

# **Skill Gap and Employment Needs of Displaced Coal-Fired Power Plant Workers**

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# 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)

# Occupation Level Comparison

Skill Type	Skill	Power Plant Operators Level	Registered Nurses Level	Gap
	<b>Top 5 skills for power plant operators</b>			
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
	<b>Top 5 skills for registered nurses</b>			
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
	<b>Job zone</b>	<b>2</b>	<b>3</b>	<b>1</b>

# 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	-1.39
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 White Collar

	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	\$25.67	\$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	\$25.44	\$29.11
Medical and health services managers	\$42.04	\$12.68	\$2.37	\$24.83	\$18.37	\$10.81	\$19.43	\$24.09	\$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	\$12.74

# Power Plant Occupations into Blue Collar

		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
	<b>Job Zone</b>	<b>3</b>	<b>3</b>	
	<b>Median hourly wage</b>	<b>\$31.23</b>	<b>\$21.12</b>	<b>-\$10.11</b>

# 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
	<b>Job Zone</b>	<b>3</b>	<b>4</b>	<b>1</b>
	<b>Median hourly wage</b>	<b>\$31.23</b>	<b>\$40.83</b>	<b>\$9.60</b>

# Conclusion

- Most emerging occupations with easy transitions pay less than lost coal-fired power plant jobs
- Transition to new employment opportunities will require retraining and/or educational advancement
- Analysis based on closures in Ohio, but findings are probably generalizable to other Midwest states