	<b>34</b>	<b>5,590,446</b>	<b>21,794,140</b>	<b>3.9</b>	<b>16,738</b>

# Conclusion

- All the previous results were achieved with less than 2% of Michigan agricultural enterprises
- MFEP has expanded into energy policy and program development affecting agriculture in Michigan
- MFEP has now expanded to include large commercial food processors/manufacturers, and is partnering with water conservation/treatment experts at MSU to perform combined energy and water audits on these facilities

## Contact Us:

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