

MWrite Prompt 2: A Watershed Moment in Energy Storage

You are a consultant working at a renewable energy consulting firm here in Ann Arbor. Your firm works with companies such as DTE and Consumers Energy to help create more renewable and sustainable energy projects around Michigan.

Your boss, Mr. Green, is a marketing wiz, but is not always up to speed on the technical side of the projects. He is on a visit of the Ludington Pumped Storage Plant. He sends you an email saying that it is going well and shares with you an MLive [article](#) from 2011, discussing the 6-year upgrade project that increased the efficiency of the plant (see attached pages if link does not work). Mr. Green is pretty sure that your firm would be able to oversee and advise on the construction of a project that would be very similar to the Ludington Pumped Storage Plant, but he is unsure on how the system completely works.

Later that day, you get a call from Mr. Green.

“Hey, this place is really cool, we should definitely send you out here sometime. Anyway, the reason I called is because while the team here has been great at going over the logistics and, like, the financial aspects of this place, they haven’t really gotten all that technical with me, maybe they don’t think I’ll understand?”

Who knows, but I was wondering if you could have a memo, or something, memo would probably be good. If you could have a memo ready for me when I get back tomorrow. Could ya go over some of the physics behind this sort of facility? I really want to know where this energy is coming from, I mean, I know it’s off the grid, but that’s electricity. How is that supposed to lift the water in the first place, and where does it go after? Is this the ‘moving between systems’ thing you were talking about the other day?

They keep telling me that the energy is stored in this water and the energy system, but what does that even mean? What is the system they are talking about? Then they said the energy could be uh, I think they said ‘lost’? How does this happen, does it like, leak out of the water? I’ve never seen energy leaking out of water. And lost? Where does it go? Last week you were going on and on about how energy couldn’t be created or destroyed, but they are telling me they lost this energy and it’s now gone? Were you serious about that energy conservation stuff, what’s going on here?

I do really like this place though, it’s really nice. Do you think that this is something that is uh, that is sensible for state of Michigan to store energy elsewhere in the state? Where do you think these kind of facilities would work the best?

Hope that’s not too much. I’d really appreciate it if you could do this for me.”

You reply that you will be able to draft a memo that answers all of his questions about the process while explaining the physics behind it. Mr. Green thanks you and hangs up the phone.

In your report be sure to...

- Define the system that the energy is flowing into and out-of, by stating what entities (things) should be included in the system.
- Describe the energy transfers that occur within your defined system.
- Address Mr. Green's concerns about the 'loss' of energy, explain how this is consistent with the Conservation of Energy.
- Close your report with your judgement of whether this type of project is possible and how it might impact the area around it. Include where these projects would work best.

Keep in mind...

- Make sure to convey your physics understanding clearly and precisely
- Do not include your name (to preserve anonymity for peer reviews)
- Stay within 300-500 words
- Write your response to resemble the body of a memo
- Use an appropriate tone of voice for your role and audience
- Outside sources are not needed, but if used, please cite them in a citation style of your choice