



**ENERGY  
CODE  
CONNECT**

# San Luis Obispo ADU Case Study

## Overview, Context, and Justification

**Summary.** The tri-county region is seeing an increase in ADUs, tiny homes, prefabricated homes, and other nontraditional housing elements. Recognizing this growth, 3C-REN (Tri-County Regional Energy Network) offers resources related to the application of the energy code and green building standards to these alternative housing elements. The following case study was developed from an interview with a local resident and property owner in San Luis Obispo who recently built his own, all-electric ADU.



**Why?** In considering building an ADU, Eric realized an opportunity to maximize the beneficial use of his property while adding to the property's value and helping the City meet its need for relatively affordable housing in downtown.

**Who?** Eric is a resident and property owner in the City of San Luis Obispo. His 11,000 square foot R2 lot in the Old Town District hosts three residential single-family buildings with four total units. Previously, Eric's lot was effectively at maximum density until new legislation enabled the addition of an ADU.

**What?** Eric's interest in building an all-electric, high performance ADU on his property originated at a local Tiny House Expo. He began researching the energy code and various models of small, functional spaces. Deciding that a high performance ADU designed for long-term living and rental was the right fit for his property, he found and purchased blueprints online which matched the size of the unit he wanted to construct.

# A High Performance, All-Electric ADU

**Q: Why did you want to go all-electric for this build?**

**A: "I was really driven by a couple of things, one being values. I didn't want to be creating additional greenhouse gas emissions in the new construction. The second is around cost saving. It was easier in construction to avoid adding the natural gas utility and there wasn't any real premium in any of the equipment I brought in to meet those needs, so it was really a no brainer."**

**Low-Cost.** Going all-electric meant there was no need to install natural gas infrastructure or pay the premiums for associated equipment. The ADU is run off an electrical panel on an adjacent building, a 75-amp breaker, and its own main panel. The unit has a very small load, due in part to the use of a two-burner induction stove and a minimum mechanical ventilation requirement enabling the use of a 10cfm Panasonic fan (in addition to kitchen and bathroom ventilation). Within the project, Eric added a 2.5 kW solar array that was more than enough to cover the utilities. According to Eric, going all-electric provided a safe and efficient building that is low cost to operate.

**High Performance.** Eric's ADU had a number of features that make it high performance. According to him, **"high performance really come down to a well-designed and well-built envelope."** Eric's ADU is a 2x6 construction with blown-in cellulose insulation and a sealed bottom plate that was caulked from the slab to the bottom plate, studs and sheathing. The whole insulation process with materials was very cost-effective at only \$1,500.

**Upgrades and Resale Value.** Constructing an all-electric ADU required several utility upgrades, landscaping and other updates. Eric was also able to take advantage of having an adjacent building, which allowed him to connect a newly upgraded heat pump water heater to the unit by installing underground utilities. These were upgrades that benefitted the whole property. Eric saw the addition of the ADU as an opportunity to invest in making the whole property nicer and improve infrastructure that was going to need replacement anyway. Eric charges \$1,500 for rent which, due to the high efficiency of the building, includes all utilities. After taxes and insurance, Eric estimated a \$1,200 positive monthly cash flow plus an immediate bump in resale value of double the investment.



# From Vision to Reality: Planning, Contracting, Permitting and Building



Chart 1) From investigation to occupancy, Eric’s project took almost exactly 1 year.

**Contracting.** The ADU Eric chose called for a 250 sqft lower footprint with a 100 sqft loft. With Eric acting as the general contractor, he hired a management team of a consulting contractor, an architect, and a structural engineer. The consulting contractor worked with Eric to develop cost estimates and plans for layout and building assembly. The architect and structural engineer adapted the Australia-based tiny house-on-wheels plan to meet California building codes for an all-electric ADU.

During the construction phase, Eric worked with a contractor for laying the foundation, a carpenter who completed the bulk of the actual construction, and individual sub-contractors for plumbing, electrical, insulation, drywall and painting. An HVAC contractor was eventually brought in to complete the mini split.

**Permitting.** Eric submitted his plans around the end of the year, which resulted in delays related to the holidays. Eric followed up with City staff proactively to help expedite plan approval. Working with a good architect who was able to anticipate challenges during the planning and building phase ahead of time was helpful. Eric dedicated some of his focus into learning the relevant California codes that support such a project. He found that being educated on the standards and requirements of the planning and building phase also helped to expedite the permitting process. His proposed plans went through two rounds of revisions before being approved.

**Inspection.** High demand for inspection services meant that inspection had to be requested two to three days in advance. Eric noted that following up helped move the process along. Each inspection was carried out by a different person. Each inspector identified distinctly different problems, contributing to overall safety and quality, but also creating a lack of consistency from inspection to inspection. Eric put a lot of attention to detail in compliance with Title 24 Energy Code Requirements but ultimately inspectors did not spend much time assessing these measures.

Item	Approx. Cost
Pre-designed Plans	\$300
Permitting/Fees	\$7,000
Architectural Engineering	\$6,000
Utilities	\$20,000
Construction/Materials	\$70,000
<b>TOTAL COST</b>	<b>\$103,300</b>

Chart 2) Eric was able to fund this project out-of-pocket and had an initial budget of \$100,000



## Challenges, Benefits, and Lessons Learned



**Benefits.** Eric felt that building the ADU allowed him to take advantage of an underutilized area that added value to the property. Using the ADU as a rental added another source of income to support his family while also providing relatively affordable housing downtown. He noted that the ADU attracted a diverse applicant-pool of potential renters. Eric also noted the versatility of such a building in the long term, stating **“this is a space that could offer flexibility into the future if we have family that wanted to come stay or, once the kids move out, it could become an alternative spot for us to live.”**



**Challenges.** The main challenges Eric faced when building his ADU were encountered in the Permitting and Inspection phase. Planning and Building departments have limited staff, a high volume of work, and are becoming more familiar with ADUs. Eric’s advice in this phase is to understand that City staff are busy and have a lot going on, so being proactive about the project and following up with permitting staff are the best practices for getting a project approved. One of the challenges for building an energy efficient tiny house structure is that there is a lot of surface area, which equates to higher heat gain and a need to prioritize the building envelope. Eric responded to this demand by using 2x6 construction on all the wall, purchasing high efficiency doors and windows, and using an insulated foundation. This was a source of additional complexity and cost, especially because some of these methods are new and not necessarily well-understood by contractors.



**Conclusions.** State laws and regulations like reduced setback requirements and not having to replace, add or provide parking incentivize ADU construction. Eric’s experience demonstrates that creating a high performance ADU requires resources and commitment, but he was able to avoid material markup and contractor fees by acting as his own general contractor. Eric felt a project of this scale was manageable for him. When asked why he advocated for more ADUs in the region, Eric responded **“I just think that ADUs are a great way to add density and affordable housing. From my perspective, they are smaller by design, they add value to neighborhoods, and they solve a lot of problems and achieves a lot of our goals.”** By going all-electric with solar, this project kept its construction costs lower than a mixed-fuel project, minimizes its carbon footprint, and provides stability in energy costs that can be passed along to tenants.

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