Energy Policy for the Isle of Navitas

You are the chief energy officer (CEO) of one of three provinces on the Isle of Navitas. The Isle of Navitas is an island about the size of Pennsylvania. It has a population of about 7,000,000 people. Your task is to develop an energy policy for your province. An energy policy is a statement of government policy to address issues of energy development including energy production, distribution and consumption. The energy policy will determine from where the future energy resources in your province will come. **Your mission is to provide sufficient energy for your province, while minimizing the environmental impact.**

The people in each province in the Isle of Navitas require a certain amount of energy each year to maintain their energy consumptive lifestyle. This annual energy need is listed in the second row of the table below. Cambria requires 7,340 Megawatts (MW), Gaul requires 19,200 MW, and Iberia requires 33,900 MW.

In each province, different energy resources may contribute different amounts of energy. The maximum annual (yearly) amount of energy that could possibly be obtained from each energy resource that can contribute to a province's total energy need is listed in the table below. All values are in Megawatts (MW). For example, the maximum amount of tidal energy that could be developed by Cambria each year is 200 MW. Tidal energy can contribute up to 1,000 MW in Gaul and up to 10,000 MW in Iberia each year.

Some energy resources contribute **0 MW** to a province. This means that this energy type does not have a resource in the province. If a province wishes to use that particular energy resource, it must import that resource from a different province. For example, Gaul does not have any oil fields. If Gaul were to use oil as an energy resource, it must import oil from Iberia, the only province that has oil.

Each energy resource has an **environmental impact rating**. The **environmental impact domestic** column in the table below lists the relative environmental impacts (as related to the potential energy produced) for each energy resource if it is acquired and used in the same province. The larger values have greater environmental impacts than smaller numbers in this column. For example, hydropower has the least impact (1). Coal has the greatest impact (200). This means that coal's environmental impact is 200 times greater than the environmental impact of hydropower.

The **environmental impact imported** column in the table below lists the relative environmental impacts for each energy resource if it is acquired in one province and transported for use in a different province. These relative impact values are slightly larger than the values in the **environmental impact domestic** column. This is due to the fact that additional environmental impacts occur with transporting energy across provinces. Furthermore, additional infrastructure is also needed to move energy across provinces.

	Environmental Impact Domestic	**Environmental Impact Imported**	**Cambria**	**Gaul**	**Iberia**
Energy Need (MW)			**7,340 MW**	**19,200 MW**	**33,900 MW**
Energy Resource					
Tidal	2	3	200	1,000	10,000
Hydro	1	2	5,000	12,000	2,000
Solar	8	9	100	1,000	2,000
Wind	4	5	5,000	100	500
Biofuels/Biomass	50	60	200	10	100
Geothermal	2	3	400	100	0
Oil	100	110	0	0	20,000 (50 years)
Gas	60	65	0	0	20,000 (30 years)
Coal	200	250	0	0	50,000 (100 years)
Nuclear	10	11	9,000 (40 years)	0	0

NOTE: Fossil fuels and uranium on the Isle of Navitas have a limited supply. For example, the oil fields will be used up in 50 years at the current consumption rate.

Your task is to:
1. Write an energy policy statement for your province.
2. Create a short presentation of your energy policy statement that will be given at the Isle of Navitas Energy Summit meeting.
3. Present your energy policy to the Isle of Navitas Energy Committee at the Energy Summit meeting.

a. Write an energy policy **statement** that is based on the energy needs of your province, available energy resources, and infrastructure for production and distribution. Your energy policy should maximize the use of renewable energy resources and minimize environmental impact. Address the following questions:

1. What efficient combination of energy resources do you recommend for your province? Include each energy resource and the amount of energy (in MW) that each resource contributes. The total MW needs to be equal to or greater than the energy need for your province. For example, the total MW for Cambria needs to be equal to or greater than 7,340 MW.

   As you consider your energy resources, do your best to select resources that have the **least environmental impact ratings**. Look at the chart on the previous page and make sure that your environmental impacts are kept low. Keep in mind that fossil fuels have larger environmental impacts than sustainable (renewable) resources and imported energy has larger environmental impacts than domestic energy sources.

   If you **import** a resource from another province, specify only the amount (in MW) that you need to import. For example, if your province is Cambria and you wish to import coal from Iberia, you may need to import only 2,000 MW. Therefore you would import only 2,000 MW of coal from Iberia, not the entire Iberia coal supply of 50,000 MW.

2. Describe the locations in your province that you recommend to locate new energy-generating plants. **Be specific**. If you recommend developing a new hydroelectric power plant, be sure to list the name of the river and its specific location. Clearly explain why you would build the energy-generating plants in those locations. For example, in the middle of the Hokey River where there is a steep elevation change would be a good location for a hydroelectric dam.

3. What major transportation infrastructure (**such as existing highways, railroad tracks, pipelines, and grid**) is required for your recommended energy resources? Be sure to describe why such things are needed. For example, if you select coal as an energy resource, you would need highways or railroad tracks to transport coal from a coal mine to a coal-fired power plant. The coal-fired power plant would need to have access to the grid to transport electricity to homes, schools, and businesses.
   If you **import** an energy resource, describe how it will be transported to your province.

   Include **graphics that show the locations of power plants, energy resources,** and **transportation infrastructure** in your policy statement.

4. What are the major benefits (**such as free and unlimited supply, no/little pollution**) of each of your recommended energy resources?

5. What are the **environmental impacts** of each of your recommended energy resources?

6. Provide at least 5 recommendations for energy conservation for the Isle of Navitas. What can citizens do to conserve energy?

b. Develop a **presentation** of your energy policy statement. You will present your energy policy to the Isle of Navitas Energy Committee at the Energy Summit meeting.
Your team will create a short, 5-10 minute PowerPoint presentation that describes why your energy policy provides for the best future energy use for your province. Remember, you are trying to convince the rest of the class that your energy policy is the best policy for the future of the Isle of Navitas. Your presentation needs to be as persuasive as possible. Make claims clearly and support them with **facts** and **evidence from your energy policy statement**.

Guidelines:

- Your PowerPoint presentation must contain a minimum of **6 slides**.
- You should include **graphics of your province that show locations of power plants, energy resources,** and **transportation infrastructure** in your presentation.
- Describe your recommended energy resources and the proposed energy-generating plant locations. It is recommended that you take screenshots from My World GIS that include appropriate data layers that clearly show why you are locating your proposed energy-generating plants in a specific location. You should justify your plant locations during your presentation.
- Discuss the major transportation infrastructure (**such as existing highways, railroad tracks, pipelines, and grid**) required for your recommended energy resources. If you **import** an energy resource, describe how it will be transported to your province.
- Discuss the major benefits (**such as free and unlimited supply, no/little pollution**) of your recommended energy resources.
- Discuss how your recommended energy resources will impact the environment.
- Recommend at least 5 energy conservation ideas for the citizens of the Isle of Navitas.