Electricity Generation "Re-regulation" in Ohio

the Utilities'

Job Killing, $ 29.4 Billion Subsidy

to

The Ohio Manufacturers' Assoc.

by : Clean Energy Future, LLC (CEF)

November 17, 2016

Conclusions

- "Re-reg " requires that all electricity ratepayers **give up** **"customer choice"** for their electricity supplier (with generation available from non-utility generators)
- 2016 poll shows ratepayers demand **"customer choice"** by a 5:1 margin (1)
- "Re-reg" requires that any future gas-fired project can only be built by a regulated utility entity
- "Re-reg" is effectively a **$ 29.4 Billion "subsidy"** paid to the Ohio power utilities, by Ohio customers
- This $ 29.4 Billion amount comes from : subsidizing old coal $ 14.4 B ; plus mandatory construction of new gas-fired plants by inefficient utilities $ 15.0 B
- This level of "economic" millstone will have dramatic negative effects in Ohio :
  - cause cost of goods to increase, for existing businesses
  - act as a deterrent for new businesses looking to locate in Ohio
  - rising product/services costs have to be met with other cost reductions (jobs)
  - consumers spending more on electricity, have less disposable income for purchase
  - this un-necessary economic burden acts as an automatic "brake" on the Ohio economy
- Such a utility "Re-reg" proposal is driven by their known inability to compete in the existing open-market environment

(1) "Ohio GOP voters Support Green Energy, Efficiency Programs and Customer Choice." Sept. 21, 2016, The Plain Dealer.

Bill Siderewicz, P.E. : Ohio Power Experience

- President, Clean Energy Future, LLC (CEF)
- CEF is bringing private investment of **$ 4.5 Billion** into Ohio
- Five (5) gas-fired projects in Ohio, with 4,505 MW capacity :
  - Fremont : 710 MW (operating)
  - Oregon-1 : 960 MW (in construction)
  - Lordstown - 1 : 940 MW (in construction)
  - Oregon-2 : 955 MW (advanced development)
  - Lordstown-2 : 940 MW (advanced development)
- Thirty-six (36) years experience in developing and building **non-utility** power projects
- 35 successful projects (14,350 MW), 97% gas-fired
- Environmental/civil engineering background
  - Cornell University – M.S. Engineering (Fellowship)
  - Northeastern University – M.B.A. Finance
  - Merrimack College – B.S. Engineering (cum laude)
- Personally involved in development, financing and on-going management of power projects

3

De-regulation of Electricity Generation in Ohio

- De-regulation of generation in Ohio started in 1999 - 2000
- Ohio's regulated utilities were compensated $ Billions, as Step -1 in de-regulation, for "stranded assets", to address their non-competitive power plants
- Ohio became part of a 13-State PJM open-market based on competition to reduce :
  - electricity capacity costs
  - electricity energy costs
- PJM (www.pjm.com) has 171,648 MW of capacity, approx. 18.4 % of total U.S. generation capacity of 930,000 MW, and serving 61 million people
- A highly functional PJM has consistently pushed DOWN the cost of generated electricity
- Changing from a 16-yr free market power production system, back to a "re-regulated" market would place $ B's invested in Ohio, in financial jeopardy

4

De-regulated Power Generation Mimics Telephone De-regulation

- In the past, Ma Bell (regulated monopoly) was the only long distance provider, making telephone use very costly
- After telephone de-reg we have : Sprint, AT&T, Mobil 1, Verizon, etc.
- De-regulation of the telephone industry has opened competition and driven long distance rate, dramatically downward
- At one time AEP, FE and DP&L were the only power generators/providers (regulated monopolies)
- Through a competitive PJM power market, the same electricity cost reduction has occurred with power generation
- **Today, Independent Power Producers (IPPs) have entered the Ohio market and provided Ohioans with low-cost, clean and reliable power**
- Consumer choice for power is alive and well in Ohio

5

Power Transmission (T) and Distribution (D) Remain Regulated (Monopoly)

- T + D services remain under monopoly control by Ohio's utilities
- T + D economics are based on a cost plus "pass through" methodology
- There is no incentive whatsoever to minimize T+D costs to Ohio's customers, in fact the opposite can be argued to be true
- There is no competition or price control
- History has shown that **T + D costs have not decreased**

6

"Game Changing" Event called Shale Gas Discovery

- Gas/oil is being produced at record low costs via fracking technology
- E/SE Ohio is the beneficiary of the large-scale Utica Shale formation
- The Utica formation is just one of many U.S. formations such as Marcellus, Barnett, etc.
- South Point (OH/PA/WVa) is now the lowest price point for U.S. natural gas .. . . . trading at a discount to Henry Hub gas pricing, 12 months a year
- Gas prices are so low in South Point that gas flows in Midwest gas pipelines are being reversed, and gas is now flowing east to west
- Low-cost, abundant local natural gas has been the "spark plug" for new IPP power generation in Ohio
- The presence of new gas turbine technology coupled with abundant, low-cost gas have made vintage coal plants economically obsolete

7

Why Gas Will Not Let Coal Off the Mat

- A recent 2-year Univ. of WVa study (2) shows the Utica formation sized at 3,192 TCF (trillion cubic feet)
- If every single U.S. power plant, or 810,000 MW demand (930,000 MW capacity) ran on Utica gas . . . we have a near 80 year fuel supply
- **If every Ohio based MW of generation (ie. 24,000 MW demand) ran on Utica gas . . . we have a 2,660 year fuel supply**
- A local, low-cost supply of natural gas far exceeds gas demand making a coal/gas price cross-over highly unlikely
- Recently, at the PUCO PPA case, Ohio utility spokesmen have argued that coal will somehow become more economical than shale gas . . . to justify a coal plant subsidy, in the near term
- FERC (via the recent Ohio PPA subsidy case) has thankfully rejected such a view, because the facts do not substantiate such a position

(2) A Geologic Play Book for Utica Shale Appalachian Basin Exploration"; July 1, 2015; by WVa Univ. Research Corp.

8

Electricity Energy Costs from Coal are Simply Non-Competitive

- Laws of science and physics can not be denied :
  - Coal : net heat rate 12,500 Btu/kwh, coal cost (3) $ 2.25/MMBtu, Var O+M $ 5.75/MWh
  - Gas : net heat rate 6,500/kwh, gas cost $ 2.85/MMBtu, Var O+M $ 2.10/MWh
- Cost of electrical energy is thus :
  - Coal : $ 33.88/MWh (or 3.39 cents per kwh)
  - Gas : $ 20.63/MWh (or 2.07 cents per kwh)
- On-line real-time PJM data shows typical daily energy market prices in Ohio to be $ 25-28/MWh, see www.pjm.com, data shortcuts, maps (LMP)
- It's only a difference of 1.3 cents/kwh, why worry about providing Ohio utilities a "subsidy" for coal ?
- If all the remaining 9,933 MW of coal-fired Ohio generation (4) were provided a 1.3 cent/kwh subsidy for 15 more years, ratepayers would be saddled with a **over-charge of $ 14.4 Billion**

(3) "AEP 2016 Fact Book, 51 st EEI Financial Conf. " ; Phoenix, AZ; Nov. 6-9, 2016
(4) OH Coal Plants : FE 2,200 MW , AEP/JV 6,113 MW and DP+L/JV 1,620 MW

9

Electricity Capacity Costs from Coal are Simply Non-Competitive

- Remaining book values of coal-fired plants are still very high $ 850-900/kw (5)
- A **new gas-fired** power project, with a high energy efficiency, can be built for about the same $/kw capital cost
- At a 50/50 utility debt/equity ratio, and knowing cost of capital dictates the capital recovery needed
- Coal-fired plants have very high Fixed O+M costs, driven by :
  - large sized operating staffs, to manage coal systems
  - added benefit costs for such a staff
  - property tax payments
  - insurance for physical plant and liability
  - fixed maintenance plant costs, whether running or not
  - fixed cost of coal inventory, even if not used
  - fixed costs of maintaining ash disposal system
- PJM 's Capacity Auctions (May of each year) dictate the value of capacity in Ohio
- The most recent auction yielded a $ 100/MW-day capacity value
- The high : (i) capital recovery needs and (ii) Fixed O+M of coal firing means OH utilities will typically NOT clear the PJM Capacity Auction

(5) "AEP Takes $ 2.3 B Write-down of Coal Plants to Avoid Ohio's Deregulation Debacle." Nov. 1, 2016, Columbus Business First.

10

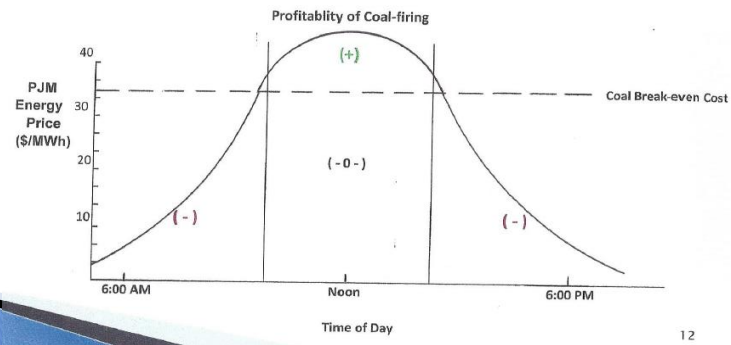
Other Negative Aspects of Aging Coal Plants

- Coal-fired plants emit nearly 100% more CO2 than equal sized modern gas-fired plants
- Emissions such as SOx, NOx and Particulate are magnitudes lower with gas
- Coal stack emissions include airborne mercury deposited to local surface waters
- If a cooling tower is used, coal firing requires 300% as much water as gas
- If once-through cooling in used for coal firing, 1,000,000,000 gal/day will be heated per 1,000 MW plant
- Ash ponds/landfills bring an added dimension of management risk, to protect against leaching of hexavalent chromium to local groundwater
- Coal plants can **not** be ramped up/down over short time periods making it difficult to make money in a dynamic PJM energy market

11

Inability for Coal Plant Ramp Up/Down

- A long ramp-up time means losing money to reach the targeted time of day for profitability
- A long ramp-down time means losing money to exit targeted time of profitability
- If the targeted time of profitability does not materialize (ie. incorrect forecast), money is lost in all three phases : ramp up, run time and ramp down



12

12

New Technology Makes Gas-fired CCGT Advantageous

- Numerous large industrial manufacturing entities continue to push the envelope of higher performance
- Gas turbine technology is derived from the aerospace industry (jet engines)
- The dominant large-scale power plant major equipment options are :
  - Siemens : F-class and H-class GTs
  - G.E : F-class and H .01 and H .02 GTs
  - MHI : J-class and G-class GTs
- Today's gas-fired net heat rates are at 6,400-6,500 Btu/kwh (HHV) ; twice as efficient as a coal plant

13

IPP Gas-fired Plants Have Equally Offset Closing Coal

- Ohio utilities can not shut down a coal plant until PJM has studied such an action, to preserve system reliability for Ohio's power consumers
- PJM has approved the closing of 10,295 MWs of Ohio coal plants, and lists them on the PJM web site (see Exhibit A)
- Exhibit B illustrates that 3,877 MW of modern gas-fired projects are in operation/construction and another 6,959 MW are in advanced development (10,836 MW total)
- Contrary to what has been stated by recent utility quotes, new modern gas-fired generation is on pace to equally offset closed coal plants

14

Private Investment has Filled Utility's In-action Void

- The IPP industry noticed this coal closure trend years ago based on : (i) added cost to meet smoke stack clean up regulations and (ii) the excessive cost of power production from coal vs. gas
- IPPs have moved into action without any need for Ohio Legislation or OhioPUC consideration
- IPPs have invested $ 4.0 Billion to date in Ohio, and are on a path to invest an added $ 7.0 Billion, for those projects in active development
- Such IPP investment is occurring without any risk/recourse to the Ohio ratepayer

15

Ohio Power Utilities Can Not Compete

- Since their very beginning, utilities have been monopolies, that do not compete and don't know how to compete
- Their world revolves around "cost plus" and "pass through" economics
- With a guaranteed rate of return on equity, it can be argued they have an incentive to "gold plate" everything to increase BOTH the rate base and their own profits
- Hard current-day economic facts, known to the IPP industry and EPC firms, point to utilities having a cost structure that is 30-40% higher than the costs of the IPP sector
- This first-hand knowledge comes from the grid interconnection process that allows an IPP-based power project to connect to the local utility grid . . . via the "self build" process
- This fact is also evident by way of the many attempted utility gas-fired projects that have failed in Ohio

16

What is the Magnitude of this Utility New-build Inefficiency

- A cornerstone provision to "Re-reg" is that any new gas-fired project can only be built by an Ohio regulated utility
- It is likely that at least another 10,000 MW of new gas-fired generation will be needed in Ohio, beyond the current 10,000 MW build out
- Knowing that a utility's cost of construction and operations are at least 35 % above the private sector, there is an **implicit subsidy** to be paid :

- Construction costs (+ 35%) :	$ 7.5 Billion
- Operating costs (+ 35%) :	$ 4.5 Billion
- Fuel costs (+ 5 %) :	$ 3.0 Billion
	$ 15.0 Billion

- Since new plants will be running for at least 40 years, the **subsidy** attributed to these new 10,000 MW of plants is **$ 15.0 Billion**

Decision-making for Ohio's Power Utilities is Quite Simple

- Seek strategic utility partners to : sell to/merge with
- Close and write-down ineffective generation facilities
- Sell un-economical generation to others
- **Form an un-regulated affiliate (like AEP announced Nov. 2 nd to pursue renewables) and start developing gas-fired generation tomorrow (6)**
- **There is absolutely no need whatsoever to change State electricity regulations**
- Create partnerships with others (IPPs such as CEF) who have developed modern gas-fired projects, vs. going it alone
- Invest in gas infrastructure, vs. dismissing it, as Southern Co. has done (7)
- Create cost saving measures to make T+D more economical

(6) "AEP Plans to Spend $ 1 Billion on Renewables." Nov. 2, 2016, Columbus Business First.
(7) "Southern Co. Ups Bet on Natural Gas, Buying Pipeline for $ 1.5 B." July 11, 2016, Atlanta Journal Constitution.

IPPs are Local Ohio Partners

- The Owners of Lordstown IPP have a market capital 400% larger than AEP, with far more gas-project experience, and participate locally

- The IPP local involvement is quite significant :
  - Improvements to local infrastructure (schools, roads, water supply and sewer services)
  - Tax payments to local school district and community
  - Salary and Project's community income taxes enhance local budgets
  - 750 - 1,000 union construction jobs over 2.5 years
  - Contributions to local scholarship efforts
  - 4-H Club of Trumbull Co.
  - Women's Auxiliary
  - Lions Club
  - Boy Scouts of Trumbull/Mahoning Counties
  - Rescue Mission of Mahoning Co.
  - Inspiring Minds youth program (Deryck Toles – NFL)
  - Integration of local H.S. and colleges into design and construction/operations of IPP plants
  - Unique contributions for local special needs (Lordstown H.S. sports uniforms)

19

IPP Economic Impact on Ohio is Significant

- OPSB permit process requires an independent economic "ripple effect" analysis be completed, before a construction permit is issued
- New IPP projects favorably impact many areas :
  - local salary tax (construction and operation phases)
  - local income tax on Project's income
  - State income tax (by new jobs and the Project itself)
  - property tax
  - water purchase
  - sewer service purchase
  - purchase of construction related goods/services
  - 750 - 1,000 union construction jobs
  - local gas transport service
  - purchase of natural gas (from Ohio resources)
  - new full time plant jobs
  - local goods/services to support annual maintenance
- Over a 40-yr period a single IPP plant has a $ 13.8 Billion impact
- The 12 new IPP plants for Ohio will yield over $ 170 Billion of in-State value

20

An Ohio Political Leader's Summation

- Oregon, OH is an energy center of Ohio : home of two (2) major refineries and 2,000 MW of gas-fired power generation
- The City Administrator, Michael J. Beazley, J.D. is intimately familiar with all ranges of energy issues
- Mr. Beazley also taught a course at the Univ. of Toledo designed to illustrate how regulated utilities use their status/network to shape business terms in Columbus, to meet their own financial needs
- When asked about the latest proposed "Re-reg" pursuit by Ohio's power utilities he stated :

  " Within the last five years every single form of Ohio energy goods and services have decreased in cost, except for two (2), monopolized electricity transmission and distribution. Why would anyone support a legislative initiative that would place electricity generation into the same environment, leading to its upward cost spiral ?"

21

Why Will Utility Brass Fight for "Re-reg" ?

- Without control of power generation, utilities fear a loss of income potential
- Reduced utility income, negatively impacts their stock price
- Reduction in stock price negatively impacts compensation to management
- Monopoly (utility) managers are some of the highest paid in Ohio, even though they have no competition . . page 23
- Personal financial enhancement can be maintained/achieved via a subsidy paid by others (ratepayers) .. . page 24

22

Top 5 Salaries in Ohio

Top Compensated CEOs in Ohio

Rank	Name	Business	Annual Compensation	Perform Against Competition
1	Leslie Wexner	Retail	$ 27.17 million	YES
2	George Barrett	Cardinal Health	$13.27 million	YES
3	Nicholas Akins	AEP	$11.45 million	NO (monopoly)
4	David Campisi	Big Lots	$8.63 million	YES
5	Emil Brolick	Wendy's	$ 8.28 million	YES

Source : Columbus Business First, Nov. 10, 2016

23

AEP Manager Compensation

Name of Respondent	This Report is:	Date of Report (Mo, Da, Yr)	Year/Period of Report
AEP Ohio Transmission Company, Inc.	(1) X An Original (2) _ A Resubmission	/ /	2015/Q4

FOOTNOTE DATA

Schedule Page: 104 Line No.: 1 Column: a

Executive Compensation Table

The following table provides summary information concerning compensation paid to or accrued by us on behalf of our Chief Executive Officer, our Chief Financial Officer and the three other most highly compensated executive officers, to whom we refer collectively as the named executive officers.

Name and Principal Position (a)	Salary ($)(1) (b)	Bonus ($) (c)	Stock Awards ($)(2) (d)	Non-Equity Incentive Plan Compen-sation ($)(3) (f)	Change in Pension Value and Non-qualified Deferred Compen-sation Earnings ($)(4) (g)	All Other Compen-sation Earnings ($)(5) (h)	Total ($) (i)
Nicholas K. Akins — Chairman of the Board and Chief Executive Officer	1,279,900	—	6,719,981	3,150,000	199,027	103,658	11,452,566
Brian X. Tierney — Executive Vice President and Chief Financial Officer	709,246	—	1,907,216	1,100,000	0	84,125	3,800,587
Robert P. Powers — Executive Vice President and Chief Operating Officer	709,246	—	1,888,008	1,075,000	0	90,234	3,762,488
David M. Feinberg — Executive Vice President and General Counsel	591,426	—	998,394	800,000	59,069	68,163	2,517,052
Charles E. Zebula — Executive Vice President-Energy Supply	446,310	—	1,496,037	570,000	51,420	54,279	2,618,046

24

Exhibit A

Coal Plant Closures in Ohio (1)

Utility Co.	Plant Name/Boiler No.	Size (MW)
ATSI	Burger 3	94
"	Niles 1	109
"	Niles 2	108
"	Bay Shore 2	138
"	Bay Shore 3	142
"	Bay Shore 4	215
"	Eastlake 1	132
"	Eastlake 2	132
"	Eastlake 3	132
"	Eastlake 4	240
"	Eastlake 5	597
"	Ashtabula 5	244
"	Lake Shore 18	245
	subtotal	2528
AEP	Conesville 1	115
"	Conesville 2	115
"	Conesville 3	165
"	Gorsuch	189
"	Sporn 1	145
"	Sporn 2	145
"	Sporn 3	145
"	Sporn 4	145
"	Sporn 5	440
"	Clinch River 3	230
"	Glen Lyn 5	90
"	Glen Lyn 6	235
"	Kammer 1	200
"	Kammer 2	200
"	Kammer 3	200
"	Kanawha River 1	200
"	Kanawha River 2	200
"	Muskingun River 1	190
"	Muskingun River 2	190
"	Muskingun River 3	205
"	Muskingun River 4	205
"	Muskingun River 5	600
"	Picway 5	95
"	Sporn 1	145
"	Sporn 2	145
"	Sporn 3	145
"	Sporn 4	145
"	Tanner Creek 1	145
"	Tanner Creek 2	145
"	Tanner Creek 3	198
"	Tanner Creek 4	500
	subtotal	6212
DP&L	Indian River 1	90
"	Indian River 2	89
"	Indian River 3	170
"	Hutchings 1	53
"	Hutchings 2	50
"	Hutchings 3	59
"	Hutchings 4	62
"	Hutchings 5	58
"	Hutchings 6	57
	subtotal	688
Duke	Walter C. Beckjord 1	94
"	Walter C. Beckjord 2	94
"	Walter C. Beckjord 3	128
"	Walter C. Beckjord 4	150
"	Walter C. Beckjord 5	238
"	Miami Fort 6	163
	subtotal	867
	TOTAL Ohio Closures	10295
	Total Boilers Closed	59

1. Sources : PJM Plant closure data (www.pjm.com; planning tab)

25

Exhibit B

Gas-fired Generation in Ohio

Plant	Size (MW)	Status
Fremont	710	Operating
Oregon-1	960	In construction (COD 5/'17)
Carroll Co.	742	In construction (COD '18)
Middletown	525	In construction (COD '18)
Lordstown -1	940	in construction (COD 6/'18)
Subtotal	3,877	
Columbiana Co.	1,152	COD 2019
Lordstown-2	940	COD 2020
Oregon-2	955	COD 2020
Pickaway Co.	1,050	COD 2020
Guernsey Co.	1,100	COD 2020
Hannibal, OH	485	COD 2020
Harrison Co.	1,277	COD 2021
Subtotal (in development)	6,959	
Total in Ohio	10,836	

26