**Maine 2040: A Plan for Maine's Energy Independence and Economic Viability**

**The Project: 250 Total points**

 You and your group are asked to generate two essays for your portfolios:

Essay 1: Write a 1 to 1.5 page argument in favor of *reducing* Maine's dependence on oil as a primary energy source over the next 25 years. You and your partners should develop THREE distinct arguments for why you believe that Maine needs to reduce its use of oil, and each argument should be a separate paragraph in your paper.

Essay 2: You and your partners need to decide whether or not hydroelectric power generation is a feasible way for Maine to wean itself from oil over the next 25 years. Conduct some research on hydroelectric power generation in Maine. What are some advantages to hydroelectric power generation in Maine? What are some disadvantages and concerns about hydroelectric power generation in Maine? Looking at Maine's economy, what impact(s) might dams have on Maine's economy? Write a 1 page argument for or against the construction of new dams as a way for Maine to meet its future energy needs.

 **Essay 1 is worth 50 points. Essay 2 is worth 35 points.** Each essay will be graded based on the following criteria:

- correct sentence structure, proper grammar, appropriate vocabulary usage, and

 spelling

* quality of research
* soundness (logic) of arguments
* clear understanding of issues being discussed
* responding to all questions posed in assignment description
* creativity in generating ideas
* grasp of both local and global consequences of this energy production

**How is Electrical Energy Produced?**

Design and produce **TWO posters** that explain the physics behind electrical energy production. These can be digital or physical documents.

-Document One: Poster providing a simple, basic, visual explanation of the way that electric energy is produced in a “typical” (coal, hydro, wind, tidal, nuclear) electric generator.

-Side Two: Poster providing a simple, basic, visual explanation of the way that electric energy is produced in a solar panel (photovoltaic) generating system.

**Each poster will be worth 25 points** and assessed according to the following rubric:

**Posters 1 and 2: “How is Electrical Energy Generated?”**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Superb Work/Meets Expectations | Satisfactory Work/Mostly Meets Expectations | Unsatisfactory Work |
| Poster is attractive, creative, and organized | 5 | 3 | 1 |
| Poster clearly describes the essential components of device | 5 | 3 | 1 |
| Poster explains BASIC science ideas behind electricity production  | 5 | 3 | 1 |
| Energy conservation is shown: energy input = energy produced | 5 | 3 | 1 |
| Information sources for information/images are cited | 5 | 3 | 1 |

**Poster 3: Incorporating Energy Efficient Principles into Building Design**

What can local home owners and business owners do over the next 20 years to decrease Maine's reliance on oil? **Design and produce a 1 page poster** that identifies THREE energy-saving designs that could be incorporated into new or existing buildings to reduce Maine's energy usage. Additionally, include one on-site method for generating the electrical energy that the building uses. **This poster will be worth 30 points.**

**“Green” Building Poster Assessment Rubric**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Superb Work/Meets Expectations | Satisfactory Work/Mostly Meets Expectations | Unsatisfactory Work |
| Poster is attractive, creative, and organized | 6 | 4 | 1 |
| Energy-saving design is practical and appropriate for Maine's climate  | 6 | 4 | 1 |
| Energy-saving design is practical and appropriate for Maine's climate  | 6 | 4 | 1 |
| Energy-saving design is practical and appropriate for Maine's climate  | 6 | 4 | 1 |
| Energy producing method is practical and appropriate for Maine's climate  | 6 | 4 | 1 |

**Digital Document: Maine's future energy**

**85 points**

As a group, determine which energy source, or sources, (wind, solar, tidal, wood, hydro) is the best option, in your opinion, for Maine's future electrical energy needs. **Create a “digital document”** that summarizes a) where these energy generators would be located in Maine, b) how much electrical energy could be produced with these generators, c) THREE major advantages that you see in utilizing this particular technology, d) ONE potential disadvantage/concern about this type of energy production, and e) who in Maine is currently working on developing and implementing this technology.

Your document can be in any digital format that your group chooses to utilize. Please include the following discussion points:

* Primary locations of generators in the state
* Estimated maximum and average electrical energy production possible
* Three advantages/arguments in favor of this method
* One disadvantage/concern about your energy choice
* Current efforts to develop this technology in Maine
* Information sources that you used in your research

Essentially, you and your partners are being asked to develop a plan-- a reasonable and realistic plan-- that can be implemented over the next 25 years as a way to wean Maine from its dependence on Heating Oil. What I care about, more than anything else, is that your plan is actually realistic and sensible: it needs to be something that could actually happen, and it needs to be something that you can justify with sound arguments and specific factoids of information.

What is the suggested plan that your group is proposing? Include both LARGE scale and SMALL scale (individual home and building) components.

What is the time frame for implementing this plan? What should happen first? Second?? Why??

How do you propose to pay for your plan? Do you want to let private companies bid for ownership of these projects, or do you want the projects to be owned by towns/cities/counties/the State? Do you believe that local/State/Federal tax revenues should be used for any pieces of your proposal?

**Scoring for this component will be all or nothing**: please demonstrate with your product that you have a) learned something over these past few days, and b) you understand that scientists and engineers, like all members of democratic societies, share the burden of trying to work together in order to make sound decisions for the communities that we are parts of.