

Mapping Your Future

Building and Maintaining Green Buildings



What are Green Buildings?

Buildings constructed today are very different from those built 25 or 50 years ago. People have become more concerned about sustaining our world in a way that will protect natural resources and be healthier for people. Engineers, architects and those that build, operate and maintain buildings have developed methods that use fewer natural resources. These new environmentally friendly buildings are sometimes called green buildings. Green buildings have become much more common in the last 10 years. Creating these new buildings requires skilled workers who understand new design and construction techniques. Also, most buildings that exist today will stand for many years to come. These existing buildings are being renovated to use less electricity, gas and oil.

Many buildings are also being operated in a green way. This means more recycling, using green cleaning products, and keeping constant track of energy usage.

Building and maintaining green buildings includes such things as:

- Choosing a building's location near public transportation, so people don't have to drive to work
- Designing the building to use natural light as much as possible during daytime hours
- Putting in energy efficient windows that offer good protection from the cold and heat
- Installing heating and cooling systems and appliances that use less energy and water
- Saving water by using recycled ("gray") water instead of drinking water to flush toilets, or using less water per flush

- Installing heat recovery systems that use waste heat instead of mechanical power to warm air or water
- Using non-toxic cleaning products and high-quality vacuum cleaners
- Installing more efficient light bulbs and water faucets
- Using renewable energy, such as solar panels or wind turbines

Employers reported that more than a quarter of construction jobs and building services jobs are green. This means that people who perform these jobs produce goods or deliver services that are saving energy. There are more than 75,000 jobs in green construction and energy efficiency in New York City. Workers who understand green practices and concepts will build and maintain better, higher-performing buildings.

Green is where the new and better jobs are. All city, school and college construction in New York City must be done sustainably. A lot of private sector construction is green. This trend should grow and continue in the future as energy costs and environmental issues are becoming more important.

Sales plays a role in this field also. Someone must sell a solar system before solar panels can be installed on a roof. Someone must communicate with customers about the energy efficiency assistance programs available before people can take advantage of them. The entry-level sales and marketing jobs are often internships, usually but not always paid.

INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED

High School Diploma/ Equivalent and Training

Weatherization Technician/Installer

DUTIES:
Install insulation, doors and windows. May caulk around windows and add sweeps under doors. May also make upgrades to heating and cooling equipment. Requires basic carpentry skills and knowledge of principles of green construction. Also requires attention to detail.

PAY RANGE: \$26,000 to \$53,000 per year

Solar Panel Installer

DUTIES:
Install solar panels on roofs. May also measure, cut, assemble and bolt structural framing and solar modules. Involves work outdoors in all types of weather and at all temperatures.

PAY RANGE: \$36,000 to \$44,000 per year

Construction Laborer

DUTIES:
Perform tasks involving physical labor at construction sites. May be responsible for recycling materials that are removed from a construction site, such as cardboard, metal, brick, concrete, plastic, glass, or tiles. May also perform basic tasks such as caulking and installing insulation to reduce energy usage.

PAY RANGE: \$30,000 to 74,000 per year

Plumber Helper

DUTIES:
Help plumber. May use, supply or hold materials or tools, and clean work area and equipment. Green plumber helpers must understand water conservation and ways to help people use water more efficiently.

PAY RANGE: \$22,000 to \$37,000 per year

Post-High School Certificate, Apprenticeship or Associate Degree

Plumber

DUTIES:
Assemble, install, change and repair pipelines or pipe systems that carry water, steam, air or other liquids or gases. Green plumbers may install systems that harvest rainwater to use in toilets and gardens or low-water or dual-flush toilets. They also connect solar panels used to heat water and install water meters so people know how much water they use.

PAY RANGE: \$37,000 to \$84,000 per year

Electrician

DUTIES:
Install, maintain, and repair electrical wiring and equipment. Make sure that work is done in accordance with codes. Green electricians connect solar panels used for electricity, install electricity meters so that customers are more aware of their energy use, and install Energy Star appliances.

PAY RANGE: \$49,000 to \$100,000 per year

Heating, Ventilation, Air Conditioning (HVAC) Mechanic/Installer

DUTIES:
Install or repair heating, central air-conditioning or refrigeration systems. Heating systems include oil burners, hot-air furnaces and heating stoves. Green HVAC mechanics may replace boilers or chillers with newer energy efficient models.

PAY RANGE: \$34,000 to \$70,000 per year

Carpenter

DUTIES:
Construct, install or repair structures and fixtures made of wood. May also install cabinets, siding, drywall and insulation. Green carpenters have greater knowledge of green building standards and principles. They use local and natural wood, natural carpet fibers and non-toxic glue. They follow proper recycling practices for construction materials. They understand how green construction practices contribute to a healthier indoor environment.

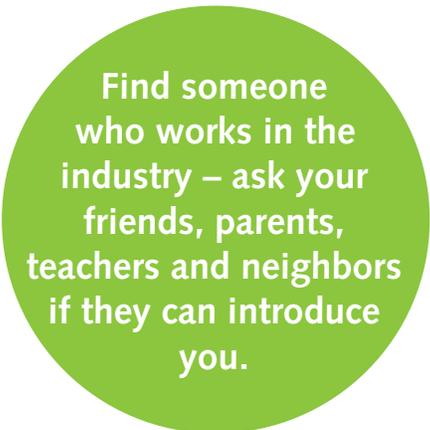
PAY RANGE: \$34,000 to \$70,000 per year

Put Yourself on the Map: How to Use This Brochure

Like any map, this Career Map helps you find your way to new places – in this case, a bunch of careers within one specific industry. (An industry is a loosely defined area of businesses engaged in similar work.) As you read, ask yourself: what different kinds of jobs are there? How could one job lead to the next? Which ones will I like? How much money can I earn, and how long will it take me to get there? What kind of training do I need?

One of the best ways to find a satisfying career is to get clear about your personal interests and strengths. What do you most enjoy doing? What do your friends, teachers, parents say you do best? Do you prefer to work with people, ideas or things? Do you want to be in charge, or work alongside your peers? Which of these jobs will let you be your best?

Once you've found a path that sounds like a good fit, it's time to test it out. Find someone who works in the industry – ask your friends, parents, teachers and neighbors if they can introduce you. Ask if they are willing to talk with you for a few minutes. This is called an "informational interview." You're not asking them to find you a job; you're only asking to listen and learn about their experience. If you ask in a professional manner, many people are happy to speak with you. (If you're nervous about this, ask a teacher, guidance counselor or parent to help.)



**Find someone
who works in the
industry – ask your
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you.**

Before you meet with the person, reread this brochure and write down any questions you have, for example:

- What do you spend your day doing in this job?
- How did you get started in this field?
- How much reading, writing or math do you do in your job?
- How do people dress at the work place?
- Do you have a routine set of tasks you do every day or do you do something different every day?
- Do you work the same schedule every week, or does it change?
- What courses would I take in high school or college to prepare for this job?
- What is my next step after high school if I am interested in this field?
- Where can I find people who can help me learn more about this field?

Make sure to send a thank you note, and in no time you'll be on your way. For more information about this industry and many others, you can visit www.careerzone.ny.gov

INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED

Bachelor's Degree

Energy Auditor/Home Energy Rater

DUTIES:

Compile data on energy use, analyze energy usage and prepare reports on a building's or home's total energy profile. Inspect property to identify cost-effective, energy-saving measures and improvements. May work with energy modeling software to determine energy use patterns. The skills involved in an audit vary depending on a building's size and the complexities of its systems. Knowledge of construction and building operations is critical.

PAY RANGE: \$72,000 to \$87,000 per year

Cost Estimator

DUTIES:

When a new building is being planned, estimate how much it will cost to build. These estimates help architects and owners keep the project within budget. In green construction, there are often added costs for energy-efficient windows or more efficient mechanical and plumbing systems. These added costs during construction may lead to energy savings in operating the building after it is built.

PAY RANGE: \$52,000 to \$101,000 per year

Construction Manager

DUTIES:

Plan, direct or coordinate the construction of buildings and systems. Make sure the work is done the right way, whether it is new construction, renovation, weatherization or installation of solar panels. Green construction managers incorporate sustainability into the design phase of construction, and make sure the trades people who work on the project are trained on green construction requirements and practices.

PAY RANGE: \$69,000 to \$170,000 per year

Civil Engineer

DUTIES:

Plan, design, and oversee construction projects and facilities, including buildings and systems for water supply and sewage treatment. Green civil engineers study the environmental impacts of engineering decisions, minimize environmental impacts and support sustainability goals.

PAY RANGE: \$62,000 to \$105,000 per year

Architect

DUTIES:

Plan and design buildings, such as homes, offices, stores and factories. Green architects include elements of the environment that other people may not think of, such as a building's orientation to the sun. They work closely with other professionals, such as engineers and landscape architects.

PAY RANGE: \$53,000 to \$100,000 per year

Types of Employment

	HOURS/WEEK	SCHEDULE	WAGE/SALARY	PAYMENT	COMMON BENEFITS
Full-Time	Usually 35+	Steady	Annual	Weekly or bi-weekly	Paid sick leave, vacation time, health insurance, retirement savings
Part-Time	Usually <35	May vary	Hourly	Weekly or bi-weekly	Usually none
Temp	As needed by employer	May vary	Hourly	Weekly or bi-weekly	Usually none
Per Diem	As needed by employer	Daily or Per Shift	Hourly	Weekly or bi-weekly	Usually none
Self-employed aka Freelance	Varies	Varies	Negotiate rate of pay with client	Upon completion of work or on a schedule of deliverables	None: must pay own taxes and health insurance
Union			Typically higher than comparable non-union positions		As negotiated by the union with the employer on behalf of members

What are some sample career paths that people can follow?

Industry experts say that people move up based on their technical ability and their social and workplace skills. The better they perform in their jobs and the more they excel, the more likely they'll be promoted. Within the solar industry, people move from roofer to solar installer, from the field to the office and then to being a supervisor. To move up from being a construction worker to a construction manager, a person needs a college degree.

There are career pathways in building maintenance within residential buildings, from porter to doorman or handyman, and then potentially to building superintendent. Many of these jobs are covered by labor union agreements. To take advantage of these pathways individuals need additional technical, communication, and interpersonal skills. It helps to know green practices in building maintenance.

Resident or property managers often have trade or technical backgrounds while others may have studied architecture or engineering. There are very few specific degrees for property management—much must be learned on the job.

Sales and marketing jobs require both good people skills and good technical skills about sustainability. There are programs that combine both of these for people with a passion for green.

For more information on careers in this industry:

<http://www.greencareersny.com/>

<http://gpro.org/>

<http://www.labor.ny.gov/youth/green-jobs.page>

<http://www.1000supers.com>

<http://www.nyserda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Green-Jobs-Green-New-York/Workforce.aspx>

For information about the DOE CTE Programs:

<http://schools.nyc.gov/ChoicesEnrollment/CTE/Parentsandstudents/default.htm>

<http://CTECouncil.org>

Where can I get additional general information on careers?

For careers in New York State: www.careerzone.ny.gov

For general career information, including videos of nearly 550 careers: www.acinet.org

For general career information: www.bls.gov/k12/

Office of Postsecondary Readiness (OPSR)
New York City Department of Education
52 Chambers Street
New York, NY 10007

INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED

High School Diploma/ Equivalent	Post-High School Certificate, On-the-Job Training or Associate Degree	Bachelor's Degree or Extensive Experience
<p>Janitors, Cleaners, and Porters</p> <p>DUTIES: Keep buildings in clean and orderly condition. Use green cleaning products. May perform routine maintenance activities. Responsible for separating recyclables such as paper, newsprint, cardboard, glass, metal, and plastic according to NYC recycling law.</p> <p>PAY RANGE: \$20,000 to \$39,000 per year</p>	<p>Handyperson</p> <p>DUTIES: Fix leaky faucets, replace inefficient light bulbs, install low-flow faucets, and replace old parts. May also keep machines, equipment, and the structure of a building in good condition. These simple, cheap, and effective strategies make a building more energy-efficient.</p> <p>PAY RANGE: \$27,000 to \$50,000 per year</p> <p>Stationary Engineer/ Boiler Operator  (also called Operating Engineer in NYC)</p> <p>DUTIES: Control and maintain equipment that is used to generate heat, air conditioning, and/or electricity in all types of buildings. Make sure that equipment is operating properly. May require knowledge of building automation systems, which are computerized networks designed to monitor and control a building's mechanical and lighting systems to use less energy.</p> <p>PAY RANGE: \$54,000 to \$87,000 per year</p> <p>Building Controls Systems Technician</p> <p>DUTIES: Inspect, maintain, repair, and replace building mechanical and electrical systems including building automation control systems. Requires understanding of building systems plus advanced skills in programming, networking, and systems integration. Building management systems are used to monitor and manage energy usage.</p> <p>PAY RANGE: \$63,000 to \$77,000 per year</p>	<p>Building Superintendent</p> <p>DUTIES: Maintain a building's good physical condition. Make sure machinery and building systems operate efficiently and smoothly. May supervise other staff in the building. A "Green Super" also knows about measuring energy usage, analyzing water-saving techniques, recycling, green cleaning, and energy-saving appliances. Also uses energy-efficient practices, related to heating, ventilation, air conditioning, and lighting.</p> <p>PAY RANGE: \$70,000 to \$86,000 per year</p> <p>Resident Manager</p> <p>DUTIES: Make sure the property or building operates smoothly, looks nice and keeps its value. Green resident managers oversee the maintenance of multifamily residential buildings and maintain energy and water efficiency; schedule and coordinate repairs of building systems by outside experts; communicate with maintenance staff to identify patterns in energy use and propose building-wide solutions; and identify incentive programs that can help pay for building energy efficiency upgrades.</p> <p>PAY RANGE: \$57,000 to \$130,000 per year</p> <p>Mechanical Engineer </p> <p>DUTIES: Oversee installation, operation, maintenance, and repair of equipment such as centralized heat, gas, water, and steam systems. May be responsible for making sure that building systems are operating the way they are supposed to and in sync with one another, so that there are more energy savings and that other green standards are being met. Mechanical Engineering requires specialized education at the bachelor's degree level.</p> <p>PAY RANGE: \$59,000 to \$104,000 per year</p>

INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED



Post-High School Certificate or Associate degree

Clean Tech Marketing Intern

DUTIES:
Assist with development of marketing strategies; design marketing campaign, research specific target markets in clean tech industry; write and edit blog posts.

PAY RANGE: \$21,000 to \$54,000 per year

Auditing, Sales, and Marketing Intern

DUTIES:
Reach out to small businesses in a targeted neighborhood to educate them on the many energy efficiency solutions and incentives available to them. Assist them with a free energy audit and connect them to appropriate agencies, contractors and/or vendors to facilitate implementation of energy efficiency upgrades.

PAY RANGE: \$29,000 to \$71,000 per year

Did you know?

- Green construction and maintenance are the wave of the future in New York City.
- All new city, state and school buildings and major renovations are being built green.
- This field is good for people who like to work with their hands.
- Some jobs combine technical knowledge with sales skills.
- Green skills development is being offered by the NYC Department of Education, unions, non-profit organizations, universities, community colleges and trade organizations.

Who should work in this field?

There are many types of jobs in this industry, and most involve hands-on work and the use of materials like wood, tools and machinery. People who enjoy this work like to work with their hands, and enjoy seeing the results of their work. In construction, a lot of the work is outdoors on building sites. In addition to good hands-on skills, it is also important to have good communication skills. Some of the jobs also require good sales skills in addition to technical skills.

Building and maintaining green buildings requires an understanding of both the principles of sustainability combined with trade-specific green construction knowledge.

Many jobs in this industry, in both construction and building maintenance, are unionized. People who work in unionized jobs generally earn more than people in the same job in a non-union environment.

MAP KEY

 Expected to grow faster than average between now and 2020.

 Licensing or certification required.

Pay Range The pay range reflects typical pay from entry level to experienced. The higher pay takes many years to reach and development of significantly greater skills and knowledge.

Jobs that are primarily part-time are expressed as hourly pay; jobs that are primarily full-time are shown with annual pay. Those that could be either are shown both ways.

Education Minimum education and experience requirements. This may vary from employer to employer.

This flyer highlights jobs in the sector projected to have the same or more openings between now and 2020.