

Energy Efficiency Paper

A new area of technology is energy efficiency. This issue is important, not only for climate change issues, but also because computer-embedded devices often run on battery.

Step 1: Sign up for an energy efficiency topic on my web page.

Step 2: Access Information about your Technology

Go to the UWP Library web page and select “Databases” subject area “computer science”.

Select 2 papers from a news or encyclopedia source:

- Environmental, business or general newspapers: Search under environmental or business Databases, including ABI/INFORM Complete.
- News or news magazines: Academic Search Complete Database
- Encyclopedia of Science, Technology, and Ethics

Select 2 papers from a technical, scientific research database. You do not need to understand the full paper. If you can understand what the paper is about, and what the conclusion is, then you are successful.

- IEEE Explore database.
- ACM Digital Library.

Select 2-3 papers (or web pages) from a website.

You will include each of these in your Reference area, and refer to them in your text.

Do not copy long sections from any source (more than a paragraph), but instead paraphrase. In paraphrasing you can summarize, or describe the gist of the section in your own words. **Any substantial cut-and-pastes from other sources and claiming the work as your own will result in a zero for the assignment.**

Step 3: Write the Paper

This paper will have 6 sections:

1. **Introduction:** Define the goal or preferred impact of lower energy consumption. Use statistics or a story to entice into your topic. Discuss the business, political, or societal effects. This could relate to local versus international issues, or barriers to implementation. Discuss the ethical implications using two or more ethical categories. Use 2+ non-technical sources of references, including preferably articles from a social and/or environmental database (not IEEE).
2. **Vocabulary:** Introduce vocabulary and definitions used in the next section. Include at least 5 definitions for new technical words.
3. **Technology Description:** Describe different methods of achieving energy efficiency, through hardware technology. Use IEEE, magazine, and web references to describe three different technological solutions. You may also describe an experiment you did using Kill-a-Watt.

4. **Evaluation:** Describe the tradeoff of one versus the other technique. Why or when would you choose one technique over the other? How do these solutions relate to the ethical arguments you discussed in the earlier sections of the paper?
5. **Conclusion:** Summarize the contribution of this paper. What is the take-home message you would like the reader to consider?
6. **References:** This lists each reference you used in your paper. Refer to the references in your paper as [NameYear], as shown below.

The expected page lengths should be 1+ pages each (single-spaced) for Introduction and Evaluation; 2-3 pages for Technology. The specified page numbers should be doubled for double-spaced.

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Step 4: Turn your paper in

Turn in a copy of your paper within a binder. Also submit your paper in a D2L drop box, in Word or PDF form. Include your partial (2-page) or complete references in the binder or in your drop box.

Step 5: Present a Summary of Your Topic

You may present on either your energy efficiency or security solution as a PowerPoint. This can be done individually, as a pair, or as a trio. You will have per person:

- 1 slide Introduction: Motivation/Society/Environment
- 2 slides: Technology
- 3 content slides or 4 minutes total per person

Using References Correctly

For each section (except Evaluation and Conclusion) be sure to refer to references. You may include text if you put it in quotes and use a reference:

Thomas Friedman, in *Hot, Flat, and Crowded* [Fried08] describes the pollution in China as rampant:

“An American friend in Beijing tells me that every morning he gets up and does his own air quality test - as many Beijing residents do: He looks out his 24-story window and checks how far he can see. On a rare pristine day, ... he can see Fragrant Mountain rising to the northwest. On a ‘good’ pollution day, he can see the China World building 4 blocks away. On a bad day, he can’t see the building next door.”

You may also include figures, but be sure to include a reference:

Fig. 1. Trends in Energy Efficiency [Brown11]

In the Reference section, include references as follows (for a book, magazine, conference, respectively):

[Fried08] T. Friedman. *Hot, Flat, and Crowded*. Publisher-name. 2008. pages 95-106.

[YLu11] Y-H. Lu, Q. Qiu, A. R. Butt, K. W. Cameron. "End-to-End Energy Management", *Computer Magazine*, Nov. 2011, pages 75-77.

[XLu11] X. Lu, T. Lu, M. Remes, M. Viljanen. "Energy Efficiency Assessment for Data Center in Finland: Case Study", *2011 31st International Conf. on Distributed Computing Systems Workshops*, IEEE, 2011, pages 54-60.