Sea, Soil and Sky: Renewable Energy on Canada's East Coast

http://www.cbc.ca/player/News/Canada/NB/ID/2664251096/

1. Energy resources are often organized as coming from one of the four spheres of the earth (Atmosphere, Lithosphere, Biosphere and Hydrosphere). To which sphere do each of New Brunswick's potential energy resources belong?

Hydroelectricity	Hydrosphere
Biomass Heating	Biosphere
Wind Power	Atmosphere
Tidal Power	Hydrosphere

2. The video mentioned that one of the disadvantages of wind-power is that you can't rely on the wind blowing regularly. Why is this problematic for relying on wind for electricity production?

Wind energy cannot be stored for when it would be needed. If the wind doesn't blow then there would be no electrical power. Power plants that burn fuel can change the amount of fuel they use to meet demands and hydroelectric dams can open and close their turbine chutes to allow the water to flow. Wind power doesn't have this degree of control.

3. Most of our energy resources are ultimately from the sun. Tidal energy is somewhat unique because the sun contributes very little to the energy of the tides. What is the primary source of energy for the tides?

Tidal energy comes, primarily, from the moon's gravity. As the earth turns and the moon orbs the earth, the gravity of the moon pulls a bulge of water around the earth's surface causing the tides to rise and fall twice a day every day. The sun does this too, but weakly.

4. Burning biomass produces carbon dioxide, a greenhouse gas. However it is still seen as a renewable resource that is "cleaner" and "greener" for the environment than burning fossil fuels. Why might that be?

The plant matter that we burn for biomass can be easily replaced by growing new plants. The photosynthesis performed by these plants uses up the carbon dioxide that was produced by the burning. When we burn coal or oil we have no way of turning that CO_2 back into coal/oil to store underground. So it stays in the atmosphere.

5. Currently New Brunswick relies heavily on hydroelectric dams to produce its electricity.
a) Which of the three alternatives do you think would be the most advantageous to the communities of New Brunswick?

Tidal, Wind and Biomass are all acceptable, see justifications in part B

b) Explain your choice by comparing the advantages and disadvantages of your system with the other two alternatives.

Biomass	**Wind Power**	**Tidal Power**
Advantages -Well Developed Technology -Reliable and able to adapt to changing demands -Plants are a renewable resource that also stores CO_2 through photosynthesis Disadvantages -Does produce CO_2 in the short term -Requires harvesting machines that run on fossil fuels	Advantages -Clean, no CO_2 emission -Cheap, well developed technology -Wind is renewable via warming from the sun Disadvantages -Loud -Visually unappealing -Wind is unpredictable and unreliable	Advantages -Clean, no CO_2 emissions -Tidal energy is renewable via the earth's rotation and moon's gravity -Tides are reliable and regular twice a day -Very effective with New Brunswick's huge tides Disadvantages -New technology, not fully developed -More expensive to implement/no current infrastructure