Coal Refuse Reclamation to Energy Industry: A Public Benefit in Jeopardy

By: Jaret Gibbons, ARIPPA Executive Director
Monday, February 3, 2020
www.arippa.org
**WHAT IS ARIPPA?**

- Appalachian Region Independent Power Producers Association

- ARIPPA is a non-profit trade association representing the coal refuse reclamation to energy industry in Pennsylvania and West Virginia.

- Comprised of environmental remediation facilities that utilize circulating fluidized bed (CFB) boiler technology to convert coal refuse into electricity.

- An industry which has helped the states turn environmental challenges into economic opportunities.
2016 Pennsylvania Economic and Environmental Study

“Economic and Environmental Analysis of Pennsylvania's Coal Refuse Industry”
The Coal Refuse Reclamation to Energy Industry
A Public Benefit In Jeopardy

Date: June 2019
Submitted to: ARIPPA
1. Assessing Pennsylvania’s Coal Refuse Problem

CHAPTER SUMMARY:

- Pennsylvania’s coal mining legacy has left the Commonwealth with significant environmental liabilities, including more than 220 million tons of coal refuse piles identified by PA DEP.

- For three decades, the coal refuse reclamation to energy industry has helped the state address these liabilities by removing piles, reusing the coal refuse to generate energy, and restoring mining affected lands.

- Industry activities are undertaken through a closely regulated and proven process, and give the PA DEP a tool to help address sites of significance to communities.

- These public benefits are in jeopardy due to market and regulatory challenges.
CURRENT INVENTORY

PADEP’s inventory of coal refuse piles in PA (June 2019):
- Inventory is not static but growing
- 772 piles scattered throughout the coal fields
- 45 piles are currently burning
- Covers an aggregate area of 8,300 acres
- Contain at least 220 million tons of coal refuse
PA Coal Refuse Plants and Tons of Coal Refuse Removed

1. Scrubgrass Generating - 83 MW; 517,052 tons
2. Seward Generation - 521 MW; 2,103,272 tons
3. Ebensburg Power Company - 50 MW; 423,635 tons
4. Calver Power Project - 111 MW; 667,410 tons
5. Cambria Cogen Company - 87 MW; 536,877 tons
6. Mt. Carmel Cogen - 43 MW; 577,962 tons
7. Rausch Creek Generation - 33 MW; 309,992 tons
8. Schuylkill Energy Resources - 80 MW; 1,529,810 tons
9. Gilberton Power Company - 80 MW; 723,885 tons
10. Wheelabrator Frackville Energy Company - 42 MW; 521,062 tons
11. Kimberly Clark Chester Plant - 67 MW; N/A
12. Northeastern Power Company - 52 MW; 256,878 tons [2016]
13. Northampton Generating Company - 112 MW; 193,183 tons
14. Panther Creek Energy - 80 MW; 159,995 tons
15. Piney Creek LP - 32 MW; N/A [2013]

*MW = Not capacity; Tons of coal refuse removed in 2018

Watersheds

Ohio
Genesee
Delaware
Potomac
Erie
Susquehanna

Abandoned Mine Land Problem Areas
Closed or Announced Closure
Converting to Natural Gas
POLLUTION CAUSED BY COAL REFUSE

Stream adjacent to the Lucerne Mine, Indiana County, PA

Solomon’s Creek, outside Wilkes-Barre, PA
AMD IMPAIRED WATERWAYS

- Refuse Pile
- Waterways Impaired by Acid Mine Drainage
Coal Refuse Pile Fires

Coal refuse pile fire at the Loomis Culm Bank in Nanticoke, PA

2014 fire at Simpson Park, Lackawanna County required 1.6 million gallons of water daily to contain and was extinguished at a cost to the state of nearly $2.2 million
INDUSTRY ENVIRONMENTAL SCORECARD

- Removed at least 225 million tons of coal refuse
- Restored more than 1,200 miles of stream
- Reclaimed over 7,200 acres of land
“We’ve got fish in the water now. People weren’t fishing here before. This is a good news story.”

- Cambria County Commissioner Tom Cherinsky
ENVIRONMENTAL AND PUBLIC PARTNERS
Swoyersville Culm Bank Removal and Restoration Project

Project Partners

- Keystone Reclamation Fuel Management LLC (Panther Creek Power/Northampton Generation)
- Eastern PA Coalition for Abandoned Mine Reclamation (EPCAMR)
- Swoyersville Borough
- Pagnotti Enterprises Inc.
- Foundation for PA Watersheds
- Office of Surface Mining Reclamation and Enforcement
- PA Department of Environmental Protection
2. An Existential Crisis for the Coal Refuse Reclamation to Energy Industry

CHAPTER SUMMARY:

- Economic conditions for the industry have severely worsened due to market disruptions stemming in large part from renewable subsidies and to the abundant availability of natural gas generation from the Marcellus Shale formation.

- For large portions of the year, wholesale energy prices do not allow the industry to recover its cost of production for each unit of energy. These pricing realities have already led to seasonal idlings and plant closures, reducing the industry’s level of production and therefore its environmental and economic benefits to the Commonwealth.

- These economics are not sustainable over the long run, and are exacerbated by a significant drop in capacity revenue commencing as of June 2019. Without intervention, more plants will be forced to close, resulting in a permanent loss of their public benefits.
## PA Coal Refuse Plants by County

<table>
<thead>
<tr>
<th>County</th>
<th>Plant</th>
<th>Net Operating Capacity (MW)</th>
<th>Year First Unit in Service</th>
<th>Tons of Coal Refuse Burned in 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambria</td>
<td>Cambria Cogeneration (Closed 2019)</td>
<td>87</td>
<td>1991</td>
<td>536,977</td>
</tr>
<tr>
<td>Cambria</td>
<td>Colver Power Project</td>
<td>111</td>
<td>1995</td>
<td>657,410</td>
</tr>
<tr>
<td>Cambria</td>
<td>Ebensburg Power Company</td>
<td>50</td>
<td>1991</td>
<td>423,635</td>
</tr>
<tr>
<td>Carbon</td>
<td>Panther Creek Power</td>
<td>80</td>
<td>1992</td>
<td>159,995</td>
</tr>
<tr>
<td>Delaware</td>
<td>Kimberly Clark Chester Operations (Converted 2019)</td>
<td>67</td>
<td>1986</td>
<td>175,000 (est)</td>
</tr>
<tr>
<td>Indiana</td>
<td>Seward Generation</td>
<td>521</td>
<td>2004</td>
<td>2,103,272</td>
</tr>
<tr>
<td>Northampton</td>
<td>Northampton Generating Company</td>
<td>112</td>
<td>1995</td>
<td>193,183</td>
</tr>
<tr>
<td>Northumberland</td>
<td>Mount Carmel Cogeneration</td>
<td>43</td>
<td>1990</td>
<td>577,962</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>John B. Rich Memorial Power Station (Gilberton)</td>
<td>80</td>
<td>1988</td>
<td>723,885</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>Northeastern Power Cogeneration Facility (Closed 2018)</td>
<td>52</td>
<td>1989</td>
<td>256,878</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>St. Nicholas Cogeneration (SER)</td>
<td>80</td>
<td>1990</td>
<td>1,529,810</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>Westwood Generating Station</td>
<td>33</td>
<td>1987</td>
<td>369,593</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>Wheelabrator Frackville Energy Company (Closing 2020)</td>
<td>42</td>
<td>1988</td>
<td>521,062</td>
</tr>
<tr>
<td>Venango</td>
<td>Scrubgrass Generating</td>
<td>83</td>
<td>1993</td>
<td>517,092</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td><strong>1,193</strong>*</td>
<td></td>
<td><strong>8,745,754</strong></td>
</tr>
</tbody>
</table>

Source: ARIPPA, 2018 PA Coal Refuse Tax Credit

*Excluding closed and closing facilities
DEMOLITION OF THE PINEY CREEK POWER PLANT
CLARION COUNTY - JANUARY 2019
Coal Refuse Consumption Declining

Annual Coal Refuse Consumed by Pennsylvania Plants, 2010-2018

Coal Refuse Consumption by Plant - 2018 vs. Peak Production Year

Millions of Tons

Peak Year (since 2010)  2018

Seaward  Schuylkill Energy  Colver Power  Panther Creek  Northampton  Gilberton  Scrubgrass  Cambria CoGen  Mt. Carmel  Wheelabrator  MEPCO  Ebensburg  Westwood  Pinney Creek  Kimberly Clark
PJM Capacity Market Base Residual Auction Price ($Mw-Day)

- 2017-18: $120
- 2018-19: $165
- 2019-20: $100
- 2020-21: $77
- 2021-22: $140
REGULATORY CONCERNS: POTENTIAL IMPACT OF RGGI

Executive Order

Commonwealth of Pennsylvania
Governor’s Office

Subject:
Commonwealth Leadership in Addressing Climate Change through Electric Sector Emissions Reductions

Number: 2019-07

By Direction of: Tom Wolf, Governor

Date: October 3, 2019
RGGI would potentially increase the breakeven price for coal refuse facilities as much as $12 per MW.
CHAPTER SUMMARY:

- Industry activity generates positive externalities, meaning that plants can deliver a net positive societal value even if their activity is not profitable in a private market context.

- The removal of coal refuse piles and the reclamation of mining-affected lands has demonstrated benefits including water quality, public health and safety, and land value. The environmental and public benefits produced by the industry are estimated at an annual value of $37 million over a twenty-year horizon.

- Alternately, industry activity can be valued as an avoided cost to the Commonwealth. The avoided costs to the state of undertaking remediation itself are estimated at $93 to $267 million per year.
# Quantification of Environmental and Public Use Benefits Going Forward ($M)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Year 1</th>
<th>Year 10</th>
<th>Year 20</th>
<th>Total</th>
<th>20 Year Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Quality</td>
<td>$2.2</td>
<td>$21.8</td>
<td>$43.6</td>
<td>$457.9</td>
<td>$22.9</td>
</tr>
<tr>
<td>Cumulative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health and Safety</td>
<td>$0.7</td>
<td>$7.4</td>
<td>$14.9</td>
<td>$156.0</td>
<td>$8.0</td>
</tr>
<tr>
<td>Cumulative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Value</td>
<td>$6.2</td>
<td>$6.2</td>
<td>$6.2</td>
<td>$124.9</td>
<td>$6.2</td>
</tr>
<tr>
<td>One-Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ($M)</td>
<td>$9.1</td>
<td>$35.4</td>
<td>$64.7</td>
<td>$738.7</td>
<td>$36.9</td>
</tr>
</tbody>
</table>

Source: ESI Calculations

Environmental Clean-up Benefit: $36.9 million/year
## Avoided Cost Benefits to State & Federal Government

<table>
<thead>
<tr>
<th></th>
<th>Rosebud</th>
<th>Average Bidders</th>
<th>Modeled Annual Industry Activity</th>
<th>Avoided Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal (per ton)</td>
<td>$5.40</td>
<td>$7.40</td>
<td>8 million tons</td>
<td>$43 - $59 M</td>
</tr>
<tr>
<td>Disposal (per ton)</td>
<td>$5.60</td>
<td>$25.30</td>
<td>8 million tons</td>
<td>$45 - $202 M</td>
</tr>
<tr>
<td>Rehabilitation (per acre)</td>
<td>$20,000</td>
<td>$23,000</td>
<td>240 acres</td>
<td>$5 - $6 M</td>
</tr>
</tbody>
</table>

Annual avoided costs to the Commonwealth: $93 - $267 M
4. Economic Benefits under Threat

CHAPTER SUMMARY:

- Plant operations are a driver of economic opportunity and employment in rural communities throughout the state.
- Direct expenditures by the industry are estimated at $363 million annually, and industry employees earn an average salary of greater than $75,000.
- Including spillover effects, the annual economic impact of the industry is $615 million within Pennsylvania, supporting nearly 3,000 jobs and generating $18 million in state taxes and fees.
- This activity is concentrated in coal country, creating family-sustaining jobs and purchasing power in areas that have lost population and struggled to create economic opportunities.
$615 Million in Annual Economic Impact

- $363M Direct Expenditures
- $252M Indirect/Induced Impact
- $615M Total Economic Impact
- 2,960 FTE Jobs
- $194M Earnings Supported
- $18M State Taxes/Fees

Annual direct and spillover impacts within Pennsylvania
5. Saving the Industry: Options to Sustain the Public Benefits under Threat

CHAPTER SUMMARY:

- Industry activity is not viable under current market conditions, but nonetheless remains a valuable public resource as a means of environmental remediation. To sustain these public benefits, the economic and regulatory framework must recognize the positive externalities that the industry delivers.

- Options include raising the statutory cap on the existing state tax credit to $45 million so that funding is sufficient to achieve its purpose, and leveraging the state credit with a long-term federal tax credit program.

- Alternative regulatory approaches could also be used to financially recognize the positive externalities detailed throughout this report.
CONCLUSIONS

❖ The coal refuse to energy industry is historically the most effective and prolific actor in the remediation of coal refuse piles across Pennsylvania.

❖ The removal of coal refuse piles and the reclamation of mining-affected lands has demonstrated environmental and public benefits, including water quality, public health and safety, and land value.

❖ No one but the coal refuse industry can remove these abandoned coal waste piles and address these attendant environmental and safety hazards in a holistic, efficient, and permanent manner.

❖ Market and regulatory challenges have altered the economics of the industry, as wholesale energy prices are now regularly below the “breakeven” point required for coal refuse reclamation to energy plants to simply recover their costs.

❖ Pennsylvania joining RGGI would significantly increase the operating cost of coal refuse remediation to energy facilities resulting in the immediate closure of every plant and loss of the resulting economic and environmental benefits.

❖ Any regulations in Pennsylvania must exempt or otherwise take into account the positive environmental impacts of the coal refuse reclamation to energy facilities to protect these important environmental policy resources.

❖ The current economics of the industry are unsustainable, and without some intervention will lead to further plant closures and a permanent loss of their public environmental and economic benefits.
PA Coal Refuse Remediation Projects

BEFORE & AFTER
Cambria Cogen – Ebensburg, PA
Ernest Site – Indiana County

177 ACRES, 11 MILLION TONS OF COAL REFUSE
ADJACENT TO MCKEE RUN

OVER 10.5 MILLION TONS OF COAL REFUSE REMOVED SINCE MID-1990’S
A SUBSTANTIAL REDUCTION IN ACID, IRON, MANGANESE AND ALUMINUM TO MCKEE RUN IS OCCURRING.
Cambria Cogen – Ebensburg, PA
Lucerne Site – Indiana County

197 ACRES, 9 MILLION TONS OF COAL REFUSE

ADJACENT TO YELLOW CREEK, WHICH IS AN AMD IMPAIRED STREAM

OVER 5 MILLION TONS OF COAL REFUSE REMOVED SINCE 2012

SUBSTANTIAL REDUCTIONS IN ACID, IRON, ALUMINUM, AND MANGANESE EXPECTED TO YELLOW CREEK.
Colver Power Project – Colver, PA

3.5 MILLION TONS COAL REFUSE PILE FROM COAL MINE OPERATED FROM 1911-1978

COAL REFUSE PILE VIRTUALLY ELIMINATED OVER THE PAST 23 YEARS, ELK CREEK HAS ACHIEVED ALMOST PRE-MINING WATER QUALITY
Ebensburg Power – Ebensburg, PA
Revloc Site – Cambria County

56 ACRES
3.2 MILLION TONS OF COAL REFUSE

RECLAMATION PROJECT COMPLETED IN 2011
6 MILES OF BLACKLICK CREEK RETURNED TO QUALITY TO SUPPORT AQUATIC LIFE, INCLUDING TROUT
Northampton Generating – Northampton, PA
Loomis Bank Site – Luzerne County

OVER A MILLION TONS OF CULM MATERIAL DURING 11 YEAR PROCESS TO RECLAIM SITE

RECEIVED THE “EXCELLENCE IN SURFACE COAL MINING AND RECLAMATION” NATIONAL AWARD
Northampton Generating – Northampton, PA
Loomis Bank Mine Fire

BEFORE

AFTER
Panther Creek Energy – Nesquehoning, PA

Bank A Site

COAL REFUSE PILE WAS LEFT OVER FROM A 1940’S PP&L COAL PLANT

TODAY BANK A REMAINS ABLE TO SUPPORT WILDLIFE, NO LONGER POLLUTES THE STREAMS, AND IS A VIABLE LOCATION FOR LOCAL BUSINESSES
Seward Generation – New Florence, PA
Beaverdale Site – Cambria County

15.8 ACRES, SITUATED DIRECTLY ON AN UNNAMED TRIBUTARY TO THE CONEAMAUGH RIVER

250,000 TONS OF COAL REFUSE WAS REMOVED, RECEIVED A RECLAMATION AWARD FROM THE PENNSYLVANIA COAL ASSOCIATION IN 2016
Seward Generation – New Florence, PA
Seanor Site – Westmoreland

SITUATED DIRECTLY ON AN UNNAMED TRIBUTARY TO GETTY RUN AND LOYALHANNA CREEK

PROJECT RECEIVED THE GOVERNOR’S EXCELLENCE AWARD IN 2014
Schuylkill Energy Resources – Shenandoah, PA

“STRIPPING PITS” AT THE SER PLANT

RECLAIMED WITH ASH FROM THE SER PLANT
Gilberton Power Company – Frackville, PA

BEFORE

AFTER

PLANT HAS BEEN OPERATING FOR 27 YEARS
Scrubgrass Generating – Kennerdell, PA
Armstrong County Site

BEFORE

AFTER
Scrubgrass Generating – Kennerdell, PA Clearfield County Site

BEFORE

AFTER
Questions & Contact Info

Jaret Gibbons, Executive Director
jgibbons@arippa.org
717-763-7635

www.arippa.org