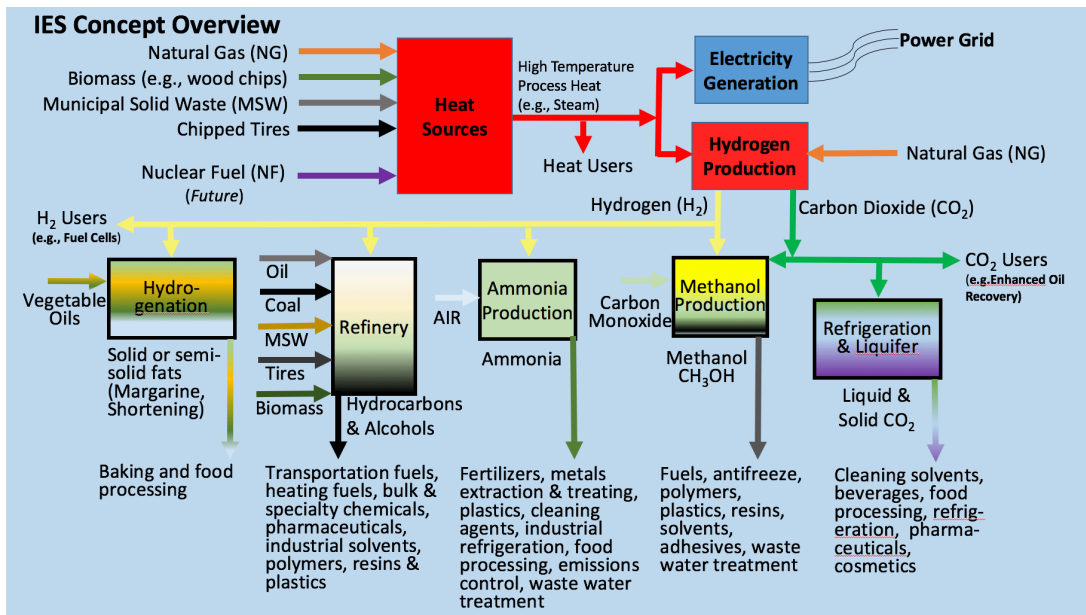




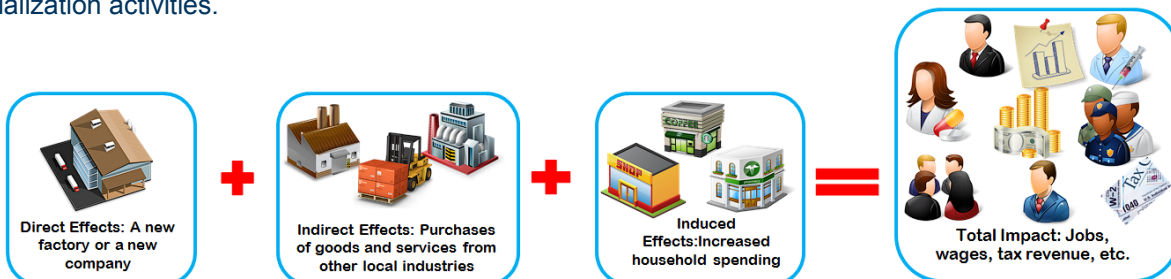
## WORKFORCE ANALYSIS FOR PROPOSED INTEGRATED ENERGY SYSTEMS (IES) COMPLEX AT PORTS

Ohio University's Voinovich School of Leadership and Public Affairs PORTSfuture project is supporting the Southern Ohio Diversification Initiative's (SODI) efforts to pursue the development of an Integrated Energy System (IES) complex at the US Department of Energy PORTS reservation in Ohio. An IES closed-loop, advanced manufacturing complex will strive to fully leverage the unique infrastructure and other assets of the site for regional economic growth by attracting and expanding industries in the region, leveraging coal and shale resources in additive manufacturing applications, creating jobs, and growing the southern Ohio economy.

Key aspects of an IES are collocating, combining, interconnecting and/or networking of energy producers and energy users and utilizing waste outputs from one industrial process as an input or feedstock into a different industrial process. In an IES, value is the driver, and desired value propositions such as high efficiency, high reliability, low emissions, low/acceptable production costs, and creation of more permanent, non-exportable higher-quality jobs can be achieved. An IES embodies a synergistic integration of an "all-of-the-above" energy strategy.



Activities to advance the IES complex will further SODI's mission to diversify the regional economy by imagining possibilities beyond the immediate and existing economic realities in southern Ohio and will identify how to best prepare the PORTS site to attract 21st century industries with enduring missions. Site reindustrialization will spur regional cluster and supply chain-related growth throughout the impacted counties and multi-state region, further advancing economic healing by growing both large and small business and employment opportunities in southern Ohio and beyond. Preparing the region's workforce for IES related jobs will be integral to the success of these reindustrialization activities.



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## BIOMASS JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	Biomass Construction Jobs
Construction and Extraction Occupations	176,140	54.2	542
Installation, Maintenance, and Repair Occupations	208,220	15.9	159
Office and Administrative Support Occupations	813,080	6.9	69
Management Occupations	243,270	5.5	55
Transportation and Material Moving Occupations	393,320	4.4	44
Production Occupations	501,570	3.8	38
Business and Financial Operations Occupations	253,180	2.1	21
Architecture and Engineering Occupations	93,140	1.2	12

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	Biomass Operation Jobs
Production Occupations	501,570	41.5	32
Installation, Maintenance, and Repair Occupations	208,220	10.2	8
Architecture and Engineering Occupations	93,140	8	6
Life, Physical, and Social Science Occupations	35,450	8	6
Office and Administrative Support Occupations	813,080	7.4	6
Transportation and Material Moving Occupations	393,320	7.2	5
Management Occupations	243,270	6.9	5
Business and Financial Operations Occupations	253,180	4.3	3
Sales and Related Occupations	514,300	1.7	1

## FERTILIZER JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	Fertilizer Construction Jobs
Construction and Extraction Occupations	176,140	58.9	707
Management Occupations	243,270	12.5	150
Office and Administrative Support Occupations	813,080	9.8	118
Business and Financial Operations Occupations	253,180	5.4	65
Architecture and Engineering Occupations	93,140	3.4	41
Installation, Maintenance, and Repair Occupations	208,220	2.9	35
Transportation and Material Moving Occupations	393,320	2	24
Production Occupations	501,570	1.6	19

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	Fertilizer Operation Jobs
Production Occupations	501,570	40.2	60
Transportation and Material Moving Occupations	393,320	11.4	17
Office and Administrative Support Occupations	813,080	9.2	14
Installation, Maintenance, and Repair Occupations	208,220	8.8	13
Management Occupations	243,270	7.1	11
Life, Physical, and Social Science Occupations	35,450	5.4	8
Sales and Related Occupations	514,300	3.9	6
Architecture and Engineering Occupations	93,140	3.7	6
Business and Financial Operations Occupations	253,180	2.8	4

*FOOTNOTE: Underlying industry, occupation, and employment data are derived using national expected averages from the Bureau of Labor Statistics' May 2015 Occupational Employment Statistics (OES) survey and 2014-24 Industry-occupation matrix data, by industry tables. Occupations that constitute less than 0.1 percent of the industry, have fewer than 50 jobs, are confidential, or include poor quality data are not displayed. Post analysis occupations that constitutes less than 1 percent of any particular project and account for less than 1 job are omitted. Jobs numbers are then rounded. These compounding suppression effects cause the percentages to add to less than 100 and the sum of occupations to be less than the total number of jobs.*

## CCGT OPERATION JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	CCGT Construction Jobs
Construction and Extraction Occupations	176,140	36.6	183
Installation, Maintenance, and Repair Occupations	208,220	35.8	31
Office and Administrative Support Occupations	813,080	7.2	36
Management Occupations	243,270	6.1	10
Architecture and Engineering Occupations	93,140	2.2	11
Transportation and Material Moving Occupations	393,320	2.1	179
Business And Financial Operations Occupations	253,180	2	11
Production Occupations	501,570	1	5

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	CCGT Operation Jobs
Installation, Maintenance, and Repair Occupations	208,220	28.8	7
Office and Administrative Support Occupations	813,080	16	4
Production Occupations	501,570	14.5	4
Architecture and Engineering Occupations	93,140	10.7	3
Business and Financial Operations Occupations	253,180	6.9	2
Management Occupations	243,270	6.5	2

## OIL JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	Oil Construction Jobs
Construction and Extraction Occupations	176,140	54.2	5420
Installation, Maintenance, and Repair Occupations	208,220	15.9	1590
Office and Administrative Support Occupations	813,080	6.9	690
Management Occupations	243,270	5.5	550
Transportation and Material Moving Occupations	393,320	4.4	440
Production Occupations	501,570	3.8	380
Business and Financial Operations Occupations	253,180	2.1	210
Architecture and Engineering Occupations	93,140	1.2	120

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	Oil Operation Jobs
Production Occupations	501,570	42.2	675
Architecture and Engineering Occupations	93,140	10.1	162
Installation, Maintenance, and Repair Occupations	208,220	8.2	131
Office and Administrative Support Occupations	813,080	6.9	110
Transportation and Material Moving Occupations	393,320	6.5	104
Construction and Extraction Occupations	176,140	6.3	101
Management Occupations	243,270	5.6	90
Business and Financial Operations Occupations	253,180	4.6	74
Life, Physical, and Social Science Occupations	35,450	3.7	59
Sales and Related Occupations	514,300	1.7	27
Computer and Mathematical Occupations	136,170	1.2	19
Healthcare Practitioners and Technical Occupations	353,160	0.5	8
Protective Service Occupations	113,800	0.2	3

*FOOTNOTE: Underlying industry, occupation, and employment data are derived using national expected averages from the Bureau of Labor Statistics' May 2015 Occupational Employment Statistics (OES) survey and 2014-24 Industry-occupation matrix data, by industry tables. Occupations that constitute less than 0.1 percent of the industry, have fewer than 50 jobs, are confidential, or include poor quality data are not displayed. Post analysis occupations that constitutes less than 1 percent of any particular project and account for less than 1 job are omitted. Jobs numbers are then rounded. These compounding suppression effects cause the percentages to add to less than 100 and the sum of occupations to be less than the total number of jobs.*

## COAL JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	Coal Construction Jobs
Construction and Extraction Occupations	176,140	54.2	542
Installation, Maintenance, and Repair Occupations	208,220	15.9	159
Office and Administrative Support Occupations	813,080	6.9	69
Management Occupations	243,270	5.5	55
Transportation and Material Moving Occupations	393,320	4.4	44
Production Occupations	501,570	3.8	38
Business and Financial Operations Occupations	253,180	2.1	21
Architecture and Engineering Occupations	93,140	1.2	12

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	Coal Operation Jobs
Production Occupations	501,570	42.2	53
Architecture and Engineering Occupations	93,140	10.1	13
Installation, Maintenance, and Repair Occupations	208,220	8.2	10
Office and Administrative Support Occupations	813,080	6.9	9
Transportation and Material Moving Occupations	393,320	6.5	8
Construction and Extraction Occupations	176,140	6.3	8
Management Occupations	243,270	5.6	7
Business and Financial Operations Occupations	253,180	4.6	6
Life, Physical, and Social Science Occupations	35,450	3.7	5
Sales and Related Occupations	514,300	1.7	2

## GAS JOBS

### CONSTRUCTION

Occupation	Total Ohio Workforce	Percentage of Project	Gas Construction Jobs
Construction and Extraction Occupations	176,140	54.2	271
Installation, Maintenance, and Repair Occupations	208,220	15.9	80
Office and Administrative Support Occupations	813,080	6.9	35
Management Occupations	243,270	5.5	28
Transportation and Material Moving Occupations	393,320	4.4	22
Production Occupations	501,570	3.8	19
Business and Financial Operations Occupations	253,180	2.1	11
Architecture and Engineering Occupations	93,140	1.2	6

### OPERATION

Occupation	Total Ohio Workforce	Percentage of Project	Gas Operation Jobs
Production Occupations	501,570	41.5	12
Installation, Maintenance, and Repair Occupations	208,220	10.2	3
Architecture and Engineering Occupations	93,140	8	2
Life, Physical, and Social Science Occupations	35,450	8	2
Office and Administrative Support Occupations	813,080	7.4	2
Transportation and Material Moving Occupations	393,320	7.2	2
Management Occupations	243,270	6.9	2
Business and Financial Operations Occupations	253,180	4.3	1

FOOTNOTE: Underlying industry, occupation, and employment data are derived using national expected averages from the Bureau of Labor Statistics' May 2015 Occupational Employment Statistics (OES) survey and 2014-24 Industry-occupation matrix data, by industry tables. Occupations that constitute less than 0.1 percent of the industry, have fewer than 50 jobs, are confidential, or include poor quality data are not displayed. Post analysis occupations that constitutes less than 1 percent of any particular project and account for less than 1 job are omitted. Jobs numbers are then rounded. These compounding suppression effects cause the percentages to add to less than 100 and the sum of occupations to be less than the total number of jobs.