

## Research and Careers in Energy and Environment

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We are looking around us as parts of the world are on fire. Some of us have woken up to orange skies and darkness that looks like night during the day. People have lost their lives to flooding; homes have been destroyed by tornadoes and unprecedented storms. It is becoming clearer that the earth is showing rapid and dramatic signs of upheaval. As the global climate shift is upon us there have been subsequent economic changes as well. In reaction, it is no surprise that one of the most lucrative and fast-growing industries is the ever-evolving "green economy." Careers in sustainability are the name of the game if one is trying to be part of the solution to creating a future for the planet and all of its inhabitants, with an outlook of 105% job growth between 2012 and 2026.

So what are careers in energy and environment? We will get much deeper below, as there are so many careers in sustainability to speak of. Once the options within the green economy are grasped, one can see that there is something for everyone who is interested in growing and using their skills to create a healthier and more viable planet.

#### Air quality engineer

Air quality engineers are critical in these times. Just consider that we have a lot to contend with when it comes to the aftermath of fires and smog from vehicles and factory emissions. These are the professionals that are responsible for the high caliber monitoring practices necessary for developing standards for air equity. They are the ones who perform chemical analysis, statistical analysis, and even computer modeling. They often modify and/ or design

equipment used for pollution control. Many air quality engineers work expressly for government agencies and some of their job responsibilities include tracking the polluters in a given region, enforcing fines, and taking legal action against those who do not comply with such regulations. There are also many experts in this field that are employed privately. In this case, they are the ones responsible for monitoring the emissions often for targeted pollutants and ensuring they are being regulated.

#### Chief sustainability officer

If one is interested in a high ranking executive position, a chief sustainability officer fits the bill. In this career path, such leaders can choose to work within a variety of organizations or corporations. As one can see, there is a six-figure salary attached to this pathway. Their primary objectives and responsibilities are to support companies to work in more sustainable and environmentally friendly ways. They not only develop programs that are in line with these objectives, but they also oversee their implementation amongst volunteers and employees of the companies. They are also responsible for the assessment aspect of the program and reflections of effectiveness. They continue to adapt programming according to assessment outcomes, ensuring that programming is efficient and effective. There are many people in this role nationwide.

#### Conservation scientists

If one loves both science and forestry, this is probably his/her dream job. This is someone who plays a big role in managing the

conservation efforts and activities associated with forestry. These professionals ensure government regulations are being enforced in regard to habitat restoration and protection. They also act as advisors for managers in agriculture. This can include farmers and ranchers. They also monitor land that has been clear cut, ensuring they can be used in the future. Another responsibility of theirs is to determine and understand the quality of soil, especially after the damage has occurred as a result of logging and natural disasters like fires. They use some unique tools to do their jobs well, including clinometers, increment borers, diameter tapes, and bark gauges. They also often use geographic information systems (GIS) and remote sensing, among other tools and resources. Most likely, they show up in the field with global positioning systems and handheld computers.

### Energy analyst

Energy Analysts are complex and in-demand careers. This is one of the careers in sustainability that emphasizes energy and all of the solutions regarding its efficiency. These professionals are data experts. They spend a significant amount of time analyzing data that in many cases they have collected on energy usage. They then develop energy models for buildings and recommend improvements based on their findings. They also support contractors to find technical support for all aspects of the work including installations. They also conduct a variety of tests on the buildings for which they are responsible including blower door tests. Studies show that the majority of people in this field have a bachelor's degree as their highest point of education. There are many working in the field that can prove this fact. Most professionals in this field have found their jobs in the industries of construction and utilities.

### Energy engineer

This position is in high demand, and it is clear that people who have chosen this career path are generally happy. Studies show that seventy percent of energy engineers are happy with their jobs, and sixty percent have stated that they believe their work is meaningful. Energy engineers are responsible for developing, designing, sometimes implementing, and evaluating the projects related to energy efficiency. Their work generally comes into play during the construction stages of building, designing, remodeling, and construction. There are many ways to specialize in this field. Some may choose, for example, to go into HVAC systems, ventilation, lighting, green building, air quality, or procurement of energy. They

are also often the ones who recommend the strategies related to energy saving and efficiency. Additional tasks that they are responsible for include energy auditing, evaluation, and identifying the costs associated with conservation. They also monitor and look deeply at energy consumption using a variety of metrics, many of which they come up with.

### Environmental consultant

Environmental consultants are curious problem solvers who have keen attention to detail and organization. They often hold the hands of organizations and companies as they tackle a large number of environmental issues. This can include green building and manufacturing, environmental disasters, sustainability initiatives, hazardous-waste remediation (disposal and cleanup), renewable energy, compliance, soil quality, water, and air. Environmental consultants also called green consultants and environmental analysts. These positions offer a ladder of growth with many stages of advancement based on experience. The minimum education requirement for this pathway is a bachelor's degree. This is a career path that can be done as self-employed individuals or consultants. In terms of a typical day, many environmental consultants probably start out with several work hours conducted from their home office prior to travelling to various sites where they will then conduct complex environmental investigations.

### Environmental engineers

These professionals are invested in ethics, safety, and quality as they work on small and large projects to optimize environmental site characterization, wastewater treatment, environmental remediation, and overall environmental compliance. There are many opportunities to collaborate in this particular discipline. They often work in concert with other engineers and related professionals to coordinate projects. Additional responsibilities include evaluating, specifying, and selecting products and engineer systems. They also might be responsible for creating comprehensive project proposals. In most cases, they work beneath a senior designer or engineer and within an environmental services team. It is a multi-faceted position with a myriad of little tasks within the job description, including assisting in complex proposal writing. They are often responsible for the construction of models that will be used to look deeply at project specifications.

### Environmental health and safety specialist

Environmental Health and Safety Specialists are responsible for education and consulting with clients to enforce health and safety regulations. They are experts in the health and safety of food sanitation, water, milk, sewage, infectious and hazardous waste, among additional health and environmental hazards. They are also responsible for supporting improvements of sanitation and water facilities within nursing homes, recreational areas, restaurants, schools, and embedded in other public facilities. Basically, they are looking at the necessary improvements that need to be made to heighten the environmental quality of any community site. Some of their daily tasks include collecting and analyzing samples in order to look for public health hazards. They also calibrate and prepare the equipment that will be used for the collection analysis process. In addition, they are charged with the task of monitoring and designing wastewater disposal and well system installations. The other aspects of this position include the management of programs related to toxic waste contamination prevention.

### Environmental project manager

Now, if one is interested in a position that will always have openings, environmental project management might be an excellent career to consider. It appears that there are almost 30,000 job openings for this position right now and a projection of a 5% growth rate. The most common skills that are sought in this career in environmental sustainability include complex problem-solving skills, interpersonal skills including teamwork, flexibility, and creative visioning. Many times one will find these professionals working within the pathway of professional industries and construction. Just under 50 percent of environmental project managers have bachelor's degrees and just over 30 percent have master's degrees, in terms of education. It is clear that many people in this role have moved up the ladder through hands-on work experience.

### Environmental technician

If one is a curious person who loves to utilize his/her technical skills and get their hands dirty, an environmental technician might be the right career pathway. Though a license is required, the minimum education requirement is a high school diploma. There is a ladder to climb here, as many people in this field start out as entry-level environmental technicians and over the course of several years can work their way up in the field from technician

managers to environmental scientists and engineers. These are the people who conduct a myriad of tests and do comprehensive investigations in the field to collect data including soil samples. Their specializations often include water, air, and soil pollution. They are experts in the use of a variety of scientific tools needed to collect samples and effectively conduct investigations. There are currently close to 35,000 environmental technicians in the country, and this career is not going anywhere anytime soon.

### Food scientist

If one interested in improving safety measures and efficiency of agricultural products and the sites where they are manufactured, a food scientist might be the perfect career path. Food scientists have a lot of job responsibilities. Some of these include conducting experiments as they relate to their research regarding improvements to sustainability and productivity of farming practices, farm animals, and field crops. They are often charged with creating new food related products and developing improved processing measures to not only package, but also deliver the goods. They also study the soil and its composition to understand plant growth and make subsequent improvements. They collaborate and communicate research to the scientific community, manufacturers of food, and the communities at large. This position requires a great deal of travel, as they are responsible for moving between the different facilities to ensure new projects are effectively being implemented. They also are the communicators for their findings within the scientific food community.

### Renewable energy consultant

Many people who have invested in this career path majored in topics such as business or finance. The salary is a real perk, as one can see, one can earn nearly 40 dollars per hour on average in this position. Many people in this role have experience working in the business sector and have extensive experience working with finances. Most people that work as renewable energy consultants find careers within the path of the automotive or construction industries. Oftentimes, renewable energy consultants have previous work experience as sales representatives, marketing experts, and environmental specialists.

### Soil and plant scientists

These scientists are the foodies or work within the environmental sustainability sector. As a soil and plant scientist

one will research ways to increase efficiency while improving the safety of agricultural establishments. It is becoming more apparent that while we feed the nations of the world we are also destroying the planet. Soil science helps discover new ways to improve the productivity and sustainability of crops and animals. In this job one is a solo roller, as most soil scientists work on their own developing individual research methods. There are a wide variety of institutions that need soil scientists, including universities and federally funded organizations that monitor the agro industry. There are many ways to get into the field. Professionals in this field have degrees such as a bachelor's degrees in biology, chemistry, botany, and plant conservation. Some advanced degree opportunities are available in agricultural and food science.

### **Sustainability coordinator**

Sustainability Coordinator positions have a wide range of skills and roles. As one of the top careers in environmental management and sustainability, it is in high demand. This career is for the self-motivator, the self-starter, and those with leadership skills. Most entry-level positions in this field are program coordinators and can advance to directors of sustainability. As this is an entry-level position, the pay is modest yet there is a lot of opportunity for growth. What does a sustainability coordinator do? Well, what don't they do? From program implementation to analysis, to marketing, and training, as well as monitoring indicators. This includes electrical usage, water usage, and waste generation. In this role, sustainability coordinators may even suggest and promote new sustainability initiatives, along with managing social media. To become a sustainability coordinator, obtaining a bachelor's degree in environmental studies, sustainability studies, business, and political science degrees.

### **Water resource engineer**

Water is our most precious resource on earth. Water resource engineers are tech-savvy problem solvers with imagination, leadership skills, and interpersonal communication skills. Their primary focus in this role is to lead while incorporating and maintaining new analysis software. As the world begins to try to solve the climate issues of our time, we have to continue to analyze the current condition of our ever-changing waterways. To become a water resource engineer most professionals hold a bachelor's and/or master's degree in environmental engineering, chemical

engineering, civil engineering, or geology. Most professionals in this field start off as senior engineers and advance to project managers. The primary need for these jobs is the implementation and evaluation of new technology to clean and test our potable water.

### **Sustainability analyst**

Sustainable Analysts hold a finger to the pulse of sustainable programs and advancements. They employ a variety of research tools to analyze and make recommendations for corporate sustainability projects and programs. In high demand for this position is a cradle-to-gate life cycle analysis using SimaPro modeling software. Companies especially want Sustainability analysts to have a high proficiency in technology as reducing the carbon footprint is rooted in developing processes around IT. To be an analyst one would have to obtain a bachelor's degree or the equivalent. Generally, professionals on this career path have degrees in Environmental Science, business, Sustainability, and environmental control technologies. Sustainability analyst positions are expected to grow 9 percent in the next 5 years. These jobs aren't always advertised as sustainability analysts. Some job titles to look for are Applications systems analyst, business analyst, functional analyst, and common systems and process analyst.

### **Natural resources specialist**

The earth's greatest gift to its inhabitants are the vast number of natural resources, a natural resource specialist conducts research, collects data and performs field work, in three main areas. These areas include wildlife, forestry, and land management. There are also needs for natural resource specialists, including: fisher biometricians, marine biologists and environmental program coordinators. These positions are usually sorted out by universities or state agencies responsible for ensuring compliance. This career is perfect for individuals with analytical skills, communications skills, and interpersonal skills. A high proficiency in these skills allows for success in this field as they are used to gather information and data to come to a logical conclusion then communicating one's thoughts and feedback to a wide range of groups. To become a natural resource specialist, a sure fire way is by obtaining a bachelor's in environmental science, biology, resource biology or wildlife management.

### **Sustainability specialist**

Sustainability specialists are essential to old and new businesses, as climate change and environmentally regulated products become the population's main concern as consumers. Companies are hiring sustainability gurus to give input in areas such as corporate branding, outreach, marketing and project implementation. They lead teams of sustainability professionals, coordinators and directors. They also have the important job of convincing employees to adopt sustainability into their thinking on all levels of the corporate ladder. Communication is a major skill for these types of professionals, as they need to explain environmental issues to stakeholders. Most sustainability specialists have bachelor degrees in sustainability or environmental science, the key is to be able to explain the science behind sustainability, geography for understanding the environmental impact of commerce and industry. There is a predicted 12 percent growth for this role from 2016 to 2026.

### **Environmental protection specialist**

Environmental Protection Specialists have the tough role of being the scientific buff bodyguards for the earth. These specialists identify the types of pollution humans create and invents ways to prevent, or fix the damage caused by that pollution. It's like forensic files on climate justice; their jobs entail collecting water, oil, food and other types of samples. Analyzing samples to investigate potential environmental threats. Once the date is in, they make detailed reports of their findings and begin the next phase of the job. They also develop plans to irrigate and repair pollution. Environmental protection specialists do this in one of two ways or both, by reclaiming polluted areas, or creating processes to change human behaviour.

### **Career options**

Environmental and Energy research is a broad field of study that includes many of the major hard sciences and engineering, as a result, offers many diverse employment opportunities. The careers discussed below in environmental chemistry, conservation science, and environmental engineering all have hands-on and research components, making it possible for recipients of undergraduate and graduate degrees to find employment in the field.

### **Renewable energy hubs in India**

Tamil Nadu, Telengana, Andhra Pradesh, Karnataka, Gujarat, Rajasthan.