



Spotlight: Managers and Analysts

Teacher Manual: Lesson 14

Essential Question

How do analysts and managers contribute to designing and implementing climate solutions?

Learning objectives. Students will be able to

1. Explore how analysts and managers contribute to climate-critical solutions across key technology solutions
2. Identify the skills, training, and experiences needed to work in analyst and management roles in clean energy
3. Discuss which aspects of a career as an analyst or manager are aligned with their skills, interests, and desired work environment.

Lesson Summary

This is one of seven lessons that will highlight specific climate-critical in-demand careers.

The career-specific lessons include:

11. Electricians
12. Engineers
13. Lineworkers
14. Managers and Analysts
15. Construction, Installation, and Maintenance Workers
16. Wind Turbine Technicians
17. Sales and Customer Services Workers

Technology referenced in this lesson:

- Solar
- Wind
- Heating, ventilation, and air conditioning (HVAC)
- Building electrification
- Transportation electrification

Careers referenced in this lesson:

- Project managers
- Program managers
- Sustainability analysts
- Market analysts

Agenda	Timing	PPT Slide	Pre- lesson
Opening Activity	5 minutes	2	
Present agenda and learning objectives	5 minutes	3–5	
Direct Instruction Video Introduce technology Introduce careers	20 minutes	6–12	
Primary Learning Activity Partner or small group work Reinforce what was learned	20 minutes	13–14	
Closing Review learning objectives Closing activity Reflection	5 minutes	15–17	
Extension			
Handouts			
TOTAL TIME	55 mins		

preparation:

- Read the Student Presentation Deck (PPT).
- Watch the video(s) included in the Student Presentation Deck (most are available on the [MassCEC YouTube channel](#)).
- Print the worksheets before the class.
- Verify that the computer hosting the presentation deck is connected to the internet for video and hyperlink viewing.
- Please check any links in the slide deck to ensure they work as intended, and then review the content below.

Where to Learn More About the Lesson's Content

If additional preparation time is available, these resources will provide further background on the topics covered in this lesson.

1. [Massachusetts Clean Energy Workforce Needs Assessment](#): This is a report that describes the most in-demand jobs for reaching MA's 2025 and 2030 climate goals.

Overview and Opening Activity (10 mins)

Materials and resources:

- Slide deck

Opening activity: Get the students thinking and talking right away.

Activity objective: To prompt the students to think analytically to spot trends and hypothesize possible causes; to encourage the students to relate to real-world situations when analysts and managers use datasets to make decisions on clean energy projects.

Introduction:

- Data analysis is a key part of many roles in the clean energy field, including analysts and managers who monitor projects such as solar installations or wind farms.
- Part of data analysis is identifying patterns in the data and determining whether those patterns indicate a potential issue for the project.

Instructions:

- You can conduct this activity as a class or divide the students into pairs or small groups to analyze the data and then come back together for discussion.
- Present the data for a local solar installation. This table shows energy output over the past six days.
- Ask the students to analyze and reflect on the data. Ask them
 - What do you notice about the energy output?
 - Are there any days where the energy output is significantly higher or lower?
 - What do you think might have caused these changes in energy output?
- Encourage the students to share their observations and what steps they took to get to their analysis or conclusions.
- Discuss the possible causes and conclusions and ask the students to hypothesize the reasons behind the changes. Let the students be creative! Examples:
 - Weather changes
 - Equipment issues or maintenance needs
 - Seasonal or daily sun variations
- Explain that identifying patterns and understanding their cause is critical for data analysts and project managers in clean energy. By analyzing data like this, they can spot

issues early and take action to keep the project on track or address any problems before they get worse.

Present the agenda. Students should be familiar with the format:

- After the opening activity, they will learn new information. The main activity helps them apply the new information and lets them practice in the climate-critical occupation. The closing activity helps them synthesize what they learned and helps with knowledge transfer.

Present the big question and lesson objectives:

- Ask the students how they think analysts and managers contribute to designing and implementing climate solutions.
- Explore how analysts and managers contribute to climate-critical solutions across key technological solutions.
- Identify the skills, training, and experience needed to work in analyst and management roles in the field of clean energy.
- Discuss which aspects of a career as an analyst or manager are aligned with their skills, interests, and desired work environment.

Direct Instruction (20 mins)

Provide information to help the students achieve the learning objectives and prepare them to actively engage with the activity.

- Use inquiry-based learning strategies to engage learners where possible.
- Highlight careers related to the technologies.
- Help the learners to relate the learning to themselves and their communities.

Show the video (3–5 mins) and follow it with a brief check-in to hear what students took away.

(video coming soon - Available on the [MassCEC YouTube Channel](#))

Meet a sustainability manager with a construction company that builds environmentally friendly buildings.

Video debrief

1. What surprises or interests you most about this type of analyst work?
2. How does the analysis shown in the video connect to other climate-critical careers discussed in this course?

Manager roles:

- The term manager can describe many different parts of a job and is often used to refer to someone who supervises others.
- In this context, when we talk about managers and analysts, we refer to a specific type of manager.
- We're talking about **project and program managers** rather than people managers in every career path.
- **Project managers:**
 - **Project managers** oversee and organize specific projects, such as installing solar panels on someone's home or building an offshore wind project.
 - **Project managers** organize all the moving pieces so that the inspections are completed on time, the installation crews have everything they need, the customers have the information they require, and everything can run smoothly. They are the conductors.
- **Program managers:**
 - **Program managers** are similar, except they oversee related projects that contribute to larger goals. For example, suppose Massachusetts has a local incentive program to encourage more homeowners to install solar panels. In that case, program managers help launch, organize, and track those projects so that the state has accurate accounts of what has happened, what's working, and what can be improved across its program.
- These roles have many responsibilities and require strong leadership, organization, communication, and problem-solving skills.
- Managers are in high demand in Massachusetts as the state continues to invest in more renewable energy infrastructure.

Analysts:

- Analysts collect and analyze data, identify trends, and make recommendations to improve efficiency and impact in clean energy projects.
- These are two examples of clean energy analyst roles growing in demand in Massachusetts.
- **Sustainability analysts** broadly evaluate energy use and emissions, or sustainability practices, and make recommendations for improvement.
- **Market analysts** research market trends related to clean energy, which can help influence business decisions. For example, when it's clear that consumers care about a

product's carbon footprint or are looking for waste-free packaging, that will help convince organizations to adopt some of these sustainability practices more quickly.

- Therefore, these data-focused roles are essential to helping organizations, communities, and governing bodies make informed decisions.
- They also help companies and communities adapt to changes in energy markets and regulations, which improves the efficiency of clean energy efforts.

Knowledge and Skills

Manager and analyst roles share four common key skills:

- **Communication:** People in these roles need to communicate clearly and effectively with team members, customers, community members, and all kinds of stakeholders and project members. This includes speaking clearly and listening carefully. They also need to communicate well when people are upset, as they may be dealing with difficult situations such as project delays or unexpected situations.
- **Critical thinking:** These roles require problem-solving and strategic decisions. Managers and analysts must exercise sound judgment, even under pressure.
- **Project management:** These roles include planning, organizing, and leading projects. They are great roles for detail-oriented people.
- **Analytical skills:** all of these roles require some level of collecting data, analyzing and understanding that data, and making evidence-based recommendations.
- All of these skills are important to careers in clean energy. They help clean energy projects go smoothly, educate people about the benefits of clean energy, and help them transition to new technologies.

Education and training:

- Explain that most manager and analyst roles require a college degree.
- Some two-year programs for project managers can be a good starting point; however, many positions require a bachelor's or four-year degree.
- Highlight that several project management certifications, such as a Master of Project Management certification, can help you obtain more senior project management roles and potentially higher pay rates.
- Explain that there are similar certificate programs for program managers and certain analysts.
- Point out that there are also programs that specialize in energy management or sustainability for business and focus on business practices that can benefit analysts. Most of those programs last from a couple of months to one year.
- Share the median wages.

Growth Potential

Massachusetts needs nearly 3,000 new manager and analyst positions by 2030 in clean energy to support its climate goals.

Primary Learning Activity (20 mins)

Materials:

- Worksheets

Project Back on Track

Activity Objective: Students will practice data analysis and critical thinking by assessing the status of a clean energy project and creating a plan to address any challenges. They will develop communication and resource-planning strategies that are necessary for success.

Instructions:

- Divide the students into small groups and direct them to their worksheets, which they will use to complete this activity.
- Assign each group one of three possible projects, each with a unique set of challenges:
 - Project A: Community Solar Installation Delays
 - Project B: Offshore Wind Turbine Maintenance
 - Project C: Electric Vehicle (EV) Transit Hub Charging Station
- Instruct the students to work as a group to review the provided information about their assigned project. They must
 - Identify key factors affecting the project (e.g., delays, budget issues, staffing shortages) and determine the current status of the project based on the data
 - Develop a project recovery plan
 - Define a clear goal for getting the project back on track. Examples:
 - For Project A: complete solar panel installation by April 15 within a revised budget
 - For Project B: repair the high-priority turbines within two weeks and maintain production levels
 - For Project C: complete the charging station set up by March 20 with minimal impact on nearby businesses
 - Name clear actions needed to achieve their defined goal
 - Describe a communication plan, clearly stating who they will communicate to and how

- Identify any resources required (budget adjustments, additional labor, access to equipment, etc.)
- Encourage students to think critically about the cause of each delay and consider alternative strategies—problem-solving and creative thinking are essential project management skills!
- After 10–12 minutes of project planning, ask the groups to present their project plans to the rest of the class.

Presentations and debrief:

There are no right or wrong responses; the goal of this activity is to practice the process of problem-solving and communication.

- Discuss the different approaches that the groups took to manage their challenges.
- Identify any differences between groups that worked on the same projects.
- Encourage the groups to respond to these two prompts on the screen:
 - What was the most challenging aspect when creating your project recovery plan?
 - What did you learn from how other groups approached their project?
- Highlight the importance of adaptability, data analysis, and communication in managing real-world projects.

Summarize key takeaways:

1. Managers are one of the most in-demand roles in clean energy.
2. Communication skills are essential for effective managers.
3. Managers and analysts have similar skill sets but perform different roles.

Differentiations and Adaptations: Learning Activity

For students who prefer visuals, use a dashboard template rather than a written worksheet.

Adaptation: Provide a visual “dashboard” template that displays project status metrics, such as progress percentage, budget use, and staffing levels. Students can use this to understand the scenario better and visually map their recovery plan with graphs or charts.

Goal: To engage learners who understand data more easily when presented visually than in writing by presenting data in a format that is easier to interpret and integrate into their plans.

For students who focus better on hands-on engagement, use role-specific decision cards.

Adaptation: Assign each group member a specific role (e.g., budget analyst, project manager, communication lead). Provide “decision cards” with role-specific prompts (e.g., “As the budget analyst, suggest one cost-saving action”). These cards guide their contributions and ensure balanced group participation.

Goal: To support active engagement and collaboration while encouraging students to approach the problem from different professional perspectives that still fall within the manager and analyst skillset.

Closing Activity (5 mins)

Materials:

- Presentation/slide deck, slides
- Reflection journal or worksheet

Activity objective: To encourage students to reflect on key takeaways and identify areas of curiosity for further exploration.

Skills inventory:

- Ask the students to name one skill or attribute that makes managers and analysts crucial to successful clean energy projects.
- Ask the students to share one skill or trait they possess that would make them a good manager or analyst.
 - *It does not need to be one of the four skills highlighted in this lesson but can be something else they picked up on from the video or the activities.*

Check individual understanding of the learning objectives.

Extensions: If learners are loving this topic and want more . . .

Simulate a Budget Management Challenge

Prompt: Imagine you are a clean energy project manager given a fixed budget to complete a project (e.g., installing wind turbines or solar panels, leading a community education initiative for a new geothermal project). Choose how to allocate funds between labor, equipment, materials, and any unexpected costs. Include trade-offs in your decisions (e.g., hiring more labor might reduce delays but increase total costs). Create a summary or short report explaining your choices.

Goal: To encourage students to explore the financial decision-making aspect of clean energy projects, emphasizing critical thinking and resource prioritization.

Analyze a Real-World Case Study of a Delayed Clean Energy Project

Prompt: Research a real-world clean energy project that faced delays or budget overruns (e.g., an offshore wind farm or a solar array installation). Create a summary or model analyzing the causes of the delay, how they were addressed, and what lessons managers and analysts could learn from the project.

Goal: to help students connect classroom concepts to real-world examples, enhancing their understanding of the challenges and complexities of managing clean energy projects.

Handouts: Group Activity (below)

Project Back on Track

Instructions

You are managing a critical clean energy project for your town, but the project has yet to be completed. Analyze the data provided for your assigned project to identify the cause. Then, use the prompts below to create a plan to get the project back on track. Set a goal for your project, determine a communications plan, and identify any additional resources or adjustments needed to complete this project.

Project Planning Prompts

What underlying challenges caused the delay or delays in your project?

What is your new project goal, and what steps will you take to achieve it?

Who do you need to communicate with, and what do you need to communicate?

What additional resources do you need? What adjustments must be made?

Community Solar Installation

Group 1

You are managing a project to install a community solar array to supply power to several public buildings in the area. The project has encountered delays due to unexpected equipment delivery issues and rising material costs. It is currently behind schedule and over budget. Community members are starting to get angry, and the city has been receiving complaints about disruptions caused by the delay.

Original deadline: March 1 | **Expected completion date:** April 15

- **Cause of delay:** Supplier delays
 - Solar panels were expected in December but delivered in January.
 - Installation was scheduled to begin in February and was delayed until March due to missing components.

Initial budget: \$250,000 | **Current spending:** \$275,000

- **Cost increases:** Rising transportation costs and a 10 percent increase in solar panel prices from the original supplier quote
- **Potential savings:** Alternative supplier with a 5 percent lower cost per panel but an additional two-week delay for orders

Stakeholder feedback:

- **The solar equipment supplier** claims the delays are due to high demand and production constraints.
- **Community representatives** are frustrated by delays and are concerned about losing support for the project.
- **The city officials** are concerned about exceeding the approved budget and will only consider additional funding if there is a clear recovery plan.

Notes:

Offshore Wind Turbine Maintenance

Group 2

An offshore wind farm has several turbines that require urgent maintenance. You have been hired as a maintenance manager to oversee the ongoing upkeep of the turbines, and you are responsible for repair schedules and team assignments. The repair team is currently understaffed, and a parts shortage results in delays.

Maintenance Log:

- **Turbine 1:** Repaired twice in the last month; ongoing issues with gear alignment are causing reduced power output (parts are available from an alternate supplier, but it will take five days to receive them)
- **Turbine 2:** Severe wear on blades; blades need to be replaced immediately to avoid turbine shutdown (the part is expected to arrive in two weeks; faster delivery is available for a 15 percent surcharge)
- **Turbine 3:** Minor wear detected; no immediate maintenance required

Staffing report:

- **Current team size:** Four technicians; typically, six technicians are needed to meet maintenance demands
- **Staff availability:** Two technicians are on medical leave
- **Productivity impact:** Repairs take 30 percent longer due to limited staff

Stakeholder feedback:

- **The equipment suppliers** report backlogs due to the high demand for similar parts across multiple projects.
- **Local government officials** are concerned about the environmental and economic impact of reduced energy production and emphasize the need for urgent staffing solutions.

Notes:

Electric Vehicle Transit Hub Charging Station

Group 3

A new electric vehicle (EV) charging station is being installed at a downtown transit hub. The project has received considerable attention from local press and government officials, so there is a lot of pressure for it to go smoothly. However, issues with permit approvals and site preparation have caused significant delays. The previous project manager has left the project, and you have been hired to get it back on track.

Original project deadline: February 10 | **Expected completion date:** March 20

- **Reason for delay:** Delayed permits and utility line complications
 - Permit approval was delayed by two weeks.
 - Excavation and site prep were paused due to unexpected utility lines. Before work can resume, additional work is required to relocate the utility lines.

Initial budget: \$120,000 | **Current spending:** \$110,000

- **Projected additional costs:** \$15,000 to cover utility line relocation and permits

Stakeholder feedback:

- **The city permits office** reports that additional permit requirements were needed due to utility complications.
- **Local business owners** are concerned about noise and disruption and want assurances that the project will be completed on time.
- **The transit hub operations manager** emphasizes the importance of minimizing disruption to transit hub operations and completing the project promptly.

Notes: