



Missouri Target Industry Brief

ENERGY SOLUTIONS

Energy Solutions Industry

The **Energy Solutions** Target Industry Group includes energy technologies which provide long-term, low-impact, high-value energy solutions for the State of Missouri's current and future residents and businesses. Demand for electricity is expected to grow 30 percent by 2030 so developing diverse alternate energy technologies is important for Missouri's future.

Missouri is home to an Energy Solutions Industry that employs 117,817 workers. The industries employing the most in the Energy Solutions Industry Group is *Architectural and Engineering Services* employing 21,597 with *Management and Technical Consulting Services* following with an employment of 12,440.

Location quotient (LQ) compares the regional share of an industry to the national share. An LQ over 1 indicates sectors of employment concentration larger than the nation. Missouri has particularly high employment concentrations in *HVAC/Commercial Refrigeration Equipment Manufacturing* with a LQ of 3.45 and *Agricultural Chemical Manufacturing* with a LQ of 2.39.

2014 Employment and Establishment Data for the Energy Solutions Target Industry Group

Total Private Sector Industries		175,198	2,250,914	\$44,698	
3112	Grain and Oilseed Milling	38	2,247	\$52,260	1.95
3251	Basic Chemical Manufacturing	60	3,270	\$68,895	1.16
3252	Resin, Rubber, and Artificial Fibers Manufacturing	17	741	\$62,241	0.41
3253	Agricultural Chemical Manufacturing	51	1,716	\$71,838	2.39
3261	Plastics Product Manufacturing	223	11,852	\$45,774	1.12
3272	Glass and Glass Product Manufacturing	20	1,109	\$52,773	0.69
3315	Foundries	42	2,958	\$47,952	1.20
3323	Architectural and Structural Metals Manufacturing	251	7,433	\$45,585	1.06
3329	Other Fabricated Metal Product Manufacturing	135	7,681	\$53,997	1.42
3332	Industrial Machinery Manufacturing	57	1,191	\$55,684	0.56
3334	HVAC and Commercial Refrigeration Equipment	56	8,653	\$44,747	3.45
3336	Turbine and Power Transmission Equipment Mfg.	25	2,771	\$48,557	1.43
3344	Semiconductor and Electronic Component Mfg.	49	5,789	\$79,048	0.80
3345	Electronic Instrument Manufacturing	60	3,077	\$60,594	0.40
3353	Electrical Equipment Manufacturing	65	4,509	\$58,232	1.61
3359	Other Electrical Equipment and Component Mfg.	55	5,131	\$48,458	2.07
4247	Petroleum Merchant Wholesalers	298	1,923	\$60,393	1.00
5413	Architectural and Engineering Services	2,025	21,597	\$80,746	0.81
5416	Management and Technical Consulting Services	2,697	12,440	\$70,931	0.52
5417	Scientific Research and Development Services	357	7,184	\$85,829	0.58
8112	Electronic Equipment Repair and Maintenance	343	1,528	\$53,732	0.77
8113	Commercial Machinery Repair and Maintenance	599	3,017	\$46,963	0.77
Total Energy Solutions Industries		7,379	117,817	\$53,276	0.90

Source: 2014 Quarterly Census of Employment and Wages, Bureau of Labor Statistics

Energy Solutions Employment Trends

Energy Solutions Five-Year Employment Trends

The employment trend for the **Energy Solutions Target Industry Group** in from 2010 to 2014 shows an increase of 6,046 total jobs. 13 industries had employment growth during the period.

Industries with the largest employment growth during the five-year period were *Management and Technical Consulting Services* with an increase of 2,873 jobs, *Semiconductor and Electronic Component Manufacturing* had an increase of 2,571 jobs, and *Architectural and Engineering Services* adding 1,557 jobs.

Industries with the largest employment loss were *Scientific Research and Development Services* with a loss of 3,109 jobs, *Other Fabricated Metal Product Manufacturing* with a loss of 1,941 jobs, and *Industrial Machinery Manufacturing* with a loss of 216 jobs.

2010 - 2014 Employment Data - Energy Solutions Target Industry Group

3112	Grain and Oilseed Milling	2,247	2,240	2,564	2,135	2,160	87
3251	Basic Chemical Manufacturing	3,270	2,959	3,149	3,164	3,095	175
3252	Resin, Rubber, and Artificial Fibers Manufacturing	741	699	641	915	772	-31
3253	Agricultural Chemical Manufacturing	1,716	1,708	1,693	1,676	1,649	67
3261	Plastics Product Manufacturing	11,852	11,646	11,496	11,391	11,758	94
3272	Glass and Glass Product Manufacturing	1,109	1,115	920	879	880	229
3315	Foundries	2,958	2,858	2,681	2,491	2,154	804
3323	Architectural and Structural Metals Manufacturing	7,433	7,301	6,656	6,484	6,541	892
3329	Other Fabricated Metal Product Manufacturing	7,681	10,230	9,846	9,873	9,622	-1,941
3332	Industrial Machinery Manufacturing	1,191	1,697	1,489	1,382	1,407	-216
3334	HVAC and Commercial Refrigeration Equipment	8,653	8,521	9,546	9,839	8,439	214
3336	Turbine and Power Transmission Equipment Mfg.	2,771	2,843	2,940	2,963	2,819	48
3344	Semiconductor and Electronic Component Mfg.	5,789	3,347	3,365	3,285	3,218	2,571
3345	Electronic Instrument Manufacturing	3,077	3,103	1,942	1,250	1,541	1,536
3353	Electrical Equipment Manufacturing	4,509	4,638	4,660	4,740	4,195	314
3359	Other Electrical Equipment and Component Mfg.	5,131	5,387	5,557	5,563	5,219	-88
4247	Petroleum Merchant Wholesalers	1,923	1,874	1,861	1,906	1,992	-69
5413	Architectural and Engineering Services	21,597	21,118	20,429	19,807	20,040	1,557
5416	Management and Technical Consulting Services	12,440	11,626	10,760	10,252	9,567	2,873
5417	Scientific Research and Development Services	7,184	6,742	10,031	10,018	10,293	-3,109
8112	Electronic Equipment Repair and Maintenance	1,528	1,485	1,524	1,622	1,583	-55
8113	Commercial Machinery Repair and Maintenance	3,017	2,918	2,970	2,990	2,827	190
	Total	117,817	116,035	116,720	114,825	111,771	6,046

Source: Quarterly Census of Employment and Wages, Bureau of Labor Statistics

Energy Solutions Occupations

Energy Solutions Occupations

The **Energy Solutions** industry group's top long-term training occupations include *Civil, Industrial, Electrical and Mechanical Engineers*. Leading moderate training occupations are *Electricians, Industrial Machinery Mechanics, and Electrical and Electronics Engineering Technicians*. Short-term training occupations include *General Office Clerks, Molding, Coremaking, and Casting Machine Setters and General Maintenance and Repair Workers*.

2014 Top Energy Solutions Occupational Employment

Occupation Code	Title	2014 Employment	2014 Average Wage	2014 Occupation Location Quotient
Total, All Occupations		2,673,640	\$42,790	
17-2112	Industrial Engineers	3,770	\$78,870	0.80
17-2051	Civil Engineers	3,640	\$72,710	0.70
17-2141	Mechanical Engineers	3,590	\$79,530	0.67
17-2071	Electrical Engineers	3,550	\$93,930	1.03
11-3051	Industrial Production Managers	3,460	\$99,200	1.05
47-2111	Electricians	10,120	\$57,300	0.90
49-9041	Industrial Machinery Mechanics	5,120	\$47,630	0.82
17-3023	Electrical and Electronics Engineering Technicians	1,720	\$60,040	0.63
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	1,400	\$52,540	1.07
17-3026	Industrial Engineering Technicians	1,040	\$63,900	0.80
43-9061	Office Clerks, General	58,710	\$29,910	1.03
49-9071	Maintenance and Repair Workers, General	28,620	\$34,260	1.13
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3,850	\$35,850	1.32
51-4072	Molding, Coremaking, and Casting Machine Setters	2,810	\$29,890	1.11
49-9043	Maintenance Workers, Machinery	2,330	\$44,060	1.30

Source: 2014 Occupational Employment Survey, Bureau of Labor Statistics

MISSOURI ECONOMIC RESEARCH AND INFORMATION CENTER

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M I S S O U R I

Department of Economic Development



Agriculture, Food, and Natural Resources: Power, Structural and Technical Systems Career Pathway Plan of Study for Learners Parents Counselors Teachers/Faculty

This Career Pathway Plan of Study (based on the Power, Structural and Technical Systems Pathway of the Agriculture, Food and Natural Resources Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Power, Structural and Technical Systems Pathway	SAMPLE Occupations Relating to This Pathway
<i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>								
SECONDARY	9	English/ Language Arts I	Algebra I	Earth or Environmental Science	State History Civics	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students.	<ul style="list-style-type: none"> • Introduction to Agriculture, Food and Natural Resources • Introduction to Power, Structural and Technical Systems • Structural Systems 	Occupations Requiring Postsecondary Education <ul style="list-style-type: none"> ▷ Communication Technician ▷ Database Administrator ▷ Electronic Systems Technician ▷ Equipment/Parts Manager ▷ GPS Technician ▷ Heavy Equipment Maintenance Technician ▷ Information Lab Specialist ▷ Machine Operator ▷ Machinist ▷ Recycling Technician ▷ Remote Sensing Specialist ▷ Welder
	10	English/ Language Arts II	Geometry	Biology	U.S. History			
	11	English/ Language Arts III	Algebra II or other math course	Physics or other science course	World History			
	12	English/ Language Arts IV	Trigonometry or other math course	Chemistry or other science course	<i>College Placement Assessments-Academic/Career Advisement Provided</i>			
<i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i>								
POSTSECONDARY	Year 13	English Composition	Algebra	Physics Chemistry	American Government	All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	<ul style="list-style-type: none"> • Power, Structural and Technical Systems 	Occupations Requiring Baccalaureate Degree <ul style="list-style-type: none"> ▷ Agricultural Applications Software Developer/Programmer ▷ Agricultural Educator ▷ Agricultural Engineer ▷ Waste Water Treatment Plant Operator
	Year 14	Speech/ Oral Communication	Calculus	Earth Science Biological Science	American History Geography			
	Year 15	Technical Writing	Statistics		Political Science			
	Year 16	Continue courses in the area of specialization.						

