**Subject area/course**: Science/Environmental Science

**Grade level/band**: 9-12

**Task source**: Stanford Center for Assessment, Learning, and Equity (SCALE); author: Susan Schultz

**Renewable Resources**

**STUDENT INSTRUCTIONS**

1. **Task context:**

Your company, AltEnergy International (AEI), is dedicated to achieving a substantial reduction in the combustion of fossil fuels and transforming the global energy system in order to stabilize the climate and increase energy security. AEI was hired to complete a renewable energy source analysis (including cost analysis, benefits, as well as any potential negative impacts) and to produce a public awareness campaign to inform the public and generate support for increased use of renewable energy in your location.

**Your task**

The CEO for AEI has asked each team to select a renewable energy resource – such as solar energy, wind energy, biomass, geothermal energy, hydrogen fuel, nuclear power, or hydroelectric power – that is most practical for the location (a state or other country) of your choice. You will need to select a location that you can research information about its current energy resources and the environmental features of that location. You will need to submit your choice to the CEO (your teacher) for final approval before beginning the task. Once approved, your team will research the specific renewable resource you selected and determine the current use of the renewable resource within the location. Your team will:

* Research the specific renewable resource you have selected using multiple credible sources to determine the benefits and challenges.
* Analyze the feasibility of significantly expanding the use of this type of energy source for the location you have selected.
* Summarize what you have learned from your analysis.
* Prepare a logical and convincing argument with evidence about why this is a feasible alternative energy source for your location. To fully develop your argument, you must justify why your renewable resource is the “best” for your location by providing multiple credible sources of evidence to support your claim. You must also explain and refute any alternative renewable resources using evidence, and identify the limitations of your own argument.

The CEO wants your group to produce a public awareness campaign (this may be a brochure, infomercial, radio spot, or any other campaign) to inform the public and generate support for the use of your recommended renewable energy for your location.

1. **Final product:**

For this task you will need to work collaboratively with a team of students to:

* Investigate a renewable source of energy that will help generate electricity while reducing carbon emissions. Provide some type of diagram or visual to illustrate energy transfer.
* Analyze data to identify the costs and benefits of this renewable resource and cite evidence from at least three credible sources to justify why your renewable resource is the best source of energy for your selected location.
* Prepare a logical and convincing argument with evidence from your research explaining why this is a feasible alternative energy source for your location. To fully develop your argument, you must justify why your renewable resource is the “best” for your location by providing multiple credible sources of evidence to support your claim. You must also explain and refute any alternative renewable resources using evidence, and identify the limitations of your own argument.
* Create a multi-media presentation (infomercial, commercial, song, Prezi, etc.) where you make the public aware of your renewable energy awareness plan, provide details and evidence to support your argument, address potential counterclaims, and be prepared to make your presentation to local citizens.

Individually you will:

* Write an essay to reflect and share what you learned from this task. You will describe the renewable resource that you studied, including:
	+ Evaluating the feasibility of this renewable resource for the location
	+ Identify the potential costs and benefits
	+ Explain how adaptable this energy source is to your selected location
	+ Explain and justify your argument with evidence on the feasibility of this energy source as well as address why other renewable resources would not be the “best” fit
	+ Discuss the limitations of your argument
	+ Share your recommendations for ways to use this energy resource in the location

**ADDITIONAL INFORMATION**

1. **Knowledge and skills you will need to demonstrate on this task:**
* Explain how and why the source of energy reduces carbon emissions.
* Discuss the costs and benefits of the renewable energy studied and its feasibility for use in the selected location.
* Prepare an argument to support the energy source with evidence from your research.
* Conduct research and gather information. At least three credible sources must be cited.
* Analyze evidence and evaluate options in order to make an informed recommendation.
* Design and refine a solution to a complex real world problem based on scientific knowledge, prioritized criteria, and trade-off considerations.
* Prepare a logical and convincing argument with evidence from your research why this is a feasible alternative energy source for your location and demonstrate your ability to address counterclaims.
* Communicate your recommendations clearly, creatively, and effectively using evidence to support your conclusions in a way that will engage the public.
1. **Materials needed:**

When conducting your background research, you will need access to texts and the Internet. You will need access to a computer and software to create a public awareness campaign that includes video, audio, presentation, and/or a billboard.

1. **Time requirements:**

Your teacher will provide the due dates for completing each portion of the task.

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| **Due Date** | **What You Need To Do** | **Product** |
|  | Select and get approved to study a particular renewable resource and location | Multi-media production |
|  | Research the current use of the renewable resource in the location |
|  | Analyze the feasibility of significantly expanding this type of renewable resource in the location—the costs, benefits, and public sentiments |
|  | Prepare an argument supported with evidence on the feasibility of your energy source, explain and refute other renewable resources, and discuss the limitations of your own argument |
|  | Prepare an outline or storyboard of your public awareness campaign |
|  | Get teacher and peer feedback  |
|  | Revise and complete final presentation, video, etc. |
|  | Group presentation  |
|  | Reflection on Learning  | Individual Essay |

1. **Scoring:**

Your work will be scored using the SCALE Scientific Literacy Rubric and the SCALE Effective Communication Oral Presentation Rubric (see both rubrics before beginning the project). You should make sure you are familiar with the language that describes the expectations for proficient performance.