Electrifying Multifamily Affordable Housing—
6 San Francisco Affordable Housing Projects - Energy Efficient + All-Electric Systems

- Balboa Upper Yard: Mission Housing Development, Related, Mithun
- Maceo May: CCDC, Swords to Plowshares, Mithun, AEA
- Hunters Point Shipyard Block 52: McCormack Baron Salazar, Mithun
- Hunters Point Shipyard Block 54: McCormack Baron Salazar, Mithun
- Casa Adelante, 681 Florida: TNDC & MEDA, Mithun
- Casa Adelante, 2060 Folsom: TNDC/CCDC, Mithun, YA Studio, AEA
- Balboa Upper Yard: Mission Housing Development, Related, Mithun
Maceo May
Veterans Apts,
Treasure Island
105 Units, 114,836 GSF
All Electric
Battery Storage

EUI 17.8
Building Systems

Domestic Hot Water: Air Source Heat Pump

A refrigerator operating in reverse
Building Systems

Energy Recovery Ventilator

- Slow, continuous supply of fresh air
- Recovers heat and moisture
- MERV 13 filter
Energy Benchmarking—

unit: kBtu/SF/yr

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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<tbody>
<tr>
<td>U.S. National Average</td>
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<tr>
<td>Title 24 Baseline</td>
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<tr>
<td>Design</td>
<td>17.8</td>
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<tr>
<td>Net Zero</td>
<td>11.9</td>
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2030 Challenge 70%
Zero Emissions – Not Net Zero Energy

PV area required to achieve NZE:

Existing PV + 16,500 SF
Construction Cost: Lower

Key Drivers:

**Reductions**
- Eliminating Solar Hot Water saved $215,000
- Eliminating Natural Gas saved $168,000

**Additions**
- Electric DHW added $105,000

**Net**
- $242,000 lower cost
Energy Use: -32%
Emissions: -77%
Annual Utility Cost Savings—

Normalized by Gross Building Area

<table>
<thead>
<tr>
<th>Project</th>
<th>T24 Standard</th>
<th>Design</th>
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<tr>
<td>Casa Adelante - 200A Tobin</td>
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<td>Maceo May</td>
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Zero Net Carbon Affordable Housing can:

- Be Construction Cost-Neutral
- Offer Lower Utility Bills
- Be Designed and Built Today

It’s really about Zero Net Carbon (not Zero Net Energy)
Hilary Noll, AIA, LEED AP BD+C
Associate / Sustainability Integration Leader
415-489-4860  hilaryn@mithun.com
Building Systems

Wall Assemblies: Type 1A/Type IIIA, 1.5” continuous insulation
Window to Wall Ratio: 31%
Glazing: U-Value: 0.38  SHGC: 0.25
Orientation: Optimizes Bay breezes
Domestic Hot Water: Air Source Heat Pump
Ventilation: ERVs in each Unit
Heating & Cooling: VRV (Common Areas); Resistance (Units)
Lighting Controls: Occupancy Sensors, Daylight Dimming
Renewables: Solar PV sized for house load
All Electric Commercial Buildings
Current examples
01.08.2020
ALL ELECTRIC COMMERCIAL BUILDINGS

K-12 Schools  Higher Ed  Civic / Office  Complex Labs

Jess Jackson Sustainable Winery Building: Siegel & Strain Architects + Guttman & Bleavoet Engineers
270 Brannan
San Francisco
SF, Office
Perkins & Will
Interface Engineering
Bradley Terminal, LAX
All Electric Restaurants at LAX
Bradley Terminal

Andre Salvadar, So Cal Edison food service expert helped these tenants adapt to all electric, he’s a great resource!
• Kaiser Santa Rosa Medical Office
• 87,300 SF Medical Office
• LEED Platinum, ZNE
• Hawley Peterson & Sydney, Integral Group
BioEpic Laboratory, LBNL
70,000 sf, All Electric

- BioEpic Laboratory
- 70,000 SF Research Lab
- Smithgroup
California Universities Are Transitioning to All-Electric Buildings

The University of California system and Stanford University are making all-electric buildings the default in new construction.

“No new UC buildings or major renovations after June 2019, except in special circumstances, will use on-site fossil fuel combustion, such as natural gas, for space and water heating”
The Exploratorium
200,000 SF science museum
ILFI NZE certification expected
EHDD, Integral Group
Resources


The economics of electrifying buildings:  https://rmi.org/insight/the-economics-of-electrifying-buildings/

Are we ready for all electric buildings?:  https://tinyurl.com/y3unn3r4


The smog in your kitchen:  https://www.fresnobee.com/opinion/readers-opinion/article222726175.html

All electric commercial food service:  https://drive.google.com/open?id=1CjrN62JqgffTzri3zeE3hwDqW9Zu80ws

All electric restaurant kitchens:  https://www.foodserviceandhospitality.com/why-induction-cooking-is-the-hottest-trend-to-hit-restaurant-kitchens/

Zero carbon commercial construction:  http://sanjoseca.gov/DocumentCenter/View/82909
All Electric Commercial Buildings

Current examples

June 12, 2019