

Understanding the Skill Gap and Employment Needs of Displaced Coal- Fired Power Plant Workers

Voinovich School of Leadership and Public Affairs

June 18, 2018



VOINOVICH SCHOOL OF LEADERSHIP AND PUBLIC AFFAIRS

Webinar Overview

- Project Overview and Project Team
- Impact of DP&L Closures
 - Economic
 - Fiscal
 - Workforce
- Final Observations
- Q&A

Project Overview

- Ohio University's Voinovich School is assessing the skills of displaced coal economy workers and matching those skills to emerging occupations in the Appalachian region
- Webinar #2: Closing the Skills Gap for Coal Mine Workers
 - *June 28, 2018: 1:00 PM to 2:00 PM U.S. Eastern Time*
- Supported by generous investment from U.S. EDA

Project Team



G. Jason Jolley, Ph.D.
Associate Professor of Rural Economic Development



Gilbert Michaud, Ph.D.
Assistant Professor of Practice



Christelle Khalaf, Ph.D.
Economic Development Specialist

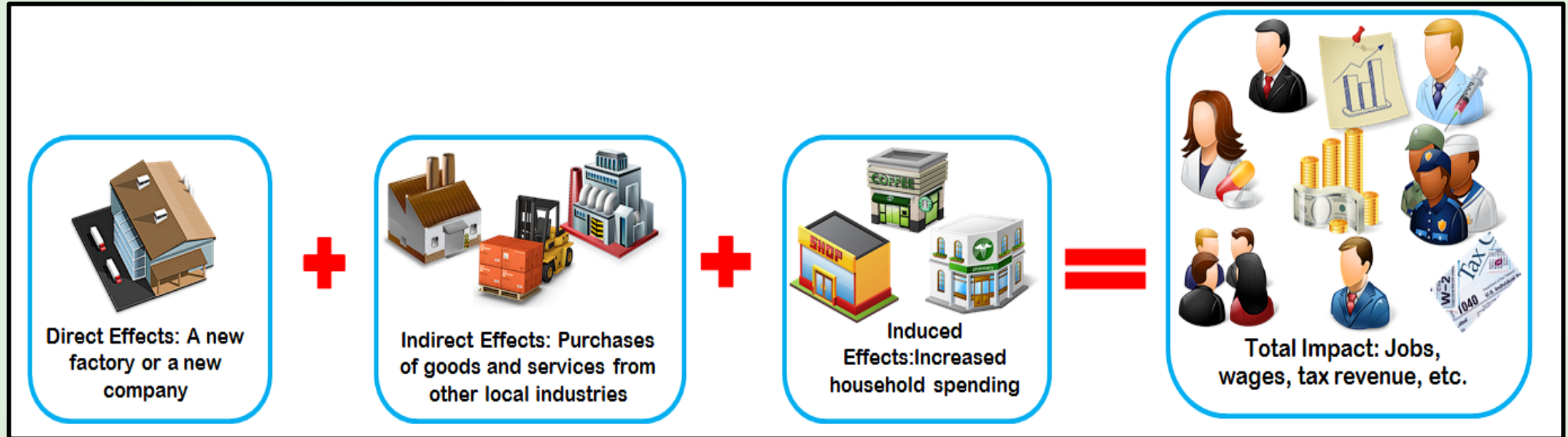
Introduction

- Assessing the impacts of the power plant closures in Adams County, Ohio
 - Killen Station & Training Center (Manchester, Ohio)
 - Stuart Station (Aberdeen, Ohio)
- What are the economic, fiscal, and workforce implications?

Economic Impact Analysis Methods

- IMPLAN code #42: Electric Power Generation – Fossil Fuel
- Conducted economic impact analysis using IMPLAN, v3.1
- Study area = Adams County, Brown County, and Scioto County in Ohio, and Mason County in Kentucky

Understanding Economic Impact Analysis



Source: IMPLAN Group LLC. (2015). *Glossary*. Retrieved from http://www.implan.com/index.php?option=com_glossary&view=glossary&glossid=13&Itemid=1866

Summary of Impacts

WARN Report

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	-370	-\$56,008,657	-\$269,519,825	-\$608,363,072
Indirect Effect	-423	-\$15,326,387	-\$23,918,932	-\$52,335,275
Induced Effect	-337	-\$10,876,287	-\$20,941,699	-\$37,446,881
Total Effect	-1,131	-\$82,211,331	-\$314,380,456	-\$698,145,227
Multiplier	3.06	1.47	1.17	1.15

For every job lost at the DP&L plants, an additional 2 jobs will be lost in the regional economy

Media Reports

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	-690	-\$104,448,579	-\$502,618,064	-\$1,134,514,944
Indirect Effect	-789	-\$28,581,642	-\$44,605,576	-\$97,598,217
Induced Effect	-629	-\$20,282,806	-\$39,053,439	-\$69,833,373
Total Effect	-2,108	-\$153,313,027	-\$586,277,080	-\$1,301,946,534
Multiplier	3.06	1.47	1.17	1.15

Top Industries Affected by Job Loss

- Maintenance and repair construction of nonresidential structures
- Full-service restaurants
- Limited-service restaurants
- Hospitals
- Real estate
- Legal services

Fiscal Impacts

- Utilities in Ohio pay tangible personal property (TPP) tax
- 2017 estimates suggest Adams County and other local governments/schools could lose \$8.5 million in tax revenue

Fiscal Impacts

- County General Fund: \$768,952 loss in revenue
 - 32% decrease in tax revenue
 - 10% decrease in total estimated revenue
- Ambulance/EMS: \$394,329 loss in revenue
 - 34% decrease in tax revenue
 - 24% decrease in total estimated revenue
- Manchester Local School District: \$5.6 million loss in revenue

Workforce Impacts

- Coal-fired power plant occupations
- Skill identification
- Mapping to emerging occupations

Coal-Fired Power Plant Occupations

Occupation	% Occupation	Employment Projections 2014-2024	Median Hourly wage	Education
Power plant operators	43.6%	-15.3%	\$33.4	High school diploma / eq.
Industrial machinery mechanics	0.9%	18.0%	\$22.6	High school diploma / eq.
Control and valve installers/repairers	4.3%	-7.6%	\$31.2	High school diploma / eq.
Maintenance and repair workers	0.1%	4.7%	\$18.0	High school diploma / eq.
Computer systems analysts	0.1%	20.4%	\$39.7	Bachelor's degree
Mechanical drafters	0.3%	-7.8%	\$20.2	Associate's degree
Purchasing agents	0.2%	-1.7%	\$29.4	Bachelor's degree
Laborers & freight/stock movers	0.0%	5.7%	\$11.7	No formal ed. credential
Bookkeeping/accounting/auditing clerks	0.0%	-8.9%	\$17.2	Some college, no degree
Machinists	0.1%	10.4%	\$19.1	High school diploma / eq.
Inspectors/testers/sorters/samplers	0.0%	-1.0%	\$17.4	High school diploma / eq.

O*NET Data

- Create Occupational Transition maps using 110 variables describing 3 types of skills and the corresponding job zone
 - Knowledge: Obtained through formal education (e.g., biology)
 - Work activities: Job experience (e.g., assisting and caring for others)
 - Capacities: Basic and cross-functional skills (e.g., social perceptiveness)
 - Job zone: Grouping of occupations based on required education, experience, and on the job training
- Each skill (i.e., knowledge, work activities, and capacities) is associated with a value that represents the level of the skill needed in an occupation (0-7)

O*NET Level Explanation

Job Zone Level	Explanation
1	<ul style="list-style-type: none"> -May require HS or GED -Little or no previous experience -On the job training (few days to a few months) (e.g., Dishwashers)
2	<ul style="list-style-type: none"> -Requires HS -Some experience -On the job training (few months to a year) (e.g., Security Guards)
3	<ul style="list-style-type: none"> -Vocational school or associate degree -Experience required -On the job training (1-2 years) (e.g., Electricians)
4	<ul style="list-style-type: none"> -Bachelor's degree -Considerable experience -On the job training (several years) (e.g., Cost Estimators)
5	<ul style="list-style-type: none"> -Graduate school -Extensive experience -On the job training (not usually needed) (e.g., Surgeons)

Top Skills for Power Plant Operators

Skill type	Skill	Level	Explanation
Work activities	Controlling Machines and Processes	5	Minimum of 2-4 years training or experience
Work activities	Monitor Processes, Materials, or Surroundings	5	Minimum of 2-4 years training or experience
Work activities	Inspecting Equipment, Structures, or Material	5	Minimum of 2-4 years training or experience
Work activities	Handling and Moving Objects	5	Minimum of 2-4 years training or experience
Work activities	Updating and Using Relevant Knowledge	5	Minimum of 2-4 years training or experience
Work activities	Performing General Physical Activities	4	At least 1 year of training or experience
Work activities	Communicating with Supervisors, Peers, or Subordinates	4	At least 1 year of training or experience
Work activities	Identifying Objects, Actions, and Events	4	At least 1 year of training or experience
Work activities	Processing Information	4	At least 1 year of training or experience
Work activities	Evaluating Information to Determine Compliance with Standards	4	At least 1 year of training or experience
	Job Zone	2	Requires HS Some experience On the job training (few months to a year)

Occupation Level Comparison

Skill Type	Skill	Power Plant Operators Level	Registered Nurses Level	Gap
	Top 5 skills for power plant operators			
Work activities	Controlling Machines and Processes	5	3	-2
Work activities	Monitor Processes, Materials, or Surroundings	5	6	1
Work activities	Inspecting Equipment, Structures, or Material	5	3	-2
Work activities	Handling and Moving Objects	5	4	-1
Work activities	Updating and Using Relevant Knowledge	5	6	1
	Top 5 skills for registered nurses			
Work activities	Assisting and Caring for Others	3	6	3
Knowledge	Psychology	1	6	5
Work activities	Monitor Processes, Materials, or Surroundings	5	6	1
Work activities	Updating and Using Relevant Knowledge	5	6	1
Work activities	Identifying Objects, Actions, and Events	4	5	1
	Job zone	2	3	1

Regional Economic Drivers

REDI Cincinnati	APEG	OVRDC
Advanced Manufacturing	Polymers & Plastics	Agriculture
Biohealth	Energy Production	Healthcare
Food and Flavoring	Food	Wood
Information Technology	Transportation & Aerospace	Manufacturing
Shared Services	Forestry & Wood Products	Freight & Transportation
	Metals	
	Logistics	
	Consumer Products	

Power Plant Occupations into Top Growing Occupations

		Purchasing agents	Computer systems analysts	Bookkeeping, Accounting, and Auditing clerks	Mechanical drafters	Control and valve installers and repairers, except mechanical door	Industrial machinery mechanics	Maintenance and repair workers	Machinists	Power plant operators	Inspectors, testers, sorters, samplers, and weighers	Laborers and freight, stock, and material movers
		\$29.36	\$39.67	\$17.21	\$23.67	\$31.23	\$22.61	\$18.04	\$19.07	\$33.41	\$17.39	\$11.72
Home health aides	\$9.83	-19.53	-29.84	-7.38	-13.84	-21.40	-12.78	-8.21	-9.24	-23.58	-7.56	-1.89
Registered nurses	\$29.46	0.10	-10.21	12.25	5.79	-1.77	6.85	11.42	10.39	-3.95	12.07	17.74
Nursing assistants	\$11.61	-17.75	-28.06	-5.60	-12.06	-19.62	-11.00	-6.43	-7.46	-21.80	-5.78	-0.11
Licensed nurses	\$19.59	-9.77	-20.08	2.38	-4.08	-11.64	-3.02	1.55	0.52	-13.82	2.20	7.87
Medical secretaries	\$14.52	-14.84	-25.15	-2.69	-9.15	-16.71	-8.09	-3.52	-4.55	-18.89	-2.87	2.80
Medical assistants	\$13.75	-15.61	-25.92	-3.46	-9.92	-17.48	-8.86	-4.29	-5.32	-19.66	-3.64	2.03

Power Plant Occupations into Computer & Electronics

	Purchasing agents	Computer systems analysts	Bookkeeping, Accounting, and Auditing clerks	Mechanical drafters	Control and valve installers and repairers	Industrial machinery mechanics	Maintenance and repair workers	Machinists	Power plant operators	Inspectors, testers, sorters, samplers, and weighers	Laborers and freight, stock, and material movers	
	\$29.36	\$39.67	\$17.21	\$23.67	\$31.23	\$22.61	\$18.04	\$19.07	\$33.41	\$17.39	\$11.72	
Software developers	\$40.83	\$11.47	\$1.16	\$23.62	\$17.16	\$9.60	\$18.22	\$22.79	\$21.76	\$7.42	\$23.44	\$29.11
Medical and health services managers	\$42.04	\$12.68	\$2.37	\$24.83	\$18.37	\$10.81	\$19.43	\$24.00	\$22.97	\$8.63	\$24.65	\$30.32
Administrative support workers	\$23.76	-\$5.60	-\$15.91	\$6.55	\$0.09	-\$7.47	\$1.15	\$5.72	\$4.69	-\$9.65	\$6.37	\$12.04
General and operations managers	\$43.25	\$13.89	\$3.58	\$26.04	\$19.58	\$12.02	\$20.64	\$25.21	\$24.18	\$9.84	\$25.86	\$31.53
Market research analysts & marketing	\$28.61	-\$0.75	-\$11.06	\$11.40	\$4.94	-\$2.62	\$6.00	\$10.57	\$9.54	-\$4.80	\$11.22	\$16.89
Accountants and auditors	\$30.46	\$1.10	-\$9.21	\$13.25	\$6.79	-\$0.77	\$7.85	\$12.42	\$11.39	-\$2.95	\$13.07	\$18.74

Power Plant Occupations into Mechanical

		Purchasing agents	Computer systems analysts	Bookkeeping, Accounting, and Auditing clerks	Mechanical drafters	Control and valve installers and repairers	Industrial machinery mechanics	Maintenance and repair workers	Machinists	Power plant operators	Inspectors, testers, sorters, samplers, and weighers	Laborers and freight, stock, and material movers
		\$29.36	\$39.67	\$17.21	\$23.67	\$31.23	\$22.61	\$18.04	\$19.07	\$33.41	\$17.39	\$11.72
Construction laborers	\$17.66	-\$11.70	-\$22.01	\$0.45	-\$6.01	-\$13.57	-\$4.95	-\$0.38	-\$1.41	-\$15.75	\$0.27	\$5.94
Electricians	\$23.88	-\$5.48	-\$15.79	\$6.67	\$0.21	-\$7.35	\$1.27	\$5.84	\$4.81	-\$9.53	\$6.49	\$12.16
Plumbers, pipefitters, & steamfitters	\$24.90	-\$4.46	-\$14.77	\$7.69	\$1.23	-\$6.33	\$2.29	\$6.86	\$5.83	-\$8.51	\$7.51	\$13.18
HVAC mechanics and installers	\$21.23	-\$8.13	-\$18.44	\$4.02	-\$2.44	-\$10.00	-\$1.38	\$3.19	\$2.16	-\$12.18	\$3.84	\$9.51
Bus & truck mechanics	\$21.12	-\$8.24	-\$18.55	\$3.91	-\$2.55	-\$10.11	-\$1.49	\$3.08	\$2.05	-\$12.29	\$3.73	\$9.40
Carpenters	\$21.05	-\$8.31	-\$18.62	\$3.84	-\$2.62	-\$10.18	-\$1.56	\$3.01	\$1.98	-\$12.36	\$3.66	\$9.33
Machine tool operators	\$17.71	-\$11.65	-\$21.96	\$0.50	-\$5.96	-\$13.52	-\$4.90	-\$0.33	-\$1.36	-\$15.70	\$0.32	\$5.99

Easy Transition

Type of skill	Skills	Control and valve installers and repairers, except mechanical door	Bus and truck mechanics and diesel engine specialists	Gap
Knowledge	Transportation	2	4	2
Work activities	Monitoring and Controlling Resources	2	3	1
Capacities	Repairing	3	4	1
Knowledge	Mechanical	5	6	1
Capacities	Troubleshooting	3	4	1
Capacities	Instructing	2	3	1
Capacities	Learning Strategies	2	3	1
	Job Zone	3	3	
	Median hourly wage	\$31.23	\$21.12	-\$10.11

More Challenging Transition

Type of skill	Skills	Control and valve installers and repairers, except mechanical door	Software developers, applications	Gap
Capacities	Operations Analysis	1	4	3
Knowledge	Computers and Electronics	4	7	3
Capacities	Technology Design	1	4	3
Capacities	Systems Evaluation	2	5	3
Capacities	Mathematics (on the job)	2	4	2
Work activities	Staffing Organizational Units	1	3	2
Capacities	Systems Analysis	2	4	2
Work activities	Provide Consultation and Advice to Others	3	5	2
Work activities	Interacting With Computers	4	6	2
Capacities	Science	1	3	2
	Job Zone	3	4	1
	Median hourly wage	\$31.23	\$40.83	\$9.60

Final Observations

- For every DP&L job lost, another 2 jobs will be lost in regional economy
- Tax base loss will have detrimental impact on local government budgets, especially the local school system
 - Even if Adams County can replace these jobs, it will be extremely difficult to replace the tax base
 - State and/or Federal government assistance will be required
- Transition to new employment opportunities will require retraining
- Most emerging occupations pay less than the lost DP&L jobs

Understanding the Skill Gap and Employment Needs of Displaced Coal- Fired Power Plant Workers

Voinovich School of Leadership and Public Affairs

June 18, 2018



VOINOVICH SCHOOL OF LEADERSHIP AND PUBLIC AFFAIRS