

1. What is the working title?

Making Sense of Zero: An Exploration Into the Economic Feasibility of Net-Zero Housing in the Consumer Space

2. Why was this topic chosen?

Per the EIA, “about 40% of total U.S. energy consumption was consumed in residential and commercial buildings, or about 39 quadrillion British thermal units.” Although it is a major contributing factor to the overall energy mix, we rarely consider the way in which our homes draw energy and, perhaps more notably, how they hemorrhage that energy once it’s there.

I have long been interested in the practicality and common-sense approach one takes when designing a Net-Zero home. It is becoming increasingly odd that in an age of such great leaps forward in technology, we continue to construct homes using outdated technology that is costing us money and further compounding our anthropogenic effects to the environment. In fact, the general public is not even aware that Net-Zero exists, and certainly isn’t aware of the various options for constructing one.

Net-Zero homes are currently an incredibly niche market and even as a student in this program, I would not know exactly where to go if I had the means to commission a Net-Zero home. This topic was chosen in an attempt to understand the costs associated with such an endeavor so as to make the business case for these homes and springboard the practice into the general public domain.

3. What research methodology is to be utilized?

Theoretical research utilizing a quantitative approach]. I will need to understand all costs associated with traditional construction and energy systems. I’ll then need to understand the various options and relative costs for constructing a home that follows passive house/net-zero standards. I will also need to research the different systems related to energy production that move a house into net-zero/net-positive territory, their costs and long term payback periods. Although Net-Zero systems cost less to operate than do traditional homes, I’ll need to quantify *exactly* what these savings are (both in energy and the overall durability and lifetime of the materials, etc.) so that I can understand the payback period for a construction project of this type. Additionally, I would like to explore and even suggest possible government incentives that would encourage builders to consider Net-Zero projects instead of standard[?] construction tract housing or other more traditional methods.

4. What do you hope the project will accomplish?

I hope that my project will demonstrate that the Net-Zero approach to housing construction is the wave of the future and that it is economically viable. I would like this research to inform home buyers that there are other options besides traditional construction that make more sense for the planet and

for their pocketbooks. Ideally, I would like to directly influence the construction/retrofitting of Net-Zero homes in the United States.

5. How has your ALM in Sustainability and Environmental Management coursework prepared you for this undertaking?

I started this program off diving head first into the environmental effects of climate change and impact that sustainable practices can have on the planet. Over the last few years, that knowledge base has grown to include concepts like Life Cycle Assessment, corporate sustainability strategy, supply chain assessments, and GIS analysis. I saved my Zero Energy in the Built Space class for last because I have always been incredibly interested in architecture and also in the practicality and efficiency of sustainable processes/decision. Marrying these two concepts seemed right up my alley, and the class has been of the most engaging and interesting to me.

This program has given me a wide base of knowledge of everything related to sustainability and has helped me build a foundation upon which I can build ideas in my life and my career. By understanding the impacts of our unsustainable actions, I can now fully appreciate the effect that proliferation of Net-Zero housing would have on the planet. I now feel comfortable that I have the knowledge and skillset to articulate my thoughts and bring about real change. This program has also connected me with the right people and tools to ensure that my research will be valuable, impactful, and meaningful to the field.

Share a few references showing the applicability of the topic and research method.

1. Net zero energy buildings : case studies and lessons learned

<http://id.lib.harvard.edu/aleph/014714380/catalog>

2. On-site or off-site renewable energy supply options? Life cycle cost analysis of a Net Zero Energy Building in Denmark

<http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science/article/pii/S0960148112000900>

3. Energy performance of net-zero and near net-zero energy homes in New England

<http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science/article/pii/S0378778813005446>

4. Energy performance evaluation of a marketable net-zero-energy house: Solark I at Solar Decathlon China 2013

<http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science/article/pii/S0960148115002116>

5. A pathway for net-zero energy buildings: creating a case for zero cost increase

<http://www.tandfonline-com.ezp-prod1.hul.harvard.edu/doi/abs/10.1080/09613218.2014.960783>

6. Net Zero Energy Buildings: Expense or Investment?

<http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science/article/pii/S1876610211045176?via%3Dihub>