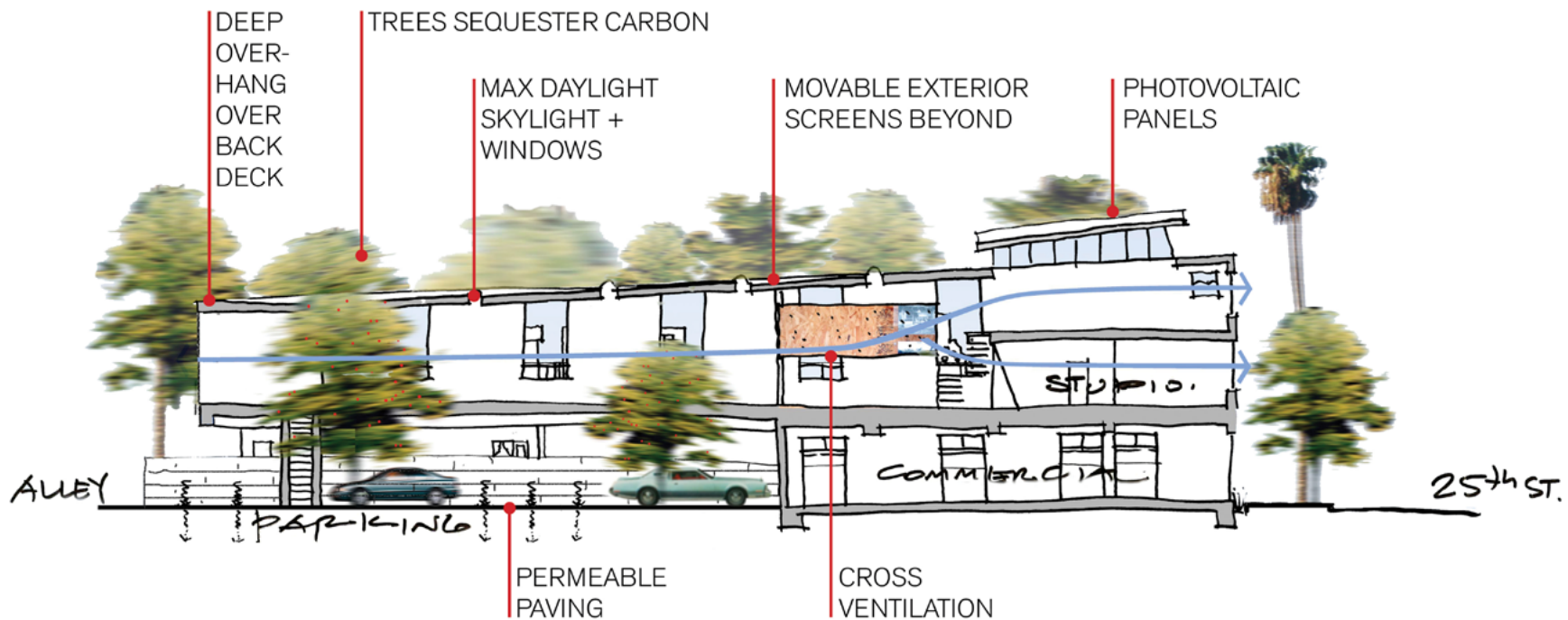


# Sustainability Action Plan



**Welcome to our studio. Completed in 1999, it provides a case study of enduring environmental principles.**

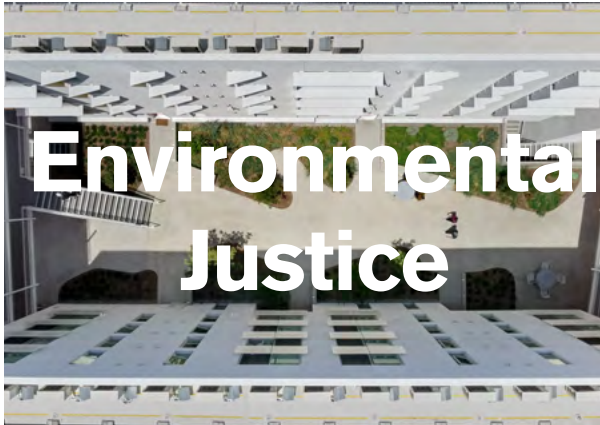
# Our Mission

**Our holistic design approach is focused on mitigating climate change and promoting responsible use of resources, while also supporting socioeconomic opportunity and wellness for all.**

**We actively support the AIA 2030 Commitment towards net-zero emissions and advance performance metrics related to operational carbon, embodied carbon, water, waste, and materials. We seek to outperform California's Title 24 energy consumption standards by at least 30% with both emerging and tried-and-true technology, incorporate cutting edge water conservation and stormwater retention systems, reuse of existing structures, and design of healthy buildings that promote wellness and strengthen communities and ecosystems.**

**In-house knowledge of Energy Modeling and Life Cycle Cost Assessments allows us to take an active role in system optimization and commissioning to enhance value. We also evaluate social and environmental outcomes to advocate for legislation that prioritizes resilience and equity.**

# Some Featured Projects



**The Arroyo** This LEED Platinum and AIA | LA COTE award winning Affordable Housing features an anchoring greenspace that converts a site constraint into a social hub.



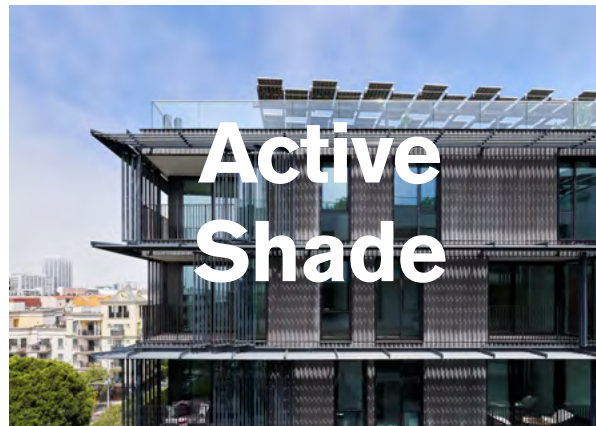
**Pico Branch Library** A distinctive roof form adds daylight as it creates a distinctive identity for this LEED platinum public library.



**MuseumLab** An unconventional and budget-conscious approach to preservation reduces carbon footprint while sparking curiosity.



**John Adams Middle School** Solar chimneys provide comfort without air conditioning while offering students an empirical lesson on differential air pressure.



**500 Broadway** This LEED Platinum housing development features sliding shade screens and PV canopies that shade rooftop gardens.



**Malibu High School** This net-zero high school begins by reinstating the natural topography and hydrology, setting up the hillside as a laboratory for learning.

# Glossary of Terms

## **Environmental / Climate Justice**

The fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental and climate change-related laws, regulations, and policies. (<https://oag.ca.gov/environment/justice>)

The goal is to ensure equal access to environmental benefits while reducing or eliminating the burden of negative environmental impacts on disadvantaged communities.

## **Building Performance**

The measurement of building design and construction quality in terms of energy consumption, water consumption, waste, infrastructure impacts, health impacts and economic cost.

## **Life Cycle Cost Analysis**

A method of economic evaluation that considers upfront, operational, and external costs to ensure that the facility will provide the lowest overall cost of ownership consistent with its quality and function over the lifespan of the building.

## **Decarbonization**

The movement to reduce embodied and operational carbon and eliminate the use of fossil fuels in the construction industry.

## **Embodied Carbon**

The total amount of energy required to extract, process, manufacture and transport construction materials, commonly expressed as kgCO<sub>2</sub>/weight of material.

## **Operational Carbon**

The total amount of energy required to operate a building, commonly expressed as kWh/sf/year (electric) or kBtu/sf/year (gas).

## **Passive Systems**

Systems that do not consume energy once installed and are employed to reduce or eliminate the need to consume energy elsewhere within the building. Such systems include orientation for solar access, orientation for prevailing breezes, high-performance glazing, insulation, shading devices, air seals, thermal mass, green roofs, stack ventilation, etc.

## **Active Systems**

Energy-consuming fixtures and appliances such as HVAC, Water Heaters, Laundry Machines, Lighting, Plug-in Devices, etc.

## **Site Energy-Use-Intensity (EUI)**

A building performance metric that is expressed as:

$(\text{Total Operational Carbon} / \text{yr}) - (\text{Total energy generated from on-site renewables} / \text{yr})$

## **Source Energy-Use-Intensity (EUI)**

A building performance metric that is expressed as:

$(\text{Total Operational Carbon} / \text{yr}) * (\text{Grid production efficiency and transmission loss factor}) - (\text{Total energy generated from on-site renewables} / \text{yr})$

The lower the EUI, the better performing the building. Buildings that draw power from “dirty” grids (i.e. coal-based) or from sources that are further away will have a higher Source EUI.

## **Net-Zero Energy**

Where the energy consumed is less than that which is generated on-site, also expressed as EUI = 0. Renewable grid energy can also be counted as an offset.

## **Water Neutrality**

Where new construction 1) does not require any imported water and 2) does not use more water than the use that previously occupied the site. Water neutrality is achieved primarily through conservation. Measures include ultra-efficient fixtures, native and drought-tolerant plantings, passive and active stormwater management systems, greywater reuse, and process water capture and recycling.

## **Certification System**

Provides independent, third-party verification of building performance. Each rating system includes its own proprietary procedures and standards; examples include LEED, Living Building Challenge, BREEAM, GreenStar, etc.

## **Passive House / PassivHaus**

A design methodology that seeks to minimize energy consumption as much as possible through rigorous envelope design. A “Passive House” design will feature very thick insulation, high-performance glazing, and will include detailed measures to mitigate infiltration, which in theory will necessitate fewer air changes and minimize the need for conditioning. This method is most appropriate in climates where temperatures are extreme (both hot and cold) and where natural ventilation is not comfortable for most of the year.

## **Energy Modeling**

A design process through which a target EUI is generated through iterative testing of a virtual building model. In California, the target EUI must be less the code-mandated baseline for a building of similar type and size. Comprehensive, detailed energy modeling that includes both passive and active systems can result in substantial energy and cost savings.



# Glossary of Terms continued

## Commissioning

A process through which design assumptions about building performance are tested prior to building occupancy. Commissioning involves thorough inspection and operation of building elements to ensure quantities, installation, functionality, efficiency, material quality, and maintenance plans meet expectations.

## Resilience

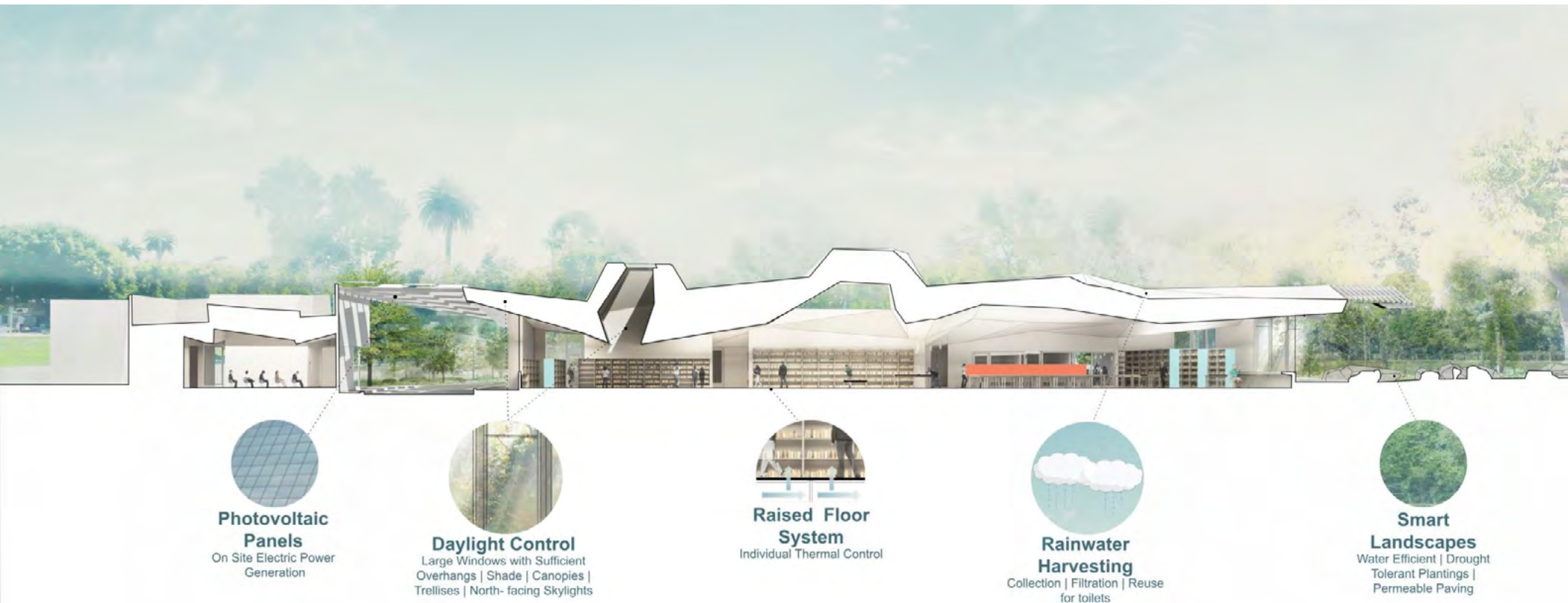
The ability of a building to maintain primary function during a natural disaster or similar adverse event.

## Environmental Product Declaration (EPD)

A third-party-verified, publicly available report that describes the environmental performance of a product. This report must include an ISO 14025 standard or equivalent Life Cycle Assessment that includes data on material extraction, manufacturing, transportation, ecological impact, toxicity, maintenance, and reuse / recycling potential.

## Red-List Material

A construction material that is known to cause significant health problems in humans, animals, plants, or other biological organisms. Examples include asbestos, formaldehyde, CFCs, toxic heavy metals, etc. In many certification systems and building codes, these materials are prohibited.



# Design Goals

## Energy

Mitigate the impact of climate change through strategies addressing embodied, operational, and building performance metrics.

- Design buildings that are carbon neutral by 2030 (E H R Ws N)
- Eliminate gas infrastructure from all projects in our portfolio (R)
- Design buildings that improve over Title 24 by at least 30% (E R)
- Employ on-site renewable energy sources on every project (E R)
- Employ the latest in heat pump water heating and other building systems technologies on every project (E N)
- Save 50-75% of project embodied carbon by reusing existing structures where possible. (E Ws N)
- Design using efficient floor plans and column grid / shear wall placements (E Ws N)

## Water

Design for water neutrality through conservation and management.

- Design using native California landscapes (W R H)
- Employ stormwater management systems that retain 100% of site rainfall (W R Ws N)
- Employ greywater systems for irrigation where feasible (W R Ws N)
- Select super-efficient plumbing fixtures (W)
- Encourage building owners to select water-efficient laundry machines or eliminate unnecessary common laundry machines (W Ws)
- Encourage building owners to sub-meter common areas and track water consumption (W N)

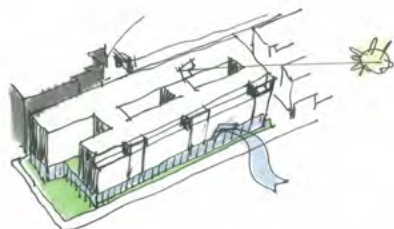
## Health

Employ strategies for healthy building design strategies and to encourage human wellness.

- Eliminate gas cooktops and related infrastructure (E H)
- Design buildings with outdoor circulation and common activity spaces (E H)
- Design buildings with desirable views, tall ceilings, and ample daylighting (E H)
- Select healthy materials (H)
- Avoid vinyl or other PVC derivatives (H)
- Avoid red-listed materials (H)
- Give preference to materials that are transparent about their ingredients and manufacturing processes (i.e. EPD, Declare, etc.) (H N)
- Give preference to naturally-derived materials (H)
- Give preferences to reclaimed materials or materials with high percentages of recycled content, especially concrete (H Ws N)
- Provide desirable street frontage that encourages walking and helps pedestrians feel safe (H R)

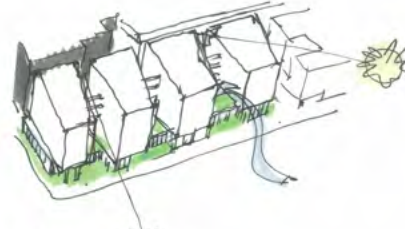
### Key

(E) Energy	(Ws) Waste
(W) Water	(N) Innovation
(H) Health	(R) Regional Impact



Typical

vs.



Proposed

# Process Goals

To integrate our Sustainability Design Goals into everyday practice, we engage actively throughout our design process.

## Design Phases

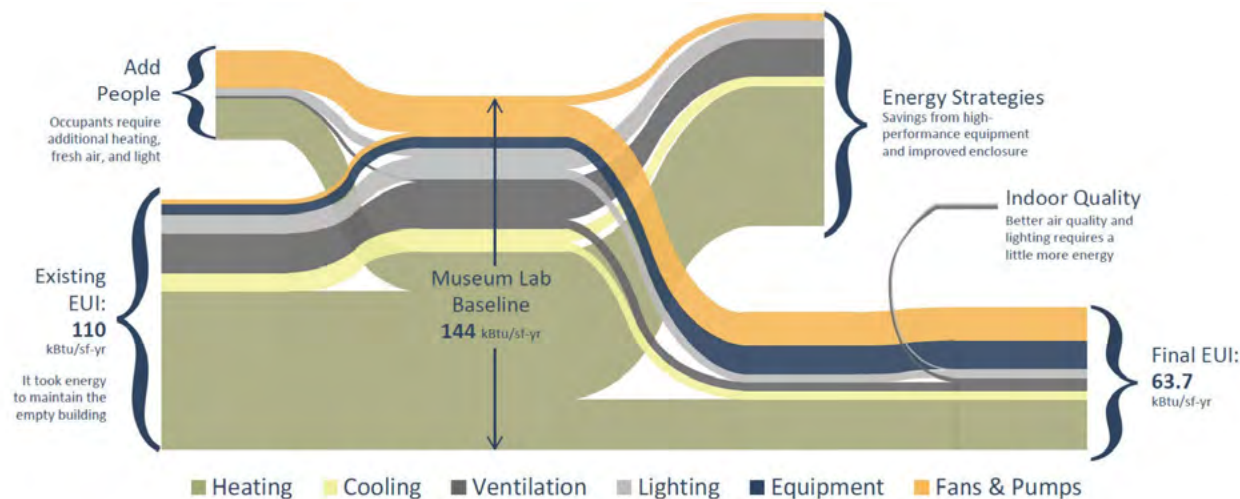
- Actively diagram sustainability strategies - particularly passive strategies which are not measured and tracked
- Engage energy modeling consultants in early design phases, improving ability to refine for performance
- Test different solutions using cost-benefit analysis in early design phases.
- Engage in collaborative efforts with the entire team to incorporate sustainable strategies in early design phases

## Construction Phase

- Take an active role in construction administration and commissioning with respect to critical systems and components

## Verification

- Conduct post-occupancy surveys to get a sense of how a building is used and how reality differs from design
- Work with building owners to gather operational data from sources such as Energy Star Portfolio Manager
  - Energy Use
  - Water Use (domestic)
  - Water Use (common areas / laundry)
  - Water Use (irrigation)
  - Renewable energy generation
  - Do the occupants or residents love the building? (A loved building is more likely to be maintained and preserved)



# Firm Goals

Sustainability permeates our people and firm culture as much as it informs our architectural practice.

## Staff development

- Encourage LEED accreditation
- Hold monthly in-house presentations on sustainability topics
- Discuss sustainability issues openly and honestly

## Advocacy

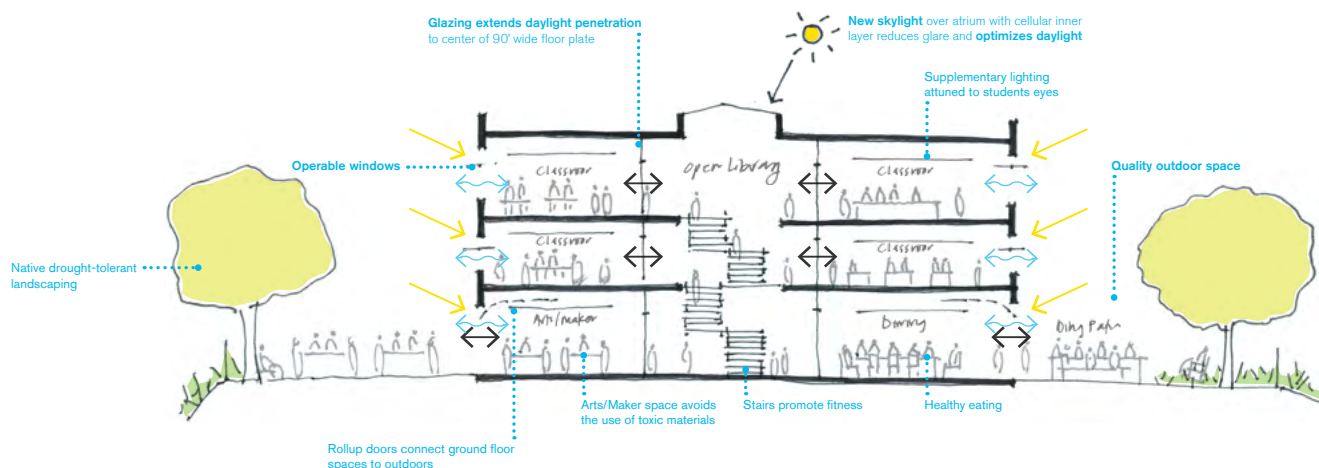
- Participate in AIA COTE and USGBC advocacy committees
- Participate in public hearings for reach codes and other initiatives down to the municipal level
- Speak publicly about our work and our process

## Carbon neutrality

- Track energy use
- Purchase carbon offsets
- Purchase green grid energy
- Support a hybrid work model that allows staff to work remotely
- Collaborate on distant projects via conference and only take long plane trips when absolutely necessary.

## Waste reduction

- Compost all organic waste
- Recycle all recyclable waste
- Eliminate all single-use plastic containers





# Suggested Reading Links

## **2030 Palette**

A resource for the design of zero-carbon, adaptable and resilient built environments world wide.

## **Project Drawdown**

The World's Leading Resource for Climate Solutions. Our mission is to help the world reach "drawdown" - the point in the future when levels of green house gases in the atmosphere stop climbing and start to steadily decline, thereby stopping catastrophic climate change - as quickly, safely, and equitably as possible.

## **Living Future**

Socially Just, Culturally Rich, and Ecologically Restorative. The International Living Future Institute is premised on the belief that providing a compelling vision for the future is a fundamental requirement for reconciling humanity's relationship with the natural world. Healthy workplaces. Thriving Communities. Inspiring Products. Beautiful Buildings.

## **USGBC**

Our mission is to transform the way buildings and communities are design, built, and operated through LEED - enabling an environmentally and socially responsible environment that improves the quality of life.

## **Building Green**

BuildingGreen champions the changemakers in sustainable design and building, with trusted insight, unparalleled education, and communities that are transforming the industry.

## **ENERGY STAR® Commercial Buildings**

ENERGY STAR® is the government-backed symbol for energy efficiency, providing simple, credible, and unbiased information that consumers and businesses rely on to make well-informed decisions.

## **EPA WaterSense**

Take steps each day to save water and protect the environment by choosing WaterSense labeled products in your home, yard, and business.

## **Carbon Smart Materials Palette**

An immediately applicable, high-impact pathway to embodied carbon reductions in the built environment.

## **Whole Building Design Guide**

The gateway to information on integrated 'Whole Building' design techniques and technologies.

## **Zero Tool**

Architecture 2030 developed the Zero Tool for building sector professionals, 2030 Challenge and 2030 Commitment adopters, 2030 District Network Members, and policymakers. The Zero Tool is used to compare a building's design or an existing building's energy use intensity (EUI) with similar building types, understand how a building achieved its EUI (via energy efficiency, on-site renewable energy, and/or green power purchases), and set EUI targets.

## **Climate Consultant**

Society of Building Science Educators  
Climate Consultant is a simple to use, graphic-based computer program that helps architects, builders, contractor, homeowners, and students understand their local climate.

## **PVWatts® Calculator**

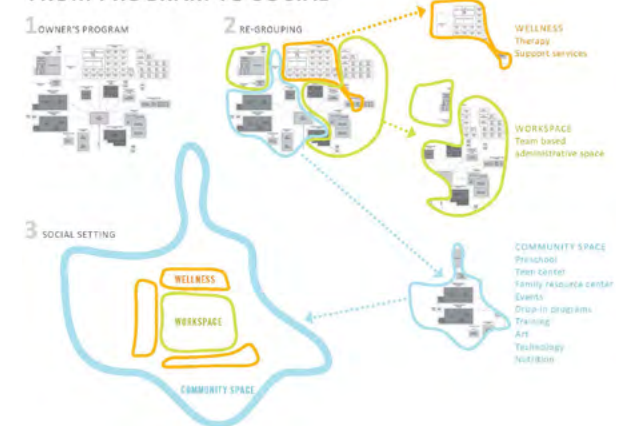
National Renewable Energy Laboratory  
Estimates the energy production and cost of energy of grid-connected photovoltaic (PV) energy systems throughout the world. It allows homeowners, small building owners, installers and manufacturers to easily develop estimates of the performance of potential PV installations.

## **The 2030 Challenge**

Architecture 2030 issued The 2030 Challenge in 2006 asking the global architecture and building community to adopt the following targets:

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 70% below the regional (or country) average/median for that building type.
- At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 70% of the regional (or country) average/median for that building type.
- The fossil fuel reduction standard for all new buildings and major renovations shall be increased to: 80% in 2020, 90% in 2025, Carbon-neutral in 2030 (using no fossil fuel GHG emitting energy to operate).

### FROM PROGRAM TO SOCIAL



## Roof

PV and solar hot water panels

High efficiency A/C units

High albedo roof

## Units

Operable windows

Open-air corridors

Sunshades reduce solar gain

## Courtyard

Large trees for shade

Open-ended courtyard captures ocean breezes and optimizes daylight

In ground drought tolerant planting. 27% planted area allows for on site water infiltration and management

9' diameter storm water drain

## Walkability

Ocean breezes



# Thank you