

id	1
Job Profile	Renewable energy consultant
ESCO URL	http://data.europa.eu/esco/occupation/114e1eff-215e-47df-8e10-45a5b72f8197
Alternative labels	sustainable energy survey consultant // sustainable energy consultant // renewable energy market consultant // sustainable energy technical consultant // sustainable energy research consultant // renewable energy survey consultant // sustainable energy market consultant // renewable energy research consultant // renewable energy technical consultant
Description	Renewable energy consultants advise clients on the advantages and disadvantages of different renewable energy sources. They conduct surveys and interviews to research demand of and opinions on renewable energy, and strive to advise clients on the most advantageous source of renewable energy for their purpose.
ISCO number	2433
	Essential
	knowledge

characteristics of products
characteristics of services
energy efficiency
market analysis
renewable energy technologies
solar energy

skill/competence

advise on heating systems energy efficiency
assess customers
develop professional network
identify energy needs
inform on government funding
perform market research
promote environmental awareness
promote sustainable energy
provide information on geothermal heat pumps
provide information on solar panels
provide information on wind turbines

Optional
knowledge

domestic heating systems
electricity market
energy performance of buildings
industrial heating systems
sales argumentation
sales strategies

skill/competence

advise on utility consumption
answer requests for quotation
assess supplier risks
attend trade fairs
carry out sales analysis
identify customer's needs
identify suppliers
inform customers on energy consumption fees
manage contracts
negotiate improvement with suppliers
negotiate terms with suppliers
prospect new customers

Future

Essential

ERP
Big Data
Basic digital skills
Basic data input and processing
Use of digital communication tools
Financial literacy
Advanced communication skills
Negotiation skills
Customer relationship management
Entrepreneurship and initiative taking
Risk management
Opportunity assessment
Critical thinking and decision making
Advanced literacy
Environmental awareness
Energy efficiency
Knowledge and understanding of international and national standards and legislation
Business Intelligence (BI)
E-commerce
Conflict resolution
Interpersonal skills and empathy
Active listening
Appropriate linguistic skills
Cultural empathy

Optional

Complex information processing and interpretation
Process analysis
Creativity
Personal experience
Ethical skills
Teaching and training others
Cross-functional process know-how
Knowledge and understanding of quality procedures related to digital transformation
Continuous learning
Interdisciplinary thinking and acting
Basic numeracy and communication
Quantitative and statistical skills
Circular economy
Climate change risk management
Product life cycle impact assessment
Adaptability and adapt to change
Teaching and training others

Renewable energy engineer

<http://data.europa.eu/esco/occupation/0e99c929-364f-4b0a-8a64-2aab42420f00>

renewable energy engineering specialist // project engineer, PV array // renewable power engineer // renewables engineer // industrial energy engineer // asset engineer, renewable power // project engineer, offshore wind // renewable energy technology engineering adviser // renewable energy technology engineering consultant // renewable energies engineer // renewable energy engineering expert // renewable energy technology engineering expert // renewable energy engineering consultant // project engineer, energy efficiency // wind turbine project engineer // renewable energy systems engineer // turbine engineer // project engineer, renewables // renewable energy engineering adviser // renewable energy technology engineer // renewable energy technology engineering specialist

Renewable energy engineers research alternative sources of energy in order to design systems for renewable energy production. They strive to optimise energy production from renewable sources, and reduce production expenses and environmental strain. They design systems which focus on energy sustainability and efficiency.

2149

Essential

knowledge

civil engineering
electrical engineering
engineering processes
environmental engineering
fluid mechanics
industrial heating systems
mechanical engineering
mining, construction and civil engineering
machinery products
power engineering
renewable energy technologies
solar energy
technical drawings

skill/competence

adapt energy distribution schedules
adjust engineering designs
approve engineering design
carry out energy management of facilities
design wind turbines
ensure compliance with safety legislation
inform on government funding
make electrical calculations
manage engineering project
perform project management
perform scientific research
promote sustainable energy
provide information on geothermal heat pumps
provide information on solar panels
provide information on wind turbines
research locations for wind farms
use CAD software
use technical drawing software
use thermal management

Optional

knowledge

electric generators
electrical power safety regulations
energy market
energy performance of buildings
engineering principles
power electronics

skill/competence

analyse energy consumption
assess project resource needs
coordinate electricity generation
create AutoCAD drawings
develop material testing procedures
examine engineering principles
identify energy needs
inspect facility sites
inspect wind turbines
maintain photovoltaic systems
manage contracts
oversee quality control
prepare technical reports
report test findings
troubleshoot
use software tools for site modelling

Future

Essential

IoT
Big Data
Artificial Intelligence (AI)
Augmented Reality
Knowledge and understanding of quality procedures related to digital transformation
Sensors Technology
Machine Learning

Cloud Computing
Digital twin
Communication among components, equipment (M2M), and environment
Traceability
Advanced IT skills and programming
Advanced data analysis and modelization
Data management-safe storage
Cybersecurity
Use of digital communication tools
Risk management
Opportunity assessment
Adaptability and adapt to change
Critical thinking and decision making
Cross-functional process know-how
Interdisciplinary thinking and acting
Advanced literacy
Quantitative and statistical skills
Appropriate linguistic skills
Complex problem solving
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Climate change risk management
Knowledge and understanding of international and national standards and legislation
Monitoring systems of energy consumption
Entrepreneurship and initiative taking
Continuous learning
Complex information processing and interpretation
Waste reduction and waste management
Sustainable resource management
Water conservation
Circular economy
Risk management

Optional

Business Intelligence (BI)
Financial literacy
Advanced communication skills
Negotiation skills
Continuous learning
Ethical skills
Active listening
Teamwork skills
Conflict resolution
Leadership and managing others
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Creativity
Resource reuse/recycling
Interpersonal skills and empathy
Teaching and training others

3

Renewable energy sales representative

<http://data.europa.eu/esco/occupation/ff3a164d-4045-4511-a472-49093dabf9fc>

alternative energy sales promoter // renewable energy salesperson // renewable energy salesman // renewable energy sales rep // alternative energy seller // renewable energy sales negotiator // renewable energy seller // alternative energy saleswoman // renewable energy sales consultant // alternative energy sales consultant // alternative energy salesperson // alternative energy sales negotiator // alternative energy salesman // renewable energy saleswoman // residential renewable energy sales representative // residential alternative energy sales representative // alternative energy sales rep // renewable energy sales promoter

Renewable energy sales representatives assess clients' energy supply needs, and attempt to secure sales of renewable energy methods. They promote renewable energy suppliers and the use of renewable energy products, and liaise with consumers to increase sales.

3322

Essential

knowledge

characteristics of products
characteristics of services
renewable energy technologies
sales argumentation
sales strategies
solar energy

skill/competence

advise on heating systems energy efficiency
answer requests for quotation
assess customers
carry out sales analysis
identify customer's needs
identify energy needs
inform customers on energy consumption fees
inform on government funding
manage contracts
promote sustainable energy
provide information on geothermal heat pumps
provide information on solar panels
provide information on wind turbines

Optional

knowledge

domestic heating systems
electricity market
energy performance of buildings
industrial heating systems

skill/competence

achieve sales targets
advise on utility consumption
assess supplier risks
attend trade fairs
deliver a sales pitch
implement marketing strategies
implement sales strategies
liaise with advertising agencies
manage contract disputes
manage development of promotional material
monitor after sales records
negotiate improvement with suppliers
negotiate terms with suppliers
perform market research
plan customers' sales visits
plan event marketing for promotional campaigns
prepare sales checks
promote environmental awareness
prospect new customers
review completed contracts

Future

Essential

ERP
Big Data
Basic digital skills
Basic data input and processing
Use of digital communication tools
Financial literacy
Advanced communication skills
Negotiation skills
Customer relationship management
Entrepreneurship and initiative taking
Risk management
Opportunity assessment
Critical thinking and decision making
Advanced literacy
Environmental awareness
Energy efficiency
Knowledge and understanding of international and national standards and legislation
Business Intelligence (BI)
E-commerce
Conflict resolution
Interpersonal skills and empathy
Active listening
Appropriate linguistic skills
Cultural empathy

Optional

Complex information processing and interpretation
Process analysis
Creativity
Personal experience
Ethical skills
Teaching and training others
Cross-functional process know-how
Knowledge and understanding of quality procedures related to digital transformation
Continuous learning
Interdisciplinary thinking and acting
Basic numeracy and communication
Quantitative and statistical skills
Circular economy
Climate change risk management
Product life cycle impact assessment
Adaptability and adapt to change
Teaching and training others

4

Solar energy technician

<http://data.europa.eu/esco/occupation/75b63949-1b93-4bf2-a777-ccf978dc3e8a>

solar energy system installer // photovoltaic cell technician // solar technician // solar energy farm technician // solar energy panel technician // solar energy generation technician // solar roofer // solar energy system designer // PV field technician // photovoltaic energy installer // solar energy installation technician // solar energy system builder // solar energy plant technician // solar energy system constructor // photovoltaic energy panel installer // solar O and M technician // solar operations and maintenance technician // solar farm technician // photovoltaic field technician // solar energy array technician // photovoltaic system technician // photo-voltaic cell technician // solar energy harvesting technician // solar energy system maker // solar energy panel installer // solar energy system technician

Solar energy technicians install and maintain systems that collect solar energy. They prepare the necessary fixtures, often on roofs, install solar panels, and plug them into an electronic system including an inverter to connect the solar energy systems to the electricity lines.

7411

Essential

knowledge

electrical wiring plans
electricity
mechanics
solar energy

skill/competence

comply with legal regulations
follow health and safety procedures in
construction
follow safety procedures when working at
heights
inspect construction supplies
inspect electrical supplies
install circuit breakers
install electrical and electronic equipment
interpret 2D plans
interpret 3D plans
mount photovoltaic panels

Optional knowledge

building codes
solar panel mounting systems
types of photovoltaic panels
zero-energy building design

skill/competence

answer requests for quotation
calculate needs for construction supplies
calculate solar panel orientation
demonstrate products' features
estimate profitability
install inverter
keep personal administration
maintain equipment
maintain solar energy systems
maintain work area cleanliness
monitor stock level
order construction supplies
process incoming construction supplies
provide information on solar panels
rig loads
use safety equipment in construction
work in a construction team

Future

Essential

IoT

Big Data

Artificial Intelligence

Artificial Intelligence

Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Basic data input and processing
Use of digital communication tools
Basic numeracy and communication
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Use of drones
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation

Optional

Teamwork skills

Active listening

Appropriate linguistic skills

Data management-safe storage

Sustainable resource management

Resource reuse/recycling

Teaching and training others

Knowledge and understanding of quality procedures
related to digital transformation

Adaptability and adapt to change

Teaching and training others

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Solar energy sales consultant

<http://data.europa.eu/esco/occupation/fd4b90ed-6bb4-447e-b13a-afb8015700b3>

solar sales consultant // solar energy sales assistant // solar sales representative // solar sales assistant // solar power sales assistant // solar power sales advisor // solar sales advisor // industrial solar energy sales consultant // solar energy sales advisor // industrial solar power sales consultant // solar power sales representative // solar energy sales representative // domestic solar energy sales consultant // domestic solar power sales consultant

Solar energy sales consultants provide advice on solar energy for domestic or industrial purposes, and aim to promote the use of solar energy as an alternative and more sustainable source of energy. They communicate with prospective clients, and attend networking events, to ensure increased sales of solar energy products.

2433

Essential

knowledge

characteristics of products
characteristics of services
domestic heating systems
electricity market
energy efficiency
industrial heating systems
solar energy

skill/competence

advise on heating systems energy efficiency
assess customers
develop professional network
identify customer's needs
inform customers on energy consumption fees
inform on government funding
promote environmental awareness
promote sustainable energy
provide information on solar panels

Optional
knowledge

electricity
energy performance of buildings
renewable energy technologies
sales argumentation
sales promotion techniques
sales strategies

skill/competence

advise on utility consumption
answer requests for quotation
assess supplier risks
attend trade fairs
carry out sales analysis
deliver a sales pitch
identify energy needs
identify suppliers
implement marketing strategies
implement sales strategies
manage distribution of destination promotional materials
manage production of destination promotional materials
negotiate improvement with suppliers
negotiate sales contracts
negotiate terms with suppliers
perform market research
prepare sales checks
prospect new customers
review completed contracts

Future

Essential

ERP
Big Data
Basic digital skills
Basic data input and processing
Use of digital communication tools
Financial literacy
Advanced communication skills
Negotiation skills
Customer relationship management
Entrepreneurship and initiative taking
Risk management
Opportunity assessment
Critical thinking and decision making
Advanced literacy
Environmental awareness
Energy efficiency
Knowledge and understanding of international and national standards and legislation
Business Intelligence (BI)
E-commerce
Conflict resolution
Interpersonal skills and empathy
Active listening
Appropriate linguistic skills
Cultural empathy

Optional

Complex information processing and interpretation
Process analysis
Creativity
Personal experience
Ethical skills
Teaching and training others
Cross-functional process know-how
Knowledge and understanding of quality procedures related to digital transformation
Continuous learning
Interdisciplinary thinking and acting
Basic numeracy and communication
Quantitative and statistical skills
Circular economy
Climate change risk management
Product life cycle impact assessment
Adaptability and adapt to change
Teaching and training others

6

Solar energy engineer

<http://data.europa.eu/esco/occupation/42dbb769-4c91-47dc-bd16-ec8e70c4180f>

solar power engineer // solar energy technology engineering expert // solar engineer // solar energy technology engineering specialist // solar energy technology engineering adviser // solar energy engineering expert // solar energy systems engineer // solar energy technology engineer // solar energies engineer // solar energy engineering specialist // solar energy engineering adviser // solar energy engineering consultant // solar energy technology engineering consultant

Solar energy engineers design systems which generate electrical energy from sunlight, such as photovoltaic systems. They design and construct systems which optimise the energy output from solar power, and the sustainability of the production process of solar systems.

2149

Essential

knowledge

electrical engineering
energy
energy market
engineering principles
engineering processes
power engineering
solar energy
technical drawings
thermodynamics
types of photovoltaic panels

skill/competence

adjust engineering designs
adjust voltage
approve engineering design
conduct engineering site audits
create AutoCAD drawings
design solar energy systems
examine engineering principles
maintain concentrated solar power systems
maintain solar energy systems
manage engineering project
perform scientific research
promote sustainable energy
provide information on solar panels
use technical drawing software
use thermal analysis

Optional

knowledge

electricity market
fluid mechanics
industrial heating systems
quality standards
renewable energy technologies

skill/competence

assess financial viability
calculate solar panel orientation
design thermal equipment
draw blueprints
inspect facility sites
maintain photovoltaic systems
perform project management
read engineering drawings
run simulations
test procedures in electricity transmission
troubleshoot
use CAD software
wear appropriate protective gear

Future

Essential

IoT
Big Data
Artificial Intelligence (AI)
Augmented Reality (AR)

Sensors Technology
Machine Learning
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Augmented Reality (AR)
Post-processing
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Equipment and process monitoring & its implementation
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Quantitative and statistical skills
Complex information processing and interpretation
Complex problem solving
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Process analysis
Risk management
Continuous learning
Adaptability and adapt to change
Use of digital communication tools

Optional

Business Intelligence (BI)

Knowledge and understanding of quality procedures related to digital transformation

Leadership and managing others

Financial literacy

Interpersonal skills and empathy

Adaptability and adapt to change

Resource reuse/recycling

Sustainable resource management

Teamwork skills

ERP

Conflict resolution

Active listening

Ethical skills

Advanced communication skills

Waste reduction and waste management

Teaching and training others

7

Solar power plant operator

<http://data.europa.eu/esco/occupation/6d823dbb-4008-4fb7-b98d-f9d934478647>

solar energy plant worker // solar farm worker // solar electricity power plant operator // solar energy plant operator // solar array worker // solar power plant maintenance operator // solar energy plant operative // solar farm operative // solar array operative // solar power plant safety operative // solar electric power plant operator // solar farm operator // solar power plant safety operator // solar electric power plant operative // solar array operator // solar electricity power plant operative // solar power plant maintenance operative

Solar power plant operators operate and maintain equipment which produce electrical energy from solar power. They monitor measuring equipment to ensure the safety of operations, and that the production needs are met. They also react to system problems, and repair faults.

3131

Essential

knowledge

electric current
electric generators
electrical power safety regulations
electricity
solar energy

skill/competence

apply health and safety standards
install concentrated solar power systems
install photovoltaic systems
maintain concentrated solar power systems
maintain electrical equipment
maintain photovoltaic systems
maintain records of maintenance interventions
monitor electric generators
respond to electrical power contingencies

Optional
knowledge

automation technology
electricity consumption
renewable energy technologies

skill/competence

arrange equipment repairs
control temperature
coordinate electricity generation
develop strategies for electricity contingencies
ensure compliance with electricity distribution
schedule
ensure equipment maintenance
ensure safety in electrical power operations
install electrical and electronic equipment
liaise with engineers
operate steam turbine
provide information on solar panels
read engineering drawings
replace large components
resolve equipment malfunctions
set up machine controls
wear appropriate protective gear

Future

Essential

Artificial Intelligence
Sensors Technology
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Digital twin
Predictive and Proactive maintenance
Cyber-physical systems (CBS)
Computerized Maintenance Management
Use of drones
Use of digital communication tools
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation
Advanced data analysis and modelization

Optional

Teamwork skills
Active listening
Appropriate linguistic skills
Appropriate linguistic skills
Sustainable resource management
Resource reuse/recycling
Teaching and training others
Knowledge and understanding of quality
procedures related to digital transformation
Adaptability and adapt to change

Wind turbine technician

<http://data.europa.eu/esco/occupation/98562ce3-9632-4226-b129-c67eb9c54f0f>

on-shore wind turbine maintenance technician //
 wind farm worker // wind turbine service
 technician // off-shore wind turbine repair
 technician // onshore wind turbine worker // wind
 turbine repair technician // wind turbine
 inspection technician // on-shore wind turbine
 inspection technician // wind plant technician //
 on-shore wind turbine repair technician //
 windfarm worker m,f,n) // wind turbine worker //
 offshore wind turbine worker // wind energy
 installer // wind turbine maintenance technician //
 off-shore wind turbine maintenance technician //
 wind turbine array worker // off-shore wind
 turbine inspection technician

Wind turbine technicians maintain and repair wind turbines by performing diagnostic inspections, analysing faults, and performing repair duties. They ensure the wind turbines operate in compliance with regulations, and assist the wind engineers in the construction of wind turbines. Wind turbine technicians may also test and install hardware and software components of wind turbines.

7412

Essential

knowledge

electrical power safety regulations
electricity
electronics
mechanics
types of wind turbines

skill/competence

arrange equipment repairs
ensure equipment maintenance
follow safety procedures when working at heights
inspect wind turbines
install electrical and electronic equipment
maintain electrical equipment
maintain electronic equipment
maintain hydraulic systems
maintain records of maintenance interventions
wear appropriate protective gear

Optional

knowledge

aerodynamics
hardware components
hardware testing methods
hydraulics
renewable energy technologies
technical drawings

skill/competence

assemble electrical components
ensure compliance with electricity distribution
schedule
execute software tests
inspect underground power cables
install hydraulic systems
liaise with engineers
oversee pre-assembly operations
provide advice to technicians
provide information on wind turbines
read engineering drawings
repair underground power cables
replace large components
report test findings
resolve equipment malfunctions
write inspection reports

Future

Essential

Big Data

Artificial Intelligence

Collaborative/Autonomous Robotics

Agile human-machine interfaces (HM)

Augmented Reality (AR)

Online inspection and monitoring systems

Predictive and Proactive maintenance

Computerized Maintenance Management

Advanced IT skills and programming

Basic data input and processing

Use of digital communication tools

Basic numeracy and communication

Quantitative and statistical skills

Environmental awareness

Energy efficiency

Platforms for energy management of equipment and plants

Use of drones

Monitoring systems of energy consumption

Knowledge and understanding of international and national standards and legislation

Complex problem solving

Advanced literacy

Process analysis

Critical thinking and decision making

Risk management

Cross-functional process know-how

Continuous learning

Complex information processing and interpretation

Optional

Teamwork skills

Active listening

Appropriate linguistic skills

Data management-safe storage

Sustainable resource management

Resource reuse/recycling

Deep-sea exploration skills

Working in confined spaces/heights

Team living

Advanced first aid and rescue

Teaching and training others

Knowledge and understanding of quality procedures
related to digital transformation

Adaptability and adapt to change

Teaching and training others

Wind energy engineer

<http://data.europa.eu/esco/occupation/1b99cad3-27c6-4e19-83b6-7b5f8338ed2b>

wind energy systems engineer // engineer for wind energy // wind energy technology engineering expert // wind energy technology engineering adviser // wind energy engineering consultant // wind energy engineering expert // wind-turbine engineer // wind energy technology engineer // wind energy technology engineering consultant // wind energy engineering adviser // wind engineer // wind energies engineer // wind turbine engineer // wind energy specialist // wind energy technology engineering specialist // wind power engineer // wind energy engineering specialist

Wind energy engineers design and install wind energy farms and equipment. They research and test locations to find the most productive location, test equipment such as wind-turbine blades, and develop strategies for more efficient energy production, and environmental sustainability.

2149

Essential

knowledge


aerodynamics
civil engineering
electric generators
electrical discharge
electrical power safety regulations
engineering principles
engineering processes
meteorology
mining, construction and civil engineering
machinery products
renewable energy technologies
technical drawings
types of wind turbines

skill/competence

adjust engineering designs
approve engineering design
design wind turbines
develop test procedures
ensure compliance with safety legislation
inspect wind turbines
perform scientific research
provide information on wind turbines
record test data
report test findings
research locations for wind farms
test wind turbine blades
use technical drawing software

Optional

knowledge



skill/competence

assemble electrical components
coordinate electricity generation
design wind farm collector systems
develop strategies for electricity contingencies
monitor electric generators
operate meteorological instruments
oversee pre-assembly operations
promote sustainable energy
provide advice to technicians
respond to electrical power contingencies
review meteorological forecast data
wear appropriate protective gear

Future

Essential

IoT
Big Data
Artificial Intelligence (AI)
Augmented Reality (AR)

Sensors Technology
Machine Learning
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Augmented Reality (AR)
Post-processing
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Equipment and process monitoring & its implementation
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Quantitative and statistical skills
Complex information processing and interpretation
Complex problem solving
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Process analysis
Risk management
Continuous learning
Adaptability and adapt to change
Use of digital communication tools

Optional

Business Intelligence (BI)

Knowledge and understanding of quality procedures related to digital transformation

Leadership and managing others

Financial literacy

Interpersonal skills and empathy

Adaptability and adapt to change

Resource reuse/recycling

Sustainable resource management

Teamwork skills

ERP

Conflict resolution

Active listening

Ethical skills

Advanced communication skills

Waste reduction and waste management

Teaching and training others

Agile human-machine interfaces (HM)

Cyber-physical systems (CBS)

Creativity

Resource reuse/recycling

Interpersonal skills and empathy

Geothermal power plant operator

<http://data.europa.eu/esco/occupation/c3959398-a5d7-4b26-abcf-ef7af87e5822>

geo-thermal plant operator // geothermal power plant operative // geothermal plant operator // geothermal plant worker // geo-thermal power plant worker // geothermal plant operative // geo-thermal plant worker // geo-thermal plant operative // geo-thermal power plant operative // geothermal power plant worker // geo-thermal power plant operator

Geothermal power plant operators operate and maintain equipment, often steam-driven turbines, which produce electrical energy. They monitor measuring equipment to ensure the safety of operations, and that the production needs are met. They also react to system problems, and repair faults. They may regulate the generators to control the flow of electricity to the power lines.

3131

Essential

knowledge

electric current
electric generators
electrical power safety regulations
electricity
geothermal power generation methods
geothermal power plant operations
thermodynamics

skill/competence

apply health and safety standards
control steam flows
maintain electrical equipment
monitor electric generators
monitor valves
operate steam turbine
regulate steam pressure
troubleshoot
wear appropriate protective gear

Optional knowledge

electricity consumption
renewable energy technologies

skill/competence

arrange equipment repairs
coordinate electricity generation
develop strategies for electricity contingencies
ensure compliance with electricity distribution
schedule
ensure safety in electrical power operations
liaise with engineers
maintain records of maintenance interventions
operate forklift
perform minor repairs to equipment
read engineering drawings
replace large components
report on production results
resolve equipment malfunctions
respond to electrical power contingencies

Future

Essential

IoT
Big Data
Artificial Intelligence
Sensors Technology

Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Digital twin
Predictive and Proactive maintenance
Cyber-physical systems (CBS)
Computerized Maintenance Management
Use of digital communication tools
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation
Advanced data analysis and modelization

Essential

Teamwork skills

Active listening

Appropriate linguistic skills

Appropriate linguistic skills

Sustainable resource management

Resource reuse/recycling

Teaching and training others

Knowledge and understanding of quality procedures
related to digital transformation

Adaptability and adapt to change

11

Hydropower engineer

<http://data.europa.eu/esco/occupation/e12f08fb-4748-4388-9489-b647df60332a>

Hydropower engineers research, design and plan the building of facilities that generate electricity from the movement of water. They search optimal locations, conduct trials and try different materials to achieve the best result. Hydropower engineers develop strategies for more efficient energy production and analyse environmental consequences.

2142

Essential

knowledge

CAD software
CAM software
electrical power safety regulations
electricity
electronics principles
energy efficiency
energy transformation
engineering principles
project management
renewable energy technologies
technical drawings

skill/competence

approve engineering design
design electric power systems
draw blueprints
examine engineering principles
manage engineering project
operate scientific measuring equipment
perform project management
perform risk analysis
perform scientific research
promote innovative infrastructure design
troubleshoot
use CAD software
use CAM software
use technical drawing software

Optional

knowledge

automation technology
mechanical engineering
oceanography

skill/competence

inspect facility sites
promote environmental awareness
promote sustainable energy
research ocean energy projects
use personal protection equipment

Future
Essential

IoT
Big Data
Artificial Intelligence (AI)

Augmented Reality (AR)
Sensors Technology
Machine Learning
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Augmented Reality (AR)
Post-processing
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Equipment and process monitoring & its implementation
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Quantitative and statistical skills
Complex information processing and interpretation
Complex problem solving
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Process analysis
Risk management
Continuous learning
Adaptability and adapt to change

Essential

Resource reuse/recycling
Sustainable resource management
Teamwork skills
ERP
Conflict resolution
Active listening
Ethical skills
Advanced communication skills
Waste reduction and waste management
Teaching and training others
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Creativity
Resource reuse/recycling
Interpersonal skills and empathy

Hydropower technician

<http://data.europa.eu/esco/occupation/7ef064b1-aab8-4818-a468-8f17acbfd995>

mechanical engineer, hydropower //
hydroelectric plant technician // marine energy
technician // hydroelectric technician // tidal
power technician // wave power technician //
hydropower mechanical engineer // hydropower
plant technician // hydroelectric mechanical
engineer // hydropower mechanical technician

Hydropower technicians install and maintain systems in hydropower plants. They perform inspections, analyse problems and carry out repairs. They ensure the turbines operate in compliance with regulations, and assist the hydropower engineers in the construction of turbines.

3113

Essential

knowledge

electric generators
electrical power safety regulations
electricity
energy
energy efficiency
energy performance of buildings
energy transformation
engineering processes
environmental engineering
oceanography
renewable energy technologies
technical drawings

skill/competence

adjust engineering designs
apply health and safety standards
design electric power systems
maintain electrical equipment
manage engineering project
monitor electric generators
operate scientific measuring equipment
perform risk analysis
promote innovative infrastructure design
troubleshoot
use technical drawing software

Optional

knowledge

automation technology
mechanical engineering
power engineering
scientific research methodology

skill/competence

conduct engineering site audits
coordinate electricity generation
draw blueprints
ensure safety in electrical power operations
inspect facility sites
maintain records of maintenance interventions
perform minor repairs to equipment
perform project management
perform scientific research
promote environmental awareness
promote sustainability
promote sustainable energy
replace large components
research ocean energy projects
resolve equipment malfunctions
wear appropriate protective gear

Future

Essential

IoT
Big Data
Artificial Intelligence
Collaborative/Autonomous Robotics

Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Basic data input and processing
Use of digital communication tools
Basic numeracy and communication
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Use of drones
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation

Essential

Teamwork skills

Active listening

Appropriate linguistic skills

Data management-safe storage

Sustainable resource management

Resource reuse/recycling

Teaching and training others

Knowledge and understanding of quality procedures
related to digital transformation

Adaptability and adapt to change

Teaching and training others

Hydroelectric plant operator

<http://data.europa.eu/esco/occupation/12938d1a-eeb2-4b1e-a22b-f0bebeadfb73>

hydroelectric power plant technician //
 hydropower plant operator // hydro-power plant
 worker // hydro-power plant operator //
 hydroelectric plant worker // hydro plant worker //
 hydropower plant technician // hydro-power plant
 technician // hydro-power plant operative //
 hydroelectric plant operative // hydropower plant
 operative // hydro plant operative // hydropower
 plant worker

Hydroelectric plant operators operate and maintain the equipment used in the production of energy from the movement of water. They monitor the measuring equipment, assess the production needs, and adapt the water flow to meet these needs. They also perform repairs and maintenance duties.

3131

Essential

knowledge

electric current
electric generators
electrical power safety regulations
electricity
hydraulics
hydroelectricity

skill/competence

apply health and safety standards
maintain electrical equipment
maintain hydraulic systems
monitor electric generators
operate hydraulic machinery controls
operate hydraulic pumps
wear appropriate protective gear

Optional
knowledge

electricity consumption
renewable energy technologies
technical drawings

skill/competence

arrange equipment repairs
coordinate electricity generation
develop strategies for electricity contingencies
ensure compliance with electricity distribution
schedule
ensure equipment maintenance
ensure safety in electrical power operations
install hydraulic systems
liaise with engineers
maintain records of maintenance interventions
provide advice to technicians
read engineering drawings
replace large components
resolve equipment malfunctions
respond to electrical power contingencies

Future

Essential

Artificial Intelligence
Sensors Technology
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Digital twin
Predictive and Proactive maintenance
Cyber-physical systems (CBS)
Computerized Maintenance Management
Use of drones
Use of digital communication tools
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation
Advanced data analysis and modelization

Essential

Teamwork skills
Active listening
Appropriate linguistic skills
Appropriate linguistic skills
Sustainable resource management
Resource reuse/recycling
Teaching and training others
Knowledge and understanding of quality
procedures related to digital transformation
Adaptability and adapt to change

Biochemical engineer

<http://data.europa.eu/esco/occupation/f3e23761-0663-4ae0-97a2-0b2dd3fa38a1>

biochemical engineering specialist // biochemical engineering researcher // biochemical technology engineering expert // biochemical technology engineering specialist // tissue engineer // biochemical process engineer // metabolic engineer // biochemical engineering consultant // biochemical researcher // process development engineer // enzyme engineer // biochemical technology engineering consultant // biochemical engineering expert // biochemical technology engineer // bio-fuel engineer // biochemical engineering adviser // biochemical research engineer // biochemical technology engineering adviser // bio-chemical engineer

Biochemical engineers research on the field of life science striving for new discoveries. They convert those findings into chemical solutions that can improve the wellbeing of society such as vaccines, tissue repair, crops improvement and green technolog

2145

Essential
knowledge

analytical chemistry
biological chemistry
biology
engineering principles
engineering processes
gas chromatography
gel permeation chromatography
genetics
good manufacturing practices
high-performance liquid chromatography
statistical process control
toxicology

skill/competence

adjust engineering designs
advise on manufacturing problems
advise on nitrate pollution
apply liquid chromatography
apply statistical analysis techniques
approve engineering design
develop biochemical manufacturing training materials
document analysis results
ensure compliance with environmental legislation
ensure compliance with safety legislation
examine engineering principles
interpret 2D plans
interpret 3D plans
manage chemical testing procedures
perform scientific research
run laboratory simulations
test samples for pollutants
use chromatography software
use technical drawing software

Optional

knowledge

fermentation processes of food
food materials
food science
food storage
packaging engineering
packaging processes
pharmaceutical chemistry
pharmaceutical drug development
pharmaceutical industry
pharmaceutical manufacturing quality systems
processes of foods and beverages
manufacturing

skill/competence

clinical biochemistry
evolutionary biology
medical laboratory technology
microbiology-bacteriology
pest control in plants
plant disease control
production processes
toxicology
virology

Future

Essential

Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Augmented Reality (AR)
Post-processing

Online inspection and monitoring systems
Equipment and process monitoring & its implementation
Predictive and Proactive maintenance
Computerized Maintenance Management
Basic digital skills
Basic data input and processing
Use of digital communication tools
Knowledge and understanding of quality procedures related to digital transformation
Leadership and managing others
Risk management
Adaptability and adapt to change
Continuous learning
Critical thinking and decision making
Teamwork skills
Basic numeracy and communication
Quantitative and statistical skills
Complex information processing and interpretation
Process analysis
Complex problem solving
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Monitoring systems of energy consumption
Sustainable resource management
Waste reduction and waste management
Resource reuse/recycling
Product life cycle impact assessment
Circular economy
Climate change risk management

Optional

Business Intelligence (BI)

Knowledge and understanding of quality procedures
related to digital transformation

ERP

Teaching and training others

15

Biogas technician

<http://data.europa.eu/esco/occupation/6eb85dd0-1188-4081-bf54-1345fb5de3ca>

biomass gas generation technician // biogas equipment technician // anaerobic digester technician // biogas generation technician // biogas production technician // landfill gas plant technician // biogas equipment maintenance technician // biomass plant technician

Biogas technicians work in the derivation of gas from organic matter and produced as landfill gas or digested gas. They operate equipment in biogas plants, perform tests and maintenance tasks, and take action in the event of a failure.

3133

Essential

knowledge

skill/competence
adapt energy distribution schedules
adjust engineering designs
approve engineering design
carry out energy management of facilities

skill/competence

examine engineering principles
maintain concentrated solar power systems
maintain solar energy systems
manage engineering project
perform scientific research
promote sustainable energy
provide information on solar panels

Optional
knowledge

test wind turbine blades
use technical drawing software
optional
skill/competence
assemble electrical components
coordinate electricity generation

skill/competence

skill/competence
analyse energy market trends
assess financial viability
coordinate electricity generation
design utility equipment
develop electricity distribution schedule
ensure equipment maintenance
inspect industrial equipment
maintain electrical equipment
monitor electric generators
monitor nuclear power plant systems
monitor utility equipment

Future

Essential

Big Data
Artificial Intelligence
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)
Augmented Reality (AR)
Online inspection and monitoring systems
Predictive and Proactive maintenance
Computerized Maintenance Management
Advanced IT skills and programming
Basic data input and processing
Use of digital communication tools
Basic numeracy and communication
Quantitative and statistical skills
Environmental awareness
Energy efficiency
Platforms for energy management of equipment and plants
Monitoring systems of energy consumption
Knowledge and understanding of international and national standards and legislation
Complex problem solving
Advanced literacy
Process analysis
Critical thinking and decision making
Risk management
Cross-functional process know-how
Continuous learning
Complex information processing and interpretation

Optional

Teamwork skills

Active listening

Appropriate linguistic skills

Data management-safe storage

Sustainable resource management

Resource reuse/recycling

Teaching and training others

Knowledge and understanding of quality
procedures related to digital transformation

Adaptability and adapt to change

Teaching and training others

Power production plant operator

<http://data.europa.eu/esco/occupation/72381086-cb6e-455e-a40b-ccb26550aab6>

wind plant operator // electric power station worker // power station operative worker // electricity generation operator // electric power station operator // power station worker // generating station operator // power station operator // biomass plant operator // electricity generating plant operative // power plant operator // electricity generation plant operator // electricity generation plant worker // electricity generation worker // electricity generation operative // electric power station operative // electricity generating plant worker

Power production plant operators maintain and operate the equipment in power stations and other energy production plants. They repair faults, operate machinery directly or from a control room, and handle materials related to electricity production in compliance with safety and environmental procedures. They facilitate interaction between electrical energy facilities, ensuring that distribution occurs safely.

3131

Essential

knowledge

automation technology
electric current
electric generators
electrical power safety regulations
electricity
mechanics

skill/competence

conduct routine machinery checks
ensure equipment maintenance
maintain electrical equipment
maintain power plant machinery
monitor automated machines
monitor electric generators
resolve equipment malfunctions
respond to electrical power contingencies
use remote control equipment
wear appropriate protective gear

Optional knowledge

biomass conversion
electricity consumption
fossil fuels
hydroelectricity
nuclear energy
renewable energy technologies
types of wind turbines

skill/competence

arrange equipment repairs
control temperature
develop strategies for electricity contingencies
ensure compliance with electricity distribution
schedule
ensure safety in electrical power operations
inspect wind turbines
liaise with engineers
maintain records of maintenance interventions
operate automated process control
operate boiler
operate hydraulic machinery controls
operate steam turbine
perform minor repairs to equipment

Future

Essential

IoT
Big Data
Artificial Intelligence
Sensors Technology
Collaborative/Autonomous Robotics
Agile human-machine interfaces (HM)

Agile human-machine interfaces (HMI)

Augmented Reality (AR)

Online inspection and monitoring systems

Digital twin

Predictive and Proactive maintenance

Cyber-physical systems (CPS)

Computerized Maintenance Management

Use of drones

Use of digital communication tools

Quantitative and statistical skills

Environmental awareness

Energy efficiency

Platforms for energy management of equipment and plants

Monitoring systems of energy consumption

Knowledge and understanding of international and national standards and legislation

Complex problem solving

Advanced literacy

Process analysis

Critical thinking and decision making

Risk management

Cross-functional process know-how

Continuous learning

Complex information processing and interpretation

Advanced data analysis and modelization

Optional

Teamwork skills

Active listening

Appropriate linguistic skills

Appropriate linguistic skills

Sustainable resource management

Resource reuse/recycling

Teaching and training others

Knowledge and understanding of quality procedures
related to digital transformation

Adaptability and adapt to change

Electric power generation engineer

<http://data.europa.eu/esco/occupation/58db3ac6-5217-4d46-8a4c-126598be1d13>

production and electric power engineer // gas generation engineer // power plant project engineer // power station engineer // energy generation engineer // control and electric power engineer // quality and electric power engineer // power supply engineer // power generation networks engineer // power generation systems engineer // electric power plant project engineer // electric power station engineer // electric power supply engineer // electricity generation engineer // power plant engineer // electric power plant engineer

Electric power generation engineers design and develop systems which generate electrical power, and develop strategies for the improvement of existing electricity generation systems. They strive to conciliate sustainable solutions with efficient and affordable solutions. They engage in projects where supply of electrical energy is required.

2151

Essential

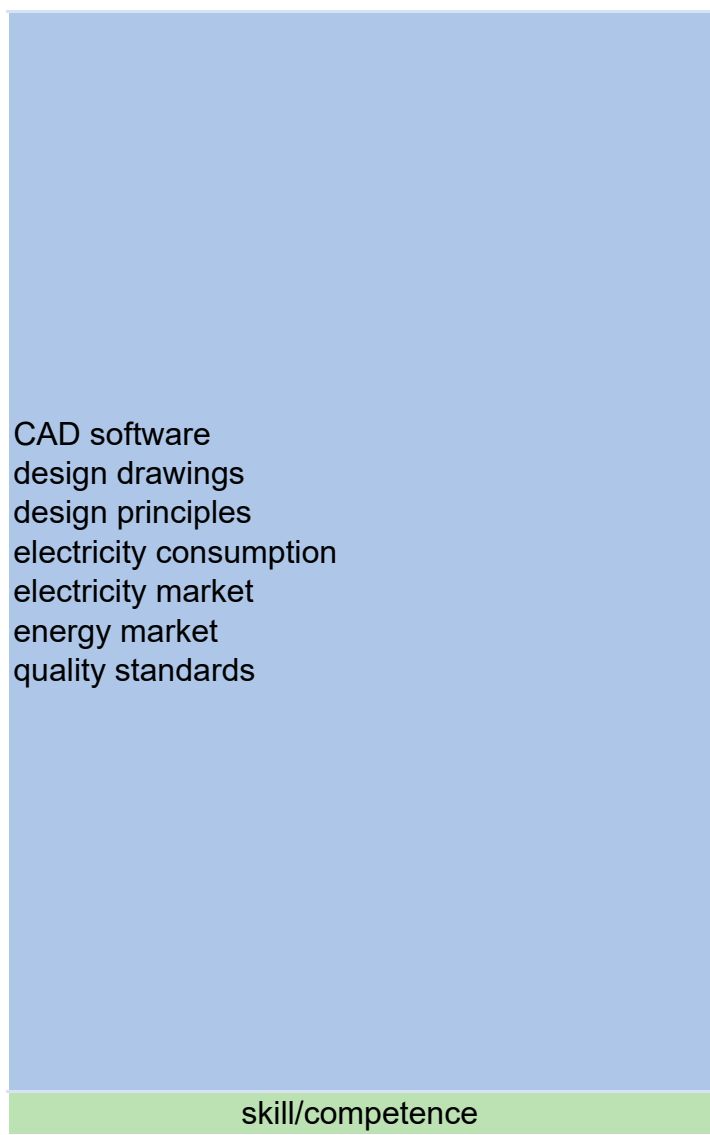
knowledge

electric current
electric generators
electrical engineering
electrical power safety regulations
electricity
energy
engineering principles
engineering processes
renewable energy technologies
technical drawings

skill/competence

adjust engineering designs
approve engineering design
design electric power systems
develop strategies for electricity contingencies
ensure compliance with electricity distribution
schedule
ensure safety in electrical power operations
perform scientific research
promote sustainable energy
respond to electrical power contingencies
shift energy demands
use technical drawing software

Optional
knowledge



CAD software
design drawings
design principles
electricity consumption
electricity market
energy market
quality standards

skill/competence

analyse energy market trends
assess financial viability
coordinate electricity generation
design utility equipment
develop electricity distribution schedule
ensure equipment maintenance
inspect industrial equipment
maintain electrical equipment
monitor electric generators
monitor nuclear power plant systems
monitor utility equipment
resolve equipment malfunctions
supervise crew
wear appropriate protective gear

Future

Essential

IoT
Big Data
Artificial Intelligence (AI)
Sensors Technology
Augmented Reality (AR)

Machine Learning
Cloud Computing
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Digital twin
ERP
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Traceability
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Data management-safe storage
Cybersecurity
Use of digital communication tools
Adaptability and adapt to change
Continuous learning
Complex information processing and interpretation
Complex problem solving
Sustainable resource management
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Quantitative and statistical skills
Process analysis
Cross-functional process know-how
Risk management

Essential

Financial literacy

Advanced communication skills

Teaching and training others

Leadership and managing others

Knowledge and understanding of quality
procedures related to digital transformation

Conflict resolution

Waste reduction and waste management

Teaching and training others

Energy engineer

<http://data.europa.eu/esco/occupation/b2cede50-82bb-4684-9f11-1930e12ad672>

power engineer // energy technology
engineering specialist // energy technology
engineering consultant // energy technology
engineering expert // energy engineering
specialist // energy engineering adviser // energy
technology engineering adviser // energies
engineer // energy engineering expert // energy
engineering consultant // energy technology
engineer // energy efficiency engineer

Energy engineers design new, efficient and clean ways to produce, transform, and distribute energy to improve environmental sustainability and energy efficiency. They extract energy through natural resources, such as oil or gas, or renewable and sustainable sources, such as wind or solar power.

2149

Essential

knowledge

energy market
engineering principles
engineering processes
technical drawings

skill/competence

adjust engineering designs
approve engineering design
perform scientific research
use technical drawing software

Optional
knowledge

automation technology, CAD software, design drawings, design principles, electric current, electric generators, electrical discharge, electrical engineering, electrical power safety regulations, electricity, electricity consumption, electricity market, energy performance of buildings, energy transformation, environmental engineering, environmental legislation, fluid mechanics, fossil fuels, fuel distribution systems, fuel gas, gas consumption, gas market, heat transfer processes, heating, ventilation, air conditioning and refrigeration parts, hydraulics, industrial heating systems, manufacturing of steam generators, mechanical engineering, natural gas, pipeline transport regulations, pollution legislation, pollution prevention, power engineering, quality standards, refrigerants, renewable energy technologies, security requirements of goods transported via pipelines, solar energy, thermodynamics, transmission towers, types of photovoltaic panels, types of pipelines, types of wind turbines, waste and scrap products, wire harnesses, zero-energy building design

skill/competence

adapt energy distribution schedules,adjust voltage,advise on environmental remediation,advise on environmental risk management systems,advise on heating systems energy efficiency,advise on pollution prevention,advise on waste management procedures,analyse energy consumption,analyse energy market trends,analyse experimental laboratory data,assess environmental impact,assess financial viability,calculate solar panel orientation,carry out energy management of facilities,change power distribution systems,conduct engineering site audits,coordinate electricity generation,create AutoCAD drawings,create designs for pipeline engineering,design automation components,design electric power systems,design solar energy systems,design thermal equipment,design utility equipment,develop electricity distribution schedule,develop energy saving concepts,develop environmental remediation strategies,develop gas distribution schedule,develop hazardous waste management strategies,develop non-hazardous waste management strategies,develop strategies for electricity contingencies,develop

Future

Essential

IoT

Big Data

Artificial Intelligence (AI)

Sensors Technology

Augmented Reality (AR)

Machine Learning

Cloud Computing

Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Digital twin
ERP
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Traceability
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Data management-safe storage
Cybersecurity
Use of digital communication tools
Adaptability and adapt to change
Continuous learning
Complex information processing and interpretation
Complex problem solving
Sustainable resource management
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Quantitative and statistical skills
Process analysis
Cross-functional process know-how
Risk management

Essential

Financial literacy
Advanced communication skills
Teaching and training others
Leadership and managing others
Knowledge and understanding of quality procedures
related to digital transformation
Conflict resolution
Waste reduction and waste management
Teaching and training others

Energy systems engineer

<http://data.europa.eu/esco/occupation/1ff61522-8947-4c95-b589-cb0e0539a62b>

energy systems engineering specialist // energy systems engineering consultant // energy conservation systems engineer // energy conversion systems engineer // energy systems engineering adviser // energy systems technology engineer // energy systems technology engineering consultant // energy systems engineering expert // energy distribution systems engineer // distribution system engineer // energy systems technology engineering specialist // energy conservation engineer // environmental research engineer // energy production systems engineer // distribution project engineer // energy transmission systems engineer // energy systems technology engineering adviser // energy system engineer // energy systems technology engineering expert // distribution engineer // energy storage systems engineer // power systems engineer

Energy systems engineers supervise the energy conversion and distribution processes. They analyse the energy supply and consumption efficiency developing new ways to improve the existing processes, taking into account both the technical and the financial aspects. They also study the environmental impact of energy usage and combine the production of renewable energy in the current power systems.

2149

Essential

knowledge

electrical power safety regulations
electricity consumption
energy
energy market
energy performance of buildings
engineering principles
engineering processes
environmental engineering
renewable energy technologies
solar energy
technical drawings

skill/competence

adapt energy distribution schedules
adjust engineering designs
advise on heating systems energy efficiency
approve engineering design
carry out energy management of facilities
design electric power systems
draw blueprints
examine engineering principles
identify energy needs
inspect building systems
manage engineering project
perform risk analysis
perform scientific research
promote innovative infrastructure design
promote sustainable energy
troubleshoot
use technical drawing software

Optional

knowledge

fuel distribution systems
heat transfer processes
heating, ventilation, air conditioning and
refrigeration parts
industrial heating systems
mechanical engineering
power engineering
thermodynamics
types of wind turbines

skill/competence

assess financial viability
conduct engineering site audits
create AutoCAD drawings
design solar energy systems
inspect facility sites
oversee quality control
perform project management
promote environmental awareness
provide information on wind turbines
wear appropriate protective gear

Future

Essential

IoT
Big Data
Artificial Intelligence (AI)
Sensors Technology
Augmented Reality (AR)

Machine Learning
Cloud Computing
Agile human-machine interfaces (HM)
Cyber-physical systems (CBS)
Digital twin
ERP
Communication among components, equipment (M2M), and environment
Online inspection and monitoring systems
Traceability
Computerized Maintenance Management
Advanced IT skills and programming
Advanced data analysis and modelization
Data management-safe storage
Cybersecurity
Use of digital communication tools
Adaptability and adapt to change
Continuous learning
Complex information processing and interpretation
Complex problem solving
Sustainable resource management
Environmental awareness
Energy efficiency
Sustainable resource management
Climate change risk management
Monitoring systems of energy consumption
Platforms for energy management of equipment and plants
Critical thinking and decision making
Product life cycle impact assessment
Quantitative and statistical skills
Process analysis
Cross-functional process know-how
Risk management

Essential

Financial literacy

Advanced communication skills

Teaching and training others

Leadership and managing others

Knowledge and understanding of quality
procedures related to digital transformation

Conflict resolution

Waste reduction and waste management

Teaching and training others