



Missouri



INDUSTRY

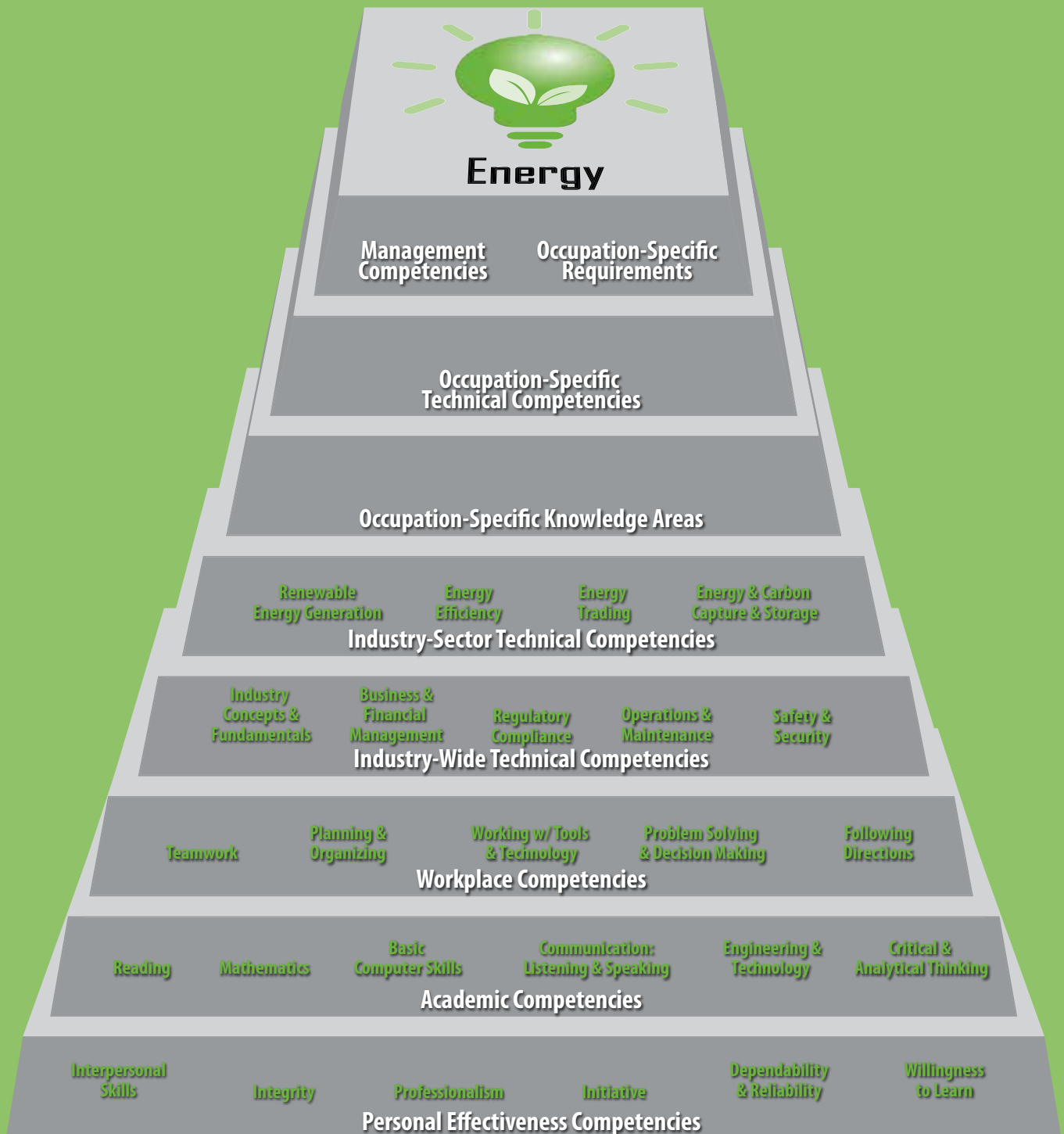
COMPETENCY

MODEL





Green Energy Competency Model



What is Green Energy?

New renewable initiatives are expected to drive green energy production and purchasing well beyond existing capacity. As population and industry demand for megawatts increase, so too will Missouri's need to create jobs in Wind, Solar, Hydro-Electric, Bio-Mass and Bio-fuel energy production

Green Energy



In this section the results of the Green Energy Competency Model analysis are discussed. Each tier lists the most essential competencies and each competency is further described in terms of behavioral attributes.

TIER 1—Personal Effectiveness Competencies

INTERPERSONAL SKILLS	INTEGRITY	PROFESSIONALISM	INITIATIVE	DEPENDABILITY & RELIABILITY	WILLINGNESS TO LEARN
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INTERPERSONAL SKILLS

- ▶ Respect the opinions, customs and individual differences of others
- ▶ Interact respectfully with coworkers of different cultures, genders and backgrounds
- ▶ Work cooperatively with others on the job and display a good-natured attitude
- ▶ Resolve conflicts and differences to maintain a smooth workflow

INTEGRITY

- ▶ Apply ethical standards of the industry to workplace/jobsite conduct
- ▶ Treat others with honesty, fairness and respect
- ▶ Demonstrate respect for property of customers, employer and coworkers
- ▶ Take responsibility for accomplishing work goals within accepted timeframes
- ▶ Accept responsibility for one's decisions and actions

PROFESSIONALISM

- ▶ Take pride in one's work and the work of the organization
- ▶ Demonstrate self-control by keeping emotions in check
- ▶ Accept criticism and deal calmly with stressful situations
- ▶ Dress appropriately for the workplace/jobsite
- ▶ Maintain appropriate personal hygiene
- ▶ Refrain from substance abuse

INITIATIVE

- ▶ Pursue work with energy, drive and effort to accomplish tasks
- ▶ Persist at a task or problem despite interruptions, obstacles, or setbacks
- ▶ Work independently and perform effectively even with little or no supervision
- ▶ Demonstrate the ability to change from one task to another
- ▶ Take initiative to seek out new responsibilities
- ▶ Establish and maintain challenging, but realistic work goals

DEPENDABILITY & RELIABILITY

- ▶ Arrive at work fit and on time each day
- ▶ Avoid absenteeism
- ▶ Work accurately and quickly under pressure
- ▶ Complete assignments and meet deadlines
- ▶ Comply with rules, policies and procedures such as safety, personal hygiene, personal discipline, substance abuse, employee theft and sexual harassment

WILLINGNESS TO LEARN

- ▶ Uses material taught in classroom and on the job training in work situations
- ▶ Treats unexpected circumstances as opportunities to learn and adopt new techniques
- ▶ Desires, shows willingness to learn new assignments, procedures and technologies

TIER 2—Academic Competencies

READING	MATHEMATICS	BASIC COMPUTER SKILLS	COMMUNICATION: VISUAL & VERBAL	ENGINEERING & TECHNOLOGY	CRITICAL & ANALYTICAL THINKING
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READING

- ▶ Read and understand technical and workplace documents such as contracts, regulations, manuals, reports, memos, forms, graphs, charts, tables, calendars, schedules, signs and notices
- ▶ Read and understand operating directions, installation instructions and standard operating procedures
- ▶ Recognize the meaning of specialized words or phrases unique to the industry
- ▶ Apply what is learned from written material to follow instructions and complete tasks
- ▶ Communicate ideas, information and messages which may contain technical material, in a logical manner

MATHEMATICS

- ▶ Adds, subtracts, multiplies and divides with whole numbers, fractions, decimals and percents; calculates average, ratios, proportions and rates
- ▶ Takes measurement of time, temperature, distance, length, width, height, perimeter etc.
- ▶ Correctly converts from one measurement to another
- ▶ Translates practical problems into useful mathematical expressions and uses appropriate mathematical formulas and techniques
- ▶ Solves simple algebraic equations
- ▶ Is able to determine slope, midpoint and distance
- ▶ Calculates perimeters, areas and volumes of basic shapes and solids
- ▶ Reads, tracks and calculates gauge measurements

BASIC COMPUTER SKILLS

- ▶ Understands and efficiently uses basic computer hardware and software to perform tasks and is familiar with fundamental capabilities of computers
- ▶ Enters data into computer with acceptable degree of accuracy
- ▶ Uses word processing programs to create, edit and retrieve files
- ▶ Uses spreadsheet software to enter, manipulate, edit and format text and numerical data
- ▶ Uses electronic mail applications
- ▶ Uses the internet and web based tools to manage basic workplace tasks

COMMUNICATION: LISTENING AND SPEAKING

- ▶ Listens carefully to others and correctly interprets information provided by others
- ▶ Speaks clearly, in a logical organized and coherent manner
- ▶ Is able to incorporate information into actions

ENGINEERING AND TECHNOLOGY

- ▶ Applies basic engineering principles and the appropriate technical solution to a problem
- ▶ Applies principles of engineering science and technology, techniques, procedures and equipment to the design and production of various goods and services
- ▶ Applies the basics of electricity
- ▶ Identifies and selects the appropriate hand or small electric tools or diagnostic equipment for the work
- ▶ Solves problems where a variety of mechanical, electrical, thermal or fluid faults could be the reason for the problem

CRITICAL AND ANALYTICAL THINKING

- ▶ Identifies inconsistent or missing information
- ▶ Critically reviews, analyzes, synthesizes, compares and interprets information
- ▶ Tests possible hypotheses to ensure the problem is correctly diagnosed and the best solution is found

TIER 3—Academic Competencies

TEAMWORK	PLANNING & ORGANIZING	WORKING WITH TOOLS & TECHNOLOGY	PROBLEM SOLVING & DECISION MAKING	FOLLOWING DIRECTIONS
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TEAMWORK

- ▶ Accepts membership in team and uses best practices for successful team functioning
- ▶ Works effectively in multi-disciplinary teams
- ▶ Gives and receives feedback constructively
- ▶ Leverages the strengths of others to accomplish a common goal
- ▶ Is open to considering new ways of doing things and the merits of new approaches to work

PLANNING & ORGANIZING

- ▶ Prioritizes various competing tasks and performs them quickly and efficiently according to their urgency
- ▶ Finds new ways of organizing work area or planning work to accomplish work more efficiently
- ▶ Estimates resources needed for project completion; allocated time and resources effectively
- ▶ Anticipates obstacles to project completion and develops contingency plans to address them; take necessary corrective action when projects go off-track
- ▶ Plans and schedules tasks so that work is completed on time
- ▶ Makes arrangements that fulfill all requirements as efficiently and economically as possible
- ▶ Responds to the schedules of other affected by arrangements; giving them complete, accurate and timely information
- ▶ Keeps track of details to ensure work is performed accurately and completely
- ▶ Takes steps to verify all arrangements, recognizes problems, generates effective alternatives and takes corrective actions
- ▶ Effectively coordinates the transition of employees at the beginning and end of each work shift; disseminates crucial information in an organized manner to rapidly bring employees up to speed at the start of their shifts

WORKING WITH TOOLS & TECHNOLOGY

- ▶ Selects and applies appropriate tools or technological solutions to frequently encountered problems
- ▶ Carefully considers which tools or technological solutions are appropriate for a given job and consistently chooses the best tool or technological solution for the problem at hand
- ▶ Demonstrates an interest in learning about new and emerging tools and technologies; seeks out opportunities to improve knowledge of tools and technologies that may assist in streamlining work and improving productivity
- ▶ Knows how to maintain and troubleshoot tools and technologies
- ▶ Uses basic computer technology to receive work orders, report progress and maintain records

PROBLEM SOLVING & DECISION MAKING

- ▶ Anticipates or recognizes the existence of a problem
- ▶ Identifies the true nature of the problem by analyzing its component parts
- ▶ Effectively uses both internal and external resources to locate and gather information; examines information obtained for relevance and completeness; recognizes important gaps in existing information and takes steps to eliminate those gaps; recalls previously learned information that is relevant to the problem; organizes information as appropriate to gain a better understanding of the problem
- ▶ Integrates previously learned and externally obtained information to generate a variety of high quality alternative approaches to the problem
- ▶ Skillfully uses logic and analysis to identify the strengths and weaknesses, the costs and benefits and the short and the long-term consequences of different approaches

- ▶ Decisively chooses the best solution after contemplating available approaches to the problem; makes difficult decisions even in highly ambiguous or ill-defined situations; quickly chooses an effective solution without assistance when appropriate
- ▶ Commits to a solution in a timely manner and develops a realistic approach for implementing the chosen solution; observes and evaluates the outcomes of implementing the solution to assess the need for alternative approaches and to identify lessons learned
- ▶ Uses scientific rules and methods to solve problems

FOLLOWING DIRECTIONS

- ▶ Receives, interprets, understands and responds to verbal messages and other cues
- ▶ Picks out important information in verbal messages
- ▶ Interprets complex instructions and their relevance to the work assignment
- ▶ Asks questions to clarify unclear directions
- ▶ Acts upon the instruction to complete an assignment



TIER 4—Industry-Wide Competencies

INDUSTRY
CONCEPTS &
FUNDAMENTALSBUSINESS &
FINANCIAL
MANAGEMENTREGULATORY
COMPLIANCEOPERATIONS &
MAINTENANCESAFETY &
SECURITY

INDUSTRY CONCEPTS & FUNDAMENTALS

- ▶ Basic Industry Knowledge and Concepts
- ▶ Contractor Management
- ▶ Data Analysis
- ▶ Electrical System Mountainous—Plant, Distribution, Transmission
- ▶ Engineering Concepts—Electrical, Mechanical, Biological, Chemical, Civil Or Nuclear
- ▶ Fleet Servicing Management
- ▶ Gis Skills
- ▶ Heat Transfer Systems
- ▶ Insulation Application
- ▶ Mechanical Maintenance
- ▶ Operational Procedures—Developing/Applying
- ▶ Operations
- ▶ Pipe Fitting
- ▶ Power Generation Technology
- ▶ Process Controls
- ▶ Procurement
- ▶ Pure Science Concepts—Chemistry, Agriculture and Physics
- ▶ Quality Control
- ▶ Rotating Machinery Maintenance
- ▶ Scada Skills
- ▶ Scada Systems—Supervisory Control and Data Acquisition
- ▶ Steam Fitting
- ▶ Vehicle Management
- ▶ Water Chemistry
- ▶ Welding

BUSINESS & FINANCIAL MANAGEMENT

- ▶ Basic Business Knowledge
- ▶ Continuous Improvement
- ▶ Contract/Mou Agreements
- ▶ Contractor Relations
- ▶ Efficiency and Economics
- ▶ Financial Analysis—Business Modeling and Finance
- ▶ Management—Project Management, Construction Management, Marketing Management
- ▶ Materials Procurement
- ▶ Networking
- ▶ Planning & Scheduling
- ▶ Procurement Skills
- ▶ Purchasing/Buyers
- ▶ Real Estate Acquisition
- ▶ Resource Accounting
- ▶ Row—Vegetation Management, Acquisition Management, Leasement Information
- ▶ Shareholder Awareness—Cost and Trim Savings



REGULATORY COMPLIANCE

- ▶ FEMA, SEMA
- ▶ Basic of Regulations and Regulatory Agencies that Oversee Electric Industry
- ▶ Industry Codes and Standards
- ▶ Laws and Regulations
- ▶ State and Federal Statutes
- ▶ Technical Specifications Development

OPERATIONS & MAINTENANCE

- ▶ Day to Day Operations
- ▶ Electrical Systems Maintenance
- ▶ General Maintenance Skills
- ▶ Testing and Start up
- ▶ Troubleshooting

SAFETY & SECURITY

- ▶ Conservation
- ▶ Environmental Safety
- ▶ Facility and Cyber Security
- ▶ General Energy Administration
- ▶ Industrial Safety
- ▶ Safety Awareness
- ▶ Safety Compliance

TIER 5—Industry–Sector Competencies

RENEWABLE ENERGY GENERATION	ENERGY EFFICIENCY	ENERGY TRADING	ENERGY AND CARBON CAPTURE AND STORAGE
<ul style="list-style-type: none"> ⇒ Principles of energy generation and usage from natural resources such as solar, wind, geothermal and biomass ⇒ Green technological practices for traditional energy generation, non-renewable sources of energy such as oil, gas, coal and nuclear ⇒ Renewable energy technologies 	<ul style="list-style-type: none"> ⇒ Strategies and technologies to reduce energy consumption and costs 	<ul style="list-style-type: none"> ⇒ Buying and selling the energy commodity and carbon credits 	<ul style="list-style-type: none"> ⇒ Knowledge of intercepting the release of energy and carbon into the atmosphere and redirecting it into geological storage locations ⇒ Power plant technologies using the integrated gasification combined cycle (IGCC) technique



TARGET OCCUPATIONS

The analysis in the section that follows will be focused on the Target Occupations (does not include the all occupations in this industry) within Green Energy that were identified by creating a custom industry staffing pattern for this industry cluster in Missouri. This was then sorted by each occupation’s impact on the economy and then mapped against the US DOL’s In Demand occupation list for Green Energy. The Target Occupations for this sector are:

O*NET SOC Code	Title
19-2031	Chemists
49-9051	Electrical Power-Line Installers and Repairers
13-1199	Energy Auditors
11-9041	Engineering Managers and Biofuels/Biodiesel Technology & Product Development
19-2042	Geoscientists, Except Hydrologists and Geographers
49-9041	Industrial Machinery Mechanics
11-3051	Industrial, Biomass, Geothermal and Hydroelectric Production Managers Including Methane/Landfill Gas Collection System Operators
17-2141	Mechanical, Automotive and Fuel Cell Engineers

TIER 6—Occupation-Specific Knowledge Areas

<p>CHEMISTS</p> <ul style="list-style-type: none"> ⇒ Chemistry ⇒ Mathematics ⇒ Computers and Electronics ⇒ English Language ⇒ Productions and Processing ⇒ Customer and Personal Service ⇒ Clerical ⇒ Engineering and Technology 	<p>ELECTRICAL POWER-LINE INSTALLERS & REPAIRERS</p> <ul style="list-style-type: none"> ⇒ Customer and Personal Service ⇒ Mechanical ⇒ Building and Construction ⇒ Public Safety and Security ⇒ Education and Training ⇒ Transportation
<p>ENERGY AUDITORS</p> <ul style="list-style-type: none"> ⇒ Building and Construction ⇒ Customer and Personal Service ⇒ English Language ⇒ Mathematics ⇒ Mechanical ⇒ Sales and Marketing ⇒ Clerical ⇒ Physics ⇒ Design ⇒ Computer and Electronics 	<p>ENGINEERING MANAGERS AND BIOFUELS/BIODIESEL TECHNOLOGY & PRODUCT DEVELOPMENT</p> <ul style="list-style-type: none"> ⇒ Engineering and Technology ⇒ Design ⇒ English Language ⇒ Mathematics ⇒ Computers and Electronics ⇒ Administration and Management ⇒ Physics ⇒ Customer and Personal Service ⇒ Production and Processing ⇒ Personnel and Human Resources
<p>GEOSCIENTISTS, EXCEPT HYDROLOGISTS & GEOGRAPHERS</p> <ul style="list-style-type: none"> ⇒ Engineering and Technology ⇒ Geography ⇒ Computer and Electronics ⇒ Mathematics ⇒ English Language ⇒ Physics ⇒ Chemistry ⇒ Customer and Personal Service ⇒ Law and Government 	<p>INDUSTRIAL MACHINERY MECHANICS</p> <ul style="list-style-type: none"> ⇒ Mechanical ⇒ Mathematics ⇒ Engineering and Technology ⇒ Design ⇒ English Language ⇒ Production and Processing ⇒ Building and Construction
<p>INDUSTRIAL, BIOMASS, GEOTHERMAL AND HYDRO-ELECTRIC PRODUCTION MANAGERS INCLUDING METHANE/LANDFILL GAS COLLECTION SYSTEM OPERATORS</p> <ul style="list-style-type: none"> ⇒ Production and Processing ⇒ Mechanical ⇒ Mathematics ⇒ Administration and Management ⇒ Education and Training ⇒ Customer and Personal Service ⇒ Design 	<p>MECHANICAL, AUTOMOTIVE & FUEL CELL ENGINEERS</p> <ul style="list-style-type: none"> ⇒ Engineering and Technology ⇒ Design ⇒ Mechanical ⇒ Mathematics ⇒ Physics ⇒ Production and Processing ⇒ Computer and Electronics ⇒ English Language ⇒ Customer and Personal Service ⇒ Administration and Management

TIER 7—Occupation-Specific Technical Competencies

CHEMISTS

TOOLS USED IN THIS OCCUPATION

- ⇒ **Benchtop centrifuges** — Chemical centrifuges; High-speed centrifuges; Tabletop centrifuges
- ⇒ **Hematology or chemistry mixers** — Automatic peptide synthesizers; Mini synthesizers
- ⇒ **Lasers** — Diode lasers; Dye lasers; Nitrogen lasers; Picosecond lasers
- ⇒ **Spectrometers** — Luminescence spectrometers; Ultraviolet-visible spectrometers
- ⇒ **X ray diffraction equipment** — Single crystal x ray diffractometers

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Analytical or scientific software** — Agilent ChemStation; Laboratory information management system LIMS software; Waters Empower Chromatography Data Software; Wavefunction Spartan
- ⇒ **Computer aided design CAD software** — ChemInnovation Software Chem 4-D; ChemSW Molecular Modeling Pro; Hypercube HyperChem
- ⇒ **Data base user interface and query software** — ChemSW Buffer Maker; Microsoft Access; Molsearch Pro; Structured query language SQL
- ⇒ **Graphics or photo imaging software** — Digital imaging software; Graphics software; MolDraw *
- ⇒ **Inventory management software** — ChemSW Chemical Inventory System CIS; ItemTracker software; UBI Biotracker

* Software developed by a government agency and/or distributed as a freeware or shareware.

ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS

TOOLS USED IN THIS OCCUPATION

- ⇒ **Conduit benders** — Cable benders; Hand benders; Hydraulic benders; Power benders
- ⇒ **Power drills** — Electric drills; Gas drills; Hammer drills; Hydraulic drills
- ⇒ **Saws** — Buck saws; Hacksaws; Hand saws; Keyhole saws
- ⇒ **Voltage or current meters** — Current leakage meters; Digital recording amp meters; Digital voltmeters DVM; Insulator testers
- ⇒ **Wire or cable cutters** — Cable cutters; Hydraulic cutters; Insulated cable cutters; Ratchet cutters

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Electronic mail software** — Email software
- ⇒ **Inventory management software**
- ⇒ **Office suite software** — Microsoft Office software
- ⇒ **Spreadsheet software**
- ⇒ **Word processing software**

ENERGY AUDITORS

TOOLS USED IN THIS OCCUPATION

- ⇒ **Air velocity and temperature monitors** — Air current testers; Draft gauges
- ⇒ **Flow sensors** — Water flow meters
- ⇒ **Leak testing equipment** — Blower doors; Smoke generators; Smoke pens
- ⇒ **Manometers**
- ⇒ **Multi gas monitors** — Combustible gas monitors; Flue gas analyzers

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Analytical or scientific software** — Architectural Energy Corporation ENFORMA Building Diagnostics; Autodesk ECOTECH; Psychrometric chart software; The Weatherization Assistant *
- ⇒ **Data base user interface and query software** — Abraxas Energy Consulting Metrix; dBase; Microsoft Access
- ⇒ **Graphics or photo imaging software** — Adobe Systems Adobe Photoshop software
- ⇒ **Internet browser software** — Microsoft Internet Explorer; Web browser software
- ⇒ **Word processing software** — Microsoft Word

* Software developed by a government agency and/or distributed as a freeware or shareware.

TIER 7—Occupation-Specific Technical Competencies

ENGINEERING MANAGERS AND BIOFUELS/BIODIESEL TECHNOLOGY & PRODUCT DEVELOPMENT

TOOLS USED IN THIS OCCUPATION

- ⇒ **Desktop computers**
- ⇒ **Graphics tablets** — Drawing tablets
- ⇒ **Notebook computers**
- ⇒ **Personal digital assistant PDAs or organizers** — Personal digital assistants PDA
- ⇒ **Tablet computers**

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Analytical or scientific software** — HEC RAS *; HEC-1 *; SPSS software; Water surface pressure gradient WSPG software
- ⇒ **Computer aided design CAD software** — Autodesk AutoCAD software; Hewlett-Packard HP SolidDesigner; Pro-E CAD software; SolidWorks CAD software
- ⇒ **Enterprise resource planning ERP software** — Made2Manage software; Microsoft Dynamics NAV
- ⇒ **Project management software** — Autodesk Buzzsaw; Microsoft Project; Primavera Systems software; The Gordian Group PROGEN Online
- ⇒ **Word processing software** — Microsoft Word

* Software developed by a government agency and/or distributed as a freeware or shareware.

GEOSCIENTISTS, EXCEPT HYDROLOGISTS AND GEOGRAPHERS

TOOLS USED IN THIS OCCUPATION

- ⇒ **Electromagnetic geophysical instruments** — Alternating field demagnetizers; Degaussing wands; Impulse magnetizers; Thermal specimen demagnetizers
- ⇒ **Geological compasses** — Geological stratum compasses; Pocket transits; Sun compasses; Global Positioning Systems (GPS)
- ⇒ **Paramagnetic susceptibility analyzers** — Magnetic susceptibility measurement systems; Magnetic susceptibility/anisotropy systems; Magnetic susceptibility/temperature systems; Pocket magnetic susceptibility meters
- ⇒ **Soil core sampling apparatus** — Automated core analysis systems; Sediment piston corers; Soil augers; Tube samplers
- ⇒ **Sonars** — Echosounders; Multibeam echosounders; Side-scan sonar equipment; Towed sonars

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Analytical or scientific software** — EarthWorks Downhole Explorer; Laboratory information management system LIMS software; SAS software; Waterloo Hydrogeologic FlowPath II
- ⇒ **Computer aided design CAD software** — Autodesk AutoCAD software; Evolution Computing EasyCAD; Trimble Terramodel; Upperspace DesignCAD
- ⇒ **Data base user interface and query software** — eNotebook software; MJ Systems Logsleuth; Oracle software; RockWare Stratbugs
- ⇒ **Graphics or photo imaging software** — Adobe Systems Adobe Photoshop software; Golden Software Surfer (graphics or photo imaging feature); IGnet software
- ⇒ **Map creation software** — ER Mapper software; ESRI ArcView; Leica Geosystems ERDAS IMAGINE; SACLANTCEN *

* Software developed by a government agency and/or distributed as a freeware or shareware.

INDUSTRIAL MACHINERY MECHANIC

TOOLS USED IN THIS OCCUPATION

- ⇒ **Hoists** — Chain falls; Chain hoists
- ⇒ **Lathes** — Engine lathes; Turning lathes
- ⇒ **Power grinders** — Cylindrical grinders; Grinding wheels; Precision grinders
- ⇒ **Welders** — Arc welders; Electric welding equipment; Spot welders
- ⇒ **Workshop presses** — Drill presses; Hydraulic squeezers; Punch presses

TECHNOLOGY USED IN THIS OCCUPATION

- ⇒ **Computer aided design CAD software**
- ⇒ **Computer aided manufacturing CAM software** — Extranet Machine Tools Suite
- ⇒ **Data base user interface and query software** — Maintenance planning and control software
- ⇒ **Industrial control software** — BIT Corp ProMACS PLC; KEYENCE PLC Ladder Logic
- ⇒ **Word processing software** — Microsoft Word

* Software developed by a government agency and/or distributed as a freeware or shareware.



TIER 7—Occupation-Specific Technical Competencies

INDUSTRIAL, BIOMASS, GEOTHERMAL AND HYDROELECTRIC PRODUCTION MANAGERS INCLUDING METHANE/LANDFILL GAS COLLECTION SYSTEM OPERATORS

TOOLS USED IN THIS OCCUPATION	TECHNOLOGY USED IN THIS OCCUPATION
<ul style="list-style-type: none"> ⇒ Calipers — Vernier calipers ⇒ Forklifts ⇒ Gauges or inspection fixtures — Taper gauges ⇒ Squares ⇒ Tape measures 	<ul style="list-style-type: none"> ⇒ Facilities management software — ABB Optimize software; Plant management software ⇒ Human resources software — Clockware software; Computer integrated manufacturing CIM time manager software; Employee performance management software ⇒ Industrial control software — Citect IIM; Marel production system MPS software; Statistical process control software; Wonderware DT Analyst Plant Productivity Improvement Software ⇒ Inventory management software — Computer integrated manufacturing CIM warehouse shipping manager software; SAP inventory software ⇒ Project management software — Exact Software JobBOSS; Scadex timecard20

MECHANICAL, AUTOMOTIVE AND FUEL CELL ENGINEERS

TOOLS USED IN THIS OCCUPATION	TECHNOLOGY USED IN THIS OCCUPATION
<ul style="list-style-type: none"> ⇒ Cold forming presses — Fused deposition modeling machines; Rapid thermal processing systems ⇒ Flowmeters — Digital particle image velocimeters; Laser Doppler anemometers; Laser Doppler velocimeters LDV; Pitot tubes ⇒ Interferometers — Interferometric microscopes; Spectrum analyzers ⇒ Machine mounts or vibration isolators — Vibration control systems; Vibration isolators ⇒ Semiconductor process systems — Spin-coaters; Wafer bonding systems; Wafer dicing saws; Wire bonders 	<ul style="list-style-type: none"> ⇒ Analytical or scientific software — ANSYS software; Sigmetrix CETOL 6 Sigma; Statistical energy analysis SEA software; The Mathworks MATLAB ⇒ Computer aided design CAD software — Autodesk AutoCAD software; SolidWorks CAD software; UGS I-DEAS; Zeemax software ⇒ Development environment software — Ladder Logic; Microsoft Visual Basic; National Instruments LabVIEW; Rockwell Software ⇒ Industrial control software — Computer numerical control CNC software; Human machine interface HMI software ⇒ Object or component oriented development software — C++; G-code



TIER 8—Occupation Specific Requirements

SOC CODE	OCCUPATION	CIP CODE	CIP TITLE
19-2031	Chemists	40.0501	Chemistry, General
		40.0502	Analytical Chemistry
		40.0503	Inorganic Chemistry
		40.0504	Organic Chemistry
		40.0506	Physical and Theoretical Chemistry
		40.0507	Polymer Chemistry
		40.0508	Chemical Physics
		40.0599	Chemistry, Other
		49-9051	Electrical Power-Line Installers and Repairers
46.0303	Lineworker		
46.0399	Electrical and Power Transmission Installers, Other		
13-1199	Energy Auditors	52.0303	Auditing
11-9041	Engineering Managers and Biofuels/Biodiesel Technology & Product Development <i>(continued on next page)</i>	03.0104	Environmental Science
		04.0301	City/Urban, Community and Regional Planning
		04.0401	Environmental Design/Architecture
		04.0501	Interior Architecture
		04.0601	Landscape Architecture (BS, BSLA, BLA, MSLA, MLA, PhD)
		14.0101	Engineering, General
		14.0201	Aerospace, Aeronautical and Astronautical Engineering
		14.0301	Agricultural/Biological Engineering and Bioengineering
		14.0401	Architectural Engineering
		14.0501	Biomedical/Medical Engineering
		14.0601	Ceramic Sciences and Engineering
		14.0701	Chemical Engineering
		14.0801	Civil Engineering, General
		14.0802	Geotechnical Engineering
		14.0803	Structural Engineering
		14.0804	Transportation and Highway Engineering
		14.0805	Water Resources Engineering
		14.0899	Civil Engineering, Other
		14.0901	Computer Engineering, General
		14.0902	Computer Hardware Engineering
		14.0903	Computer Software Engineering
		14.0999	Computer Engineering, Other
		14.1001	Electrical, Electronics and Communications Engineering
		14.1101	Engineering Mechanics
		14.1201	Engineering Physics
		14.1301	Engineering Science
		14.1401	Environmental/Environmental Health Engineering
14.1801	Materials Engineering		
14.1901	Mechanical Engineering		
14.2001	Metallurgical Engineering		
14.2101	Mining and Mineral Engineering		
14.2201	Naval Architecture and Marine Engineering		

TIER 8—Occupation Specific Requirements

SOC CODE	OCCUPATION	CIP CODE	CIP TITLE
11-9041	Engineering Managers and Biofuels/Biodiesel Technology & Product Development <i>(continued from previous page)</i>	14.2301	Nuclear Engineering
		14.2401	Ocean Engineering
		14.2501	Petroleum Engineering
		14.2701	Systems Engineering
		14.2801	Textile Sciences and Engineering
		14.3101	Materials Science
		14.3201	Polymer/Plastics Engineering
		14.3301	Construction Engineering
		14.3401	Forest Engineering
		14.3501	Industrial Engineering
		14.3601	Manufacturing Engineering
		14.3801	Surveying Engineering
		14.3901	Geological/Geophysical Engineering
14.9999	Engineering, Other		
26.1201	Biotechnology		
19-2042	Geoscientists, Except Hydrologists and Geographers	40.0601	Geology/Earth Science, General
		40.0602	Geochemistry
		40.0603	Geophysics and Seismology
		40.0604	Paleontology
		40.0606	Geochemistry and Petrology
		40.0607	Oceanography, Chemical and Physical
		40.0699	Geological and Earth Sciences/Geosciences, Other
49-9041	Industrial Machinery Mechanics	47.0303	Industrial Mechanics and Maintenance Technology
		47.0399	Heavy/Industrial Equipment Maintenance Technologies, Other
11-3051	Industrial, Biomass, Geothermal and Hydroelectric Production Managers Including Methane/Landfill Gas Collection System Operators	52.0101	Business/Commerce, General
		52.0201	Business Administration and Management, General
		52.0205	Operations Management and Supervision
17-2141	Mechanical, Automotive and Fuel Cell Engineers	14.1901	Mechanical Engineering

TIER 9—Management Competencies

- ⇒ • Manpower Planning
- ⇒ • Delegating
- ⇒ • Managing Work Flow
- ⇒ • Entrepreneurship
- ⇒ • Leadership
- ⇒ • Developing & Monitoring
- ⇒ • Preparing and Managing Budgets
- ⇒ • Team Building
- ⇒ • Developing an Organizational Vision
- ⇒ • Managing Resources



Department of Economic Development

ANALYSIS AND RESEARCH PROVIDED BY SONAL HATÉ

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