



WHAT ABOUT CHEAP NATURAL GAS? WILL ENERGY OPTIMIZATION STILL BE COST-EFFECTIVE?

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by

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TOPICS

- Q #2: Cost-effectiveness of energy efficiency (particularly *natural gas* energy efficiency)
- Q #4: History of ‘cost-of-conserved-energy’ in Michigan. How does that compare to the cost of generation (and in this case, the cost of natural gas supply)?
- Q #10 Remaining energy efficiency potential
 - Michigan’s older building stock
 - Recent data on existing buildings and equipment
- What impact would natural gas ‘fracking’ in Michigan have on the need for Energy Optimization programs?

THE PROVOCATIVE QUESTION

***Wow, with the natural gas “fracking” revolution ...
natural gas is so plentiful and cheap....
shouldn't we all just go home?***

[A: Not so fast.....]

THE SERIOUS QUESTION

What are the implications of the recent low natural gas prices for the future of natural gas energy efficiency programs?

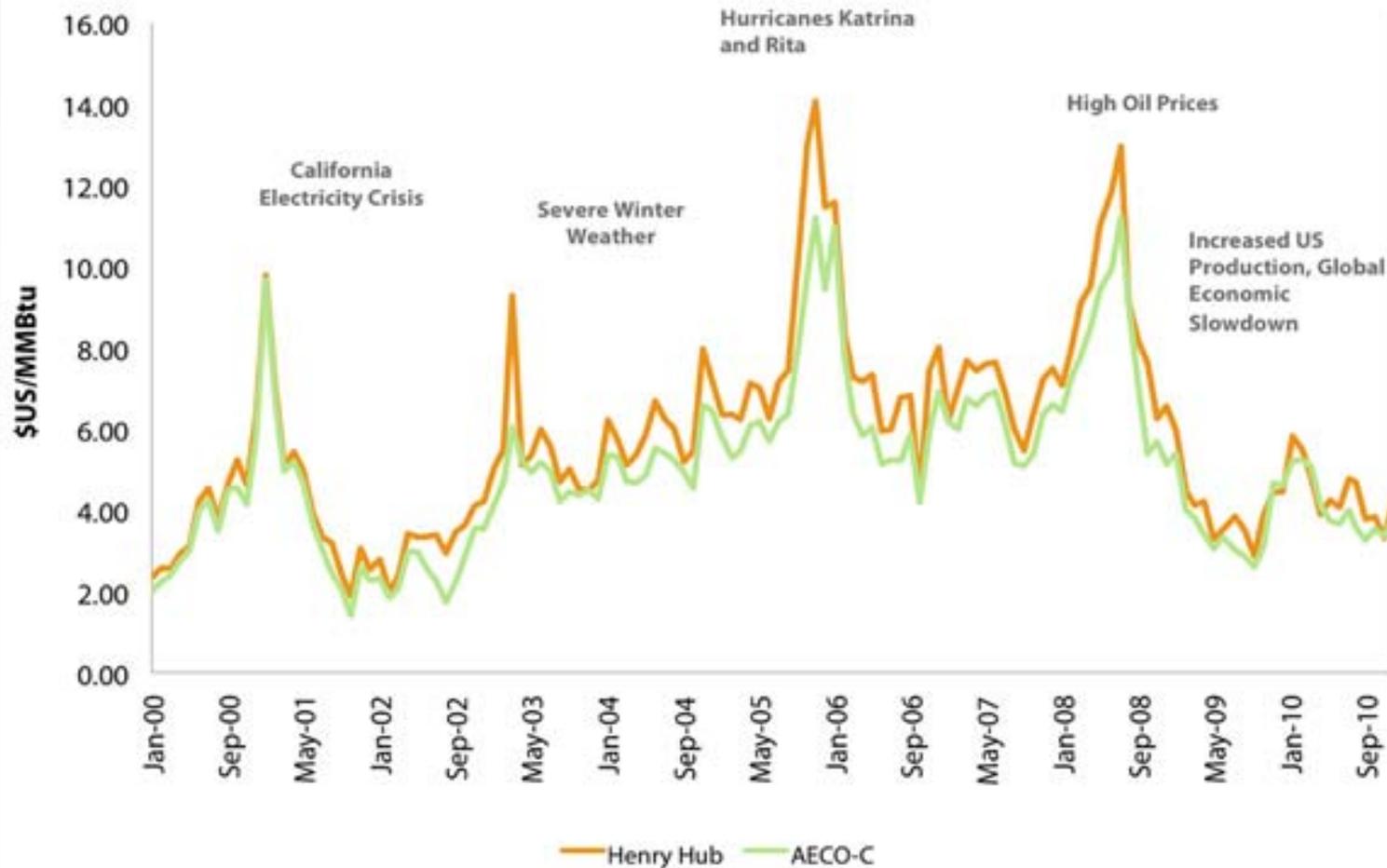
KEY POINT 1: DON'T BE MISLED BY LAST YEAR'S EXTREMELY LOW SPOT MARKET PRICES

- The absurdly low spot market prices (~ \$2.00/Mcf) seen in early 2012 were the result of a “perfect storm” of unusual circumstances
 - ❖ Demand destruction from the ‘Great Recession’
 - ❖ Shale gas production from early high-production sites & gas dumping
 - ❖ Price subsidization of dry gas from high ‘wet gas’ and ‘liquids’ prices
 - ❖ The “non-winter” of 2011/2012
 - The first 4 months of 2012 were the warmest Jan-April in U.S. recorded history
 - Residential and Commercial natural gas consumption down more than 18%
 - Gas storage was at record levels, and nearing capacity

Key point: No-one should make decisions about programs with multi-year effects based on those record-low spot market prices for natural gas

FOUR NATURAL GAS PRICE "CRISES" 2000-2010

[WHAT IS THE RISK OF FUTURE PRICE SPIKES?]



GAS PRICES HAVE ALREADY REBOUNDED QUITE A BIT FROM THEIR RECORD LOWS LAST YEAR

- Natural gas prices have risen steadily since the low point of last spring
 - April 2012: Henry Hub price fell just below \$2.00/MMBtu
 - By April 2013, the Henry Hub price hit \$4.23/MMBtu, an increase of over 126% from the low point a year ago.

PLUS

- The “citygate” price (i.e., the wholesale *delivered* all-in cost of natural gas to a utility in Michigan) is typically a **couple dollars per MMBtu higher than Henry Hub.** [That is the price that energy efficiency should be compared to.]

NATURAL GAS PRICE FORECASTS

- Mainstream forecasts predict natural gas Henry Hub prices will rise from the current \$4.00/MMBtu level to the \$5.00 - \$6.00/MMBtu range the rest of this decade, and \$6.00 - \$7.00 next decade.

(see next slide)

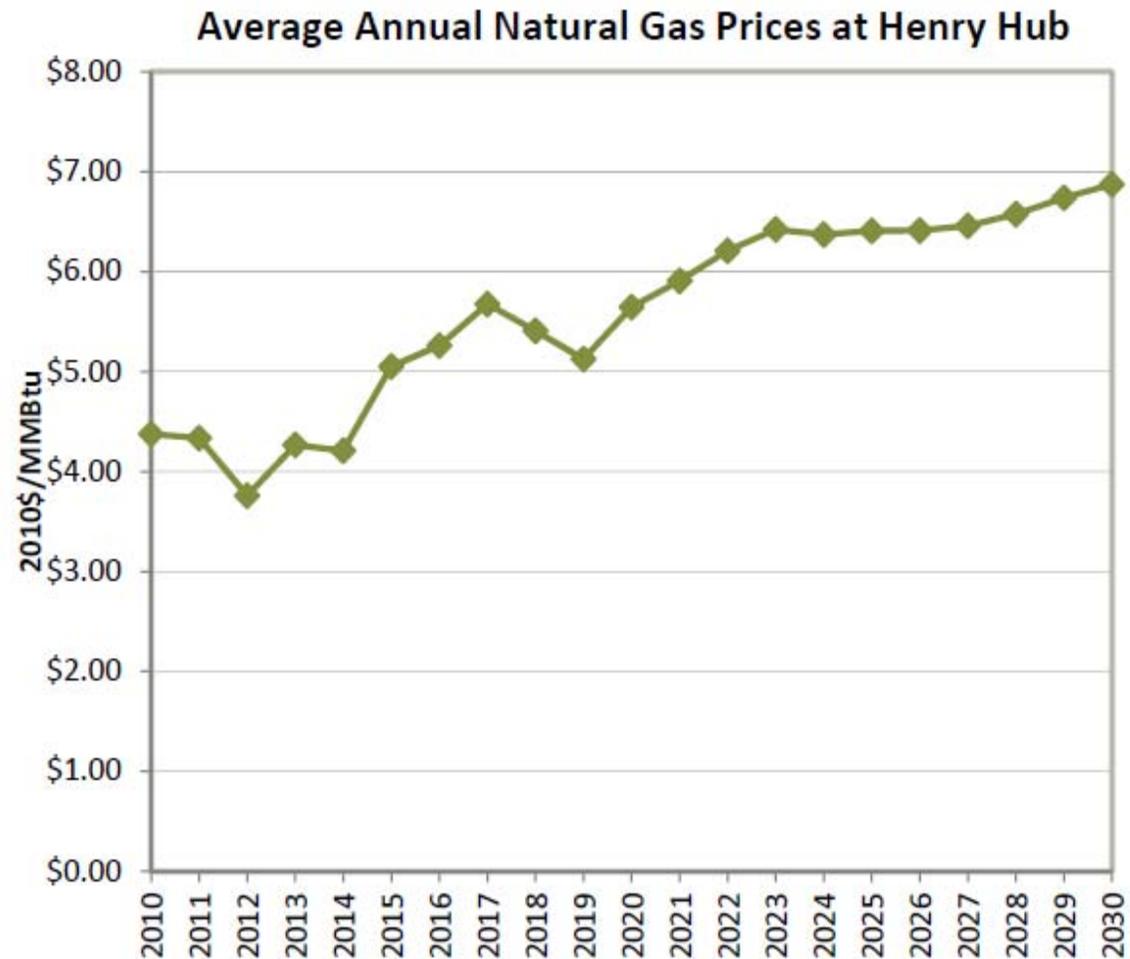
- Many industry experts say that those prices need to be **at least in the \$5.00 - \$6.00/MMBtu range** in order to sustain a large-scale 'fracking' industry.

[Note: energy efficiency is **already** very cost-effective, even at the current \$4.00/MMBtu Henry Hub price]

Gas Prices will Remain Relatively low in the Near Term, but Increase as Demand Growth Accelerates



- Natural gas prices will remain relatively low in the near term, as continued growth in shale gas production outpaces demand growth.
- However, low gas prices combined with high oil prices will continue to shift E&P activity away from gas and toward oil, thereby slowing the growth in gas production.
- Environmental regulations may accelerate growth in power sector gas use and push gas prices upward.
- After 2020, we project gas prices that stabilize between \$6 and \$7 per MMBtu, a “happy” medium for both consumers and producers.



Source: Petak, ICFI

KEY POINT #2

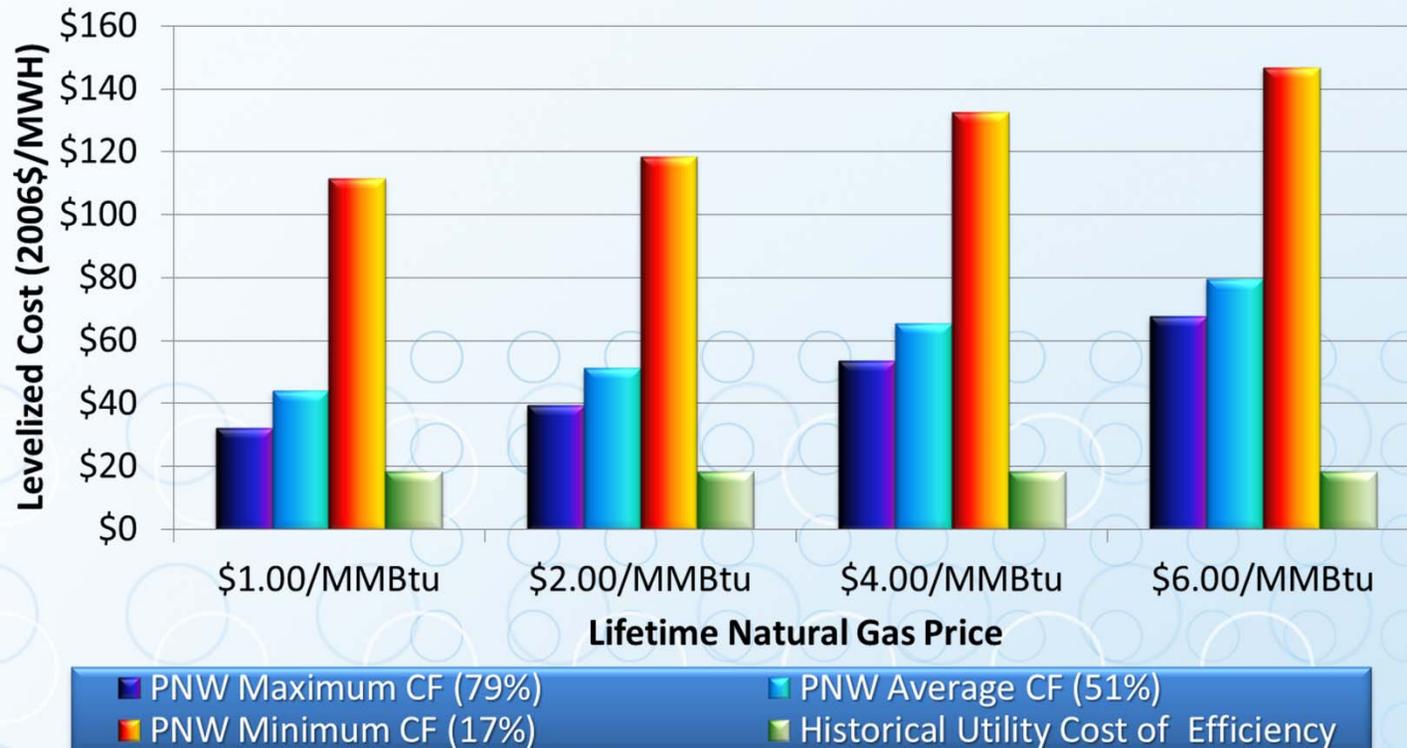
Under any realistically conceivable natural gas price path....

... energy efficiency is robustly cost-effective

ELECTRIC ENERGY EFFICIENCY IS EXTREMELY COST-EFFECTIVE, EVEN WITH "CHEAP" NATURAL GAS FUEL FOR POWER PLANTS

Levelized Cost of Combined Cycle Combustion Turbine at Alternative Natural Gas Prices and Lifetime Capacity Factors Compared to Utility Cost of Conservation

(source: Northwest Power and Conservation Council, 2012)



DATA FROM THE MICHIGAN PUBLIC SERVICE COMMISSION*

Cost of different electricity resources

- **Energy Efficiency: 2.0 cents/kWh****
- **New gas combined cycle plant: 6.6 cents/kWh**
- New coal-fired power plant: 11.1 Cents/kWh
- Current weighted average of power supply costs in Michigan, including purchased power: 6.4 Cents/kWh (excluding transmission costs)***

* 2012 Report on the implementation of P.A. 295 Utility Energy Optimization Programs, November 30, 2012

** Statewide average levelized cost of energy savings from Energy Optimization programs

*** Report on the implementation of the PA 295 Renewable Energy Standard and the Cost-Effectiveness of the Energy Standards, MPSC 2013

NATURAL GAS ENERGY EFFICIENCY IS ALSO VERY COST-EFFECTIVE

MICHIGAN'S ENERGY OPTIMIZATION RESULTS

- Michigan's **natural gas** Energy Optimization programs provide over 3 dollars in utility cost savings for every dollar of EO program costs*, and the levelized cost for 2009-2011 programs works out to about \$2.00/MMBtu.
- Consumers Energy and DTE's most recent EO plans (for 2012-2015) project the levelized cost of savings at \$1.97 and \$2.60/MMBtu for residential, and \$0.97 and \$0.70/MMBtu for business programs, respectively.**
- **All these EO program results are extremely cost-effective under current and projected natural gas prices**

* MPSC 2012 Report on the implementation of P.A. 295 Utility Energy Optimization Programs, November 30, 2012

** Consumers Energy case U-16670, DTE case U-16730

RECENT 2012 ACEEE STUDY

A National Review of Natural Gas Energy Efficiency Programs

January 2012 Report number U121

<http://www.aceee.org/research-report/u121>

- 50-state national survey (plus D.C.)
 - 41 states (incl. D.C.) have ratepayer-funded natural gas EE programs
- Based on cost and savings data for 42 individual years across 12 states, one can calculate:
 - Average utility cost of saved gas: \$2.88/Mcf
 - **Median cost: \$2.70/Mcf**
 - Range: \$0.57 to \$7.42/Mcf
 - 78% of all state/year results were < \$4.00/Mcf

SOME OTHER GOOD EXAMPLES OF NATURAL GAS ENERGY EFFICIENCY SAVINGS RESULTS

- An ACEEE national review in 2009 of 6 states with major natural gas EE programs found a **median cost of conserved energy of \$3.70/Mcf**, with a range of \$2.70 to \$5.50/Mcf

<http://www.aceee.org/research-report/u092>

- A SWEEP review in 2006 of 9 leading utilities around the U.S. found a median savings of 0.5% of annual sales (with a range of 0.1% to 1.0%/year), and a **median benefit-cost ratio of 2.4 to 1** (with gas wholesale prices at ~ \$6.00/Mcf)

[http://www.swenergy.org/publications/documents/Natural Gas DSM Programs A National Survey.pdf](http://www.swenergy.org/publications/documents/Natural_Gas_DSM_Programs_A_National_Survey.pdf)

- An ACEEE study in 2005 provided case studies of key programs at nine leading natural gas utilities, which reported saving gas at a **median cost of \$2.50/Mcf**, with a range of \$1.50 to \$4.10/Mcf

<http://www.aceee.org/research-report/u051>

WOULD IT MAKE SENSE TO TAKE MONEY OUT OF ENERGY OPTIMIZATION TO PAY LOW-INCOME CUSTOMER FUEL BILLS?

No, for several reasons:

- That use of EO funds would be **contrary to the clear purposes of PA 295** because it would **do nothing to improve energy efficiency or reduce future utility costs** (and might even be counter-productive if it reduced the recipient's motivation to conserve energy)
- Spending EO funds **one time to permanently improve the home's efficiency is much more cost-effective** than paying the customer's high energy bills year after year
- As an example, in DTE's most recent EO plan filing (for 2012 - 2015), they calculate that the low-income EO programs will save natural gas at a levelized cost of \$2.20 per Mcf*. **That is less than a third the cost per Mcf of just paying their fuel bill**

*U-16730, see testimony of R.G. Ingrody, Exhibit A-9

KEY POINT #3: MICHIGAN HAS ENORMOUS REMAINING POTENTIAL FOR NATURAL GAS ENERGY EFFICIENCY

- **Michigan's building stock is relatively old and inefficient** (much constructed prior to advanced energy building codes)
- **Recent data** on existing buildings and equipment stock in Michigan **shows huge need for efficiency improvements**
- Other state studies on energy efficiency potential show large remaining potential.... even in states that have been doing utility energy efficiency programs for decades

MICHIGAN'S BUILDING AND EQUIPMENT STOCK IS RELATIVELY OLD AND INEFFICIENT

Residential

- **Two-thirds of residential dwellings in Michigan were built prior to 1980** - - in the era before there were any energy codes in place in Michigan

http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_5YR_B25034&prodType=table

Commercial

- **7 out of 10 commercial buildings in Michigan were built before 1990** - - meaning nearly all were built before Michigan implemented the relatively modest ASHRAE 1980 standard in 1986 (standard has been upgraded several times since)

https://www.michigan.gov/documents/mpsc/Michigan_Commercial_Baseline_Study_367665_7.pdf

DATA ARE AVAILABLE ON THE RELATIVELY INEFFICIENT BUILDING AND EQUIPMENT STOCK IN MICHIGAN

- *Michigan Baseline Study 2011: Residential Baseline Report*
MPSC, 2011

www.michigan.gov/documents/mpsc/Michigan_Residential_Baseline_Study_367668_7.pdf

- *Michigan Baseline Study 2011: Commercial Baseline Report*
MPSC, 2011

https://www.michigan.gov/documents/mpsc/Michigan_Commercial_Baseline_Study_367665_7.pdf

EXAMPLES OF RESIDENTIAL ENERGY EFFICIENCY NEEDS IN MICHIGAN, FROM THE 2011 MPSC REPORT

- **40% of homes still don't have high-efficiency showerheads**
- **82% don't have pipe insulation on hot water pipes**
- **93% don't have water heater insulation wraps**
- A fourth of all homes still have no CFL lightbulbs
- **3/4s of homes with crawl spaces or unfinished basements had no floor insulation or crawl space/basement wall insulation**
- **Nearly 30% of homes had no rim joist insulation**
- **Nearly 30% with finished basements had no basement wall insulation**
- **Over one-fourth of homes still have single-pane windows**
- **Nearly one-fifth of homes have heating systems over 20 years old, and 61% of homes "never" have their heating system tuned**
- Over half of central air conditioners are over 10 years old (one-sixth are over 20 yrs old), and 56% of households "never" have a tune-up
- **Less than half (44%) of homes had programmable thermostats**
- Only 14% of washing machines were "Energy Star" qualified
- One-fourth of homes still have operating second refrigerators

EXAMPLES OF COMMERCIAL ENERGY EFFICIENCY NEEDS IN MICHIGAN, FROM THE 2011 MPSC REPORT

- **Nearly 30% of commercial buildings have no wall insulation**
- **Nearly half (49%) have roof insulation with R-value of R-12 or less**
- **29% have single-glazed windows**
- 90% have at least some inefficient T-12 lighting
- Less than 5% have the high-efficiency “Super T-8” or T-5
- 90% do not have automated lighting controls
- Nearly a third still have incandescent exit sign lighting
- Only 18% of buildings with unitary HVAC systems have automated controls
- Less than one-fourth of buildings with air handlers have ‘variable air volume’ (high efficiency) units
- **Less than a quarter (24%) of buildings with boilers have programmable thermostats or energy management systems**
- Less than 10% of buildings with commercial refrigeration equipment have high efficiency measures such as heat recovery systems, high efficiency evaporator fans or floating head pressure controls

CONCLUSIONS

- **Energy efficiency** has been, and continues to be, Michigan's **cheapest energy resource by far** (one-third or less the cost of any other generation supply option, and one-third the forecasted cost of wholesale natural gas); and has already helped Michigan ratepayers avoid billions of dollars in additional utility costs.
- Michigan's building and equipment stock tends to be older and inefficient, in both the residential and business sectors; and **there is an enormous amount of remaining need for energy efficiency improvement.**

POSTSCRIPT: KEY POINT #4 MICHIGAN NATURAL GAS FRACKING WOULD HAVE NO EFFECT ON THOSE CONCLUSIONS

- **To natural gas *utility customers*, it doesn't matter if Michigan 'fracks' a little, a lot, or none....**
 -Michigan's utilities and consumers will still be paying the prevailing "market" prices for natural gas*
- Whatever Michigan decides to do regarding 'fracking' will have no effect on the conclusions that:
 - ***Energy efficiency is by far Michigan's cheapest energy resource***
 - ***Natural gas energy optimization programs in Michigan have been, and will continue to be, very cost-effective***

*Michigan has only 1% of the U.S. recoverable natural gas reserves (U.S. EIA). Our production will not affect the market price

Whatever happens with natural gas development in Michigan....



"Energy efficiency is [^] the best example of a no-regrets policy Michigan can have"

Governor Rick Snyder, November 28, 2012