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U.S. Department of Energy Solar Decathlon 2017**

MARKET POTENTIAL

EnCity provides a unique approach to design, construction, and urban living. Encouraging residents to rethink the spaces they live in while providing private units and a sense of community within the city.

According to the U.S. Census Bureau, from 2000 to 2010 the nation's urban population increased by 12.2%, outpacing the overall average growth rate of 9.7% during the same period (U.S. Census, 2012). Globally, urban areas account for up to 76% of both fine energy consumption and fossil-fuel related CO2 emissions (Güneralpab, 2017). Furthermore, global urban population is expected to increase by an additional 2.5 billion between 2010 and 2050, resulting in an increase in total energy use and greenhouse gas emissions (Güneralpab, 2017). Besides energy consumption, urban density in turn affects other aspects of sustainability such as human well-being and economic productivity (Güneralpab, 2017).

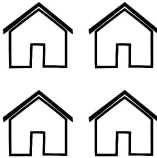
This demonstrates an increase in urban density and indicates a link between density, energy consumption, and the role of sustainability in the built environment.

URBAN LIVING IN AN ERA OF SUSTAINABILITY

With drastic increases in urban populations and the constrained nature of cities, there is an apparent need for additional housing within city limits. From this need, and the popularity of simplifying belongings and living a minimalist lifestyle, we have seen the emergence of the tiny house movement. While the beginning of the tiny house movement has roots in the financial crisis of 2007-2008 with residents demanding more affordable dwellings, it has since gained traction. Attracting the attention of those looking to shrink their carbon footprint and increase energy efficiency as well as those hoping to simplify their lives; tiny home residents shed excess belongings and aspire to live simply and minimally. This fast growing movement has spurred often illegal (due to codes and zoning laws) tiny house

communities around the country. As a result, the IRC has released a tiny house appendix to the 2018 International Residential Code, allowing for further tiny house construction. The addition of this appendix demonstrates the acceptance of tiny living, and the shift in mindset to accept nontraditional concepts of city living.

But, what exactly does it mean to live tiny? Tiny living encompasses tiny homes, environmental consciousness, self-sufficiency, life simplification, sound fiscal plans, and life adventures. These are the foundational building blocks of EnCity and our target market.



Tiny Houses



Environmental Consciousness



Self Sufficiency



Life Simplification



Sound Fiscal Plans



Life Adventure

As a test bed for smart city technology and a growing urban city, EnCity's final location will be Spokane, Washington. Urban Spokane has an estimated population of 390,000 and is predicted to grow steadily over the next 15 years (World Population Review, 2017), making it an ideal resting place for EnCity. However when looking at the larger market, EnCity has even more market potential in larger urban areas such as Seattle, Washington. As Seattle's population has quickly grown, there is an imminent push for increased urban density and a demonstrated market demand for sustainable housing options.

EnCity is a pocket neighborhood of tiny houses and a clubhouse nestled onto a single urban infill lot. It provides residents with all of the amenities of a traditional single family home, the convenience of city living, and the sense of community that so many desire. This unique concept is not only versatile for residents, but allows for various adaptations based on different price points, adapting to multiple demographics and locations.

Each private unit is equipped with a bedroom, full kitchen, dining area, bathroom, entertainment space, laundry facilities, storage space, and private deck. Beyond the tiny homes, the interior deck and clubhouse offer additional entertainment and gathering space with a full sized kitchen, dining area, and living room to host up to 10 guests. The clubhouse spaces can be reserved on the EnCity mobile application individually or you can reserve the entire building, mitigating concerns of shared spaces. This additional entertainment space and gathering area provides the potential for multiple entertainment spaces, and fosters the development of community. Lighting within both buildings can be adjusted and customized through the controls of the smart home system for various activities from studying to relaxing with friends. The customization and adaptability of the clubhouse and private tiny home create a safe, convenient, comfortable

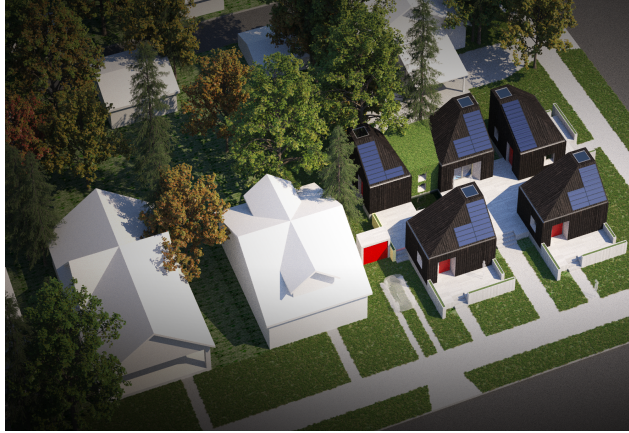
and enjoyable place to live; making a sustainable, efficient house feel like home.

YOUNG PROFESSIONALS

EnCity's target market is young professional singles or couples with an annual combined income of \$80,000 - \$160,000 making them an ideal target for this high end version of our concept. These individuals or couples are setting down roots in new cities, have few belongings, enjoy staying active, and are environmentally conscious; sharing many of the foundational building blocks of living tiny.

When moving to a new city, these young professionals look to move close to the city, but still want private space, proximity to public transportation, room for entertainment, and have demonstrated an increasing desire for a sense of community. Traditional urban housing does not cater to the ever changing needs of this generation of young professionals. Since location is a prime concern in urban areas, EnCity is designed to utilize urban infill lots allowing for optimal location within city limits and close proximity to public transportation. Aside from location, many young professionals have minimal belongings and enjoy living in efficient spaces, however they want the ability to entertain family and friends.

In addition to space for entertainment, moving to a new city and living alone can be isolating, thus there is a growing desire for a sense of community which is offered by the clustering of tiny homes. The grouping of tiny homes and clubhouse building on a single urban infill lot adds density to the city, creating a pocket neighborhood. Pocket neighborhoods are described as "clustered groups of neighboring houses or apartments gathered around a shared open space" (Chaplin). EnCity's tiny home pocket neighborhood addresses this market's needs by combining privacy with a sense of community; creating a place for neighbors to easily interact with and get to know one another as they please.



In addition to amenities and community, EnCity is designed and constructed to sustainably optimize efficiency. Sustainability is a key concern for this generation of young professionals, "despite the fact that they are coming of age in one of the most difficult economic climates in the past 100 years, a recent Nielsen global online study found that they continue to be most willing to pay extra for sustainable offerings - almost three-out-of-four respondents in the latest findings, up from approximately half in 2014" (Nielsen, 2015) are willing to pay more for sustainably constructed homes. This consumer push for sustainability has resulted in a market demand for sustainably constructed and efficient homes. With its innovative construction, reliable high grade materials, water, and energy systems EnCity offers a sustainable housing solution that reduces maintenance costs over time, and offers the ability to make more than \$5,000 annually from PV energy generation (see Table 1).

LIVABILITY

PRIVATE TINY HOME

Like a traditional single family home, EnCity offers complete privacy with no shared walls, without sacrificing any of the amenities found in a traditional home. This privacy and personal space provides residents ownership over their space, eliminates risk of unwarranted, unpleasant encounters in shared areas, and

allows residents to unwind and recharge without being disturbed.

PRIVATE DECK

In addition to the private tiny home space, EnCity offers private outdoor space through the private deck outside the tiny home. This space provides residents an outdoor area to gather with a small group of friends, or relax and enjoy the weather in peace and quiet.

ADAPTABLE INDOOR/OUTDOOR SPACE

Although the tiny home is fully equipped, EnCity also offers additional indoor/outdoor space through the shared deck and clubhouse building. The layout and design of this space facilitates simultaneous gatherings, large groups, and overnight guests, providing any extra space residents may want while creating an environment for residents to interact.

FLEXIBLE LIGHTING

EnCity utilizes daylighting from the skylight and windows as well as LED strip lighting that illuminates the white washed walls and ceilings, dispersing the light over the surface. Lighting settings can be established for various activities such as bright white for studying or a soft yellow for evening relaxing and dimmed or controlled through the smart home system mobile user interface.

RESIDENT COMFORT

EnCity ensures resident comfort by maintaining optimal temperature, humidity, and CO2 levels. Conditions within the house are monitored by the suite of sensors connected to our smart home system and adjusted automatically or at the residents request. The smart home system offers integrated monitoring and control of various home comfort features such as lighting, windows, humidity, and temperature from a mobile tablet application.

SHARED RESOURCES

Not only does EnCity offer private home space and shared indoor/outdoor entertaining space,

it also offers residents the opportunity to share resources between units. Sharing resources between units allows residents to utilize as much of the energy as possible and minimize buying energy at peak times if even at all. This interdependence of units creates a resilient network of tiny homes that can withstand uncertain weather patterns while maintaining net-zero energy consumption.

SCALABILITY & IMPACT

Although EnCity's design has been customized for this target demographic and climate, it's shell and concept can be adapted and configured in various arrangements to allow for additional potential markets moving forward. This adaptability of climates and target demographics indicate potential for scalability and furthering our overall impact. Throughout customer discovery, we have identified interest and potential for applications in co-housing, multigenerational living, empty nesters, senior living, live in nursing care, and group homes. Aside from additional demographics, our innovative water systems allows for application in multiple climates, designed for both high rain and low rain climates such as Seattle and Spokane. Our innovative modular design and flat pack system allow for prefabrication and simple assembly on site, for quick construction in high traffic areas and low labor costs.

Creating pocket neighborhoods of tiny homes for various applications adds density. Research has shown that urban living enabling use of public transportation, characterized by higher population and built up densities is associated with economic co-benefits, higher productivity, and vibrant street life (Güneralpab, 2017). This results in more resilient cities at the district, regional, and national scale. Furthermore, each EnCity pocket neighborhood creates the opportunity to share renewable resources in innovative ways unavailable to traditional single family residences and the potential for scaling within the concept of a smart grid.

MARKET ANALYSIS

Our initial target market is urban cities such as Seattle, WA. Seattle covers 83.78 square miles with a population of 668,342 and median age of 35. The current median yearly income is \$80,349 or a combined income of \$160,698 for couples (Department of Numbers). Looking specifically at housing, Seattle has one of the fastest growing housing markets, up 12.9% in the last year and expected to rise 5.5% in the next year (Zillow, 2017). Median home value is \$653,400 well above the Washington average. Seattle is experiencing a surge of green building projects, environmentally certified homes in Seattle represent nearly 45% of the market according to Green Works Realty's Ben Kaufman, and is quickly increasing, resulting in high demand for cost-effective and environmentally conscious building (Kaufman, 2017).

Secondarily, Spokane, WA has a median yearly income of \$35,097 (combined \$70,194) (Home Insight, 2017), making it an attractive market for simplified adaptations of the EnCity concept (with less sophisticated windows, and more cost effective appliances etc). Smart City infrastructure makes it the ideal resting place for EnCity following the Solar Decathlon Competition. The median list price of homes in Spokane is \$225,000 (Realtor.com, 2017) and is predicted to rise 3.3% within the next year (Zillow, 2017).

MARKETABILITY

EnCity's minimalist, sophisticated look is composed of materials that showcase their natural finish. Together this forms a clean, simple, appealing aesthetic for our target market. The expansive opportunities to entertain small or large groups in the multipurpose indoor/outdoor spaces paired with innovative technological advances make EnCity extremely marketable.

AFFORDABILITY & COST ESTIMATE

EnCity is designed with a combination of high tech and low tech sustainable and efficient solutions that can be installed all together, or built upon to lower costs, furthering its adaptability for various applications and allowing for entry into smaller lower income urban areas such as Spokane, WA.

This creates the opportunity to offer various versions all focused on efficiency and sustainability with the option to add features at a later date such as the complete PV solar system which costs approximately \$27,000 combined for both the tiny home and community building. Though a sizeable investment, there is an expected payoff period of just 3.12 years after WA State Production Incentives (up to \$5,000 annually) and Federal Tax Credit (30%). It is important to consider this is the cost of the infrastructure to support the tiny home and club house building, as more units were added, the broken out cost per tiny home and payoff period would decrease.

| PV System Payoff | | |
|---------------------------------------|---------------|-------|
| Solar System Cost | \$ 27,000.00 | |
| Federal Tax Credit (30%) | \$ (8,100.00) | |
| Cost after tax credit | \$ 18,900.00 | |
| Avg cost per kWh in WA | \$ 0.09 | |
| Avg household kWh/yr in WA | 12,492.00 | kWh |
| Avg yearly electricity bill in WA | \$ 1,065.57 | |
| Yearly WA State Production Incentive* | \$ 5,000.00 | |
| Expected payoff | 3.12 | years |

Table 1: PV System Payoff

*WA State Production Incentive: For made in Washington solar systems, payment of \$0.54/kWh of PV energy generated up to \$5,000 annually.

Aggregating all utility costs, EnCity offers residents a net yield of \$5,123.59 annually, saving them over \$6,000 every year.

| Overall Utilities Costs and Savings (Washington) | | | |
|---|-------------|-------------|---------------|
| | | EnCity | Average |
| Monthly Cost/Gain | | | |
| | Electricity | \$ 10.30 | \$ (86.92) |
| | Water | \$ (40.02) | \$ (91.79) |
| | Total | \$ (29.72) | \$ (178.71) |
| | Savings | \$ 148.99 | |
| Yearly Cost/Gain | | | |
| | Electricity | \$ 5,123.59 | \$ (1,043.08) |
| | Water | \$ (480.24) | \$ (1,101.42) |
| | Total | \$ 5,123.59 | \$ (1,043.08) |
| | Savings | \$ 6,166.67 | |

Table 2: Overall Utilities Costs and Savings

In order to verify the affordability and marketability of EnCity for our target market and location, we performed a complete cost estimate. Our overall cost estimate includes the tiny home, clubhouse building, and all site improvements. While this provides a project estimate, it is not an accurate representation of the cost for an individual couple looking to purchase a tiny home in EnCity. To better understand the cost of individual units, we broke out the cost of the tiny home and the clubhouse + site. The tiny home cost estimate was approximately \$168,000, with the remaining \$311,551 allocated to the clubhouse and site for a total project cost of \$479,551.

The clubhouse and site cost would be divided evenly between the residents. Since EnCity is designed to include a minimum of three tiny homes and a clubhouse on one site, there would be three different residents splitting the cost of the clubhouse and site adding an additional \$103,850.

All things considered, we estimate the cost of EnCity (tiny home + 1/3 of clubhouse and site) would be \$271,850. With median list price in Seattle at \$653,400, this high end version of EnCity is an attractive housing option to our target demographic. Secondly, in Spokane EnCity falls just above the median list price of \$225,000, making it an ideal location for a slightly simplified and more affordable variation of EnCity with less high cost features.

SUSTAINABILITY FEATURES

As customers become more conscientious of their environmental impact, the Seattle market for sustainable homes continues to grow, driving market value and marketability of efficient sustainable homes up. EnCity utilizes simple passive strategies to improve base level efficiency combined with technological advances and high performance products to offer a beautiful, sustainable, and efficient housing option.

BUILDABILITY

EnCity's innovative modular construction allows for ease of assembly and limits the need of skilled labor on site. This is extremely valuable when working within city limits, minimizing traffic congestion and costs to utilize city parking spaces during construction for workers, tools, and delivery of product. This minimizes on-site construction time and costs while delivering a simple and sustainable home.

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