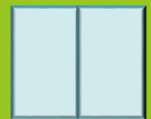
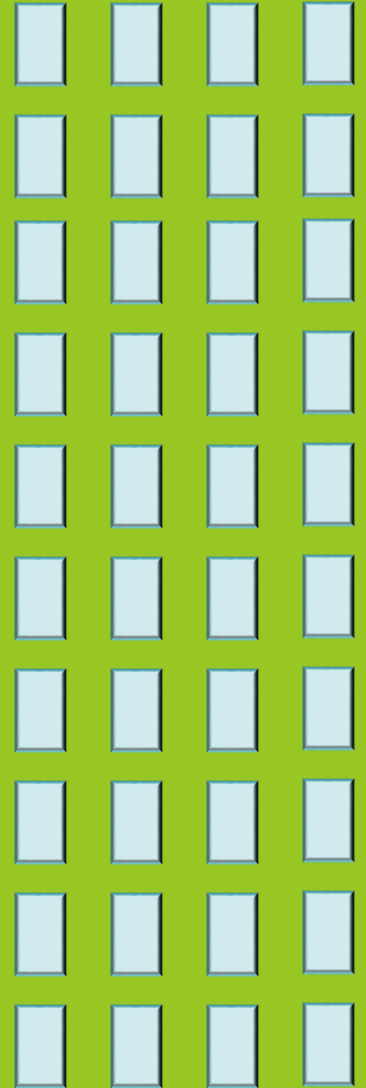


GREEN BUILDING



HOME INNOVATION: NGBS

- National Association of Home Builders (NAHB) established National Green Building Standards (NGBS) in 2008
- Certifies single family, multifamily, remodeling, and land development
- Over 356,638 homes certified
- Gets points in 6 categories and earn: bronze, silver, gold, or emerald certification
 - Site Design
 - Resource Efficiency
 - Water Efficiency
 - Energy Efficiency
 - Indoor Environmental Quality
 - Operation and Maintenance
- Projects can also earn badges: Net Zero Energy, Resilience, Smart Home, Universal Design, Wellness, and Zero Water



GREEN GLOBES

- Green Globes was developed in the UK in the 1980s and was adapted for the US in 2004 (also adapted for Canada in 2000)
- In the US the Green Globes Certification is offered through the Green Building Initiative (GBI)
- Certifies: new construction (NC), multifamily (NC), core and shell (NC), existing buildings (EB), multifamily (EB), and sustainable interiors (SI).
- Over 2,250 projects certified under new construction in the US
- Gets points in 7 categories (1000 total)
 - Project Management (100)
 - Site (150)
 - Energy (260)
 - Water Efficiency (190)
 - Materials (150)
 - Indoor Environment (150)



BUILD IT GREEN



- Build it Green is a non profit that was founded in 2005 in the bay area to certify homes, they now certifies homes all over California
- Certifies single and multifamily homes in both new construction and existing (used for remodels or for homes with existing green features)
- Over 89,444 homes certified (9,221 in 2021)
- Gets points in 5 categories
 - Community
 - Energy Efficiency
 - Indoor Air Quality
 - Resource Conservation
 - Water Conservation



LEED CERTIFICATION

■ LEED CERTIFICATION

- United States Green Building Council (USGBC) came up with a rating system for how “Green” buildings are.

■ LEED vs. 4.1 for Residential BD+C (Building, Design, and Construction) Checklist

- Integrative Process (2)
- Location and Transportation (10)
- Sustainable Sites (5)
- Water Efficiency (15)
- Energy and Atmosphere (40)
- Materials and Resources (12)
- Indoor Environmental Air Quality (16)
- Innovation (6)
- Regional Priority Credits (4)

■ Rating:

- Certified: 40-49
- Silver: 50-59
- Gold: 60-79
- Platinum: 80-110



REGIONAL CREDITS

■ Santa Barbara (Homes)

- Annual energy use (up to 29 points)
 - Design a building that is lower than LEED's energy budget.
- Advance utility tracking (up to 2 points)
 - Track utilities by the hour and give data for analysis
- Access to transit (up to 2 points)
- Material-efficient framing (up to 2 points)
 - Structural Insulated Panel System (SIPS)
- Outdoor water use (up to 4 points)
 - Have less lawn and plant native plants.
- Total water use (up to 12 points)
 - Design a building that uses lower than LEED's water budget

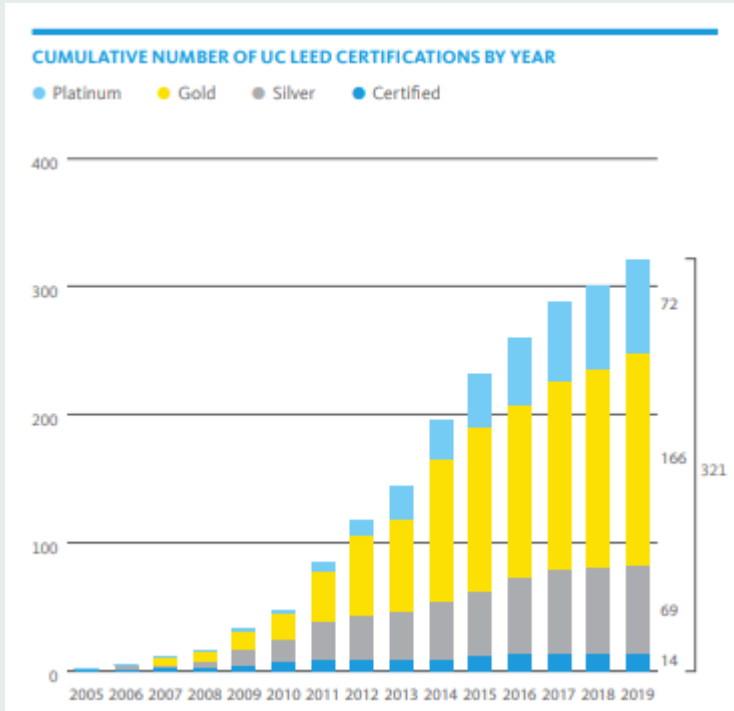


LEED CERTIFICATION

- What can be LEED certified?
- LEED Building Design and Construction
 - Residential (includes Single Family Homes, Multifamily Homes, and Multifamily Homes Core and Shell), Core and Shell, New Construction, School, Healthcare, Retail, Data Centers, Warehouse & Distribution Center, and Hospitality
- LEED Interior Design and Construction
 - Commercial Interiors, Hospitality, Retail
- LEED Operations and Maintenance
 - Existing Building, Retail, Data Centers, Warehouse and Distribution Center, and Hospitality, Schools
- Neighborhood Development



UC LEED CERTIFICATION



18% of LEED certified building at UCSB

ELECTRICAL CYCLING



ELECTRICAL CYCLING

Summer Discount Plant, Enhanced Cycling Programs Compared (Edison)

	Maximum Savings Cycling: A/C may be shut off for up to 6 hours a day	Maximum Comfort Cycling: A/C may be shut off for 15 minutes each half hour for up to 6 hours a day
Standard Options	Save up to \$140*	Save up to \$70*
Override Options	Save up to \$70*	Save up to \$35*

ELECTRICAL CYCLING

- Electrical Cycling Times 2021 (4 events, 6 hours)

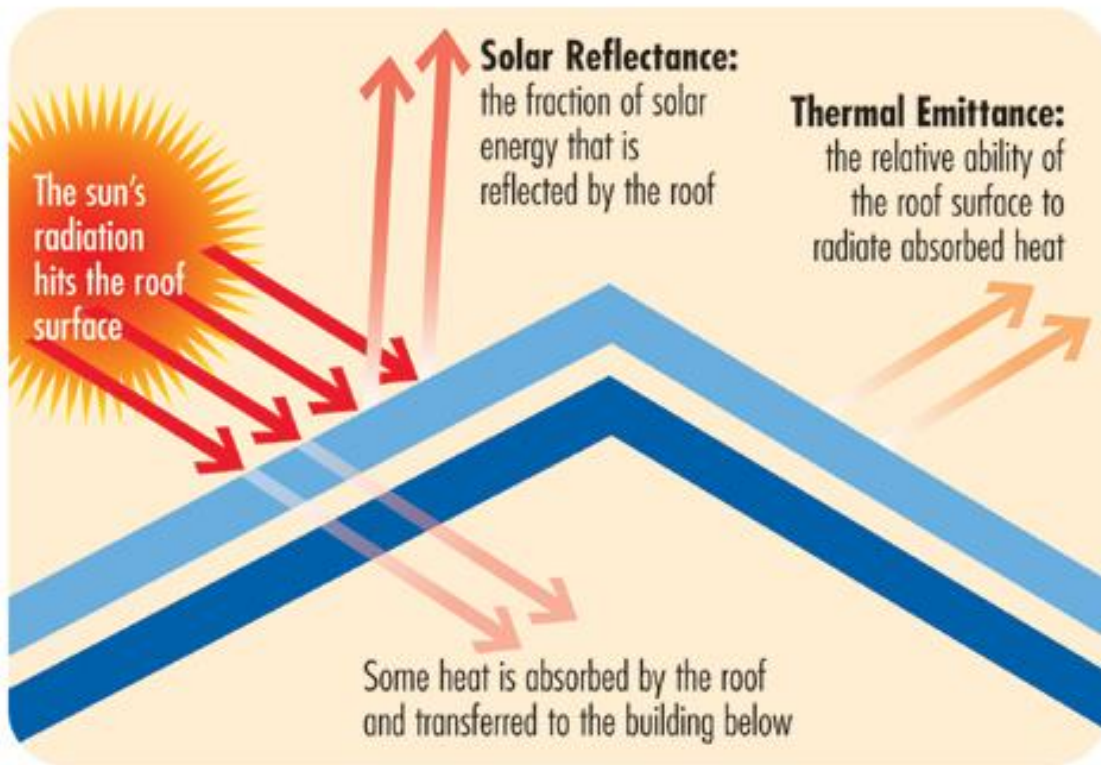
Start Date	End Date	Start Time	End Time
6/17/2021	6/17/2021	05:00PM	06:00PM
7/9/2021	7/9/2021	05:50PM	08:55PM
8/27/2021	8/27/2021	05:00PM	06:00PM
9/9/2021	9/9/2021	03:58PM	5:00PM

ELECTRICAL CYCLING

■ Electrical Cycling Times 2020 (11 events, 20 hours)

Start Date	End Date	Start Time	End Time
7/31/2020	7/31/2020	04:00PM	05:00PM
8/13/2020	8/13/2020	07:00PM	08:00PM
8/14/2020	8/14/2020	04:00PM	09:29PM
8/15/2020	8/15/2020	03:00PM	07:50PM
8/16/2020	8/16/2020	05:40PM	07:30PM
8/17/2020	8/17/2020	03:10PM	07:40PM
8/18/2020	8/18/2020	01:40PM	07:48PM
9/5/2020	9/5/2020	05:30PM	08:25PM
9/6/2020	9/6/2020	04:40PM	08:23PM

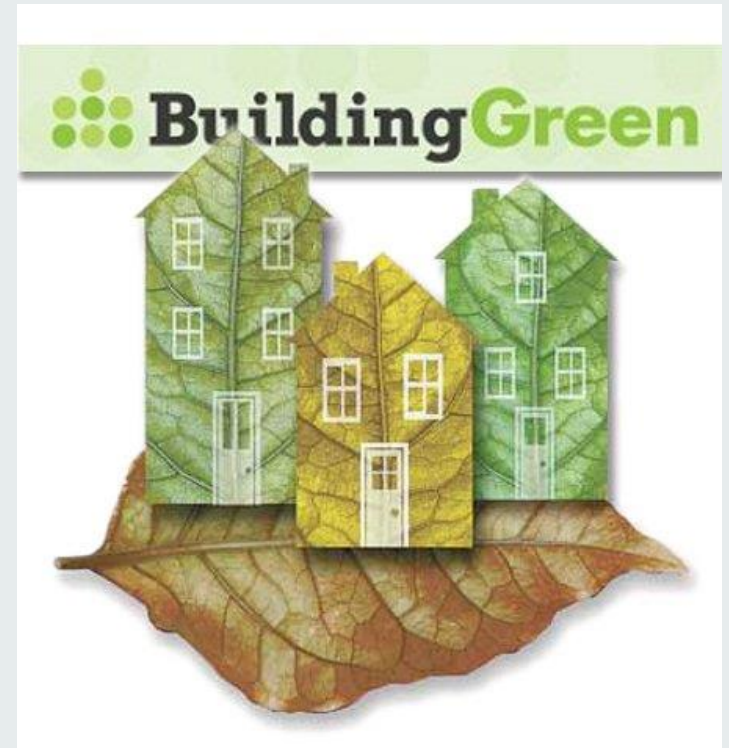
GREEN BUILDING CHOICES



- **Solar Reflectance Index (SRI):** Indicates the roof's ability to reject solar heat, and is the combined value of reflectivity and emittance.
- **Standard Black: 0**
- **Standard White: 100**

GREEN BUILDING CHOICES

- What factors effect green building choices?
 - Looks
 - Cost
 - Convenience
 - Environmental Impacts
 - Laws
 - Control
 - Education



GREEN BUILDING CHOICES



GREEN CITIES/DEVELOPMENTS

- **Masdar City, Abu Dhabi, United Arab Emirates**
 - Started construction in 2008
 - Zero carbon
 - Zero waste
 - Population of 50,000
 - 1,500 small businesses
 - 60,000 workers
 - Completed in 2015



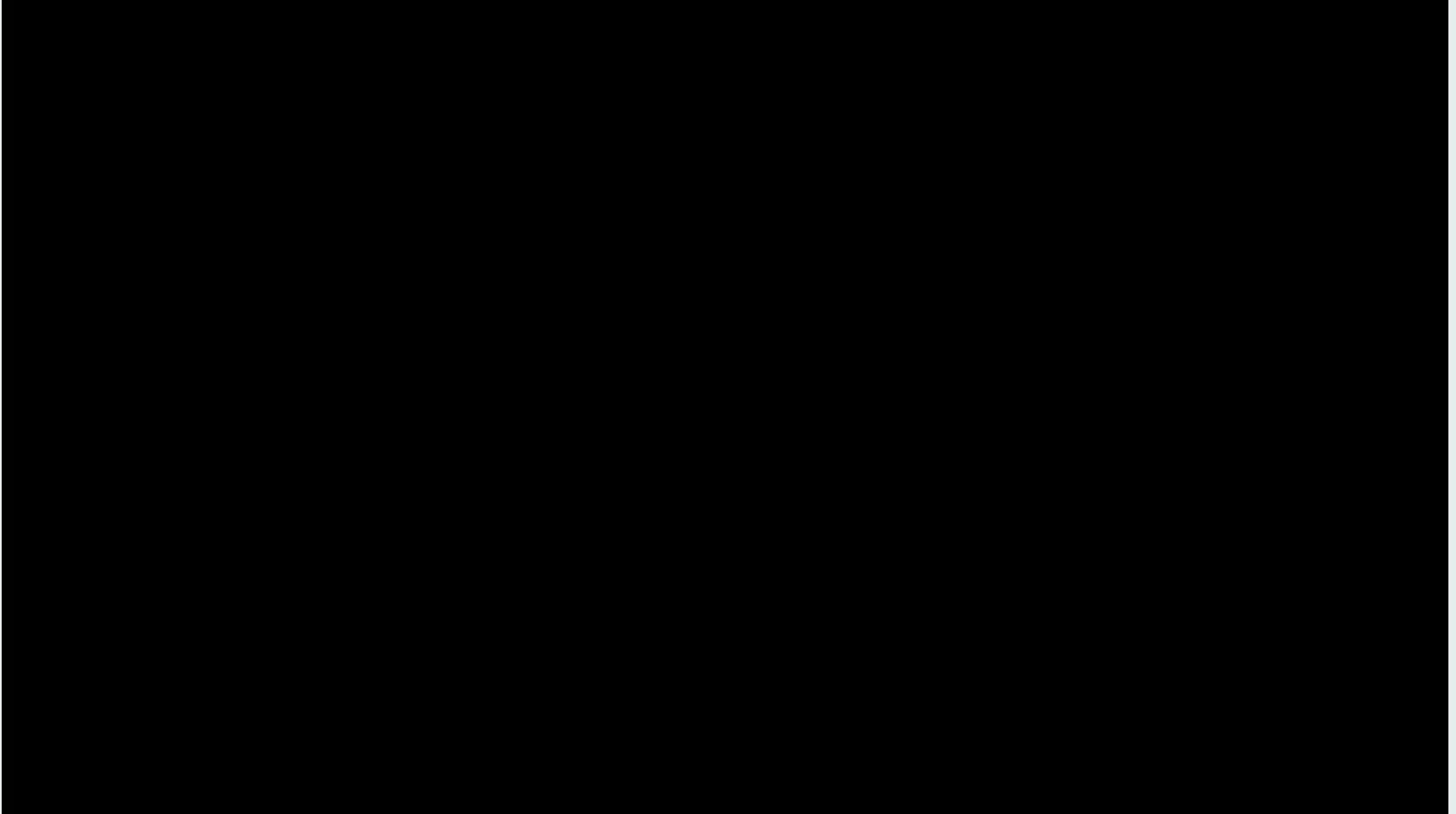
GREEN CITIES/DEVELOPMENTS



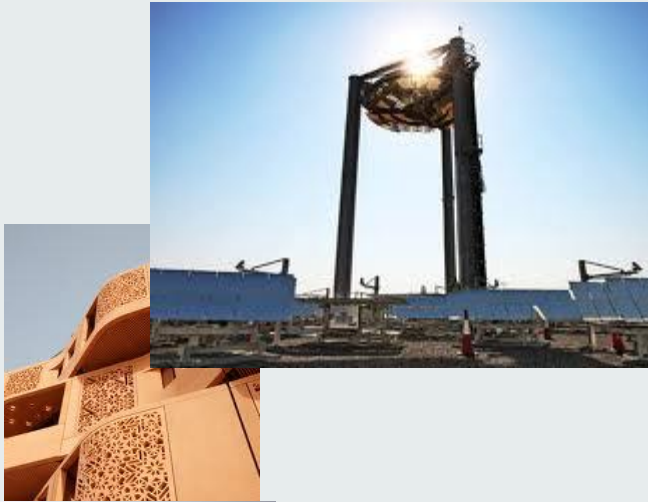
- Residential
- Community Facilities
- Offices and Retail
- Research and Development
- Light Industrial
- Hotel
- Institutional
- Mosque
- Parks and open spaces
- Utilities



GREEN CITIES/DEVELOPMENTS



GREEN CITIES/DEVELOPMENTS



What Makes Masdar Green?



GREEN CITIES/DEVELOPMENTS



■ Vitoria, British Columbia

- Going for LEED platinum for the development
- 1st carbon-neutral community in North America
- Biomass gasification plant
- Sewage Treatment

■ How far along is the project?

- Buildings that are in color are completed (phase 1 and 2) in progress the building in and the building in green are not completed.
- Phase 1 and 2 earned LEED platinum for NC and Development
- 25% Complete will finish in ???
- Starting to build three more residential buildings, ~300 units.



GREEN CITIES/DEVELOPMENTS



SOM/Ratio Design Associates / Gerald Ratto Photography



■ Treasure Island, CA

- 8000 housing units in serial varying height high-rise buildings (25% low income)
- restaurants
- ferry terminal facing San Francisco
- ~~organic farm~~ (25 acre urban farm with community gardens)
- ~~a wind farm~~ (will have demonstration wind turbines)
- parkland and tidal marshes.
- ~~as car independent as possible~~, with the ferry terminal and basic goods within a 10-minute walk of the residences
- 110 of 404 acres will be urbanized

■ How far along is the project

- Initial idea conceived in 2005
- City Council gave preliminary approval 2011
- Ground Breaking scheduled in 2012?
- Estimate time for completion 20-30 years
- April 2013 Chinese pulled funding.
- Two new investment companies took over the project (Lennar Corporation and Kenwood Investments)
- July of 2014 an agreement was made to transfer the title from the Navy to the new investors
- March 1216 the Navy has put forth a proposal to clean up hazardous waste
- Stated demolition work in a small area of the island
- The first ~2000 new homes will be done sometime in the next 2 or 3 years
- Got approval to start phase 1 or 4. They are currently working on infrastructure improvements.
- Residence filled a lawsuit in 2020 that claims that contamination from the Navy is causing health programs. This had put a stop on construction.