

Energy Generation: Why is Ohio Ground Zero?

Presented by:

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Moderated by: Todd Snitchler, Vorys Advisors LLC



The background is a solid teal color. On the left side, there are several thin, white, curved lines that intersect to form a series of overlapping circles or loops. On the right side, there is a faint, stylized image of a staircase with a metal railing, ascending towards the top right corner.

BOB FLEXON

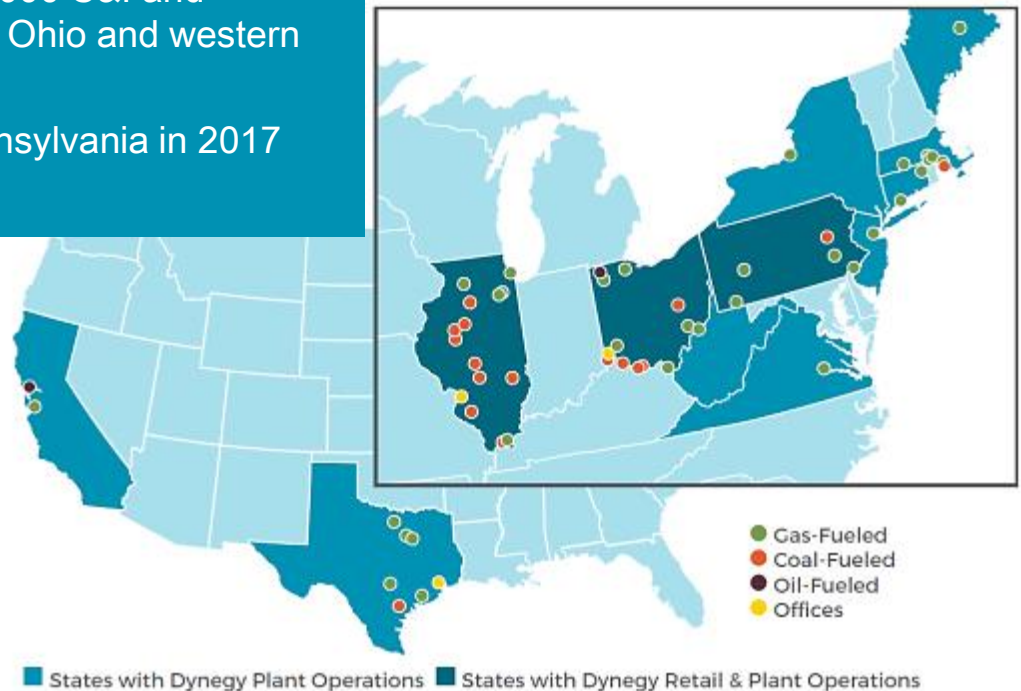
DYNEGY PRESIDENT & CHIEF EXECUTIVE OFFICER

VORYS ENERGY FORUM

JANUARY 31, 2017

DYNEGY AT A GLANCE

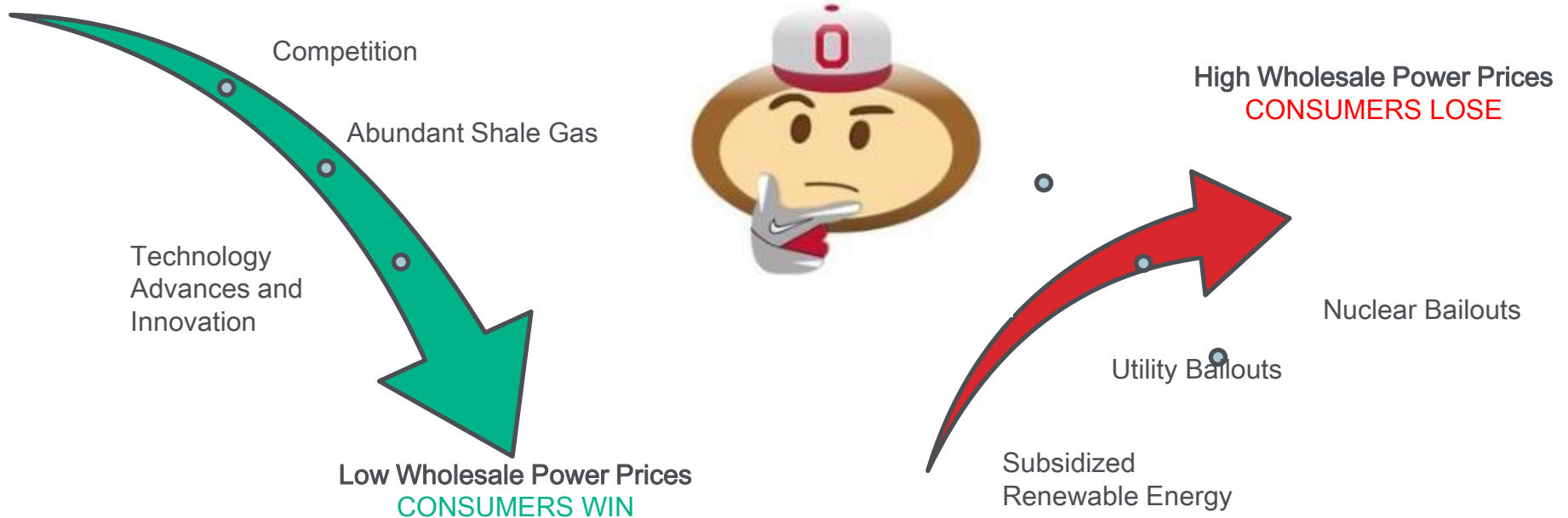
- Geographically diverse fleet located in 12 states
- Fleet primarily located in desirable markets: PJM, ISO-NE and ERCOT
- Generating capacity of ~31 GW with 51 power plants⁽¹⁾
- Largest merchant CCGT fleet in PJM and ISO-NE
- 1 million residential customers and 46,000 C&I and municipal customers located in Illinois, Ohio and western Pennsylvania
- Retail expansion to entire state of Pennsylvania in 2017
- Total employees ~ 3,105



(1) As of 9/30/2016 and reflects the pending ENGIE acquisition, expected to close 1Q17

POWERING COMMUNITIES WITH AFFORDABLE, RELIABLE POWER

CHALLENGING WHOLESALE COMPETITIVE MARKET ENVIRONMENT



GENERATORS MUST LEARN TO OPERATE MORE EFFICIENTLY TO NAVIGATE PERIODS OF LOW POWER PRICES RATHER THAN ASK FOR A HANDOUT

OPTIMIZING GENERATION IN TODAY'S MARKETS

Innovative generators, such as Dynegy, are responding by transitioning fleets for the future

1. Reshape generation fleet

- Acquire/build efficient and flexible generation

2. Close uneconomic generation

- Older, inefficient coal assets
- Nuclear facilities
- Oil peaking assets

3. Seek alternative market-based revenue sources

- Target ancillary services
- Promote fair capacity market



Results of a highly functioning power market

Erosion of a highly functioning power market

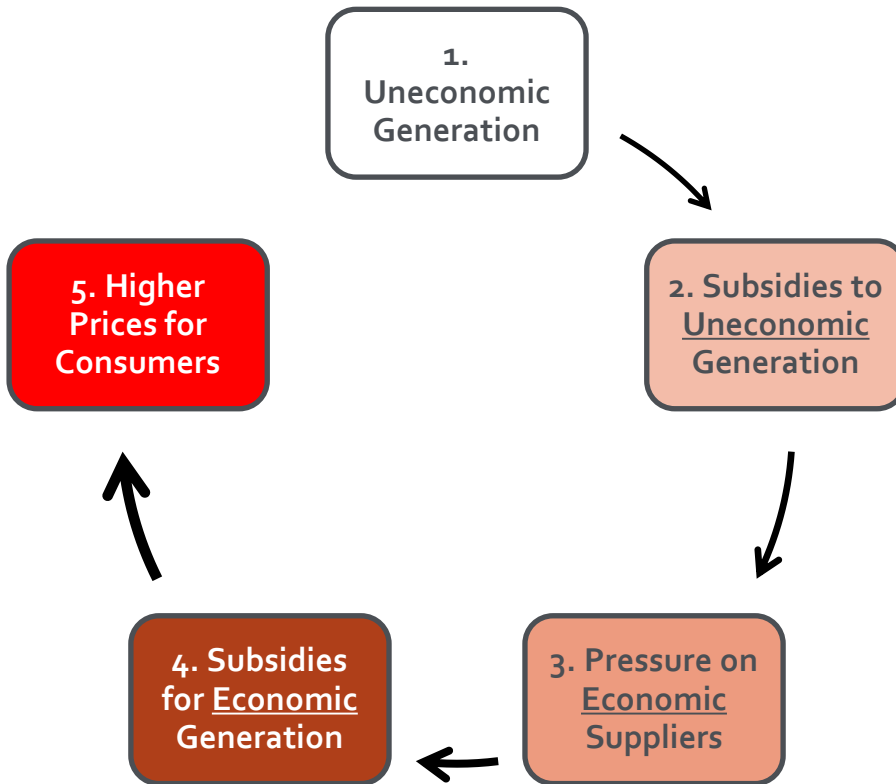


Investment in and enhancement of the existing generation fleet is hampered when attempts to extend the life of inefficient generation through subsidies and/or long-term PPAs with the regulated utility

COMPETITIVE GENERATION OF THE FUTURE SHOULD BE EFFICIENT AND ECONOMIC, NOT INEFFICIENT AND SUBSIDIZED



SUBSIDY DEATH SPIRAL



- The market is providing reliability, newer efficient generation and renewables (at lowest cost)
- Utilities and uneconomic suppliers respond with ways to hide costs from consumers -- Non-bypassable charge is convenient regulated tool
 - This is a mechanism to extend life of utility-owned and uneconomic generation
 - Disadvantages more efficient existing generation and delays investment in more efficient generation
- Question – if a utility receives subsidies from local ratepayers, should the utility's shareholders (typically out-of-state) receive dividends?
- Competitive market model can provide fair returns to investors if regulatory intervention is prohibited
 - Uneconomic generation retires
 - More efficient units can reliably meet supply while new technologies are built to meet future demand

MULTIPLE MEANS OF “CHARGING” CONSUMERS FOR POWER
HIDES TOTAL COSTS

QUESTIONS



Why Ohio is Ground Zero for Competitive Power Producers

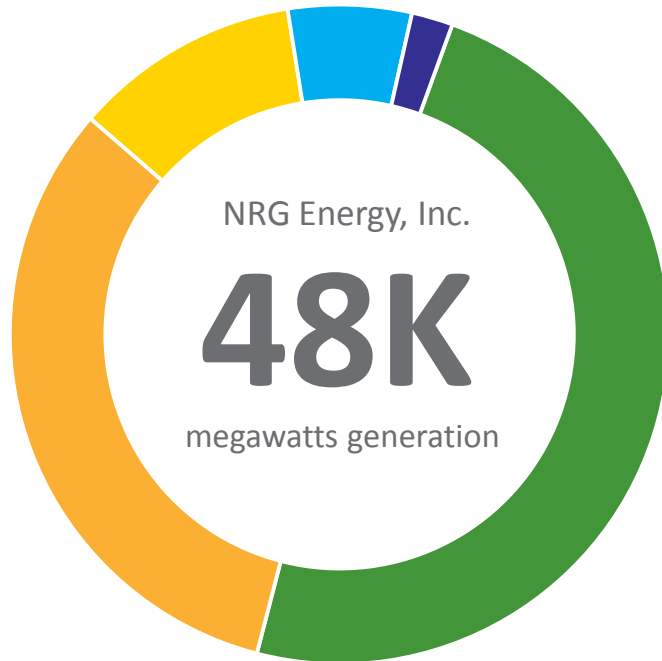
David R. Hill
Executive Vice President & General Counsel
NRG Energy, Inc.

January 31, 2017





NRG by the Numbers



Largest independent power producer and **third-largest** renewable generation company in the U.S.

\$3 billion+

Invested on environmental improvements

~3 Million

Retail customers























Fortune 200

- and -
S&P 500 Index



NRG Offers a Full Suite of Energy Solutions for the 21st Century Electricity Market

NRG circa 2000	NRG today			
 Generation	 Diverse generation resources	 Retail electric providers	 Micro-grid solutions	 Smart energy solutions
 Retail electric providers	 Energy Services	 Distributed wind & solar	 Community Solar	 Demand Response
 Combined heat & power systems	 Energy Services	 Energy Efficiency	 Distributed Generation	 Electric vehicle charging
 Combined heat & power systems	 District Energy Systems	 Fuel Cells	 Repowering	 Backup generation



NRG in Ohio – Avon Lake





NRG in Ohio – Avon Lake (*cont.*)

- ❖ NRG saved what FirstEnergy wanted to close;
- ❖ 700 MW plant;
- ❖ Multi-million dollar investments in back-end controls;
- ❖ Option to convert to natural gas upon completion of pipeline;
- ❖ Employment of traditional work force;
- ❖ Continued local community leadership and engagement.



NRG in Ohio – Avon Lake (*cont.*)

- ❖ NRG supports competition and open markets in Ohio, in the PJM market generally, and throughout the country;
- ❖ Generation costs are coming down and consumers should be allowed to benefit from those cost reductions;
- ❖ Out-of-market riders and other non-bypassable charges on customer bills will make Ohio customers' bills higher than they should be, and will prevent consumers from realizing the benefits of new technology and cost reductions.



Competitive price formation – *not a Rube Goldberg policy like is being tried elsewhere* – delivers value to Ohio

$$\text{\$} = \text{Social Cost of Carbon} - \text{Price Adjustment}$$

$$\text{\$} = \text{Social Cost of Carbon} - (\text{Market Price Index} - \text{Baseline Market Price Index})$$

Social Cost of Carbon =
Year 2016 = \$16.5/MWh

Year 2017 – 2023 =
SCC (\$/ton)* grid carbon
intensity (ton/MWh)

Year post 2023 = \$1/year
increase

Market Price Index (for year 2017-2019) =

Forward market energy price for
PJM Northern IL hub in the next year end by 5/31

$$+ \frac{50\% \text{ Base Residual Auction (BRA) capacity price for PJM RTO}}{24 \text{ hours}} + \frac{50\% \text{ Planning Resource Auction (PRA) capacity price for MISO Zone 4}}{24 \text{ hours}}$$

Market Price Index (post 2020) =

Forward market energy price for
PJM Northern IL hub in the next year end by 5/31

$$+ \frac{50\% \text{ BRA capacity price for PJM ComEd zone}}{24 \text{ hours}} + \frac{50\% \text{ PRA capacity price for MISO Zone 4}}{24 \text{ hours}}$$

Baseline Market Price Index =

Ave DA energy price for PJM Northern IL hub
in the past year end by 5/31

$$+ \frac{50\% \text{ BRA capacity price for PJM RTO}}{24 \text{ hours}} + \frac{50\% \text{ PRA capacity price for MISO Zone 4}}{24 \text{ hours}}$$



Vorys Energy Forum

Independent Developer Perspective

January 31, 2017



1,820 MW
in construction or
development in
Ohio



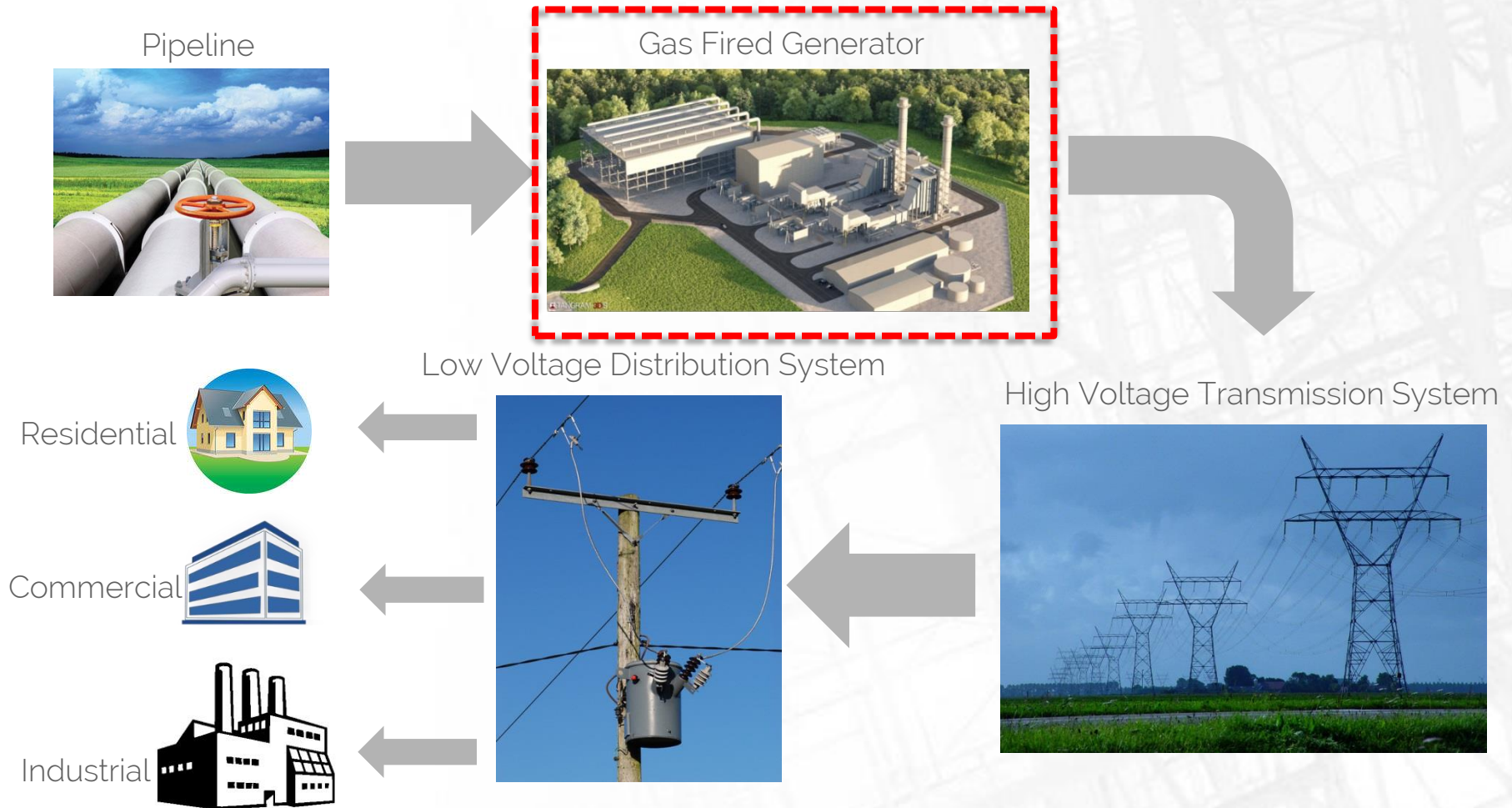
Introduction

a solid vision backed by experience

- > Advanced Power's vision is to be a **world-class developer** and a **manager of independent power generation and related infrastructure projects**.
- > Management has led the development of over **15,000 MW** of power generation projects and **\$7 billion** of limited recourse project financing. The company currently has **7,000 MW** in operation or under development.
- > Advanced Power has a mandate to develop, acquire and manage **5,000MW** over the next 5 years in North America and Europe.



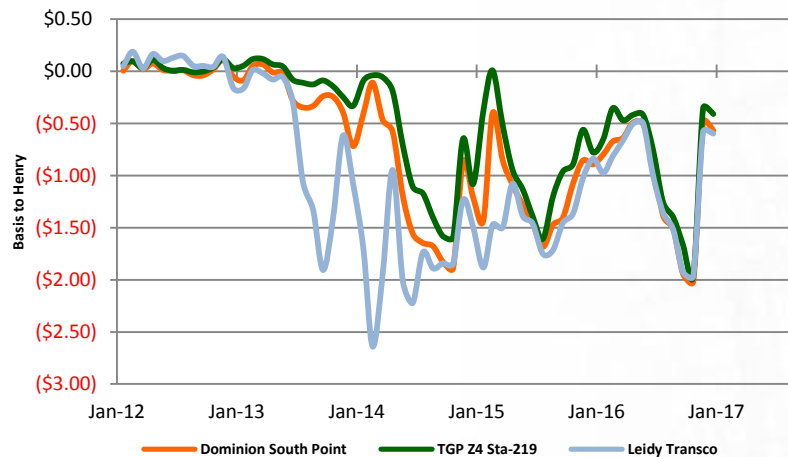
Electric generation from pipeline to end user



Why Ohio?

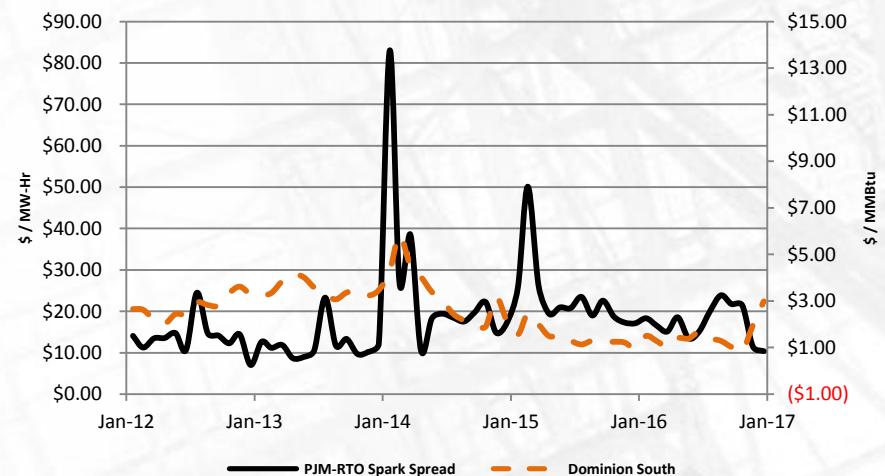
- > Main drivers for Advanced Power's development in Ohio
 - > Deregulated, large, liquid and well-established electricity markets in PJM allow gas fired generation to fully and freely compete with installed generation.
 - > Robust gas and electrical infrastructure and clear regulatory environment
 - > Generation capacity needed in Ohio, over 7.5 GW of coal fired retirements announced in Ohio prior to end of 2016.
 - > Significant negative gas basis to Henry Hub driven by Marcellus and Utica production.

Marcellus Basis Differentials to Henry Hub



Data Source: Ventyx

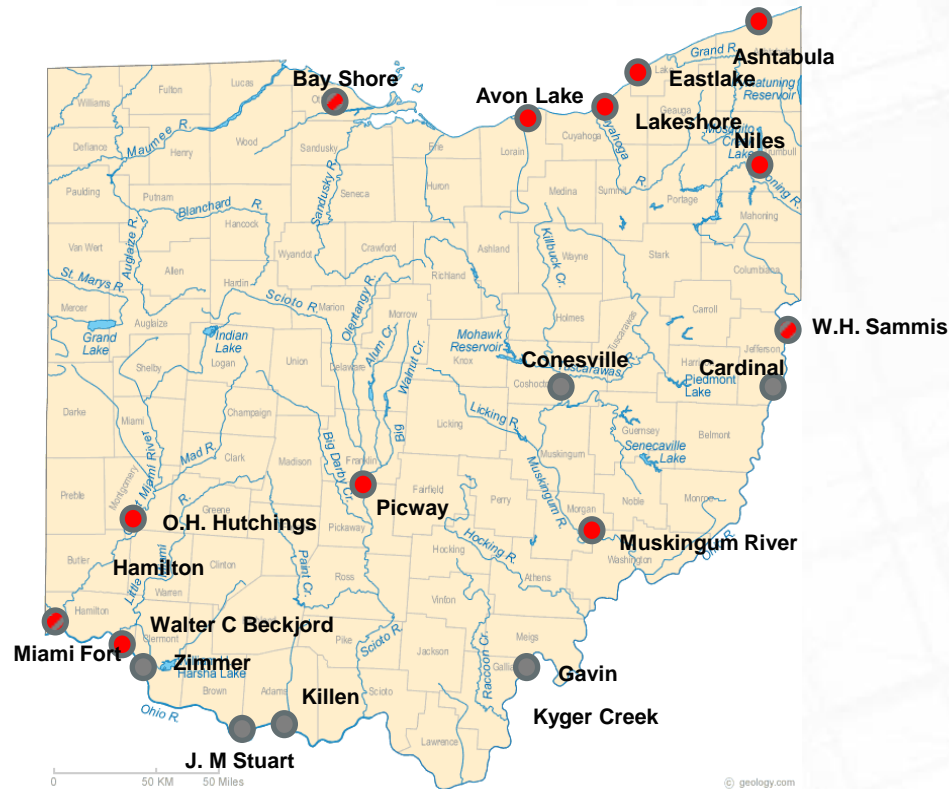
PJM RTO Spark Spreads



Data Source: Ventyx

Ohio Capacity Needs

- > 7.5GW Coal Capacity retirements announced in Ohio since 2012



- Coal Plant Retirement Announced
- Partial Coal Plant Retirement Announced
- Coal Plants Expected to Continue Operating

Announced Retirements	Age (yr)	MW	Year
Bay Shore (1)	50	152	2021
W.H. Sammis (1-5)	45-54	1,020	2020
Ashtabula	55	244	2015
Avon Lake	43-64	721	2015
Bay Shore (2-4)	45-54	495	2012
Eastlake	41-60	1,233	2015
Lakeshore	51	245	2015
Miami Fort (1-4)	53	163	2014
Muskingum River (1-5)	46-60	1,375	2015
Niles	59	216	2012
O.H. Hutchings	60-65	365	2015
Picway	58	100	2014
Walter C. Beckjord	44-61	1,180	2014
Totals		7,509	

Carroll County Energy

> Construction Phase



November 1, 2016

Advanced Power's Impact on the State of Ohio

- > Investment
 - > Over \$2.0 billion of total investment through construction
- > Jobs:
 - > Average of over 1,000 construction jobs and more than 2,700 indirect and induced jobs
 - > ~55 new full-time facility jobs and more than 200 indirect and induced jobs
- > Operations:
 - > \$75 million total economic impact annually
- > Community Benefits:
 - > Through Enterprise Zone Agreements, Advanced Power projects also provide a guaranteed source of revenue to local schools and municipalities



4H Club Support
Source: Carrollton Free Press Standard



Carroll County Toys for Tots

BACK TO SCHOOL BASH – Food, Prizes and GiveAways!

When: Aug. 25, 2016 Where: Wellsville Jr. Sr. High School
6:00-8:00 p.m. (In case of rain, the event will be in the gym)

For Ages: Preschool -12th Grade. GAMES, FREE FOOD, FREE BACKPACK WITH SCHOOL SUPPLIES. This event is open to all Wellsville Local Students and Families.

Participating Sponsor of WLS Back to School Bash



For more information about Advanced Power,

please contact:



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Advanced Power

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or visit advancedpowerna.com



Electricity Generation : Why is Ohio Ground Zero ?



by:

CLEAN ENERGY FUTURE

January 31, 2017

Gas-firing Replacing Vintage Utility Coal Plants

- ▶ Utility coal plants closed to date : 10,003 MW (56 boilers)
- ▶ Ohio's utilities' track record with new gas-fired replacements
 - Batting average of : 0 for 1,656
 - PJM documented **failures** : X1-064; Y1-035; Y1-036 and Z1-030
 - Lack of gas knowledge and bloated utility costs, yields complete Ohio utility failure
- ▶ Ohio's **coal** plant energy costs are nearly **100 % higher** than energy from non-utility gas-fired plants
 - Coal cost \$ 34/MWh : (12,500 HR x \$ 2.25/MMBtu coal plus \$ 5.75/MWh V O+M)
 - Gas cost \$ 18/MWh : (6,500 HR x \$ 2.45/MMBtu gas plus \$ 2.10/MWh V O+M)
- ▶ Non-utility co's with private capital, have **equally offset** "dead" coal plants :
 - 11,386 MW of modern gas fired plants in Ohio (12 sites)
 - Operating (710 MW) , in construction (3,167 MW) and advanced development (7,509 MW)
- ▶ Inefficient coal still up and running in Ohio : 12,533 MW
- ▶ Ohio's utilities (AEP, First E and DP&L) seek to salvage coal "dinosaurs" on the backs of the public via a change in law, namely "re-regulation" a \$ 100 Billion bailout

Economic Impact of Non-utility Successes

- ▶ 11,386 MW of gas plants equals \$ 12 Billion of new capital investment in Ohio
- ▶ Collective construction effort (12 plants) requires 18,000,000 man-hr of field labor
- ▶ Once up and running 300 new full-time, high-paying jobs
- ▶ Each project brings \$ 14 B of economic value to Ohio (incl. gas purchase), so 12 plants is \$ 170 Billion of new business
- ▶ Each host community experiences immediate impacts : new jobs, property tax boost, income tax receipts, school improvements, and sale of municipal services
- ▶ These economic pluses dwarf any local coal plant “shut down” impacts
- ▶ Ohio is rich in low-cost and abundant (2,660 yr. supply) gas, via the Utica formation (OH/WVa/W-Penn)
- ▶ Electricity prices in Ohio will be kept low and made possible thru “customer choice” a \$ 3 Billion/yr savings vs. power from Ohio’s monopoly utilities

Ohio's Utilities Feverishly Working to Kill Non-utility Success

- ▶ Ohio's power utilities know the facts : their cost structure is excessive and they can't compete with non-utility performance
- ▶ Ohio has been part of a 13-State, open, competitive, low-cost power generation system (called PJM) since 1999
- ▶ For 18 years Ohio's utilities have attempted to compete in this open and free marketplace and have **FAILED**
- ▶ There is nothing stopping Ohio's utilities from forming an un-regulated affiliate and start developing gas-fired plants tomorrowbut they know they can't be cost competitive
- ▶ Their next logical step . . . if you can't compete . . .change the rules/laws of competition via "re-regulation" in the Ohio Legislature
- ▶ What are the utilities' strengths via "re-reg" :
 - Use ratepayer money to donate to elected officials
 - hire PR firms, lobbyists and consultants to also donate to elected officials while also promoting the utilities' messaging
 - influence law/rule making to meet their own financial objectives
 - create law/rules that are anti-customer, anti-competition and anti-Ohio

Utility 2017 “Re-reg” Effort : \$ 100 B Bailout Paid by Ratepayers

- ▶ Basic “Re-reg” principle: If you knowingly can’t compete then change the Ohio laws at the expense of the ratepayer
- ▶ Utility “Re-reg” has 3 bailout cost components :
 - prop up 12,533 MW of coal generation : \$ 22 Billion
 - prohibit current non-utility competitors for all future gas plants : \$ 20 Billion
 - **STOP** “customer choice” : \$ 60 Billion
 - **total bailout** from Ohioans : \$ 100 BillionAdded details at : www.cleanenergyfuturellc.com
- ▶ Who benefits from “Re-reg” ?
 - sr. management of AEP/FE/DP&L via multi million \$/yr compensation
 - Wall St. as the utilities’ stockholders and bond/note holders
 - lobbyists/consultants and PR advisors paid handsomely by utilities pushing false “Re-reg” story
 - elected officials who accept utility donations directly/indirectly and support “Re-reg”

Note : ratepayers are not on this list of beneficiaries; they are the PAYEE of the bailout
- ▶ Ohioans Demand “Customer Choice” to buy electricity
 - Polls show 85 % of electricity customers want “customer choice ” to buy electricity
 - “Re-reg” eliminates “customer choice”
 - Legislators theoretically are in place to represent the desires of their constituents
 - Goals of “re-reg” are opposite the public’s desire
 - OSU study shows why public is right : “customer choice” yields savings of \$ 3 Billion/yr

Code Words for “Re-regulation” that = **Bailout**

- ▶ Utility PR dept's/sr. management have created code words to disguise the real intent of “re-regulation”, in the media . . . don't be fooled
- ▶ Sample of “code words” :
 - “sustainable energy solutions” the only sustaining here is sustaining the utilities' profits
 - “keeping utility financially healthy “ we're losing money through poor decision making, so help us raise our profits to stay healthy
 - “the utility's financial integrity is at stake” . . . poorly run utilities are typically purchased by competent competitors vs. making it the ratepayer's obligation to fund incompetent management
 - “electric security plan” suggesting that if there is no bailout of coal, etc. Ohio is not secure, which is total nonsense and factually baseless
 - “common sense re-regulation” “Re-reg” as proposed by Ohio's utilities is common sense only to them because they are asking the public to bail them out of their self-generated \$\$ mess any clear thinking individual will see their proposal as nonsensical
- ▶ It is clear that “Re-reg” is a utility Legislative manipulation, so verbal disguise is a necessity

“Pay-to-Play” is On-going in Ohio

- ▶ Ohio's power utilities spend \$ millions each year to lobby and influence the Legislature to accommodate their laws/regulations
- ▶ The new 2017 “Re-reg” push by utilities is a \$ 100 Billion Bailout
- ▶ “Re-reg” is :
 - anti consumer
 - anti-competition
 - anti-Ohio
- ▶ Ethical Dilemma : If “Re-reg” is a known **\$ 100 B bailout** paid for by Ohioans, for the **sole benefit of utilities**, how can Legislators knowingly accept utility/coal contributions and support “Re-reg” ??