Clean Coalition

Green Rebuild Initiative

Facilitating 100% Electric, Net Zero Energy Homes, featuring Solar Microgrid Resilience and Engineered for Extreme Weather

Meet the Team

Clean Coalition

Craig Lewis, *Executive Director*

- Founder of Clean Coalition, a nonprofit organization dedicated to accelerating the transition to clean energy and a modern grid.

Lollie Kuhl, *Design Lead*

- Architectural designer focused on empowering homeowners with actionable guidance for rebuilding sustainably.

Haley Weinstein, *Communications Lead*

- Communications lead for community outreach and corporate partnering.

Gregory Young, *Director of Programs*

- Leveraging his expertise to conduct sophisticated analyses for Solar Microgrid and Community Microgrid projects.

Green Rebuild Initiative

Clean Coalition

Mission:

The Green Rebuild Initiative (GRI) aims to facilitate sustainable and resilient rebuilds through "Super Green" home designs, featuring 100% Electric Net Zero Energy (NZE) designs, supported by Solar Microgrids – for unparalleled resilience. The new homes will also be built with non-toxic materials and be engineered to withstand extreme weather events.

Plan:

1. Identify Homeowners
2. Facilitate Design
3. Perform Load Analysis and Size Solar + Storage
4. Streamline Permitting
5. Coordinate with Contractors

Repeat to develop Super Green neighborhoods!

Target Collaborators

- **Architects**
  - Altadena Collective
    - Tim Vordtreide
    - Chris Corbett Design
  - Uriu Architecture: Scott Uriu
  - Joubert Homes: Steffen Andrews
  - Bildsten Arch: Ellen Bildsten
  - Union Studios: Ben Willis
  - Lance Collins: NOMA
  - Garcia Architecture: Elisa Garcia
- **Landscape Architects**
  - Kiesel Design: Jack Kiesel
- **General Contractors**
  - Allen Construction: Dennis Allen
  - Williams Homes: Patrice Queensberry
  - Best Tech Contracting: Jason Scheurer

Prefab/Modular Manufacturers

- Plant Prefab: Steve Glenn
- Joubert Homes: Darin & Steffen
- ReMo Homes: Ryan Blowers/ Vamsi Kotla
- BPublicPrefab

Other Collaborators

- Mayor of LA: Karen Bass
- USGBC LA: Ben Stapleton
- Bello Global: John Bello, P.E.
- Desert Estate Development: John Pedalino
- Taft Office: Margie Taft
- Box Power: Fallon Vaughan
- Steadfast LA: Rick Caruso
- Permacity Foundation: Jonathan Port
- California Home+Design: Lauren Michele
- Direct Relief
- Habitat for Humanity

Community Engagement

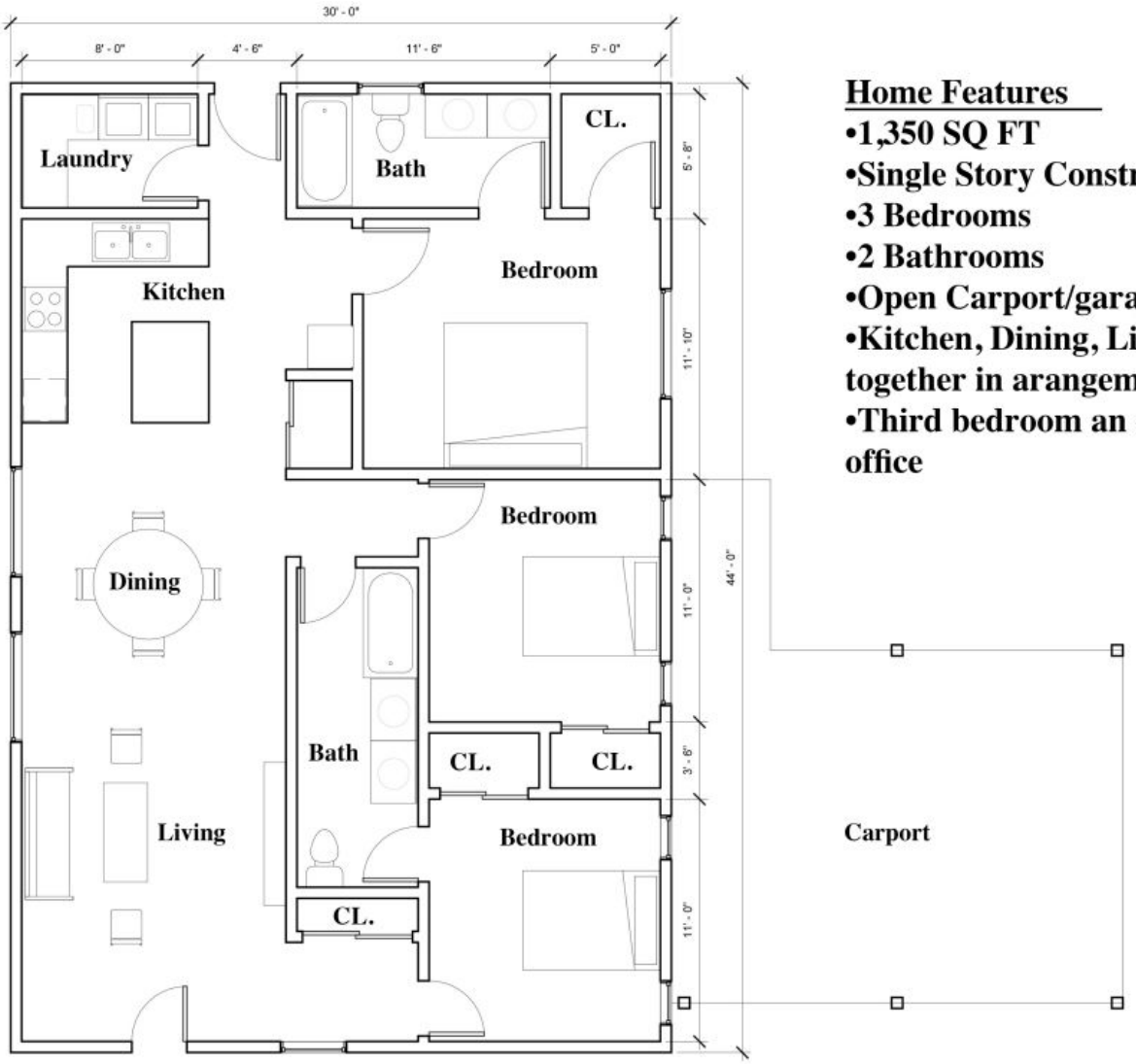
- **State of California**
  - Elena Kounalakis - Lt. Governor Cali
- **City of Los Angeles**
  - Steadfast LA
  - LA Rises
  - USGBC-LA
  - Mayor's Office
  - Kathryn Barger - County Supervisor
  - LA Sentinel
- **Altadena**
  - Altadena Collective
  - Altadena Rebuild Coalition: NOMA
  - Altadena Chamber of Commerce
  - Altadena Heritage
  - Altadena Green
  - Altadena Strong

Pacific Palisades

- Resilient Palisades
- Palisades Recovery Coalition
- Pacific Palisades Community Rebuild
- Pacific Palisades Preservation Coalition (PPPC)

Conceptual Design: Exterior

Conceptual Design: Interior



Home Features

- 1,350 SQ FT
- Single Story Construction
- 3 Bedrooms
- 2 Bathrooms
- Open Carport/garage
- Kitchen, Dining, Living all together in arangement
- Third bedroom an optional office

Timeline

1. **Conceptual Design: Architect**
   - Finalize home size:
     - Square Footage
     - Orientation
     - # of Bedrooms
     - # of Bathrooms
   - Develop Conceptual Rendering (4-6 weeks)
   - Clean Coalition (2-4 weeks):
     - Design Solar Array + Battery System
     - Size System for Microgrid Resilience
     - Economic Analysis

2. **Design Development: Architect**
   - SD: Schematic (2-4 Mo.)
     - Site Survey (1-2 Weeks)
     - Submit for Permit Review (4-6 Weeks)
   - CD: Construction Documents (1-2 Mo.)

3. **Construction Schedule: GC**
   - Foundation (1-2 Month)
   - Utility Tie-Ins (4-6 Weeks)
   - Framing (1-2 Months)
   - MEP (3-4 Months)
   - Interior Finishes (3-4 Months)
   - Exterior Finishes (1 Month)
   - Certificate of Occupancy (2-4 Weeks)

Opportunity for PreFab or Modular Construction

GRI - Overview

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Super Green

1. 100% Electric
2. Net-Zero Operational Energy
3. Community Microgrid

Energy Efficiency

2. Passive House Design
3. High-Performance Insulation
4. Blower Door Testing

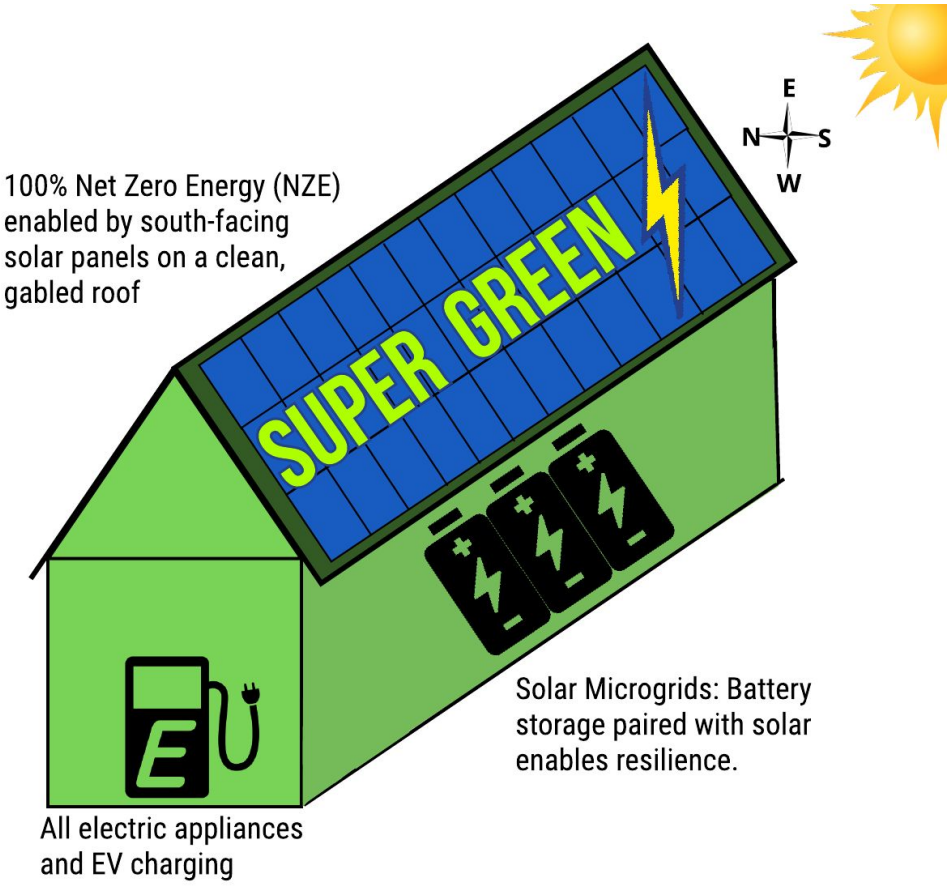
Extreme Weather Resilience

5. Extreme Heat
6. Smoke Protection
7. Wildfire Resilient

Healthy Development

8. Low Embodied Carbon
9. Low Operational Carbon
10. Indoor Air Quality
11. ILFI Red-list Free Materials
12. Thermal Comfort

Super Green



What is ”super green”?

1. 100% electric (no gas service to the home and ideally be an all-EV household).

2. Hosts enough solar to achieve Net Zero Energy (will require about 35 solar panels for a typical 2,500 square foot all-electric home with about 10,000 miles of home EV charging per year).

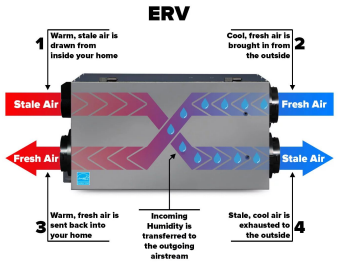
3. Includes a Solar Microgrid that combines the solar to a battery.

Super Green: 100% Electric

Specifications

- **Mechanical and Plumbing**
  - Heat Pump: Mitsubishi Hyper-Heating H2i
  - ERV: Broan Model: B130E65RT
  - Air Purifier: Lifebreath TFP3000HEPA
  - Thermostat: Ecobee
  - Water Heater: AO Smith 900 Series (50 Gal)

- **Lighting**
  - Light Bulbs
    - Interior: Bulbrite LED (776774)
    - Exterior: Bulbrite LED (778672)
  - Fixtures
    - Energy Star Certified
    - Exterior: DarkSky Compliant



Super Green: 100% Electric

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Appliances

- Bosch Range - 30" HIS8055U
- Broan Vent Hood (BBN1243SS)
- Bosch Microwave (HMB57152UC)
- Bosch Refrigerator - 21 cf (B36CT80)
- Bosch Dishwasher - 24“ (SHX65CM5N)
- LG All-in-One Washer/Dryer (WM6998HBA)
- HomeFlex Level 2 EV Charger (J1772)

Induction Cooktops

100% Electric

Energy Efficient

Super Green: Net Zero

Solar (Photovoltaic: PV)

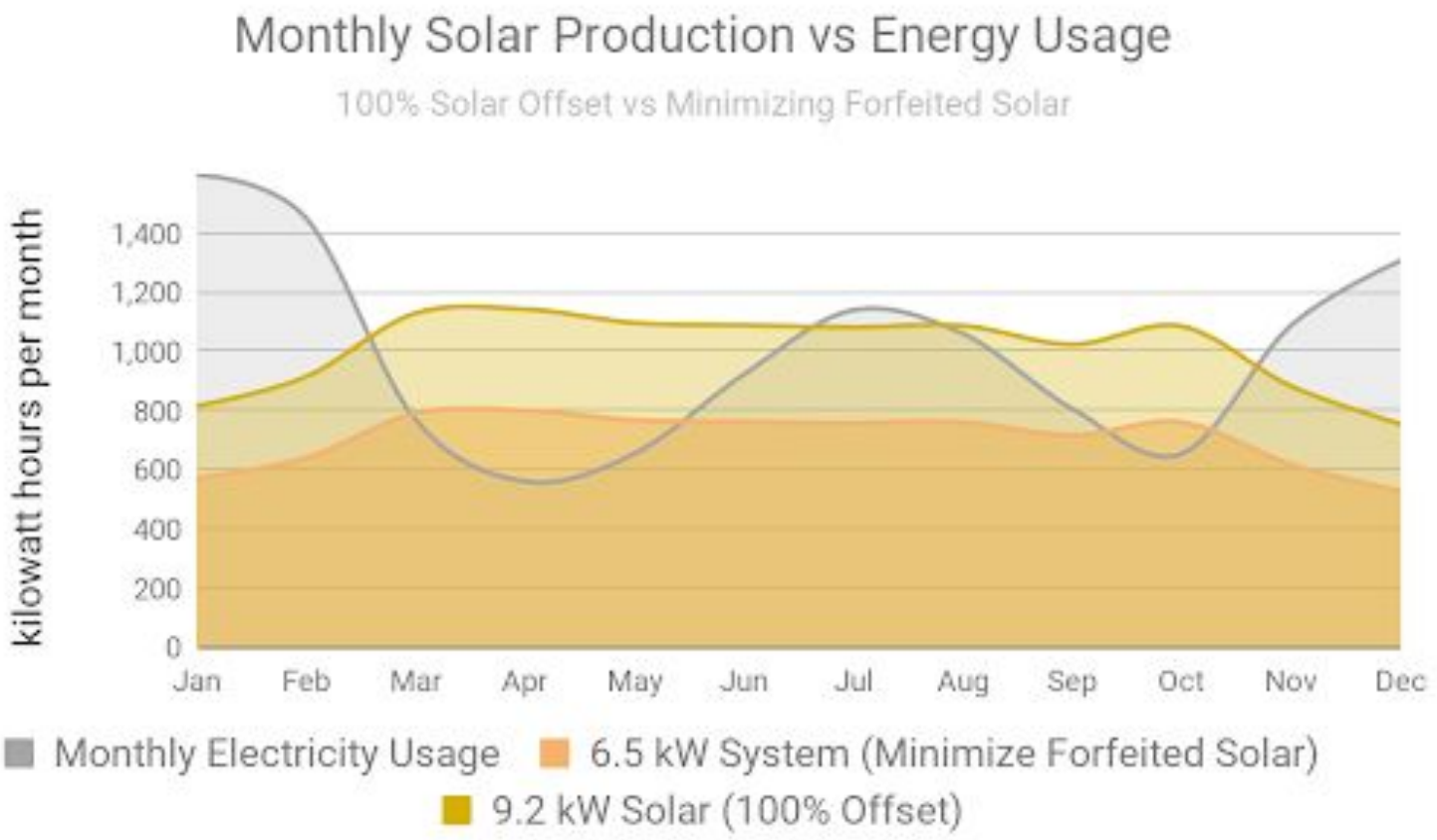
- CalGreen Title 24 Energy Code: Solar required for all new homes
- **Traditional**
  - 1,500sf = 4kW (10 Solar Panels)
  - 2,500sf = 7kW (16 Solar Panels)
- **Net-Zero**
  - 1,500sf = 10W (24 Solar Panels)
  - 2,500sf = 15kW (35 Solar Panels)

Battery Storage

- Store Solar during Day and use at Night
- Back Up Generator

Super Green: Net Zero

Net Zero Energy (NZE) a building produces as much renewable energy on-site as it consumes over the course of a year



Super Green: Net Zero

The economics associated with Super Green buildings are very attractive. A typical 1,500sf Super Green home will need about 12kW of solar to achieve Net Zero Energy (NZE), requiring about 30 standard-sized solar panels on about 600sf of clean (no protrusions) south-facing roof surface.

While the upfront cost of this 1,500sf Super Green home will be about $60k higher to build than a standard 1,500sf home, about one-third of that cost can be recovered via tax benefits, rebates, and other incentives -- and the net investment will generally earn a 10%+ tax-free, risk-free return-on-investment (ROI) via reduced energy bills. There is no other risk-free investment that earns such a high ROI, which is equivalent to a long-term certificate-of-deposit (CD) that earns a 15%+ annual-percentage-rate (APR).

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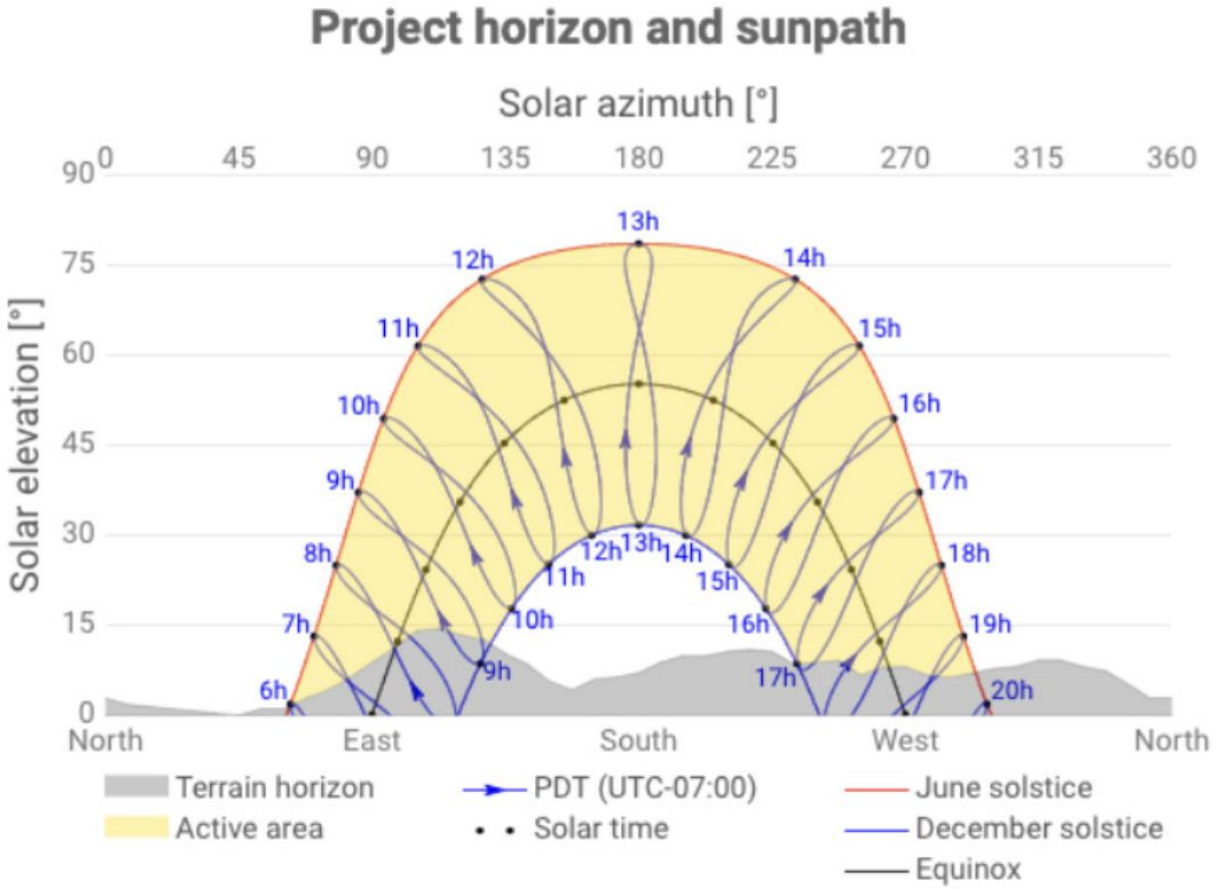
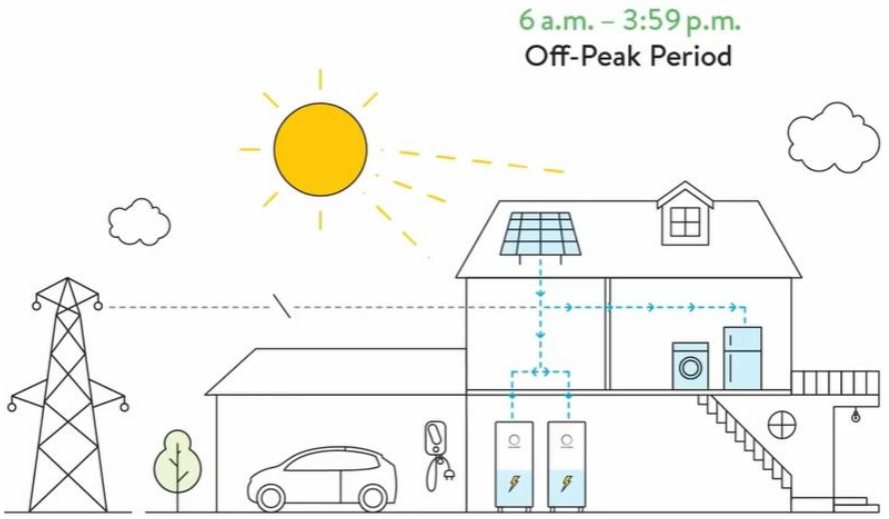
The importance of south-facing rooftops:



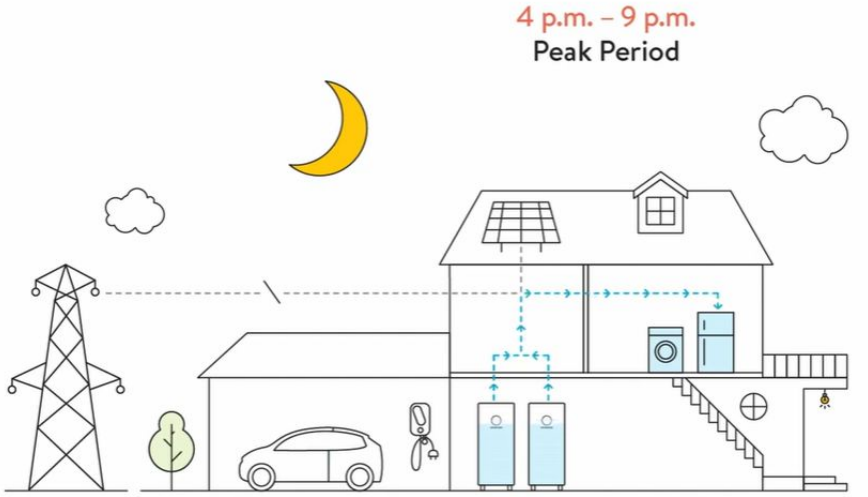
	Energy input kWh/m²	Energy loss/gain kWh/m²	Energy PVOUT specific kWh/kWp	Energy loss/gain kWh/kWp	Energy loss %
Global horizontal irradiation (GHI) theoretical	**2106.9**				
Horizon shading (terrain + horizon objects)	2095.8	-11.1			-0.5
Global horizontal irradiation site specific	**2095.8**	**-11.1**			**-0.5**

Super Green: Solar Microgrid

Off-Peak Period
Power from Sun
During the day the home draws power from its solar array and charges the home battery.



Peak Period
Power from Battery
Power is drawn from the home's battery, and Peak Utility-based costs are avoided



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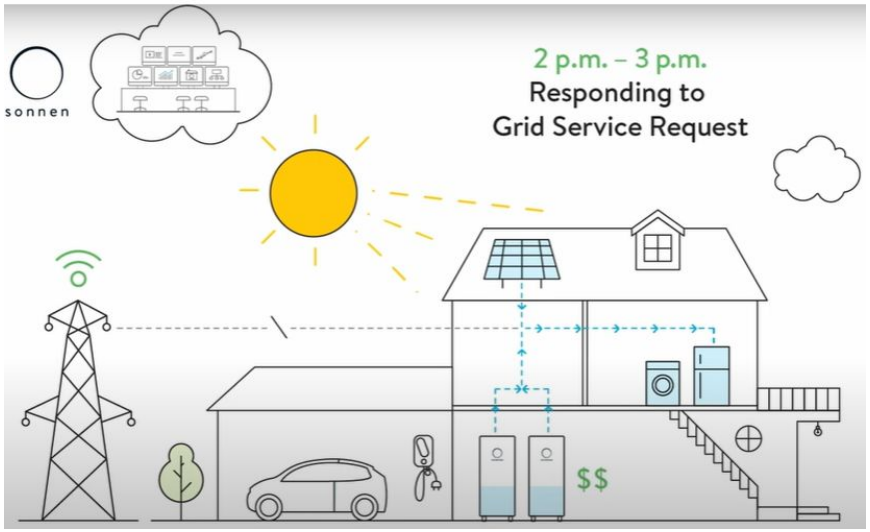
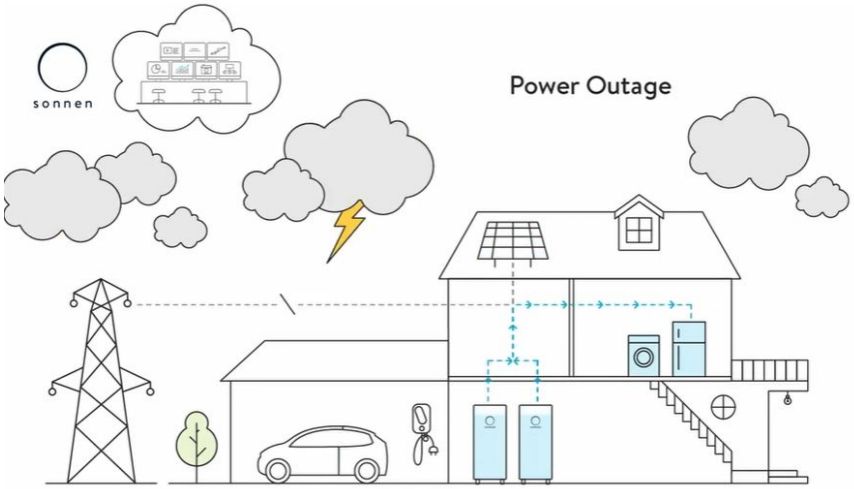
Super Green: Solar Microgrid



Grid Service Request

Earn Credits

Homeowner can earn credits from the utility company by providing excess power during a Grid Service Request. These credits can be used to offset future utility charges



Power Outage

Off-Grid Mode

During a planned and/or unexpected power outage, homeowners can shift consumption to Critical Loads and consume energy entirely from their solar + battery system. Critical Loads include only essential appliances and circuits, (HVAC, Refrigerator, Microwave, WiFi, fire-life-safety devices and select outlets).

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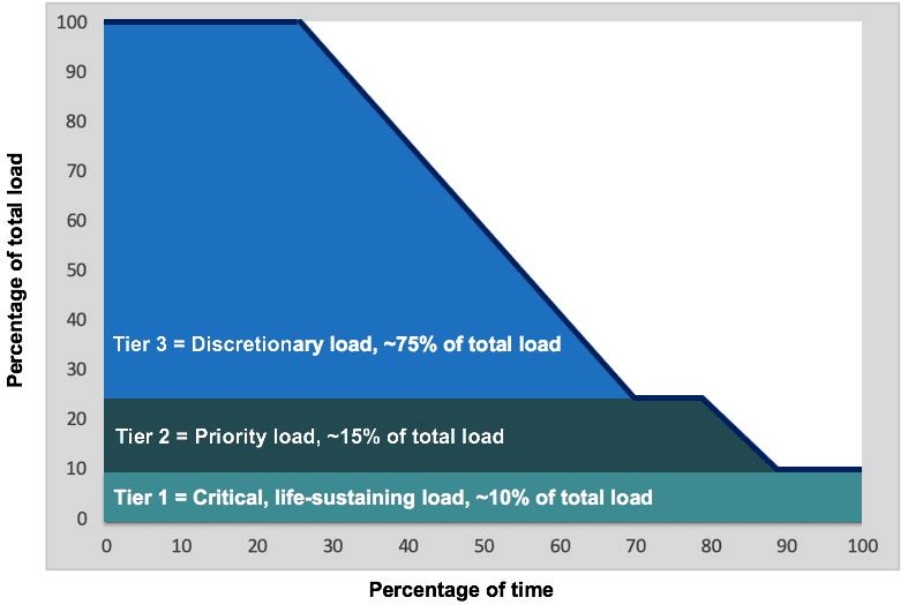
VOR123: Value of Resilience

Tier 1: Mission-critical, life-sustaining loads that warrant 100% resilience — usually about 10% of a facility's total load.

Tier 2: Priority loads that should be maintained as long as doing so doesn't threaten ability to maintain Tier 1 loads — usually about 15% of the total load.

Tier 3: Discretionary loads that should be maintained only when doing so does not threaten Tier 1 and Tier 2 resilience — usually about 75% of the total load.



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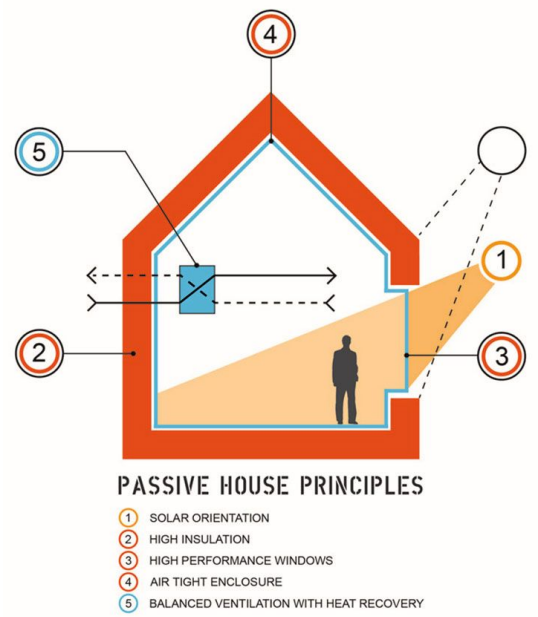
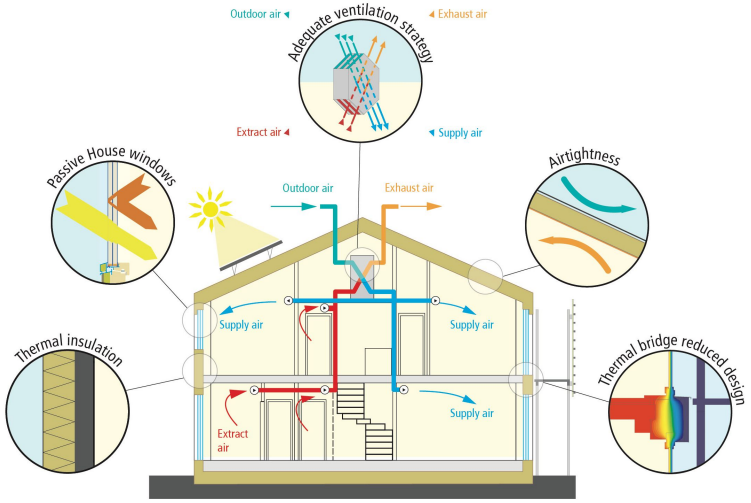
Passive House Design

1. Up to 90% Reduction in Energy Demand
2. Triple-paned Windows
3. Superior Indoor Air Quality
4. Reduced Size of Mechanical Equipment

Passivhaus Institut



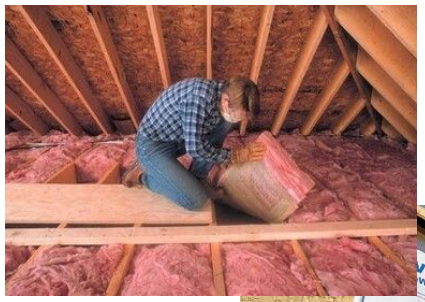


Passive House is the pinnacle standard for energy efficiency. Incorporating these principles into the home's design ensure the maximum benefit for occupancy health, well-being and energy cost savings.

High-Performance Insulation

Conventional

1. Foundation = R5
2. Floors = R10
3. Wall Assembly = R10
4. Roof Assembly = R20



Warning: likely to contain formaldehyde, VOCs, titanium dioxide, PFAS, glass fibers, phenol, heavy metals and other toxic chemicals.

Passive House

1. Foundation = R10
2. Floors = R20
3. Wall Assembly = R30
4. Roof Assembly = R50

GRI homes will be built with non-toxic materials.
See the Healthy Materials section at the end of this presentation for more info on ILFI's Red List Free materials

Note: High-performing insulation reduces the energy demand stressed on the HVAC system, creating a tremendous long-term cost saving opportunity for the homeowner.

Blower Door Test

1. Conventional Home (Code-Built)
   - ACH50 Range: 3.0 to 7.0
2. LEED Silver Home (Standard "Green" Home)
   - ACH50 Range: 1.5 to 3.0
3. Passive House (Super Green Home)
   - ACH50 Range: ≤ 0.6

Blower Door Tests are conducted on each home to measure air tightness and identify leaks in the home's exterior envelope. These leaks are then sealed prior to homeowner occupancy.

Note: Air Changes per Hour (ACH)

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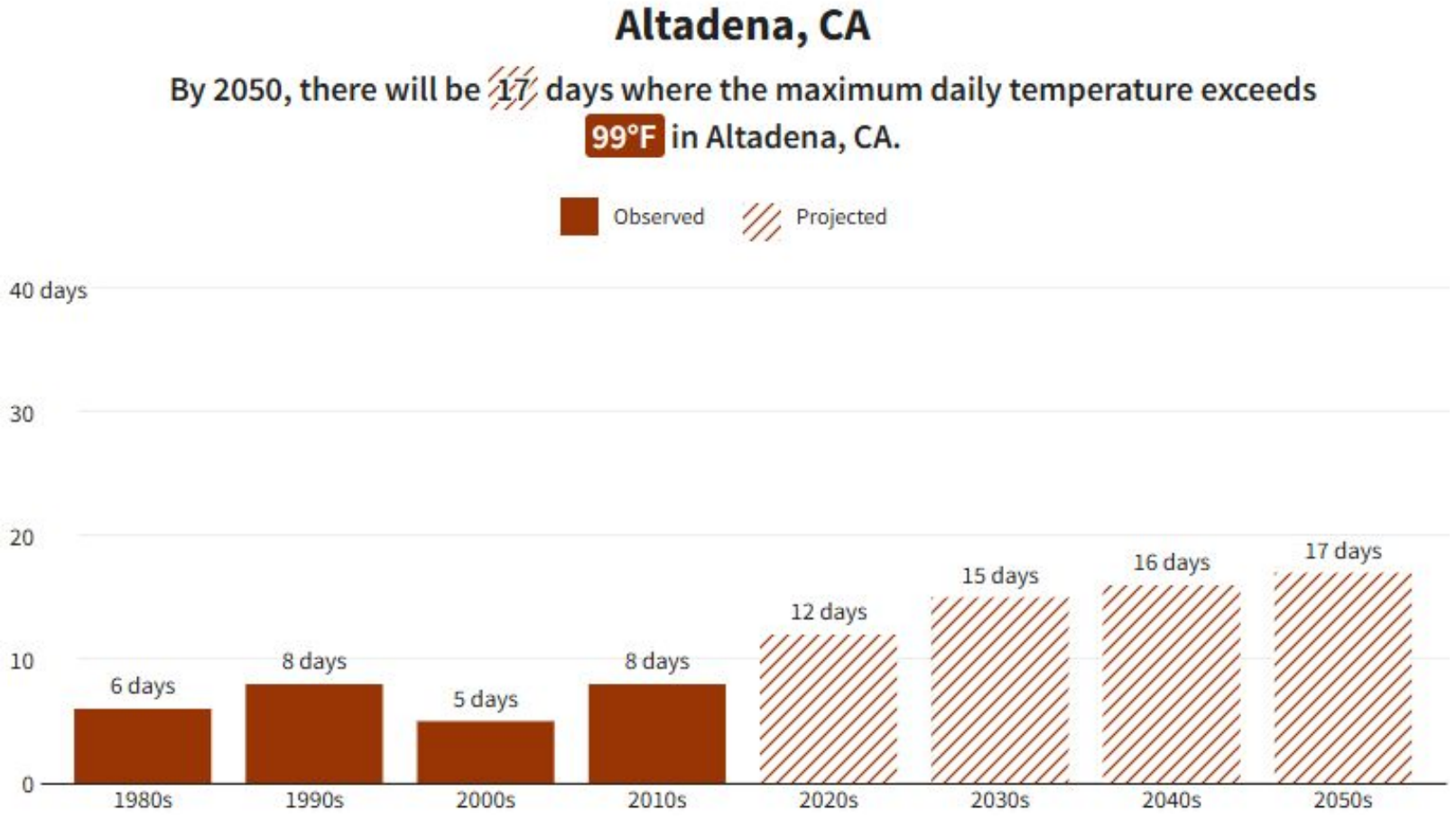
Extreme Heat



Extreme Weather Resilience: Extreme Heat

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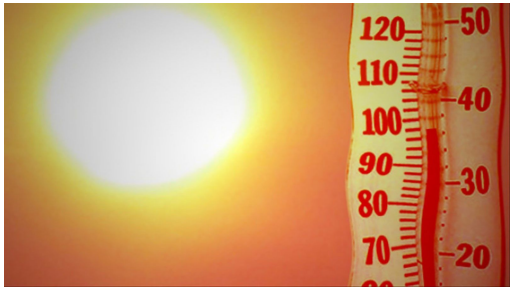
Extreme Heat



⚡ **HIGH HEAT EVENTS STRAIN CALIFORNIA'S RESIDENTS & ELECTRIC GRID**

1. Skyrocketing Demand for Air Conditioning

- On hot days, there is a massive **peak in electricity use** due to widespread use of air conditioning.
- This leads to the risk of **blackouts or brownouts** when demand exceeds supply.

2. Reduced Efficiency of Power Infrastructure

- Transmission lines lose efficiency in high heat, which reduces their capacity to deliver electricity.
- Some gas plants also become less efficient or must throttle down to avoid overheating.

3. Higher Risk of Heat Stroke

- Prolonged exposure to high temperatures combined with dehydration leads to the body's temperature regulation system failing.
- Who's at Risk: Elderly individuals, infants, and people with chronic illnesses (especially heart disease or diabetes).

🧊 **COMFORT + RESILIENCE = STAYING COOL**

A homeowner in a **Passive House-certified, net-zero energy home with battery backup** is vastly more prepared to withstand a heatwave because:

- The house stays cool for **long periods without active cooling** thanks to thermal mass, insulation, and air sealing.
- When cooling is needed, a **high-efficiency mini-split** and **heat pump system** can operate with minimal energy use.
- Battery storage ensures that **even during blackouts, the home remains livable**.
- Utility bills stay low or net-positive, freeing up income during high-price periods.

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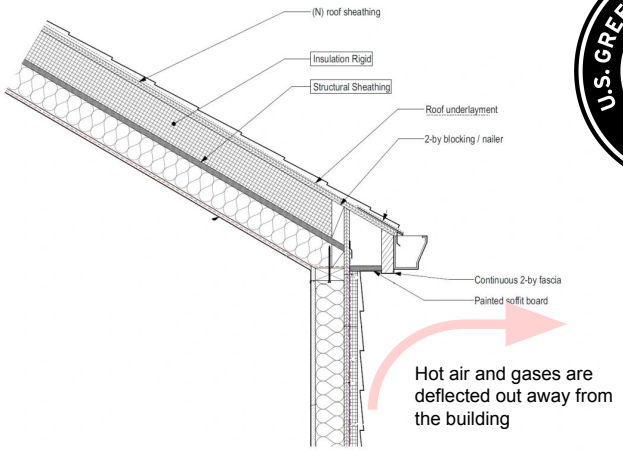
USGBC Wildfire Defense Toolkit

1. Defensive Perimeter
2. Class A Materials
3. Hot Roof (Non-Vented)
4. Tempered Triple-pane Windows
5. Heat Resistant Siding



Timber HP: Class A (2-Hr Rated)

Build back ~~better~~ once

Fire Wise Design

2-Hour Fire Rating

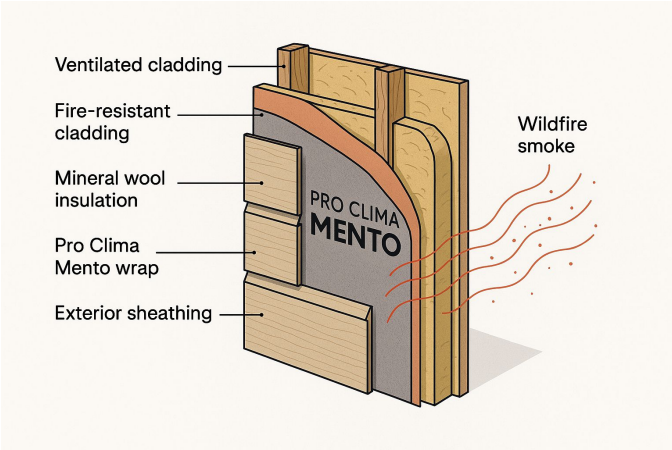
=

2-Hour Fire Rating

Build a fortress without it looking like a fortress

Note: By using Class A materials for siding, insulation, decking, and other exterior components, the home can achieve the same 2-Hour fire rating as a home with concrete walls, without the high embodied carbon impact.

Smoke Protection: Air Barrier



🔥 HOW IT PROTECTS AGAINST WILDFIRE SMOKE

- **Monolithic TEEE membrane**: Unlike microporous wraps (like Tyvek), the Mento series uses a **continuous polymer layer** that **physically blocks fine particles** like wildfire smoke (PM2.5 and PM10).
- **Highly vapor-open**: Allows interior moisture to escape, protecting your wall assembly from condensation and mold.
- **Windproof and waterproof**: Stops wind-driven rain and air leaks, increasing thermal performance.
- **UV and heat resistant**: Can be left exposed for a time during construction and remains stable in extreme heat.

Healthy Development

1. **Low Embodied Carbon**
2. **Operational Carbon**
3. **Indoor Air Quality**
4. **Healthy Materials**
   - Human Health
   - Environmental Health
5. **Thermal Comfort**

Healthy Development: Low Embodied Carbon

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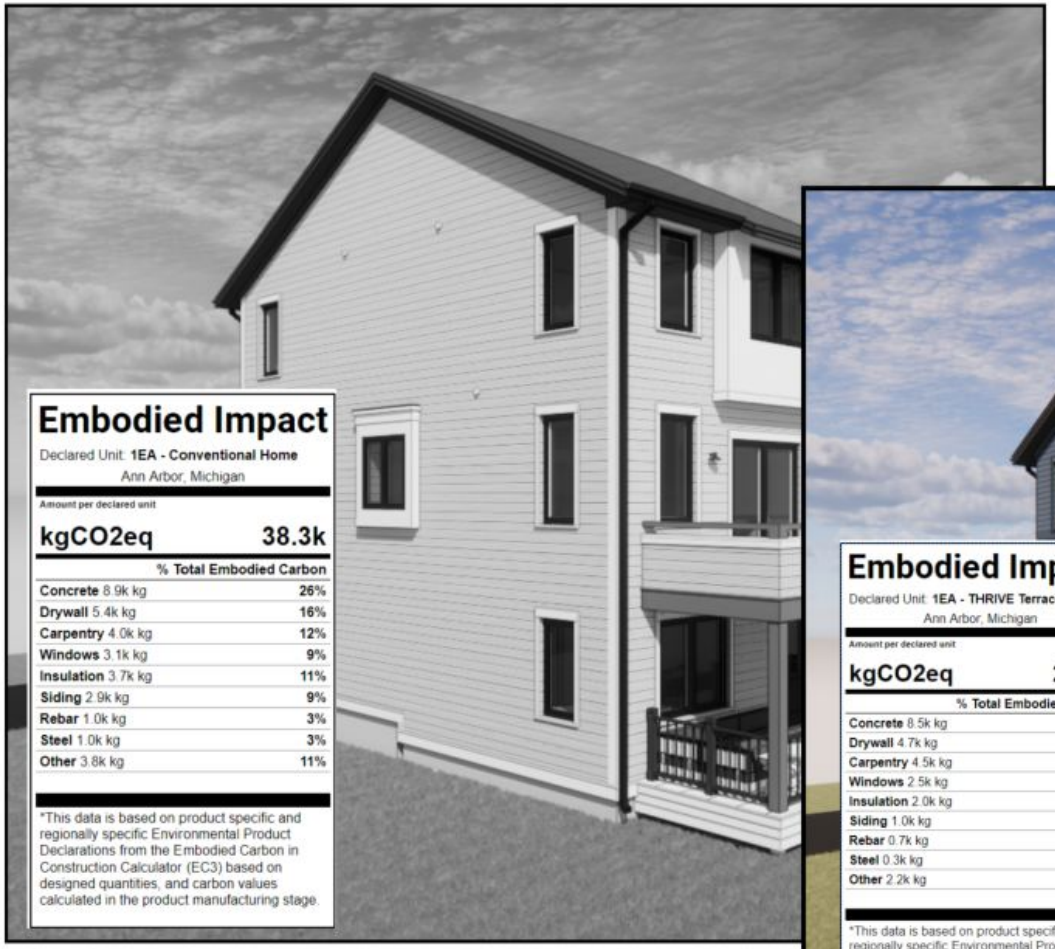
This example compares the same style home built with sustainably-sourced materials vs. a conventionally built home of the same size.



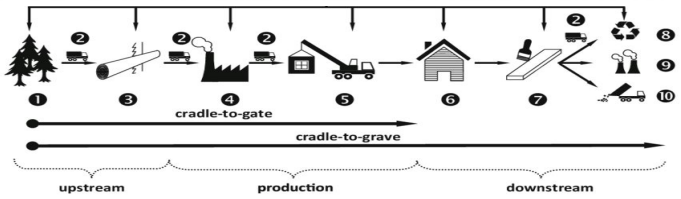
Embodied Impact

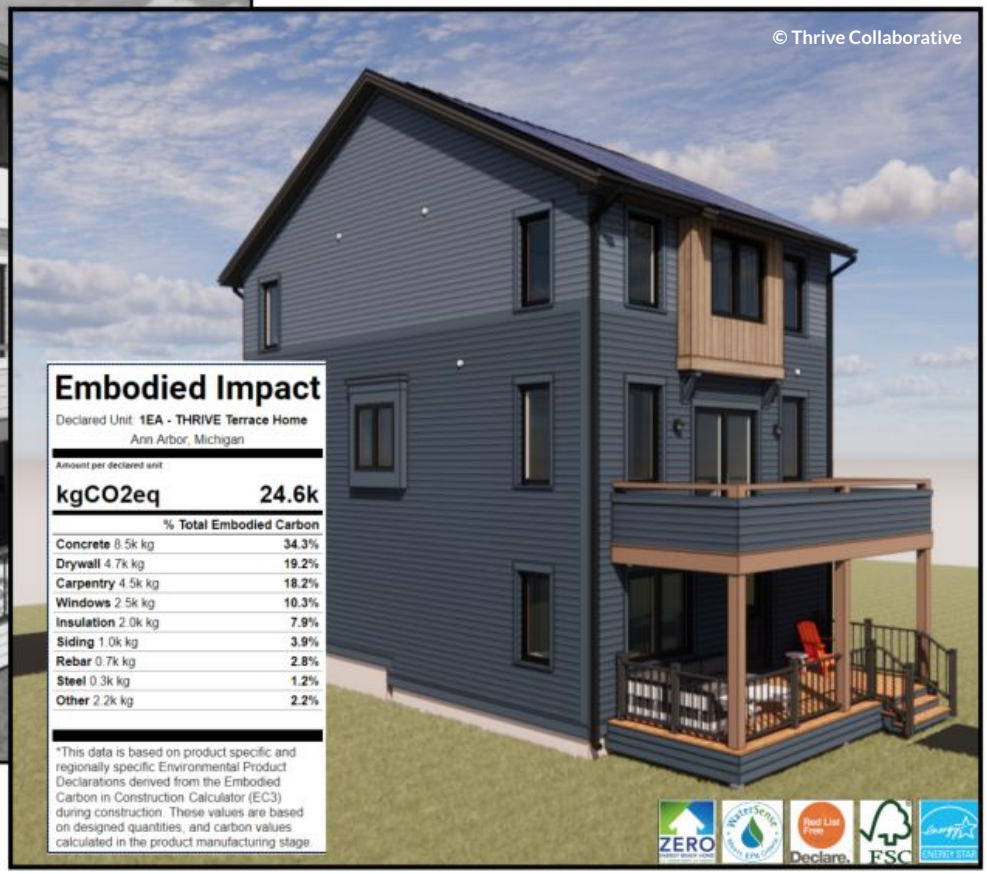
Declared Unit: **1EA - Conventional Home**
Ann Arbor, Michigan

Amount per declared unit

kgCO2eq	38.3k
	% Total Embodied Carbon
Concrete 8.9k kg	26%
Drywall 5.4k kg	16%
Carpentry 4.0k kg	12%
Windows 3.1k kg	9%
Insulation 3.7k kg	11%
Siding 2.9k kg	9%
Rebar 1.0k kg	3%
Steel 1.0k kg	3%
Other 3.8k kg	11%

*This data is based on product specific and regionally specific Environmental Product Declarations from the Embodied Carbon in Construction Calculator (EC3) based on designed quantities, and carbon values calculated in the product manufacturing stage.





Embodied Impact

Declared Unit: **1EA - THRIVE Terrace Home**
Ann Arbor, Michigan

Amount per declared unit

kgCO2eq	24.6k
	% Total Embodied Carbon
Concrete 8.5k kg	34.3%
Drywall 4.7k kg	19.2%
Carpentry 4.5k kg	18.2%
Windows 2.5k kg	10.3%
Insulation 2.0k kg	7.9%
Siding 1.0k kg	3.9%
Rebar 0.7k kg	2.8%
Steel 0.3k kg	1.2%
Other 2.2k kg	2.2%

*This data is based on product specific and regionally specific Environmental Product Declarations derived from the Embodied Carbon in Construction Calculator (EC3) during construction. These values are based on designed quantities, and carbon values calculated in the product manufacturing stage.

Embodied Carbon: all carbon expended during raw material extraction, manufacturing and transportation to the construction site (Cradle-to-Gate).

Healthy Development: Low Operational Carbon

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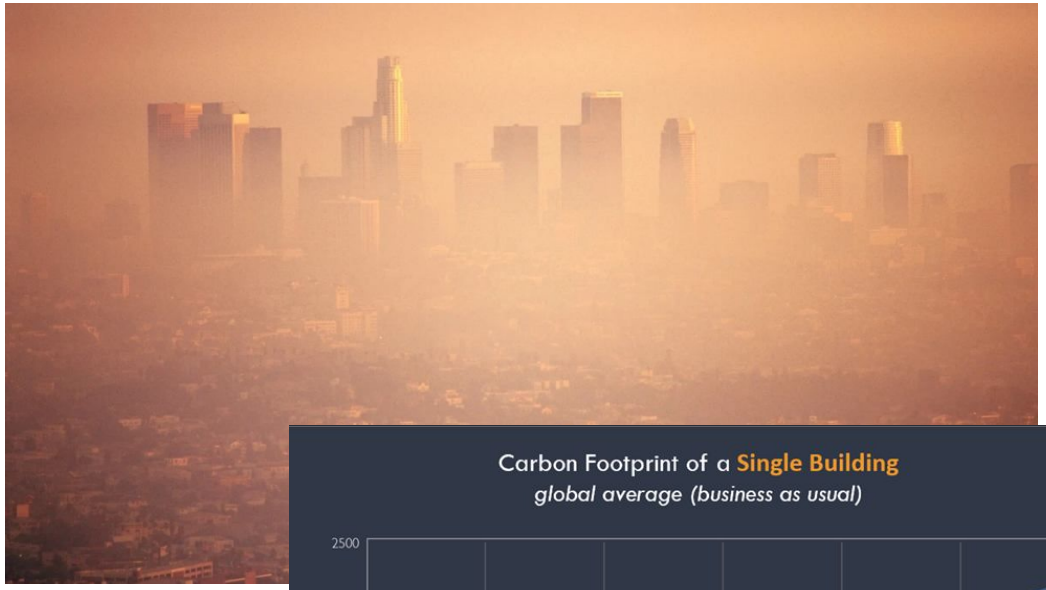
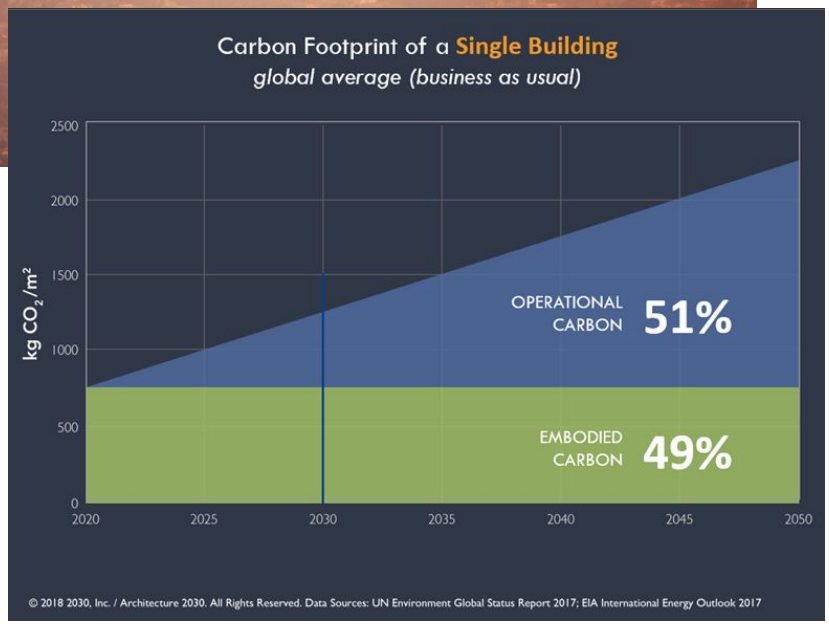




Reduces Harmful Air Pollution

Solar + battery systems lower demand for fossil fuels, cutting emissions like PM2.5 and NO_x that damage lungs and hearts

Protects Human Health

Cleaner air means fewer asthma attacks, respiratory issues-and cardiovascular problems—especially for kids and seniors

Supports Emission-Free Driving

Charge electric vehicles at home using clean solar energy, reducing smog-forming pollutants and tailpipe emissions

Lowers Carbon Emissions

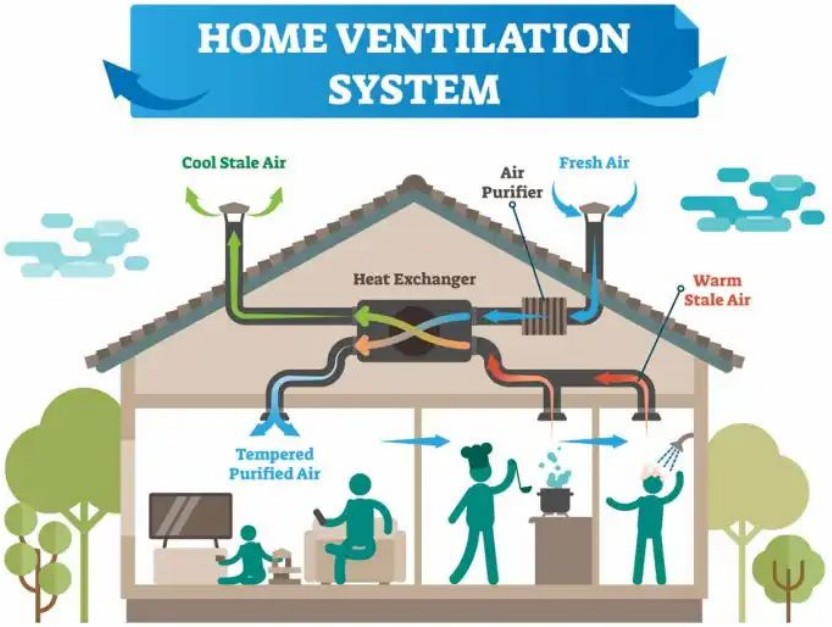
Generating your own clean power slashes CO_2 output, helping fight climate change and reduce extreme weather events

Preserves Air and Nature

Clean energy reduces the need for polluting power plants and fossil fuel

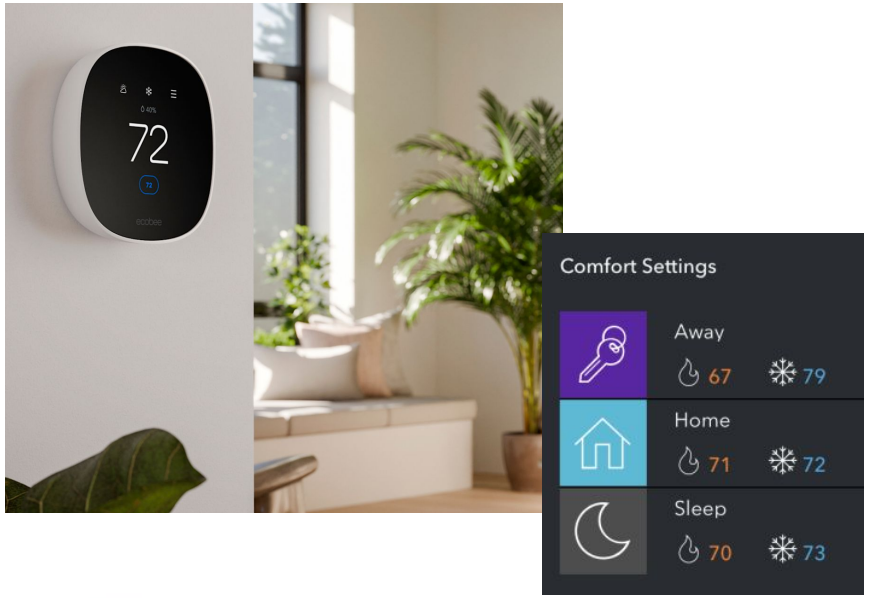
Indoor Air Quality

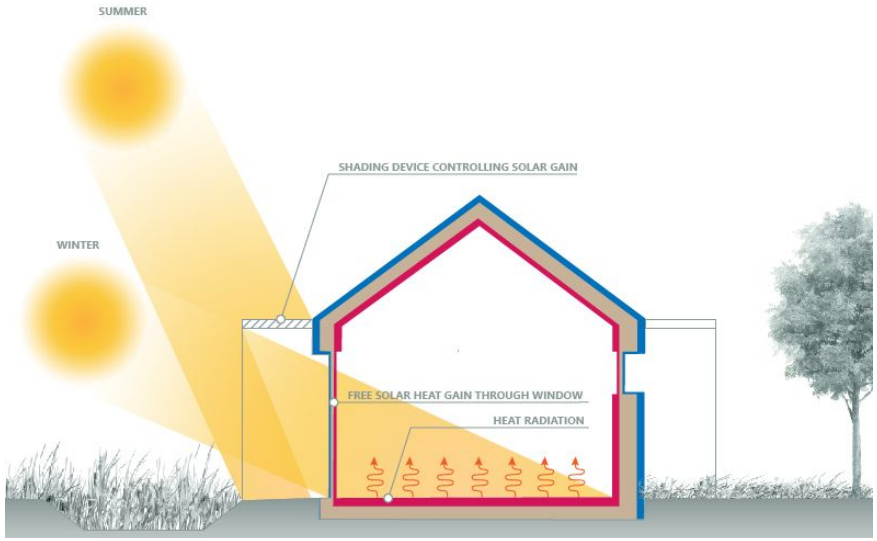
- **ERV (Heat Exchanger)**: Brings in fresh air while managing humidity and removing indoor pollutants like CO_2 and VOCs.
- **Air Purifier**: In-line Air Purifier provides enhanced protection against wildfire smoke and airborne viruses.
- **MERV 13 Air Filter**: Captures dust, pollen, and mold spores to reduce allergens and improve respiratory health.
- **Red List Free Materials**: Eliminates harmful chemicals, reducing off-gassing and supporting long-term occupant health.



Thermal Comfort

- **Home Orientation**: A south-facing orientation maximizes sun exposure during winter, capturing free heat from the low-angled sun.
- **Summer Condition**: Roof overhangs or shade structures block high summer sun, keeping interiors cool without mechanical cooling.
- **Winter Condition**: With no shading, the low winter sun penetrates deep into living spaces, naturally warming the home during cold months.
- **Triple-Paned Windows**: High-performance windows reduce heat loss while allowing sunlight in, enhancing both insulation and passive heat gain.
- **Ecobee Thermostat**: A smart thermostat that optimizes indoor temperatures by learning usage patterns and adjusting heating based on real-time conditions, maximizing comfort and energy efficiency.





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Living Future Red List

The Living Future Red List is a list of chemicals representing the “worst in class” substances prevalent in the building industry that pose serious risks to human health and environmental health.

Hazards include cancer, reproductive toxicity, acute or chronic organ toxicity, endocrine disruption, environmental persistence, bioaccumulation, ozone depletion, and others.

Homes built as part of GRI will target procurement of exclusively Red List Free material.

https://living-future.org/red-list/

Clean Coalition

Living Future Red List

Chemical	Where It's Found	Environmental Impacts	Human Health Impacts
Asbestos	Insulation, flooring, roofing, cement board	Persistent in the environment, hazardous waste	Causes lung cancer, mesothelioma, and asbestosis
Formaldehyde	Composite wood, insulation, adhesives, cabinetry	Air pollutant, contributes to smog formation	Respiratory irritant, probable human carcinogen
PVC (Polyvinyl Chloride)	Vinyl flooring, pipes, wall coverings, windows	Toxic byproducts during manufacturing and disposal (dioxins)	May contain phthalates and heavy metals; endocrine disruptor
Phthalates (e.g., DEHP)	Vinyl products, sealants, adhesives, wall coverings	Persistent, bioaccumulative; toxic to aquatic organisms	Hormone disruption, developmental and reproductive toxicity
Flame Retardants (e.g., PBDEs)	Insulation, upholstery, electronics casings	Persistent organic pollutants; accumulate in wildlife	Thyroid disruption, neurodevelopmental harm, possible carcinogen
Halogenated Solvents	Paint removers, cleaners, degreasers, adhesives	Air and water pollutant; hazardous waste	Neurotoxic, liver/kidney damage, suspected carcinogen

Clean Coalition

Living Future Red List

Chemical	Where It's Found	Environmental Impacts	Human Health Impacts
Cadmium	Pigments, coatings, plastic stabilizers	Soil and water contaminant; bioaccumulative in food	Kidney damage, respiratory issues, known carcinogen
Lead	Paint, plumbing, roofing materials	Long-lasting soil/water contaminant; harmful to wildlife	Neurotoxic, affects child development, cardiovascular effects
Mercury	Fluorescent lighting, switches, thermostats	Bioaccumulative in fish; persistent in water systems	Nervous system damage, cognitive impairment, kidney damage
Isocyanates (e.g., MDI, TDI)	Spray foam insulation, paints, sealants	Contribute to smog, hazardous waste	Respiratory sensitizer, asthma, skin and eye irritation
PFAS	Paints, Stain-resistant carpets, sealants, coatings, membranes	Extremely persistent ('forever chemicals'), water pollution	Hormone disruption, cancer, immune system effects
VOCs	Paints, sealants, adhesives, flooring, cabinetry	Ground-level ozone (smog) formation, indoor air pollution	Eye/nose/throat irritation, liver/kidney damage, carcinogenic

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Material Specifications

- **Foundation**
  - Concrete with Low GWP
- **Framing**
  - FSC Certified Lumber
- **Roofing**
  - 26g Standing Seam Metal
- **Insulation**
  - TimberHP, Rockwool, UltraTouch Denim or NuWool
- **Drywall**
  - USG Ecosmart
- **Flooring**
  - FSC Red Oak w/ Rubio Monocoat
  - Forbo Marmoleum
- **Tile**
  - DalTile or Fireclay
- **Air Barrier**
  - Pro Clima Mento
- **Plumbing**
  - PEX, IBEX and ABS
- **Windows and Doors**
  - Elitfonster Triple Paned
- **Countertops**
  - Dekton or Reclaimed Wood
- **Paint**
  - Benjamin Moore Ultra Spec
- **Siding**
  - Stucco and/or Metal
- **Decking**
  - Bison IPE Class A Wood
- **Cabinets**
  - FSC Maple and MDF

Conclusion:

Clean Coalition is committed to ensuring communities achieve resilient energy solutions and an unparalleled trifecta of economic, environmental, and resilience benefits.

Our plan bridges innovation and community action, turning the tragedy of the fires into an opportunity to create a sustainable, resilient, and thriving Palisades.

Together, we can lead the way toward a future built on renewable energy and environmental responsibility.

Conclusion