

# Jobs in the Pharma, Biotech, and Green Industries

A Workshop for One-Stop Career  
Professionals



“So, What Job Ideas Do You Have  
for Me?”

Small group activity



# Workshop Outcomes

- Describe the main job families and types of jobs available in the three sectors (pharmaceutical, biotechnology, and Green) and the job outlook for each.
- Identify the resources that a career counselor could use to keep current on developments in these three sectors, and on jobs available in the central New Jersey area in companies operating in these sectors.
- Describe the kinds of transferable skills required to compete successfully for a job in each of the main job families in the three sectors
- Analyze a job description and other relevant information and identify the kinds of transferable skills the position will require.
- Critique a resume for a position in one of the three sectors, and identify areas for improvement.
- Coach a hypothetical candidate in preparation for a job interview in one of the three sectors.



# Workshop Overview

- Jobs and Job Families in the Pharma and Biotech Sectors
- Jobs and Job Families in the Green Sector
- Crafting a Resume for One of These Sectors
- Preparing for an Interview in One of These Sectors

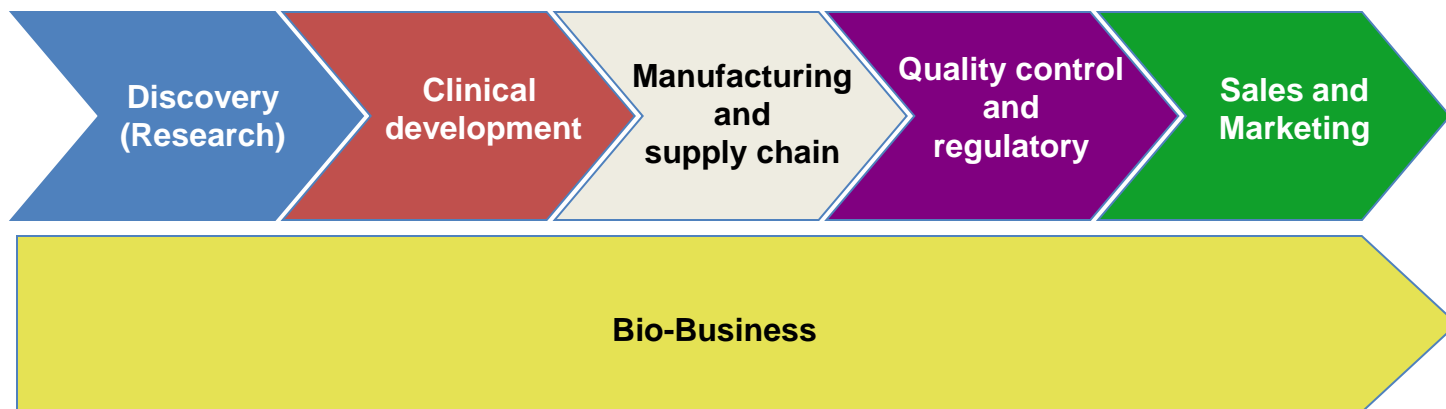


# What Are Pharma and Biotech?

- **Pharmaceutical:** Companies in this sector *use chemical processes* to develop, produce, and market drugs licensed for use in medications.
- **Biotechnology:** Companies in this sector *use biological systems* or living organisms to make or modify processes for a given use. Four main types of products include:
  - Pharmaceuticals
  - Gene therapy
  - Transgenic plants
  - Transgenic animals



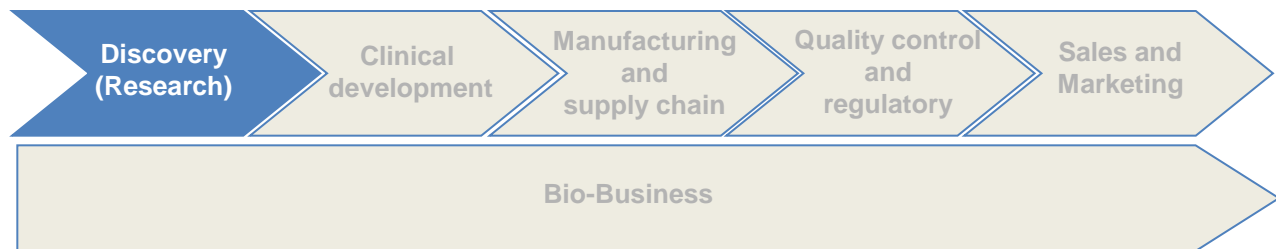
# The Pipeline for New Products (Pharma and Biotech)



Pipeline phase = job family



# Discovery (Research)



- Use basic science to find ideas for new products.
- Conduct experiments and direct research activity to uncover therapeutic potential in biologically active molecules and compounds.
- Includes informatics professionals, who build the technological tools needed to analyze data.
- Most jobs in this family require scientific training.



# Discovery Job Groups

## Research

- Conduct research toward discovering potential new approaches to problems.
- Two main types:
  - Basic research
  - Applied research
- Design and perform research experiments.
- Determine how the results can affect the lives of people throughout the world.

## Informatics

- Build the technological tools to improve the data analysis process for large data sets.
- Use advanced mathematical algorithms and computer science to organize, analyze, and interpret biological information.

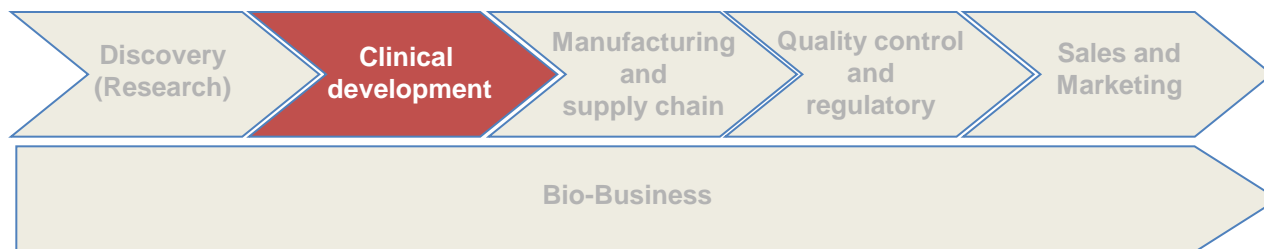


# Discovery Job Examples

Research	Informatics
<p><b>Scientist/pharmacologist</b></p> <p>M.S. or Ph.D. in Biology Salary range: \$60,000 to \$120,000</p>	<p><b>Informatics scientist</b></p> <p>M.S. or Ph.D. in statistics/biostatistics Salary range: \$85,000 to \$110,000</p>
<p><b>Laboratory assistant</b></p> <p>H.S. diploma Salary range: \$25,000 to \$45,000</p>	<p><b>Analyst</b></p> <p>B.S. computer science, mathematics, bioinformatics or molecular biology Salary range: \$25,000 to \$35,000</p>



# Product Development



- Take new product from research to marketability.
- Focus on answering the question: Is this product safe and suitable to be sold?
- Rigorous testing and documentation procedures required.



# Product Development Job Groups

- Medical expert
  - Train clinical staff during testing phase
  - Use their medical expertise to consult with marketing, sales, and regulatory affairs
- Clinical research
  - Carry out clinical trials, analyze data, interpret results
  - Ultimately, recommend whether or not new product should go to market
- Biostatistics
  - Apply advanced statistics to analyze diverse data sets
  - Guide the design of experiments, data collection and analysis
- Medical writer
  - Document clinical trial procedures
  - Develop documents for regulatory approval, scientific journals, conferences, and marketing initiatives
- Clinical trial
  - Recruit participants for clinical trials
  - Work with participants to determine safety and effectiveness of new product

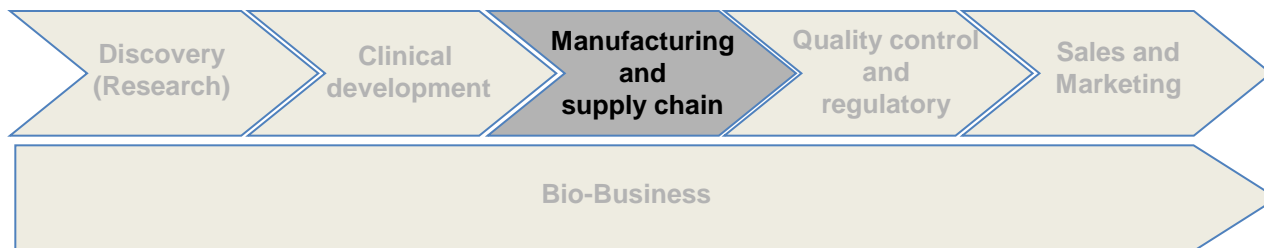


# Product Development Job Examples

Medical Expert	Clinical Research	Biostatistics	Medical Writer	Clinical Trial Recruitment
<p><b>Medical expert</b></p> <p>M.D. or Ph.D. in science \$120,000 - \$200,000</p>	<p><b>Director of clinical research</b></p> <p>M.D. or Ph.D. in science \$150,000 - \$200,000</p>	<p><b>Director of clinical biostatistics</b></p> <p>M.D. or Ph.D. in biological science \$120,000 - \$200,000</p>	<p><b>Protocol development scientist</b></p> <p>R.N. or B.S. or M.S. in biological science \$80,000 - \$120,000</p>	<p><b>Director of clinical projects mgmt.</b></p> <p>B.S. or M.S. in science \$80,000 - \$120,000</p>
	<p><b>Research clinical associate</b></p> <p>R.N. or B.S. in biological sciences \$40,000 - \$80,000</p>	<p><b>Biostatistics associate</b></p> <p>B.S. in biological or biomedical sciences \$48,000 - \$110,000</p>	<p><b>Medical writer</b></p> <p>R.N. or M.S. in science \$80,000 - \$110,000</p>	<p><b>Clinical trial associate</b></p> <p>R.N. or B.S. in science \$40,000 - \$80,000</p>



# Manufacturing and Supply Chain



- Manufacturing
  - Ensure availability of raw materials for various stages of production
  - Ensure that all safety standards are met
  - Develop and apply standard operating procedures and good manufacturing practices
- Supply chain and distribution
  - Package and monitor shipments
  - Ensure compliance with all governmental regulations



# Manufacturing and Supply Chain Job Groups

- Planning and supplier management
  - Monitor market trends that would affect production
  - Manage vendors who supply raw materials for production
- Production and operations
  - Assess test samples, monitor production process, and maintain production equipment
  - Ensure availability of raw materials for every stage of production
- Transportation and distribution
  - Assemble shipments and transport them to customers
  - Ensure that company follows all state laws regarding transportation of pharmaceutical products
- Facilities
  - Maintain plant equipment and space
  - Ensure safety standards are met
  - Provide guidance in establishing standard operating procedures

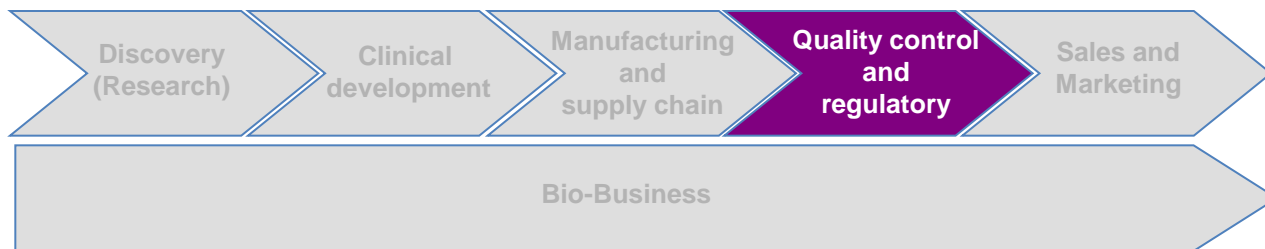


# Manufacturing and Supply Chain Job Examples

Planning and Supplier Management	Production and Operations	Transportation and Distribution	Facilities
<p><b>Director of planning and forecasting</b></p> <p>Ph.D. in science \$150,000 - \$200,000</p>	<p><b>Manufacturing supervisor</b></p> <p>B.S. in science \$80,000 - \$120,000</p>	<p><b>Transportation analyst</b></p> <p>B.S. in business or H.S. diploma \$40,000 - \$80,000</p>	<p><b>Senior engineer</b></p> <p>B.S. in engineering \$80,000 - \$120,000</p>
<p><b>Planner</b></p> <p>B.S. in science \$40,000 - \$80,000</p>	<p><b>Manufacturing technician</b></p> <p>H.S. diploma \$30,000 - \$40,000</p>	<p><b>Warehouse technician</b></p> <p>H.S. diploma \$30,000 - \$40,000</p>	<p><b>Facilities technician</b></p> <p>A.A. or A.S. in mechanical or electrical field \$30,000 - \$40,000</p>



# Quality Control and Regulatory Affairs



- Maintain quality control of products and procedures
- Create, implement, and ensure that procedures are developed based on external regulation and internal policies and procedures
- Ensure that the environment is controlled, equipment is maintained, and facility is well managed
- Act as liaison between company and US FDA.
- Prepare and submit all necessary paperwork to ensure compliance with standards
- Ultimately, ensure that products are safe for consumers



# QC and Regulatory Affairs Job Groups

- **Quality assurance**
  - Establish guidelines for manufacturing processes to minimize defects
  - Manage and participate in review of manufacturing procedures
- **Quality control**
  - Ensure that raw materials, equipment, and processes all meet internal and external standards
- **Validation**
  - Develop, implement, and manage testing plans and methods
  - Ensure that manufacturing processes and products meet regulatory requirements
- **Regulatory**
  - Ensure that both products and processes meet the requirements of all regulatory agencies
  - Ensure that correct procedural documentation is developed and submitted to the appropriate agencies
- **Dispensary/measurement**
  - Scale large quantities of materials down to sizes needed for individual production
  - Measurement experience is required in this job group

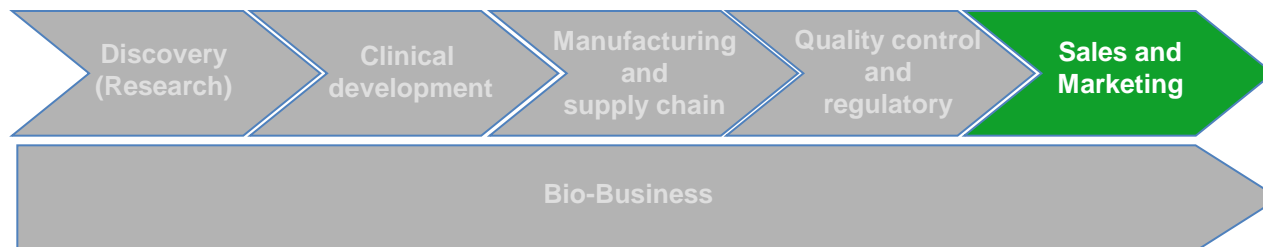


# QC and Regulatory Affairs Job Examples

Quality Assurance	Quality Control	Validation	Regulatory	Dispensary/ Measurement
<p><b>Quality assurance manager</b></p> <p>B.S. in biological or biomedical sciences \$80,000 - \$120,000</p>	<p><b>QC engineer or supervisor</b></p> <p>B.S. or M.S. in engineering \$60,000 - \$120,000</p>	<p><b>Validation director</b></p> <p>B.S. or M.S. in science \$120,000 - \$200,000</p>	<p><b>Manager of regulatory affairs</b></p> <p>B.S. or M.S. in science \$80,000 - \$120,000</p>	<p><b>Senior technician</b></p> <p>Measurement experience \$40,000 - \$80,000</p>
<p><b>Quality assurance documentation administrator</b></p> <p>H.S. diploma \$30,000 - \$50,000</p>	<p><b>QC technician</b></p> <p>H.S. diploma \$35,000 - \$60,000</p>	<p><b>Validation specialist</b></p> <p>B.S. or M.S. in science \$40,000 - \$80,000</p>	<p><b>Regulatory affairs associate</b></p> <p>B.S. in science \$30,000 - \$50,000</p>	<p><b>Dispensary technician</b></p> <p>Experience in measurement \$30,000 - \$50,000</p>



# Marketing and Sales



- Inform medical professionals about products
- Collaborate with researchers and colleagues across other job families to develop sales strategies, identify marketable features, and provide customer support
- May also be involved in:
  - Technology transfer (bringing in ideas for in-house development)
  - Business development (determining new market areas and products to pursue)
  - Competitive intelligence (what the competition is up to)



# Marketing and Sales Job Groups

## Marketing

- Manage marketing budgets, ad strategies, product launches, and product expansion
- Provide ideas for product packaging

## Sales

- Provide technical assistance and information to customers
- Serve as liaison to the medical and scientific communities
- When appropriate, work with managed care organizations to negotiate price and placement on formulary

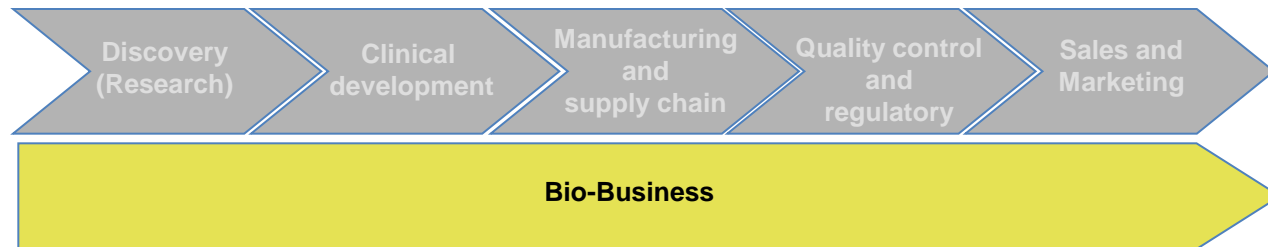


# Marketing and Sales Job Examples

Marketing	Sales
<b>Market research manager</b>  B.S. in Marketing or business, M.B.A. preferred \$80,000 - \$120,000	<b>Medical/clinical science liaison</b>  B.S. in science (biology, chemistry, engineering), M.B.A. preferred \$80,000 - \$120,000
<b>Medical information specialist</b>  B.S. in pharmacy or nursing, or M.S. or Ph.D. \$30,000 - \$70,000	<b>Sales representative</b>  B.S. or M.S. in related discipline (science, marketing, communications) \$30,000 - \$120,000



# Bio-Business



- This job family includes a very broad range of workers who support the “product stream” job families.
- Skills in this job family can transfer from a wide variety of other employment backgrounds.



# Bio-Business Job Groups

- **Communications**
  - Support organizational relations with public and investors
  - Increase public awareness of the company's activities and scientific contributions
- **Information systems**
  - Install, manage, maintain, and support computer systems—both hardware and software
- **Business development**
  - Prepare, negotiate, and manage contracts
  - Identify strategic alliances for future contracts and licenses
- **Finance and accounting**
  - Maintain records of financial operations of the company
  - Track external contracts, employee compensation, and stocks
- **Legal**
  - Provide legal advice and manage contracts
  - File and manage patent applications
- **Human resources**
  - Manage employee relations, compensation, benefits, training, and EEO
  - Provide support to line managers as appropriate



# Bio-Business Job Examples

Communications	Information Systems	Business Development	Finance and Accounting	Legal	Human Resources
<b>Corporate communications manager</b> <b>Investor relations manager</b> B.A. in communications, English, business \$100,000 - \$150,000	<b>Chief information officer</b>  B.S. or M.S. in computer science, IT, business \$150,000 - \$250,000	<b>Business development manager</b>  B.S. in Marketing or business \$80,000 - \$100,000	<b>Finance and accounting manager</b>  B.S. in accounting or finance \$80,000 - \$100,000	<b>Legal counsel</b>  Law degree \$150,000 - \$250,000	<b>Human resource manager</b>  B.S. in human resources or related \$80,000 - \$100,000
	<b>Information service technician</b>  H.S. diploma \$40,000 - \$80,000	<b>Contracts administrator</b>  B.S. in business \$50,000 - \$80,000	<b>Financial analyst</b>  B.S. in accounting or finance \$50,000 - \$80,000	<b>Paralegal</b>  B.S. degree \$40,000 - \$80,000	<b>Human resource representative</b>  B.S. in human resources or related field \$40,000 - \$80,000



# Trends in Pharma and Biotech

- Pharma and biotech are merging.
- Demographic trends (aging population) are favorable.
- Record number of patents set to expire.
  - Pressure from generic manufacturers
- Increased government regulation.
  - FDA regulation
  - Health-care legislation
- R&D productivity is declining.
- Strategies to compete include:
  - Mergers and acquisitions (fill the pipeline)
  - Outsourcing (especially of R&D to smaller companies) and cost containment



# Pharma and Biotech in New Jersey

- Pharmaceutical and medical technology sectors employ 60K people and have an impact of \$27B on state economy.
- Modest growth predicted across all functional areas during the next four years.
- More than half the jobs are in corporate administration (32%), sales (10%), and marketing (10%).
- More than 25% of employees have only a H.S. diploma.
- Six high-demand occupations: product manager, clinical scientist, regulatory affairs manager, medical doctor, biostatistician, engineer.
- Recently, more R&D than manufacturing in this area.



# Resources to Stay Current on Pharma and Biotech

- Bio-1 ([bio-one.org](http://bio-one.org))
- John J. Heldrich Center for Workforce Development (information on training and education partnerships)
- Standard & Poor's Industry Surveys (Pharmaceuticals and Biotechnology)
- U.S. Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov))
- Life Science Career Alliance ([www.lscalliance.org](http://www.lscalliance.org))
- American Association for the Advancement of Science ([www.sciencecareers.org](http://www.sciencecareers.org))
- Other job websites include: [biojobblog.com](http://biojobblog.com), [cafepharma.com](http://cafepharma.com), [corante.com/pipeline](http://corante.com/pipeline), [fiercepharma.com](http://fiercepharma.com), [invivoblog.blogspot.com](http://invivoblog.blogspot.com), [blogs.wsj.com/health](http://blogs.wsj.com/health), [industry.bnet.com/pharma](http://industry.bnet.com/pharma), [pharmamkting.blogspot.com](http://pharmamkting.blogspot.com)

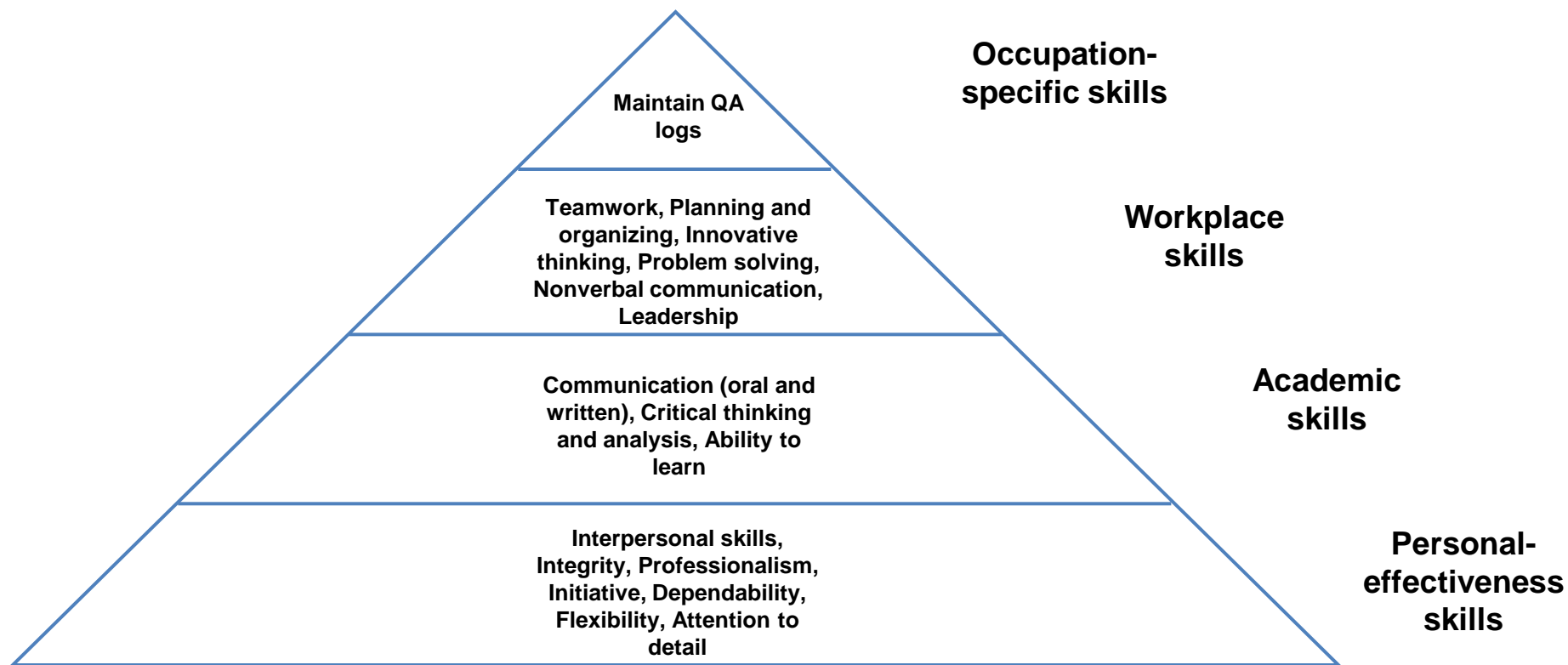


# Transferable Skills in the Pharma and Biotech Sectors

Small group activity



# Transferable Skills: A Typology with Examples



# “Have You Considered a Job in Pharma or Biotech?”

Small group activity



# Workshop Overview

- Jobs and Job Families in the Pharma and Biotech Sectors
- ➔ • Jobs and Job Families in the Green Sector
- Crafting a Resume for One of These Sectors
- Preparing for an Interview in One of These Sectors

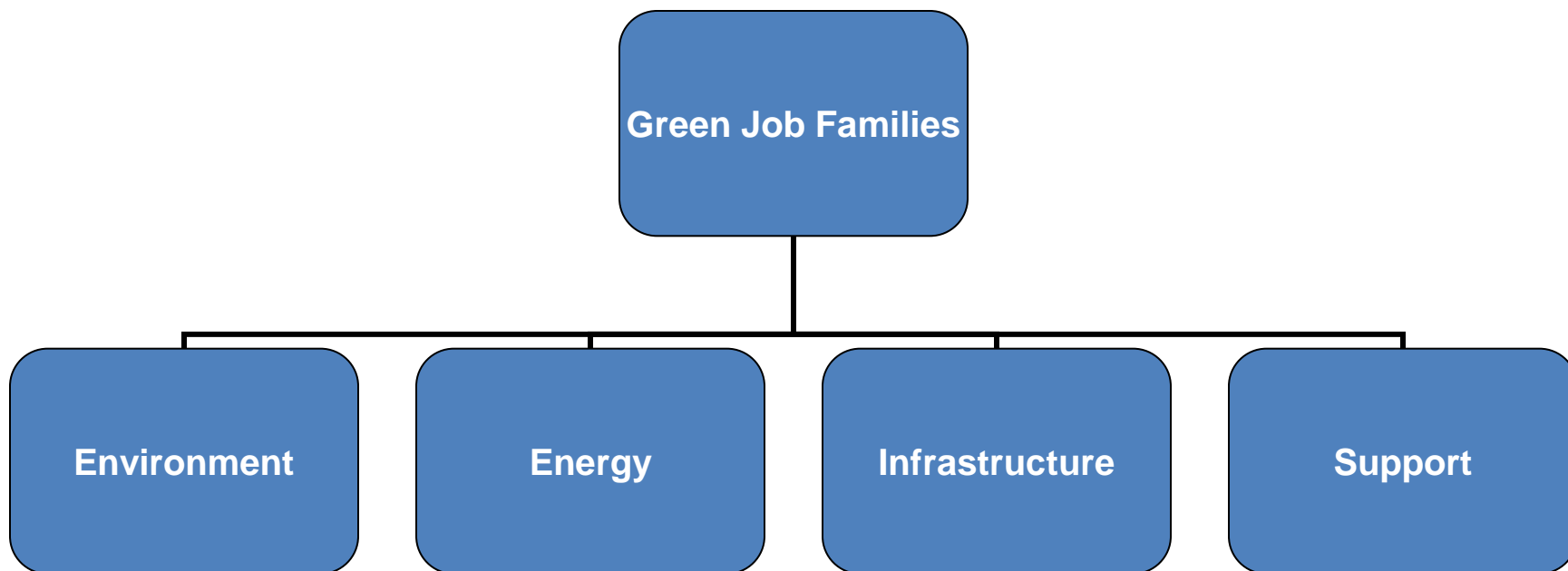


# What Is the “Green” Sector?

- The most comprehensive (and least well defined) of the three sectors.
- “Green” offers both the greatest potential for immediate employment as well as for short- and long-term growth.
- “Green” jobs are those that involve:
  - Protecting wildlife or ecosystems
  - Reducing pollution or waste (recycling)
  - Reducing energy usage, or
  - Lowering emissions (carbon especially)



# "Green" Job Families



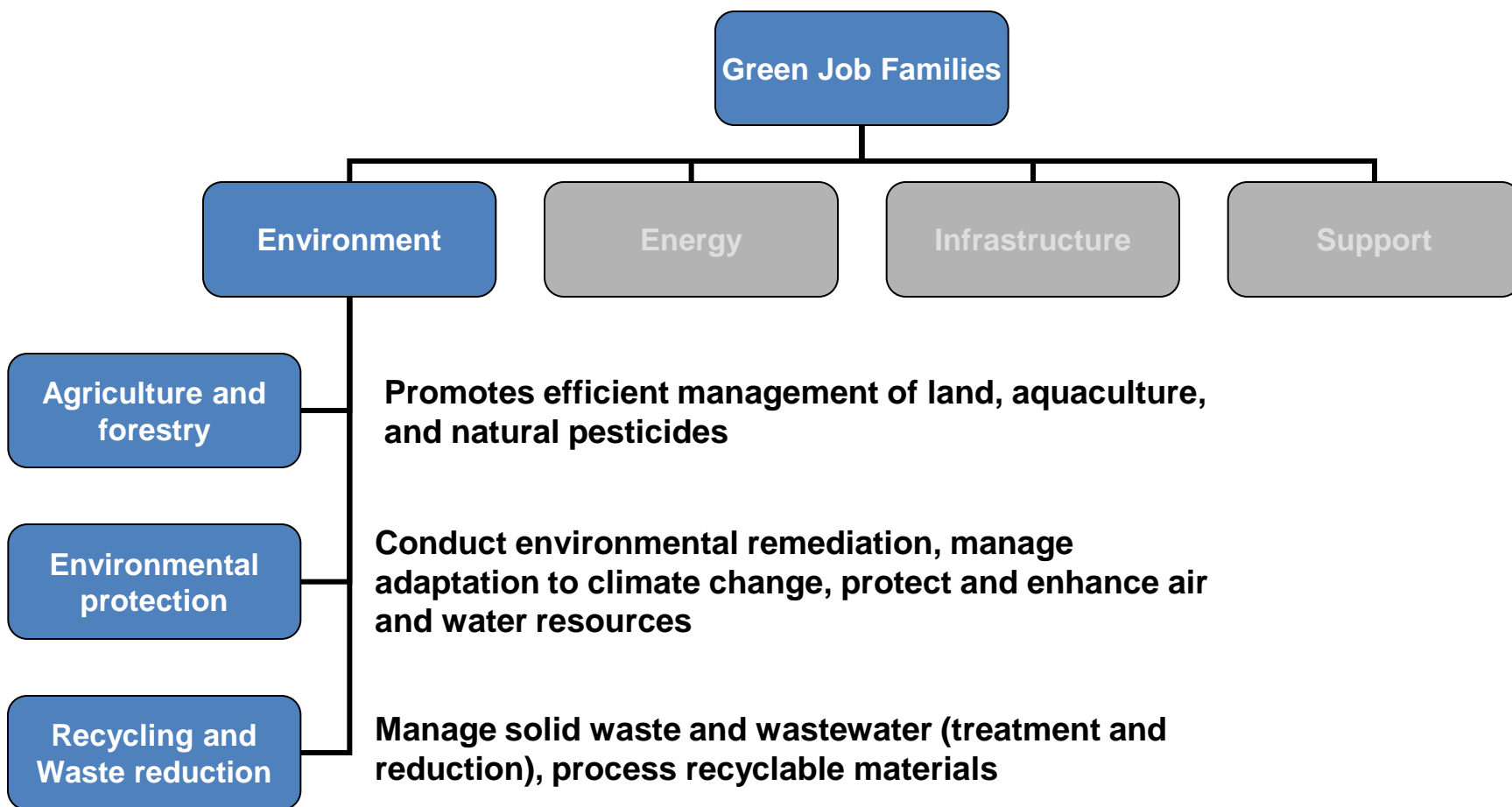
# Three Types of “Green” Jobs

- **Increasing demand** occupations (existing jobs that will be in slightly higher demand because of the Green economy)
- **Enhanced skills** occupations (existing jobs that need to be slightly changed to become Green), and
- **New and emerging** occupations (jobs that did not exist before, but are being created by the new Green economy).

Source: O\*Net ([www.onet.org](http://www.onet.org))



# Environment Job Groups

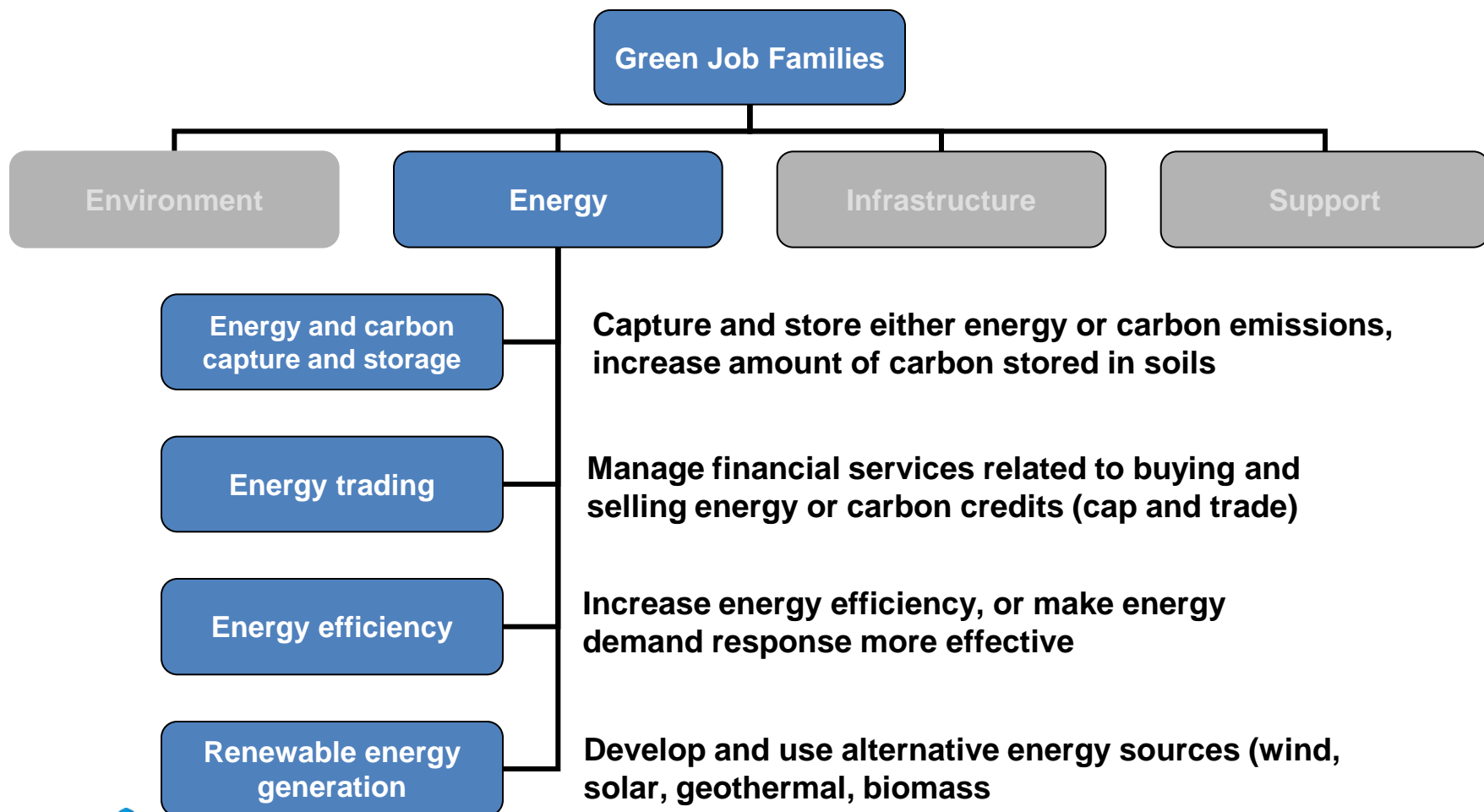


# Environment Jobs: Examples

Agriculture and forestry	Environmental protection	Recycling and waste reduction
<b>Landscape architect</b>  B.S. degree \$60,000 - \$65,000	<b>Environmental engineer</b>  B.S. degree or higher \$74,000 - \$80,000	<b>Recycling coordinators</b>  H.S. diploma or more \$40,000 - \$45,000
<b>Agricultural technician</b>  H.S. diploma \$34,000 - \$47,000	<b>Hazardous removal worker</b>  H.S. diploma \$37,000 - \$57,000	<b>Refuse and recycling material collector</b>  H.S. diploma \$30,000 - \$35,000



# Energy Job Groups

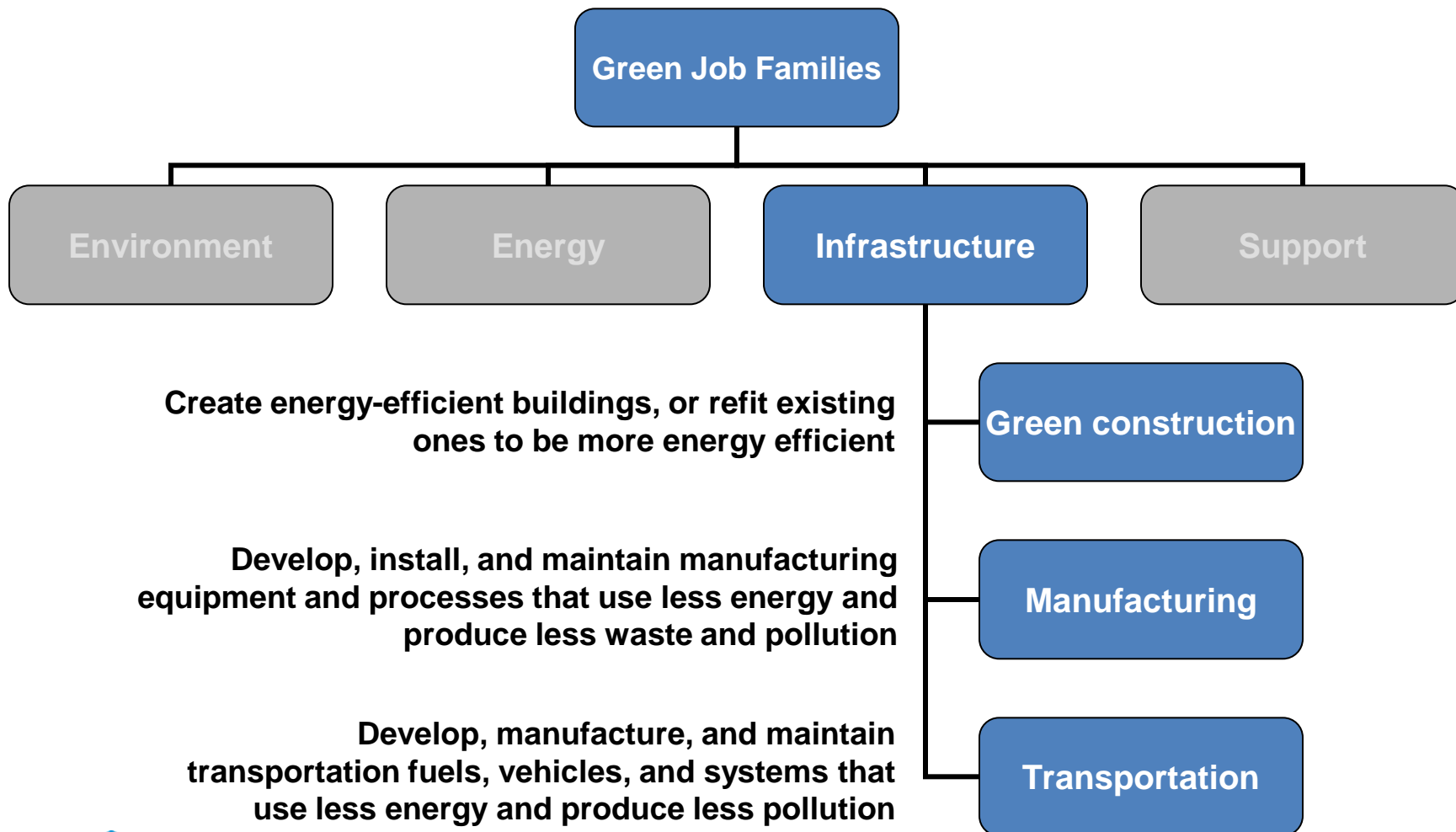


# Energy Jobs: Examples

Energy and carbon capture and storage	Energy trading	Energy efficiency	Renewable energy generation
<b>Electrical engineers</b>  B. S. \$80,000 - \$85,000	<b>Energy brokers</b>  B. S. \$80,000 - \$85,000	<b>Energy auditors</b>  B. S, or equiv. \$60,000	<b>Electrical engineers</b>  B. S. \$80,000 - \$85,000
<b>Power plant operators</b>  B.S. \$60,000		<b>General maintenance and repair worker</b> H.S. diploma \$35,000	<b>Sheet metal workers</b>  H.S. diploma \$40,000 - \$60,000



# Infrastructure Job Groups

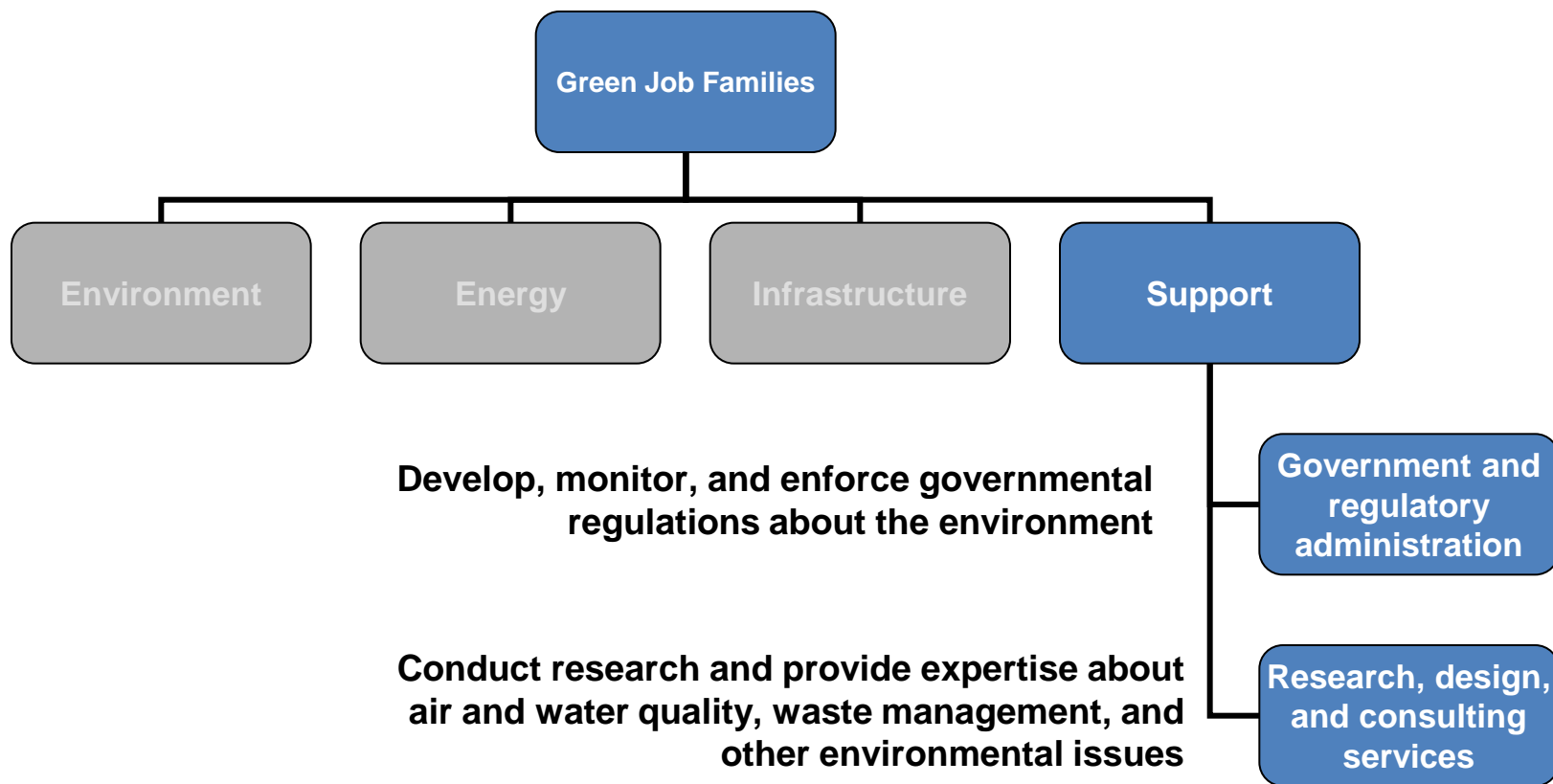


# Infrastructure Jobs: Examples

Construction	Manufacturing	Transportation
<b>Construction manager</b>  H.S. diploma or more \$80,000 - \$95,000	<b>First-line supervisors</b>  H.S. diploma or more \$60,000 - \$70,000	<b>Logistics manager or engineer</b>  B.S. or more \$65,000 - \$75,000
<b>Construction laborer, insulation worker</b>  H.S. diploma \$30,000 - \$45,000	<b>General maintenance and repair worker</b>  H.S. diploma \$35,000	<b>Industrial truck and tractor operators</b>  H.S. diploma \$37,000 - \$45,000



# Support Job Groups



# Support Jobs: Examples

Government and regulatory administration	Research, design, and consulting services
Urban and regional planner  B.S. \$60,000 - \$70,000	Civil engineers  B.S. \$75,000 - \$82,000
Inspectors, sorters, samplers, weighers  H.S. diploma \$30,000 - \$32,000	Electrical and electronics repairer (commercial and industrial)  H.S. diploma \$49,000 - \$52,000



# Five Trends in “Green” Jobs

1. Energy efficiency (building retrofits and smart grids) will provide most “bang for buck” can create larger number of jobs short term.
2. Utility industry is preparing for large number of retirements, at the same time as a sea-change in generating technologies.
3. Community colleges provide excellent access to clean-tech jobs for the economically disenfranchised.
4. Clean-tech manufacturing moves closer to end-user markets.
5. Deployment of smart grid technologies will require enormous amounts of skilled workers.



From *Clean Tech Job Trends 2009*, Clean Edge



# “Green” in New Jersey

- Hiring and short-term training needs are still evolving
- Expected job demands:
  - First wave: residential energy efficiency
  - Second wave: commercial energy efficiency, solar projects, R&D
  - Third wave: wind, biofuels, other renewables
- New York, northern New Jersey, Long Island area is currently number 3 among top U.S. metro areas for clean job activity.



# Resources to Stay Current on “Green”

- O\*Net (onet.org)
- Clean Edge, Inc. (cleanedge.com)
- The Pew Research Center
- Rutgers University
  - Rutgers Energy Institute
  - Center for Energy, Economic, and Environmental Policy
  - Heldrich Center for Workforce Development



# Looking at a Job Through Green-Colored Glasses

Small-group activity



# Have You Considered Going Green?

Small group activity



# Workshop Overview

- Jobs and Job Families in the Pharma and Biotech Sectors
- Jobs and Job Families in the Green Sector
- ➔ • Crafting a Resume for One of These Sectors
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# Crafting a Resume: Some Thoughts

- Analyze job description to identify main transferable skills (personal effectiveness, academic, workplace, and occupation-specific) the job requires.
- Highlight transferable skills in the “Qualifications Summary” section.
- Use quantitative language to describe accomplishments and experience (scientists like numbers).
- Use sector-specific terminology whenever possible.



# Critiquing a Resume

Small-group activity



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# Preparing for an Interview

- Develop a set of behavioral examples of when he or she used each of the key transferable skills.
- Do some basic homework about the hiring company, and prepare their own questions for the interview.



# Behavioral Interview Format

- **Challenge:** What was the work-related challenge you faced?
- **Action:** What did you do to overcome the challenge?
- **Result:** What was the outcome of your action? What did you learn from this experience?



# Doing the Homework

- **Industry research**
  - Industry trends, issues, challenges
  - Industry structure, main competitors
  - Industry statistics
- **Company research**
  - Strategy (what the company counts on to win vs its competitors)
  - Structure (how it is organized)
  - Main product lines
  - Profitability profiles and stock price trends
  - Main challenges in the marketplace



# Getting Ready for an Interview

Small group activity



# Workshop Review

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