Sustainable Action Fund Grant Program

LARGE GRANT - FINAL APPLICATION

For applicants requesting over $5,000. Submit applications via email to the SAF Grant Program Coordinator jolmathan.rionelle@wwu.edu

1. PROJECT TITLE: Project ZeNETH

2. PROJECT TAGLINE (*description of project in one sentence):* Project ZeNETH is the student-led effort at Western Washington University that aims to providing students of all colleges with an actionable education in addressing climate change and affordable housing through sustainable home design.

Name	**Department/School** Students also provide major/minor	**Position** Faculty/staff/ student. Students provide expected quarter/year of graduation	**Email**
Project Advisor:	Prof. Imran Sheikh	Professor	imran.sheikh@wwu.edu
Project Lead:	Kellen Lynch, *Local Energy Relations, Entrepreneurship* - Fairhaven Concentration	Student, Graduating Summer 2019	lynchk6@wwu.edu
Strategy Lead	Olivia Dingus, *Energy Policy and Management*	Student, Graduating Spring 2019	dinguso@!wwu.edu
Construction Lead	Jaise Poole, *Biology, Entrepreneurship*	Student, Graduating Spring 2019	poolej 3 @wwu. edu

Current ZeNETH Design

4. PROJECT DETAILS *(reflecting any changes since conceptual application)*

a. Describe your proposed project. (1 paragraph)

The Project ZeNETH (Zero Net Energy Tiny House) team aims to design, construct, measure, and manage a net-zero, energy efficient mobile tiny house. Our emphasis for this project is in maximizing student's education at Western Washington University, and we believe that this project serves as a strong platform for incorporating disciplines and students from all colleges at Western.

Describe the purpose of your project proposal. (1 paragraph)

The ZeNETH teams are tackling issues of student's unrealized and underutilized education potential while at Western. To act on this issue, we are engaging student learning and leadership at every opportunity. This materializes as studying energy and design as a means to reduce carbon emissions in homes and buildings. This makes the energy efficient tiny house a great opportunity for students to have a hands-on learning experience. The tiny house will serve as a tangible design project and test bed for students in courses related to design, urban planning, environmental justice, business and sustainability, biology, environmental studies/science, electrical engineering, and energy policy. Upon completion, we hope that the house can be occupied and located on, or near campus, in order to provide access to students. This will include using the house as a living laboratory, a study space, and also as a short-term research residence for eligible students.

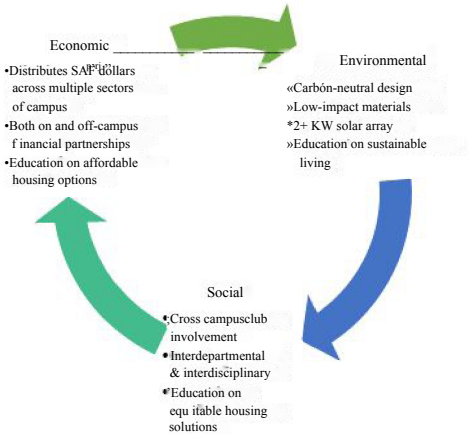
b. What are the goals and desired outcomes of your project? (Bullet format)

- To educate and engage Western students in their respective discipline
- Teach students about how tiny houses can be an attainable, sustainable, and equitable housing solution
- To provide our student-led team with practical experience on a project that will directly benefit their professional aspirations through the utilization of their education in a meaningful way.

c. Does your project tie into any broader campus sustainability goals or initiatives? If yes, please describe how.

Environmental Sustainability:

This project will have both a direct and indirect impact on the sustainability of Western's campus. The house itself will be designed to generate enough electricity from its rooftop solar array to power the entire house through utilizing efficient appliances, insulation, and carbon-neutral design. The house will be designed using the Living Building Challenge standard, as well as aspiring to implement passive house design and cradle to cradle methodologies.



Social Sustainability:

The focus of our project is to provide Western students with an actionable learning environment where classroom learning can extend into real world applications, such as engineering, sustainable building design, energy modeling, construction, project management, data analysis, socio-economic analysis, psychological impacts, urban planning, community outreach, computer science, grant writing, and marketing.

Our project fits into AS sponsored events like, "WWU Asks: What Are Solutions to the Housing Crisis in Bellingham" and many other campus and community-wide discussions on housing affordability. Affordable housing is crucial in creating a campus culture where students are not burdened by the rising rents. One student on our tiny house survey reported, "I am Homeless, and couch surf, keep doing what you are doing its just going to get harder out there for a lot of people." This comment illustrates that high rent is negatively impacting Western students and needs to be addressed immediately in order to ensure student success.

Economic Sustainability:
This tiny house project will have an indirect impact on the finances of students. We hope to partner with the Financial Literacy Intelligence program to help students win back control of the proportion of income they spend on rent. Students would benefit from this option greatly as the housing market is unaffordable for the vast majority of students. This leaves many students simply paying rent for years on end without creating equity in any property. Tiny homes across the nation, and here in Bellingham provide an opportunity for people of diverse income brackets to own a house of their own.

Tiny House Residency Program:

The primary goal of the Project ZeNETH is to both educate and create awareness about the environmental, economic, and social benefits of tiny houses within the Western and greater Bellingham community. We feel that focusing on student education and awareness rather than housing one student for a period of time will have greater impact on Western students as a whole. However, we acknowledge that housing students, especially students with housing insecurities, is important for both deeper student engagement and for collection of energy data. After discussing the pros and cons with our team, we decided to choose a balanced path between the two. After the tiny house is built, it will be used as a showcase on campus for six months. After the showcase period, the house will be incorporated in academics and used as an experiential short-term housing option for WWU students. Students who live in the house will document their experience through surveys, short written reports, and will be contributing valuable data about the house's energy performance. We believe that this approach will maximize the impact of our house on Western students.

We are in contact with University Residences (UR) to work out the lessor, lessee relationship.

d. Provide a chronological timeline listing the steps and tasks it will take to implement this project. Insert additional rows as necessary.

What follows are the respective tasks necessary to complete ZeNETH. These tasks, however, are not only linear but rely on simultaneous collaboration from all teams, all the time. The "Completed by Who" only refers to those team members who are responsible for the task's completion. For instance, Jaise, our construction lead, will not be the only one constructing the house, but is responsible for seeing it through.

Step/Task	Completed by Who	Estimated Completion Date
Teaming and Recruiting	Student Engagement Team, Kellen	Fall 2017 - Present
Design and Policy Reports	Policy/Planning and Design Teams	Winter 2018 - Spring 2018
Departmental Approvals	Olivia, Kellen, Imran	Winter 2018 - Summer 2018
Funding and Industry Partnerships	Kellen, Olivia, Imran	Spring 2018

Material Procurement	Jaise, Imran, Institute for Energy Studies	Summer 2018 - Fall 2018
House Construction	Jaise, Construction Team	Winter 2019 - Spring 2019
Green Building Class	Jaise, Fairhaven College	Spring 2019
On-Campus Siting	Kellen, Olivia, Imran, Planning Team	Fall 2019
Tiny House Showcase	Imran, Legacy Team	Fall 2019-Winter 2020
Course Integration	Imran, Institute for Energy Studies (IES), WWU Faculty	Winter 2020 - Spring 2022
Residency Program	IES, University Residences	Winter 2020 - Spring 2022
Project Wrap Up	IES	Spring 2022
Retire to Community	IES, Kulshan Community Land Trust	Summer 2022

Project Timeline

Academic Year	Aspect
Year One (2017-18)	**June:** Secure SAF Funding Receive approval from campus departments Create a Fall jump start plan
Year Two (2018-19)	**September:** Reconvene team, start purchasing materials **January:** Start building at the Technology Development Center **June:** Finish Tiny Home Construction **July:** Regional Tiny House Expo
Year Three (2019-20)	**September - March:** Park the tiny house in Red Square - Partner with clubs, S-Reps, OS, and SAF for outreach events **June:** Move tiny house to a permanent location and begin the residency program **Summer Quarter:** Begin Residency Program
Year Four (2020-21)	**Fall, Winter Quarter, and Spring Quarter:** Students apply to live in the tiny house for a period of 3 to 7 days. Two students will live in the tiny house a month. The remainder of the time, the house will be used for classroom activities, a tour destination for classes and prospective students, and club events. **Summer Quarter:** A student (most likely a graduate student) could live in the tiny house over the entirety of the summer.
Year Five (2021-22)	**Fall, Winter, and Spring Quarter:** Students apply to live in the tiny house for a period of 3 to 7 days. Two students will live in the tiny house a month. The rest of the time will be used for classroom activities, a tour destination for classes and prospective students, and club events. **Summer Quarter:** Retire to Kulshan Community Land Trust, Habitat for Humanity, or similar organization (Tentative)

5. METRICS AND MEASURABILITY

a. How will the success of the project be measured? Describe the quantitative and/or qualitative sustainability metrics you will use to measure the success of your project. Insert additional rows as necessary.

Metric *(qualitative or quantitative)*	**Description**	**Impact**
Example: Energy> Saved in kWh/year	*We plan to replace the 1 incandescent lamp in our office with an LED lamp. Will measure the energy savings/year*	*Total =2,500 kWh of savings per year. (Incandescent lamp uses 3,000kWh per 50,000 hours and LED lamp uses 500 kWh per 50,000 hours of usage. Source = www.EPA.LEDlamps. org)*
Energy Produced and Consumed	Our house is designed to be net-zero energy and must produce as much energy annually as it consumes. We will continually measure the performance through energy monitoring technology. The residency program will provide most of the necessary data.	Our house has been designed to use approximately 2800 kWh annually. Our 2.5 kW solar PV array will produce at least as much electricity to match this consumption. The average house in the USA uses five times as much energy as ours will.
Housing Economics	We plan on educating students about the financial and practical benefits they can receive when considering this housing model. We want to know if our house can be marketable as an affordable housing option, but they key to this is in demand. Are people interested and able to switch from a rental based to a mortgage based living situation? We are studying how realistic it is for students, once graduated, to consider purchasing a tiny house.	Housing affordability is federally defined as a house not costing more than 30% of a tenant's income. Locally, tenants throughout Bellingham have an increased cost burden of paying more than 30%, according to a City of Bellingham report. We hope to design, construct, and implement our house within the 30% of our target market's income. We will measure WWU student's willingness and ability to pinchase a tiny house before, during, and after our project.
Urban Planning and Policy	As local, state, and international building codes shift to match needs, our house will embody these shifts by keeping up to date on any code allowances, especially in terms of zoning and house systems, like wastewater. We aim to educate students on campus as to how zoning regulations can steer housing opportunities.	We will measure the education and awareness students have concerning urban planning guidelines before, during and after our project.
Students Reached	We aim to reach students across campus through campus newspapers, social media, blog posts, events in red square, and in-class presentations.	We will measure the education and awareness students have concerning their own education at Western. We will measure this through ongoing surveys and interviews.

Student Involvement	We plan on involving students of all seven colleges in our pre-construction process, as well as in the post-construction on-campus siting phase. Students involved will have many different tasks which can be viewed in section C of this document. It is critical that students stay involved in the process throughout the life of ZeNETH.	We have not found a project that has been as interdisciplinary as ZeNETH, and we hope that we can help set a precedent on what is possible at Western. To measure this, we will utilize surveys and interviews to track those we've had involved as they move through their time at Western and a year past graduation.

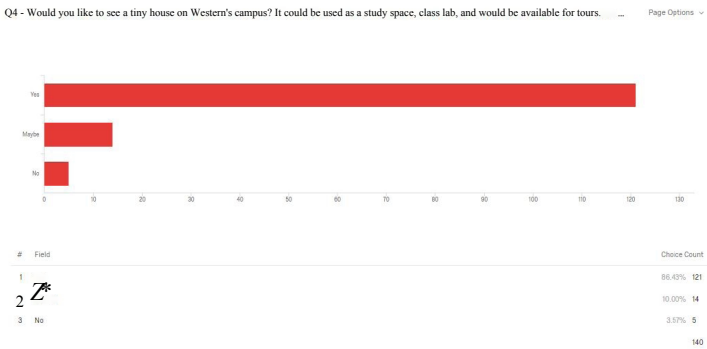
b. Describe your project's education, publicity and outreach plan here. Then complete the table below outlining the proposed results of your education, publicity and outreach efforts. Insert additional rows as necessary.

Education Outreach Publicity Effort	**Who will Make this Happen?**	**How Will this Effort be Tmnlemented?**	**Who is the Intended Audience?**	**Freauency of inmlementation One - time/daily/weekly?**
Student Engagement:	Student Engagement Team, Strategy Team	Already we have engaged students through class presentations, the Huxley and IES Speaker Series, direct club outreach, multiple student centered surveys, and by hosting events where we can interact personally with students. This direct type of outreach will continue throughout our project. Once sited on campus, students can have daily interactions with the house. For more interested students, the space will engage students as a tour destination, class lab space, event space, and as a short-term residence.	Students of all disciplines at Western. We have already engaged students of five of the seven colleges at Western and we plan on continuing that engagement moving forward.	Class Presentations: Quarterly Speaker Series: Annual Updates Club Outreach: Upon request Surveys: Annually Events: Quarterly Tour Destination: Weekly House as venue: Monthly Residency: Two weeks of every month

Publicity:	Media Team	We have received much media attention already for our work including: two articles in the Western Front, one in Western Today, a Spark Science radio interview, a video feature in Klipsun, an interview request from Seattle news channel Q13 Fox, and in June 2018 we are taking over the popular OurWestem Instagram account. Moving forward, we plan on keeping interest and attention to our project by continual project updates through social media, blog posts, and further on-campus media coverage.		Social Media Posts: Weekly Blog Post Updates: Twice monthly On Campus Media: Upon request
Green Building Class	Construction Team	During construction in Spring 2019, construction lead and Fairhaven student, Jaise Poole will be guiding other students through the basic tenets of green building construction. Fairhaven dean Jack Herring is working with us on this.	Any student at Western who is interested in developing construction skills. All may enroll in this Fairhaven class.	Spring 2019
Student Education and Course Integration	Institute for Energy Studies, Prof Imran Sheikh, Prof Charlie Barnhart, Prof Tammi Laninga	This program has thus far been coordinated by student leadership with the guidance of the Institute for Energy Studies. Students have received academic credit for their role in this project. Moving forward, this project can act as a focal point of projects, both as an independent study and with traditional coursework from such programs as: environmental studies, urban planning, energy policy and management, economics, business and sustainability, entrepreneurship, engineering, industrial design, project management,		Winter 2018-Spring2022

How will your project involve students? How many students, or what percentage of the student body, will be affected by the project?

Currently, our project is being guided by the work of eighteen students. We are aiming to involve any interested students. Our majors currently include: Industrial Design, Computer Science, Biology, Energy Policy and Management, Business and Sustainability, Environmental Science, Environmental Studies, Urban Planning, and Fairhaven's Interdisciplinary program. Our student team is growing to include other members for Spring quarter as we further our home's design. We aim to bring on students focused on art (for interior design), videography (to capture our progress), and more biology students (to research biophilic designs).



We have used social media, class raps, university newspapers, and events to engage students. Our social media platforms and website can be found at:
Facebook: https://www.facebook.com/projectzeneth/
Instagram: https://www.instagram.com/projectzeneth/?hl=en
Website: https ://wp.wwu.edu/projectzeneth/

6. BUDGET

a. Provide an itemized list of the budget items required for this project. Include Equipment and Construction Costs, Education Publicity and Outreach Costs, Personnel and Labor Costs, and any other costs. Insert additional rows as necessary.

Total Costs

Item	**Total Request**
Total Capital Costs	$49.001
Contracted Labor Cost	$3,780
Annual Maintenance Cost (2 years)	$2,720
Promo Cost	$2,000
TOTAL REQUEST	**$57,501**

Itemized Costs

Item	**Cost per Item**	**Quantity**	**Total Request**
		TOTAL REQUEST	**$**

b. If the project is implemented, will there be any ongoing replacement, operational, maintenance or renewal costs? If yes, what source have you identified to cover those costs?

We have accounted for maintenance costs in our proposed budget, and if have insufficient funds for such work the Institute for Energy Studies will be responsible for funding further maintenance.

c. Outside or Matching Funds. List pending, approved, and denied applications for funding from other sources. List amounts requested from those sources.

i. **Source of outside or matching funds: Bellingham Technical College's National Science Foundation grant, Institute for Energy Studies' board , Puget Sound Energy appliance donation,**

ii. Date request was submitted: _____

iii. Status or amount received: _____

iv. If funding was denied, please state the reason: _____

d. Project Scalability. Can this project be scaled to be smaller or larger? **Yes.** *If yes, compiete the section below.*

i. If this project was smaller, what would be the minimum budget for this project: $57,501

ii. If this project was larger, what would be the maximum budget for this project: $81,501

iii. How would the project outcome be affected if the project was scaled to be smaller or larger?

We believe that the project, as it stands today, is the minimum viable project. If we were to add in student compensation, however, our budget would increase by approximately $24,000. We believe that students should be compensated for the management and leadership given to this project. Instead of seeking these funds through the **SAF,** our team has decided to find an alternative source for these monies. In order not to burden the **SAF** with this expense, we are approaching other sources first.

7. PROJECT STAKEHOLDERS

a. If your project involves or requires permission from other organizations, departments, individuals, or stakeholders, list them below and describe their involvement in the project. Insert additional rows as necessary.

Stakeholder/Project Owner Name	Department or School and Position	Involvement in Project
Western's Institute for Energy Studies	Joel Swisher, Institute for Energy Studies	The IES is the owner of Project ZeNETH and will continue to oversee this project for the duration of the process and once it is sited. The IES approves of our project.
Office of Sustainability	Seth Vidana, Director of Sustainability	The OS is a partner of Project ZeNETH and has been supportive with media and design. The OS staff has been continually helpful in arranging meetings with offices across campus and in promotion of our project. At this time, the OS has no responsibility for the success of the project. The OS approves of our project.
Facilities Management	John Furman, Facilities Management	Facilities Management will help manage the siting of our structure and will need to approve our project for siting, but not for building.
Technology Development Center & Port of Bellingham	Nicole Hoekstra, WWU Engineering and WWU manager of TDC Terry Ilahi, Real Estate Analyst	The TDC is the proposed site of construction and owned by the Port. At this time the Port is supportive of allowing our use of the TDC for ZeNETH. As of April 6, 2018 the Port has given approval of the project and further written approval will be submitted soon.
Bellingham Technical College	Professor Peter Morgan, Professor Jill Davishahl	BTC is seeking to be a partner on this project by enlisting the help of students interested in the project. We are looking for

		help involving technical aspects of our building like electrical systems and plumbing.
Risk Management	Paul Mueller	Risk Management is helping us plan to avoid risk and addresses liability and insurance.
Environmental Health and Safety	John Kingsford-Smith	This office seeks to guide us in our process of providing safe and accountable practices, especially in constructing the house. At this time, we have met with John Kingsford-Smith and received his approval for us to move forward. We will be seeking his guidance again for safety training in Fall quarter.
Facilities Development and Capital Budget	Rick Benner	FDCB has been involved with our project and has been consulted for guidance on what steps need to be taken. Rick Benner has provided our team with tasks that must be completed, such as potential build sites, and a comprehensive plan of our whole project. We have delivered these items and are awaiting further guidance.
Space Administration	Francis Halle	Space Administration is working with us to identify a suitable on-campus location for the project.
University Residences	Terence Symonds, University Residences	University Residences became involved after meeting with Space Administration, FDCB, and Risk Management. We believe that their office might be best suited to help guide this process in the long term, especially with potential residents.

b. For every Stakeholder/Project Collaborator listed, have the individual complete a Project Stakeholder Fonn. Fonn can be found on SAF website: wwu.edu/sustain/nrograms/saf/atmlv/ under the tab "Forms. Documents, and Guidelines."

Number of Project Stakeholder Fonns attached to Final Application_____

c. If your project team is proposing a temporary or permanent facility or property modification, then a Project Owner Fonn must be submitted with the application. For every Project Owner listed, have them complete a Project Owner Fonn. Fonn can be found on SAF website: wwu.edu/sustain/programs/saf/applv/ under the tab "Fonns, Documents, and Guidelines."

Number of Project Owner Fonns attached to Final Application_____

Sustainable Action Fund Grant Program

LARGE GRANT - FINAL APPLICATION
PROPOSAL REVIEW

Once your project proposai is compiete, you must print and receive hand-written signatures from the individuais listed below. After signatures are received, applications can be delivered as a hard copy to the SAF Grant Program Coordinator, Johnathan Riopelle at Viking Commons Room 24 or by scanning the application and emailing it to iohnathan.rionellefgiwwu.edu.

8. Please set an appointment with the Sustainable Action Fund Grant Program Coordinator to review your draft proposal before submitting your application.

Sustainable Action Fund Grant Program Coordinator, Johnathan Riopelle
Viking Commons, Room 24
Office Hours: Mondays and Thursdays 2-4pm or by appointment
Email: johnathan.riopelle@wwu.edu
Phone: (360)650-4501

Signature:_____ **Date:**_____

This signature does NOT indicate that you have received funding, but it does confirm that the proposal has been reviewed and is approved for funding review by the Sustainable Action Fund Committee.

Comments:

9. After meeting with the Sustainable Action Fund Grant Program Coordinator, please set an appointment with the Campus Sustainability Manager who will review and sign your proposal application.

Campus Sustainability Manager, Seth Vidana
Viking Commons, Room 25
Phone: (360)650-2491

Signature:_____ **Date:**_____

This signature does NOT indicate that you have received funding, but it does confirm that the proposal has been reviewed and is approved for funding review by the Sustainable Action Fund Committee.

Comments: