

### RENUHOUSE A RENEWABLE, ECONOMICAL, NOURISHING, & UNIVERSAL HOME

# **PRESENTATION NARRATIVE**

### **1. INTRODUCTION**

Illinois Solar Decathlon is an interdisciplinary registered student organization at the University of Illinois at Urbana-Champaign seeking to lead innovation in design and construction to advance towards an environmentally sustainable future. We are thrilled to present our latest project, RENU House.

RENU House is a 1,510 SF energy net-zero home. RENU represents the four guiding principles of our design and construction processes: Renewable, Economical, Nourishing, and Universal.





# **ENEWABLE**

The most important feature of the project is energy net-zero status, but we have also striven to reduce the effect on the surrounding environment in every other aspect of the home.



# CONOMICAL

Sustainable developments must be financially feasible to be adopted. We have prioritized cost efficiency in every design choice to ensure the home remains affordable for our target clients.



# OURISHING

The design seeks to encourage fulfilling lifestyles by prioritizing accessibility for all abilities and emphasizing the mental and physical health of occupants.

### **NIVERSAL**

This design can be replicated in similar small-town markets across the United States, potentially bringing sustainable innovation to communities throughout America.

RENU House is nestled in the village of Rantoul, Illinois, a town of roughly 12,000 people fifteen miles north of the University of Illinois at Urbana-Champaign. Illinois Solar Decathlon has partnered with the Village of Rantoul Urban Planning Committee and the local Champaign County chapter of Habitat for Humanity for the build, consistently communicating with local stakeholders to ensure the home meets the needs of the occupants while effectively integrating into the small-town community.

RENU House was designed to be a family residence, and can accommodate a diverse range of family dynamics such as a single parent or multigenerational household. Upon completion of the Department of Energy Solar Decathlon competition, the home will be fully donated to a local Habitat for Humanity family in need: Elonda, a single mother and intermittent wheelchair user, and her adult daughter, Monae, who is pregnant with her first child.



### **2. PROJECT PHILOSOPHY**

We believe that a truly sustainable future should incorporate societal needs as well as environmental needs, placing emphasis on mental, physical, social, and financial health. RENU House's technological innovations minimize its effect on the environment through net-zero energy consumption, but the project also tackles a number of social issues on multiple levels. The project's benefits can be examined in relation to national trends, the needs of the local community, and the wishes of the family that will one day call the house a home.



#### **2.1 National Trends**

RENU House was designed to be universally adaptable. All materials and labor in the construction of RENU House were sourced from local suppliers and subcontractors in rural Illinois, implying that this home can be replicated in similar socioeconomic markets across the country. RENU House's design specifically addresses a variety of growing needs in U.S. rural markets.

Rural areas in the United States are growing older. According to the U.S. Census Bureau, 17.5% of the rural population was aged 65 years or older in 2016, a notable increase from 12.8% in 2000. Furthermore, persons with disabilities make up 23% of rural areas. As the baby boomer generation grows older, these numbers are expected to grow, leading to unique needs in housing and infrastructure. Residents of rural areas have long been characterized as valuing independence, self-reliance and individualism, traits that should be taken into account when designing this infrastructure. RENU House emphasizes accessibility for all abilities, maintaining ADA accessibility throughout the home (with the exception of one out of two bathrooms). We also prioritized low maintenance in every facet of the design: the ductless HVAC system requires less yearly maintenance than a traditional system by eliminating filtration, and using native, perennial vegetation in our landscaping requires very little work from the occupant.

The layout of the home can also accommodate a variety of living situations. The flexible hub space can be converted into a private living space, a private working space, or opened up to create a circular floor plan, as demonstrated in the graphic below. A multigenerational household, a single parent family, or an independent working professional couple could all tailor the home to fit their specific needs.





And lastly, the energy benefits of the home are applicable in any community across the United States. Although it requires an initial investment, our solar array design is estimated to pay itself back in six years, reducing homeowner energy costs for years to follow. The positive environmental impact of reducing the need for non-renewable electricity production in the U.S. also goes well beyond the financial benefits.

#### 2.2 Local Community

RENU House has been built in the Village of Rantoul, a town of roughly 12,000 people fifteen miles north of the University of Illinois at Urbana-Champaign. In 1993, the local Chanute Air Force Base, the primary economic driver in the town of Rantoul, closed down. This led to a mass exodus of residents, as the population decreased by half and approximately \$100 million in commercial spending disappeared. The community has evolved since then; as a primarily white population gets older, the black and hispanic populations have grown, primarily made up of young low-income residents attracted by an affordable housing market.

As a result of this changing population, a top priority of the local Rantoul Urban Planning Committee is to try and revitalize neighborhoods by replacing vacant and dilapidated properties with new, affordable, and sustainable housing. Illinois Solar Decathlon has partnered with the Rantoul Urban Planning Committee for the RENU House project, and we firmly believe our home's design can help meet this goal.

#### 2.3 Client

Illinois Solar Decathlon has partnered and worked closely with the Champaign County chapter of Habitat for Humanity to ensure the home will benefit a local family in need after the competition. Upon completion, the home will be donated through Habitat for Humanity to Elonda, a single mother and intermittent wheelchair user, and her adult daughter, Monae, who is pregnant with her first child. With the abundance of accessibility, low maintenance design considerations, and innovative family-centered plan, the soon-to-be trio will be comfortable at any level of physical ability and able to navigate the challenges of child development more easily than in a standard home. Overall, the RENU House will provide long-lasting stability and comfort to a family in need.

### 3. Marketing and Outreach Strategy

We knew the importance of informing the community and Rantoul Village on how RENU House would be able to refine what sustainable living could look like. We knew the importance of giving opportunities to university students to work on such an impactful project allow them to explore different career paths in the sustainability workforce. And finally, we knew the importance of engaging with corporate and financial sponsors to allow our organization to find success in building RENU House and allow companies to know that their contributions are a part of a bigger movement to make the future sustainable.



For an entirely student-led organization whose projects greatly impact our local community, relationships and publicity are especially crucial. Throughout this project we have been able to form many relationships with community members and local organizations with the goal of effectively executing this project but to also spread awareness of the work that the Illinois Solar Decathlon team has done. To keep supporters engaged we have utilized social media, newsletters, and visual media as our method of marketing and communication.

Having multiple platforms allows us to cater to many generations and social media preferences. Although college students are more likely to use Instagram, older alumni and supporters may be using Facebook or LinkedIn. We regularly share posts about our construction progress and the technical features of our projects, along with member highlights, to garner interest for our organization. Each semester, we post our monetary and product sponsors for transparency. Over the past year, we've seen an increase in our social media engagement when posting more frequently to update our followers on RENU's construction progress. With many of our followers being alumni of the organization, they've expressed their excitement about our new project through direct messages and comments. We also found that using hashtags related to sustainability and engineering increased our outreach by 30% on Instagram. Our infographic shows the number of non-followers reached actually surpassed our number of followers reached in February of 2023. Along with using hashtags, we utilized creating connections with registered student organizations on campus in hopes of reaching a younger audience interested in using sustainable housing to battle the current climate crisis. Increasing awareness through organizations with shared interests help us establish a growing sustainability community on campus. Our website is also regularly updated with newsletters and project media.

Through the use of our biweekly newsletters, we have been able to effectively able to relay information to a demographic who may not be active social media users and also being able to relay a bulk of information that keeps supporters engaged through the use of visual media. All newsletters are linked in the website for accessibility as well as documentation of our progress.

We have also taken the initiative to create visual content to promote and spread awareness of the RENU House project. We have multiple contributors when it comes to visual media, such as the media department at the Grainger College of Engineering, and our own student videographers. We did not want to completely outsource to adults or a company because we want to give as many opportunities as we can to the younger generations and University Students. The process has been rewarding so far as our videographers have expressed that they have not been involved with sustainable construction and came to learn much about our mission and goals. The link to our media outreach platform are below:

- Team website: https://www.illinoissolardecathlon.com/
- Instagram: https://www.instagram.com/illinoissolardecathlon/
- Facebook: https://www.facebook.com/illinoissolardecathlon
- LinkedIn: https://www.linkedin.com/company/illinois-solar-decathlon/
- LinkTree: https://linktr.ee/illinoissolardecathlon

With the strong engagement strategy we have developed over the course of this project, we have been able to maintain and grow relationship with 3 specific audiences which include

- 1. Community organizations and members
- 2. Members of Illinois Solar Decathlon
- 3. Corporate and Financial Sponsors

In this section we will go into detail our method of engagement and description of our relationship with each of these audiences.

#### **3.1 Local Community and Members**



Although this home is being built for the 2023 competition, RENU House will exist in the community for decades to come. Because of this, it is crucial to engage with as many members of the community to inspire and to educate on the importance of net-zero energy homes.

#### 3.1.1 Rantoul Planning Committee

Since the Air Force moved their base out of Rantoul in 1993, it has become an aging community with a below-average income level of \$44k. We worked with Rantoul's Urban Planning Committee to build RENU House as a way of bringing in a younger population in hopes of improving the town's prospects. With Rantoul's older demographic, we pushed on focusing marketing efforts towards the younger generation in hopes of exposing them to the benefits of sustainable living. The sustainable and affordable nature of the house makes it attractive to younger residents, while its reliability and versatility appeals to older generations. We've seen interest in the promotion of sustainable and affordable homes in rural areas such as Rantoul in our newsletters with people ranging from college students to older residents. RENU House proves that every generation can benefit from a greener, more affordable community.

#### 3.1.2 Rantoul School District

A significant aspect of our project involves creating multigenerational spaces in housing. This principle also extends to our outreach efforts. We have partnered with a local elementary school in Rantoul with the goal of educating the public about sustainable housing and encouraging passionate students to get involved with Solar Decathlon in the future. Hosting outreach for both older and younger members of the community allows everyone to get excited about RENU House and our efforts in sustainability. Parent night was also a chance for us to invite community members to visit the home during the public exhibition. This opportunity for additional engagement allowed us to foster excitement and to let this be a catalyst for future community sustainability projects. We created a presentation and visual aid that would both be digestible to an audience of all ages while still explaining the fundamentals of our project along with the design and building process. The students, teachers, and parents will all then be given the opportunity to ask questions about any of the subteams, the Solar Decathlon competition, our commitment to the Rantoul community, and the house itself. This direct communication is paramount in our efforts to both educate and serve the Rantoul community.

To further outreach with the youth in the community, we reached out to all the surrounding schools in Rantoul. This ranged from elementary all the way to high school. After sending our initial collaborative invitation, Mr. Cotter from Rantoul Township High School responded back with enthusiasm. He is an agriculture teacher at the school and teaches a Home Repair and Maintenance class he suggested to work with. His students learn but also

get to apply the lessons they learn in class by working on actual houses in a nearby subdivision, doing insulation, drywall, paint, and other light construction. Some of his curriculum topics include surveying, concrete, wall/roof framing, siding, plumbing, drywall, and electricity. After some consideration and talk between the teams, our construction management team seemed like the best choice to work with the class.

#### 3.1.3 Neighbors of RENU House

Back in October we had a groundbreaking event to celebrate the start of our construction and handed out flyers to the whole neighborhood. Response to our face was well received but when it came to the actual event, not many showed up. This is partially due to the fact the weather took a turn for the worse but we also realized our connection with them was not strong enough yet. Of the few that did show, they were excellent contacts and highly involved members of the community so we began our trek with them. The first neighbor is Violet, a newly retired librarian at the local Rantoul Public library. Despite her leave, she still frequently goes to the library and hosts public events like arts and crafts, game nights, or live readings. She mentioned to us how the street she lived on was personally close. In the past, they would take a day and get permission to close down the street so that they could just open their garages, share a meal, and spend the day together. This is the same





connection we want to create and reflect with the construction of our house so that our future homeowners and the neighborhood can continue to form meaningful relationships. Especially since the demographic of the neighborhood leans more towards older folks but there are quite a few children we want to enrich the environment for as well.

This is where our second neighbor, Mario comes in. He is a first-grade teacher that recently immigrated to the US and has been living in Rantoul for the past two years. He believes the project we are doing is inspiring and is currently in the works of setting up a field trip with his school to visit RENU-House so that his students can learn more about a future in sustainability. Our groundbreaking flyer is shown above.

#### 3.1.4 Girl Scouts and Boy Scouts of America

We partnered with troops of Girl Scouts and Boy Scouts of America in Central Illinois as a way to promote and educate sustainable design and construction to the youth of our future. Both Girl Scouts and Boy Scouts are non-profit organizations that encourage students ranging from kindergarten to high school in developing life skills and core values to help make the world a better place. With their variety of personal and professional enrichment activities, engaging with scouts in Central Illinois gives us an opportunity to teach youth about our design and construction process in sustainable housing. Both organizations have badges the scouts can earn from touring and participating in activities our team members plan and facilitate. Hosting tours and badge workshops encourage scouts in exploring sustainable STEM projects in their communities.

#### 3.1.5 Youth builds

Apart from promoting public awareness about our sustainability efforts, we are also strengthening our partnership with YouthBuilds, which is an organization that provides construction education and training to at-risk youth. Their goals relate closely to ours as a big part of our mission is to educate on construction. Through this shared background and our expertise, we are able to directly teach students entering the construction industry about sustainability and passive building design, actively shaping the future of the community with the next generation of builders. To facilitate this partnership, we were in communication with the Champaign YouthBuild Director who was very excited about RENU House and was hoping for a private tour of the home for 25 of the students which we were able to accommodate. More specifically, our construction management subteam is able to directly explain the building process of the house to the students, both adding to their knowledge and utilizing it to explain sustainable building science.

#### 3.1.6 The University of Illinois Urbana-Champaign

When it comes to community outreach, one group we could not ignore was our own community here at the University of Illinois Urbana-Champaign. The students here are a prime example of the youth that will tackle the climate change crisis. Furthermore, we emphasize our commitment to sustainability not just from the environmental aspect but also social aspect in the form of the livelihood of our house occupants. A special opportunity we were able to host was the visit of a FAA 330 class from our school. The course is called "Sustainable Designs" and is taught by Professor Mark Taylor who is one of the architectural faculty at our school and has a long history with our organization, ISD. Altogether, the trip included 36 students that came to tour the house (image on right). During that time the house had exterior walls and inside was all framing. While giving the tour of the house, we explained what each room was going to be while the professor added his own remarks on how certain framing techniques were more sustainable as well as what to keep in mind in general when



designing a home. This whole experience highlights the nourishing aspect of our four RENU pillars where yes, we want to create a thriving environment for our homeowners. But zooming out a bit for a bigger picture, we want



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to educate the youth on how to take on a project like ours as well as inspire the change and action that can happen even as college students.

To spread awareness on a larger University level about our sustainability efforts, we have built up relationships with the Grainger College of Engineering's media department—who assist us in publishing our media to a wider audience—, and other sustainability organizations on campus. We have worked on exchanging promotions with sustainability, design, and engineering student organizations, resharing posts on social media platforms and including RENU House in University Department newsletters. These partnerships allow us to increase the exposure of our project, particularly among students with similar interests. In turn, our members also learn of other sustainability projects happening locally. In terms of internal publicity, our team actively utilizes several social media platforms including Instagram, Facebook, and LinkedIn to share updates on our projects, news, and social events.

#### 3.1.7 Champaign Habitat for Humanity

At the beginning of the project, a huge question we had to answer was: What will happen to this house once it is donated? We knew that with such a unique project, there would be so many ways to contribute to our community and notion expand the of sustainable living in Champaign-Urbana. It was not long until we realized being able to donate this house was one of them. This is why we have partnered with the Champaign Chapter of Habitat for Humanity and have been matched with Monae and Elonda to fully donate RENU House, but with this, came many challenges. In the past, when Solar Decathlon was not a local build competition, we had a strong partnership with the University of Illinois Urbana-Champaign. It was their name on the contract so that liability shifted away from



students and to the University. In return, the University would take ownership of the home after the competition, and place it on the campus as storage space. This model for our organization hindered our ability to fully donate the home to Habitat for Humanity hence why the student leaders have founded a 501c Non-for-Profit, BuildSolar Inc., with the help of McDermott Williams law firm in Chicago. With this non-profit as the official sister organization of Illinois Solar Decathlon, we have been able to apply for grant funding without having to go through the bureaucratic process of the University. We have also been able to sign the construction contract with Nelson Builders without the University's name on it which allows us to be in full ownership of RENU House, and therefore, have the full authority to decide what will happen to the home post-competition. BuildSolar Inc. has also given our organization the ability to give tax benefits to companies that donate their product to RENU House which has helped us greatly. This new model that we have created allows all the money used to build this home to go straight to Rantoul rather than the University, and allows us to have an influence on sustainable living that will inspire many in the community.

#### **3.2 Members of Illinois Solar Decathlon**

With so many students unfamiliar with sustainable building, we made it our mission to educate others on the economic and environmental state of our community, as well as the benefits of renewable energy and smart home systems. To accomplish this, we took steps within our own organization to foster this learning. Aside from our Design and Build team that participates in each of their respective Solar Decathlon challenges, we formed a separate project team, called Concept Team, that is open to all students of any year and major. On average, Concept Team consists of over 30 students, most of whom are college freshmen and sophomores. Throughout the year, Concept Team researches new and emerging green technologies to brainstorm ways they could be implemented on our campus. They continually receive feedback and mentorship on their projects from older members of the Illinois Solar Decathlon Build Team. Our upperclassmen work with Concept Team to ensure the continued legacy of our projects and our impact on future sustainable homes. They also conduct site visits to



some of our previous projects, such as Gable House or Adapthaus, to learn about their technical features and the impact each of our projects has on the surrounding community. To further their technical skills, each year we provide student led Revit workshops so that students have the opportunity to learn critical engineering software while also providing guest presentations from other sustainability-oriented groups on campus such as the Student Sustainability Committee, Habitat 4 Humanity, the Smart Energy Design Assistance Center (SEDAC), as well as professional companies to enrich their overall knowledge of sustainable action and care. In the fall semester, we hosted a presentation with Whiting-Turner—who helped ensure the constructability of the project—, which gave our students the opportunity to network and find suitable internships. In the spring, we hosted a presentation with SEDAC, which conveyed the relevance of sustainable projects in the real world. All activities are geared towards exposing students to local sustainable projects and environmental impact, as well as preparing them professionally. These initiatives ensure that for future projects we will have successful Build Challenge competitors who will continue expanding the network of net-zero energy homes in the community. Shown below: ISD General Meeting with Whiting-Turner (left), Revit Workshop (right)



#### **3.3 Corporate and Financial Sponsors**

Fundraising and finances were the backbones of this project like they are for any project. In the current economic climate of high inflation and disrupted supply chains, we did not want costs and finances to hurt our overarching goal of sustainability and end-resident experience. Hence we were relentless in our efforts to raise funds, and all of our sub-team members collaborated to attain our financial goals.

One of the biggest requirements we wanted to reach outside of fulfilling the financial goal of our project estimates was to try and acquire products that support the mission of RENU House. Because Rantoul is located in central Illinois, and has limited resources in labor and products, each product that we chose to have sponsored had to be easily accessible to our specified location as well as play a role in our overarching goal of sustainability and functionality. With a tight construction schedule and the increasing lead times of materials due to COVID-19, we had to ensure that we kept sponsors engaged and had to create incentives for product and financial contributions.

To incentivize product and financial donations we have created a sponsorship packet that includes descriptions of benefits that are associated with the monetary value of their donation. A graphic from our sponsorship packet with the tiers and benefits are shown below:





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## **RENU HOUSE** A RENEWABLE, ECONOMICAL,

NOURISHING, & UNIVERSAL HOME

	Diamon	Plotinur	"550,000" Gold 52"	silver 51	Bronze 7	500* Orans
Recognition on print media	~	~	~	~	~	~
Recognition on social media	~	~	~	~	~	~
Entry to our featured products book	~	~	~	~	~	
Small logo on team apparel	~	~	~	~		
Access to team resume book of extremely qualified candi- dates	•	1	1	1		
Invitation to all team general meeting	~	~	~			
Feature article content about your product	~	~	~			
Medium sized logo on team apparel	~	~				
Collaborative work on supporting marketing materials	~	~				
Short video segment in video media to be displayed during tours and/or the exhibit	9 🖌					

A big challenge this project cycle has been relaying information between our sponsors and our contractor Nelson Builders Inc. We had to keep regular contact with our sponsors to have the contractor coordinate lead times, and site delivery windows and try to maintain our project schedule. Since we are a non for profit organization, we strongly emphasized our mission as an organization when communicating with a potential sponsor—the mission being to lead innovation in design and technology to advance toward an environmentally stable future. It was important for us to source these materials locally not only to minimize the financial cost but also to minimize the risk of lead times, compromising our product schedule, and embodied energy. We found that calling increased engagement with the sponsors and allowed for more of a connection than a simple email or letter ever could. We made an effort to be as transparent as possible in our request and project description to avoid any miscommunication. Calling allowed us to easily discuss aspects of our partnership, such as delivery methods, technical understanding of products, sponsorship commitments, etc. Many of our partnership have remained strong through multiple project cycles due to our commitment to engage with them which ensures that we can continue building our network of net-zero energy homes in the local community.

