

IMPLEMENTING CLIMATE ACTION:
COMPREHENSIVE SOLUTIONS FROM THE
BUILDING TO THE CITY

USING LIVING BUILDINGS TO
COMBAT CLIMATE CHANGE

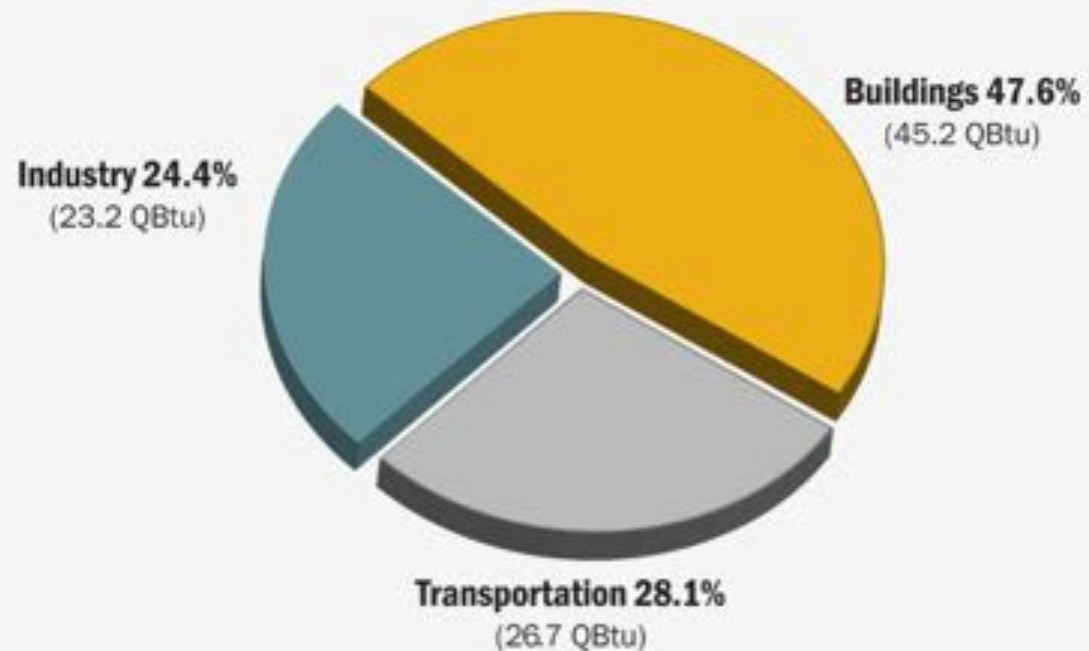
Patty Karapinar
Director of Sustainability
pkarapinar@archnexus.com



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BUILDINGS ARE THE PROBLEM

Buildings consume nearly half of all the energy produced in the United States

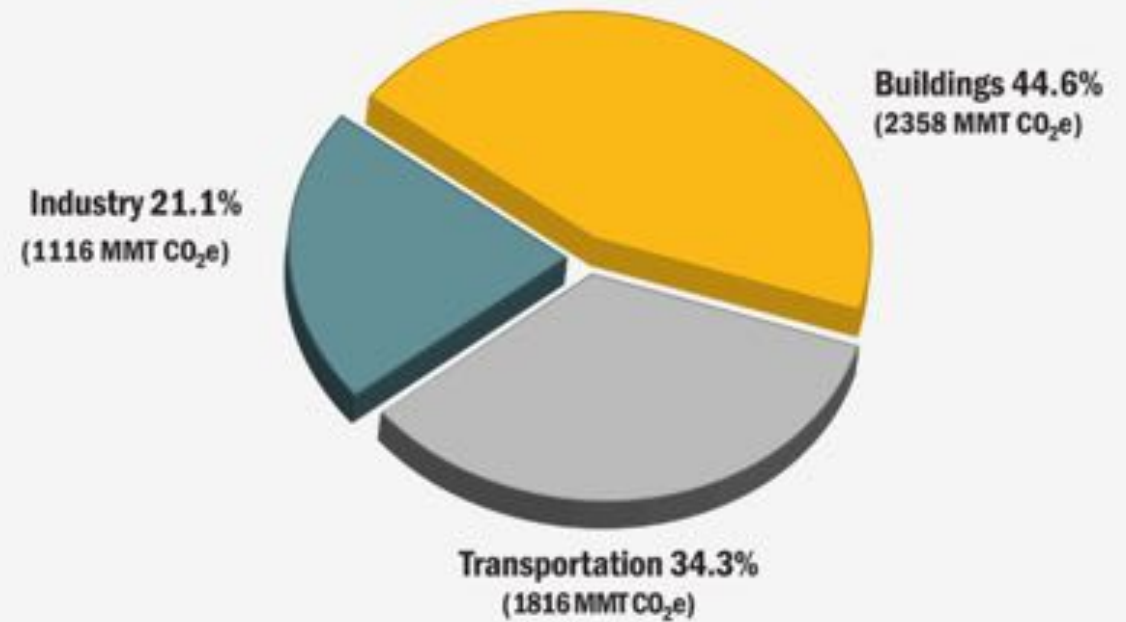


U.S. Energy Consumption by Sector

Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).

Buildings are responsible for nearly half of US CO₂ emissions

The building sector was responsible for nearly half (44.6%) of U.S. CO₂ emissions in 2010. By comparison, transportation accounted for 34.3% of CO₂ emissions and industry just 21.1%.

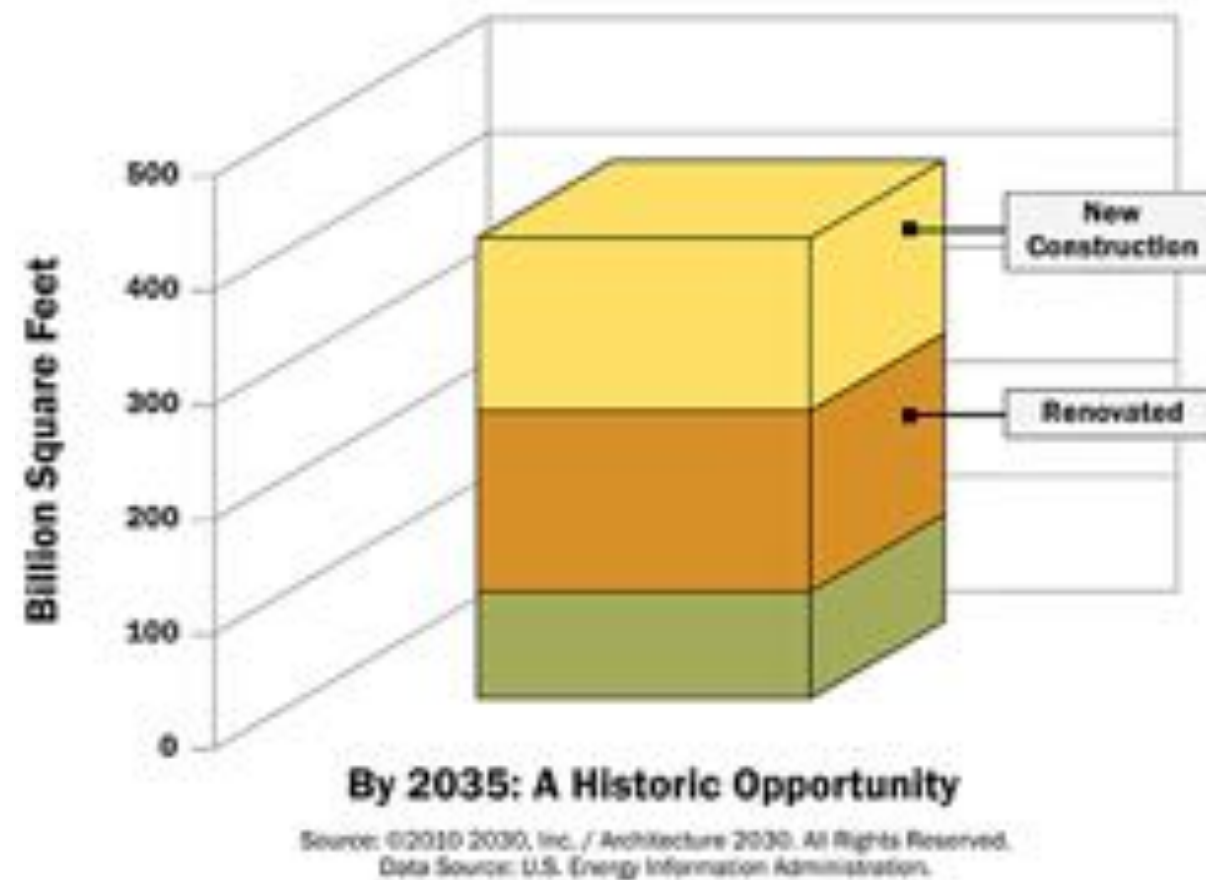


U.S. CO₂ Emissions by Sector

Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).



BUILDINGS ARE THE SOLUTION





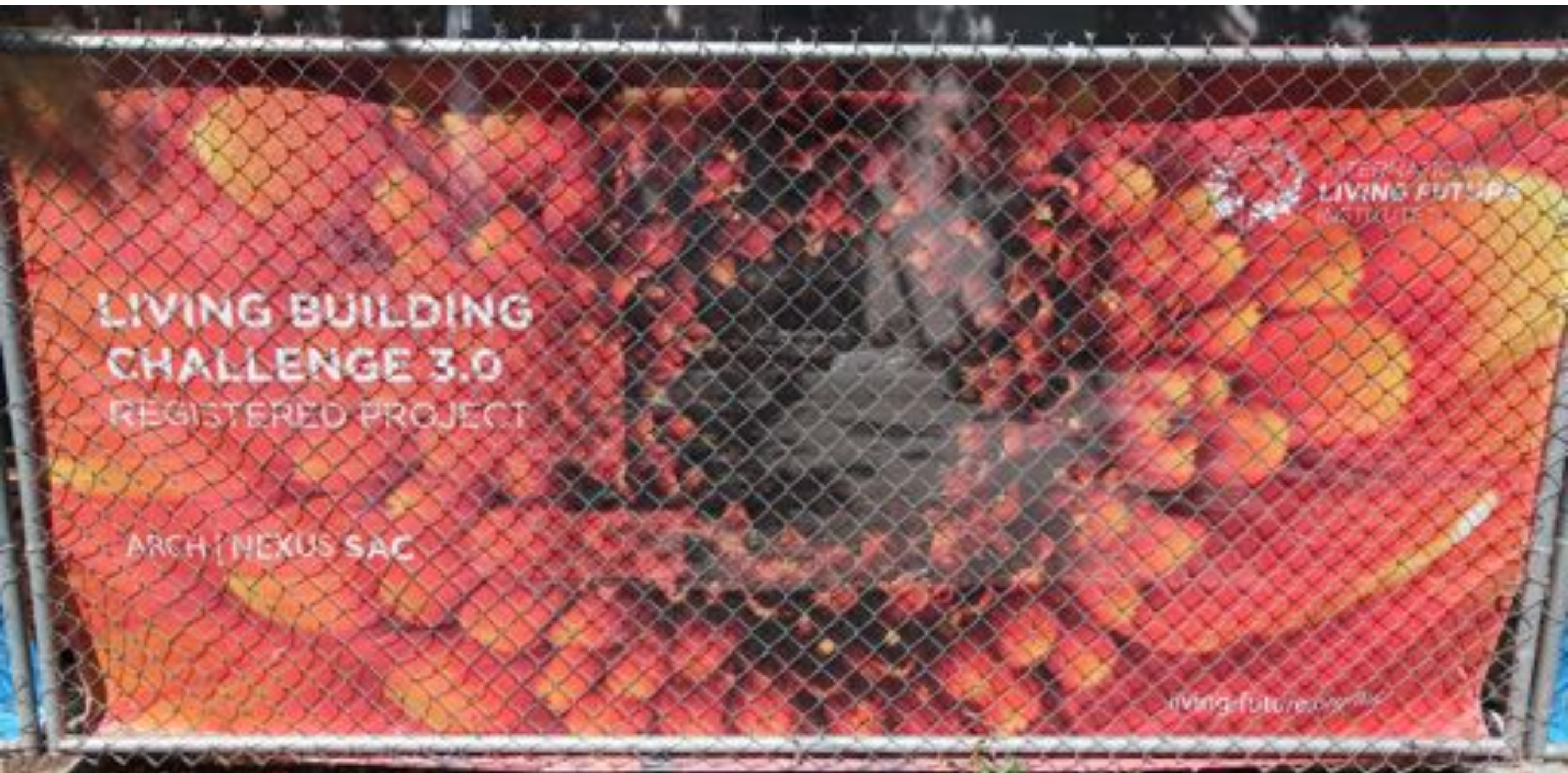
“Oz didn’t give nothing to the Tin Man
that he didn’t, didn’t already have...”
-America

REGENERATE

LIVING BUILDINGS

Living buildings give more than they take, creating a positive impact on the human and natural systems that interact with them.

-International Living Futures Institute





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LEED v4 Platinum Certified 4/20/17

LEED v4 Existing Buildings - Submitted

WELL Registered

Living Building Challenge - Submitted

JUST Certified Employee-Owned Company





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WARREN CONSULTING ENGINEERS, INC.

GLUMAC

engineers for a sustainable future™



miyamoto. EARTHQUAKE + STRUCTURAL ENGINEERS

CAPITAL
em | Howard | Architects & Engineers, INC.

MarketOne
BUILDERS
Forward Together

sustain3



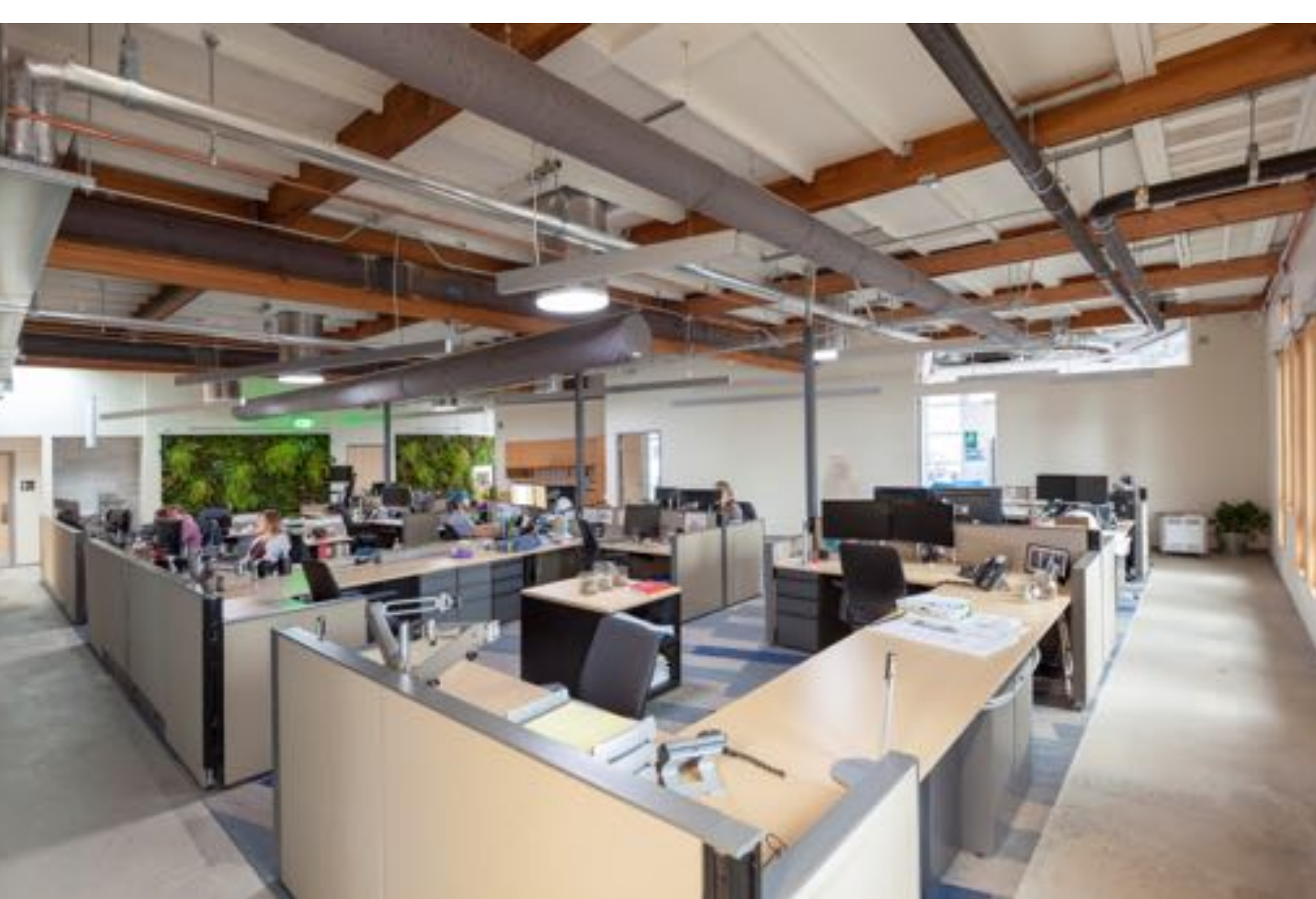












PLACE: COMMUNITY ENGAGEMENT IN DESIGN





Community Input Integration

GLUMAC
Engineering & Construction Services

DPR
CONSTRUCTION

sustain

miyamoto.

WCE
WARREN CONSULTING ENGINEERS, INC.

CAPITAL
Engineering & Construction Services, Inc.

SEED

Arch | Nexus



COMMUNITY INTEGRATION



URBAN AGRICULTURE

SCALE JUMP



NET POSITIVE ENERGY

EUI 25.1 [36.1] With PV -17.8
200% + [105%]
Carbon offsets



DAYLIGHTING

FREE, BEAUTIFUL, HEALTHY
LIGHT FOR OCCUPANTS.



PV ARRAY

ABUNDANT, CLEAN ENERGY
PROVIDES MORE THAN
ENOUGH ENERGY.



MECHANICAL

ENERGY IS SHARED
FROM ONE PART OF
THE BUILDING TO
ANOTHER.



ACTIVE STEWARDSHIP

OCCUPANTS ARE
PASSIONATELY ENGAGED IN
BUILDING OPERATIONS.



EFFICIENT WORKSTATIONS

CENTRALIZED COMPUTING SYSTEM,
USES 1/5 THE POWER OF TYPICAL
ARCHITECTURAL WORKSTATIONS.

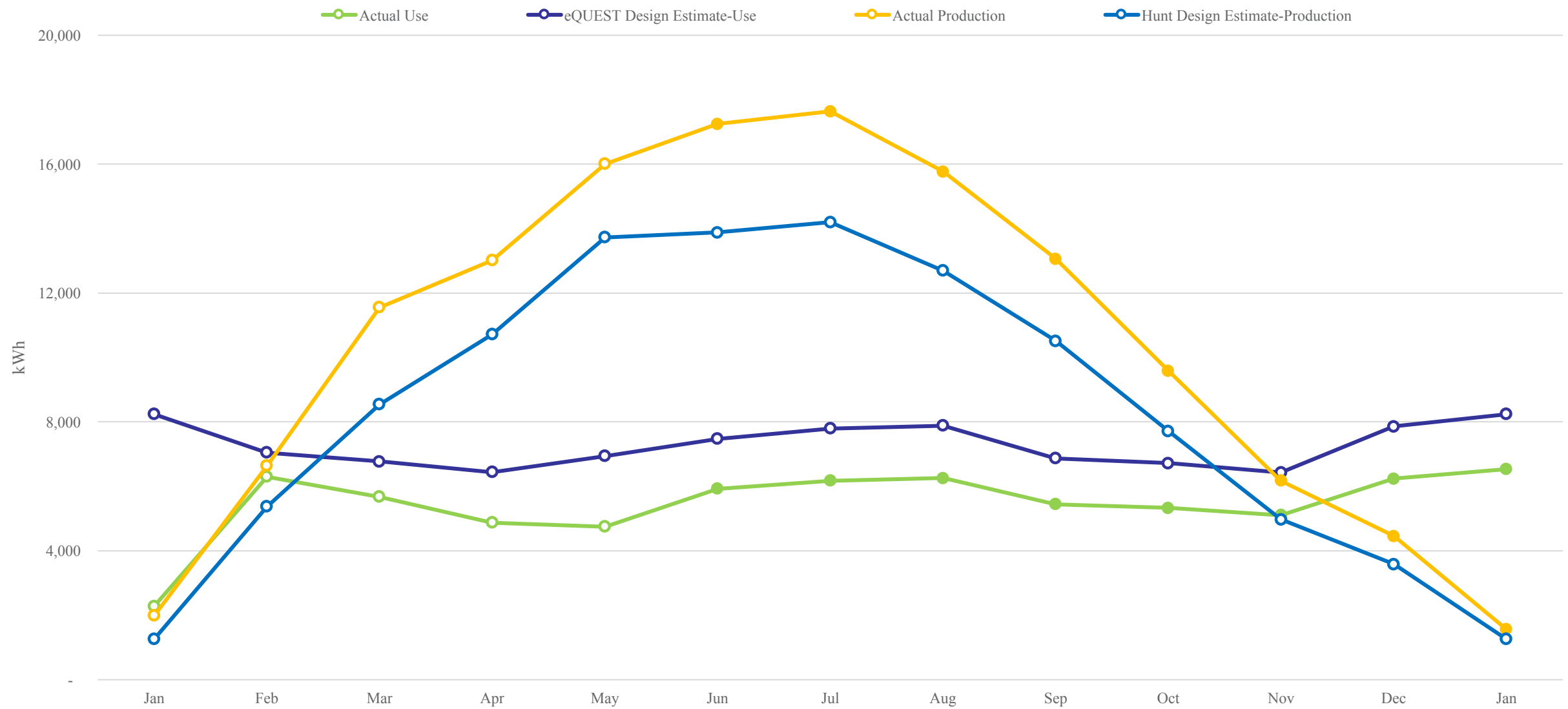
Energy Use
Intensity

26.3

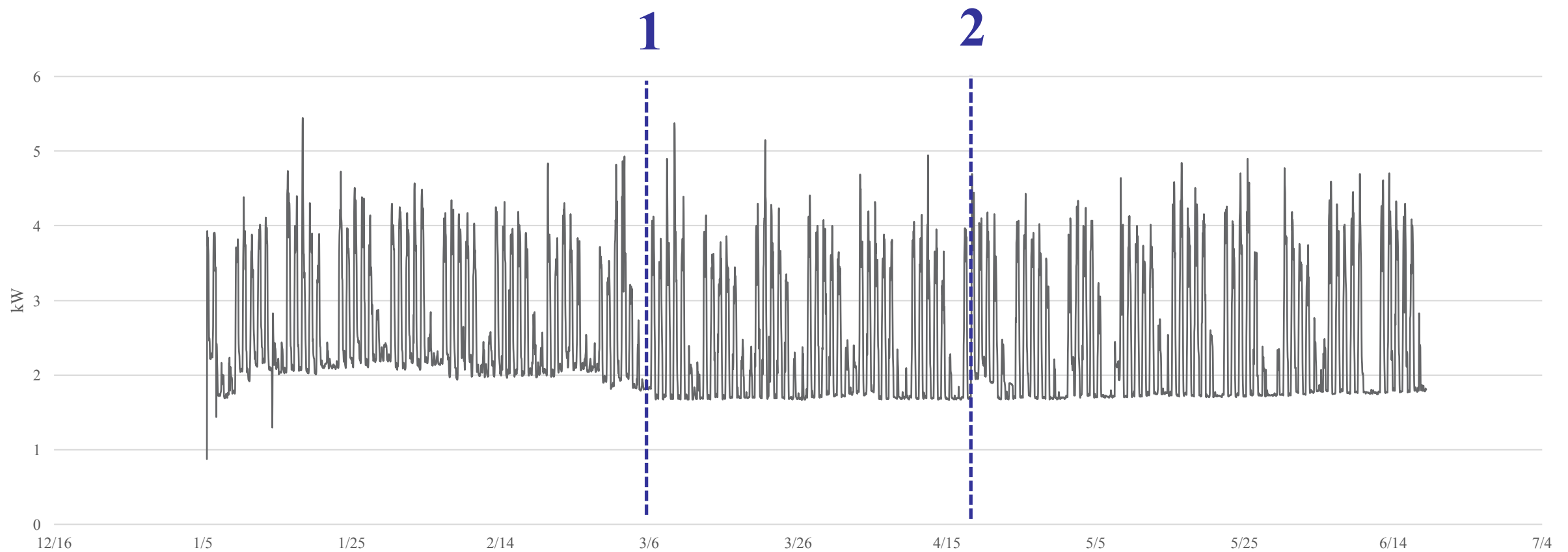
Arch | Nexus SAC uses approximately one-half of the energy of an average office building of the same size. By reducing the energy demands of this building, more than enough power is able to be generated on-site.

NET POSITIVE ENERGY

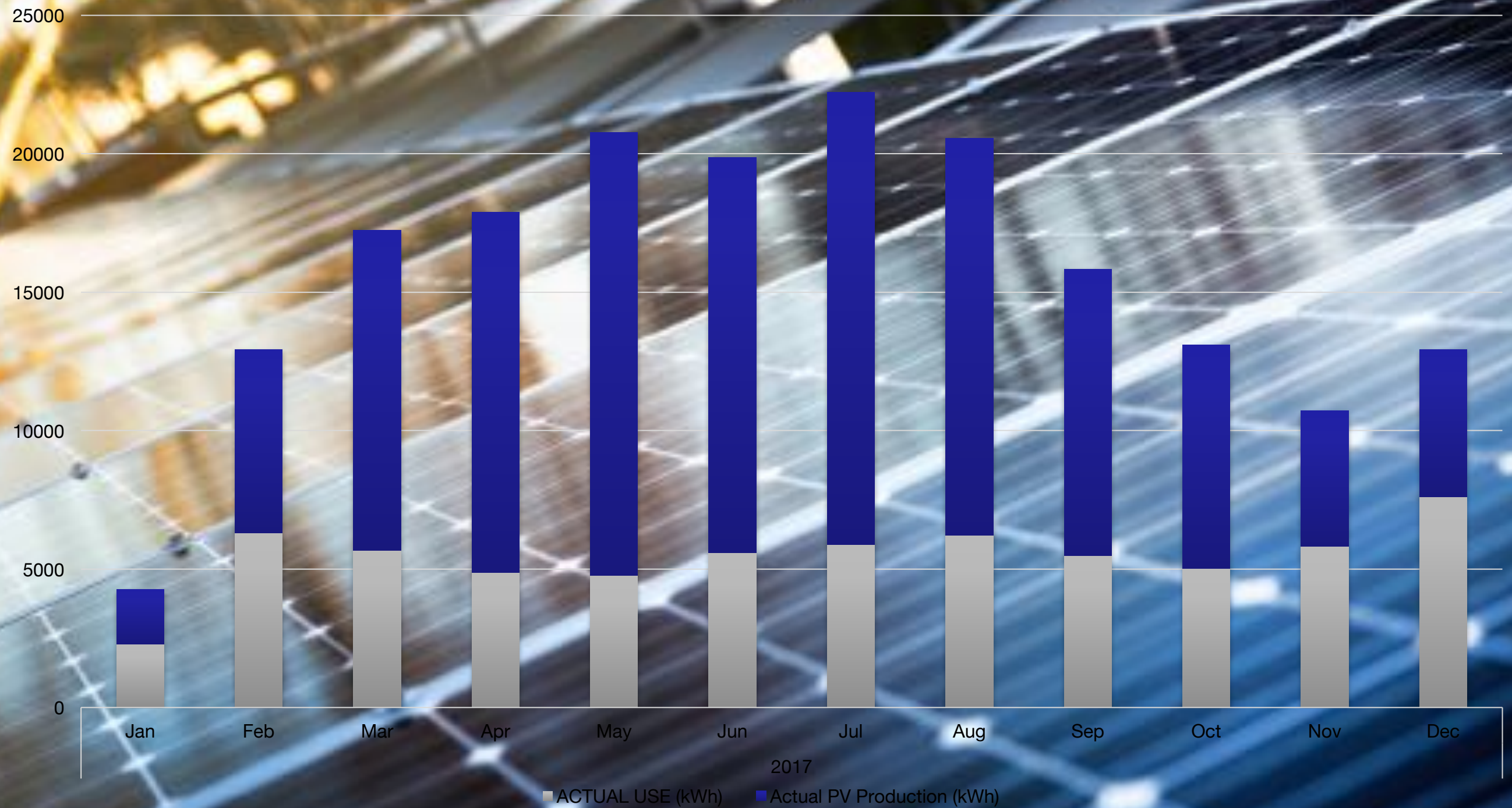
Kwh 2017



PLUG LOAD

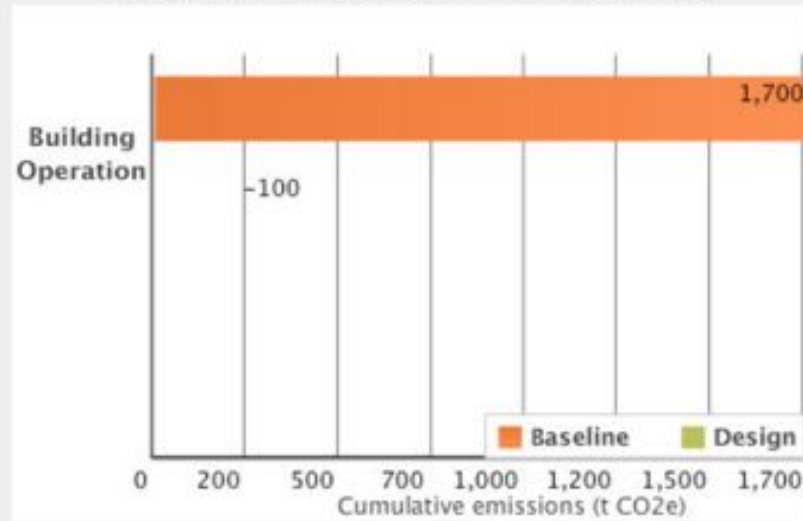


Arch|Nexus SAC Building Energy Use and Production 2017

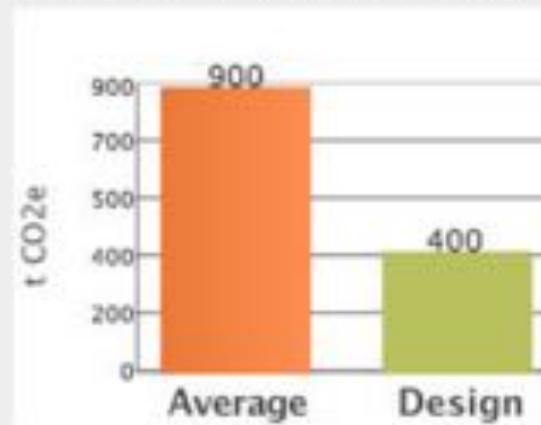


Cumulative Emissions Over 25 Years

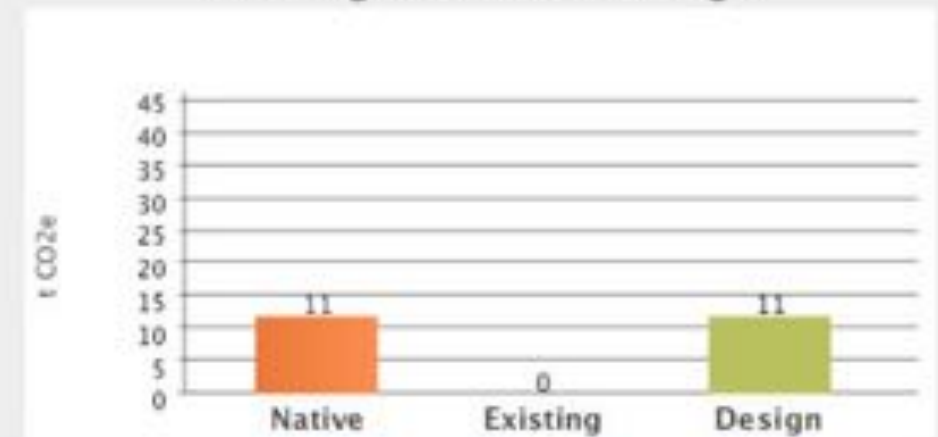
1. Operational Emissions - 25 Years



2. Embodied Emissions from Construction



3. Average Site Carbon Storage



Does your building meet the Architecture 2030 Challenge?

YES



3.4 Tons of CO2 saved through energy surplus

Operational emissions for 50-year lifespan: 5% of baseline

Construction emissions offset through :
 3Degrees, Green-e Climate Certified Landfill Gas Program
 Excess onsite energy production

NET POSITIVE WATER

Rainwater to Irrigation

Greywater Capture

Composting Toilets

Rainwater to Potable? - Waiting

WATER BALANCE - DESIGN

1 RAINWATER



FUNNELED FROM ROOF INTO CISTERNS

2 POTABLE WATER



CURRENTLY PROHIBITED BY CALIFORNIA LAW

3 GRAY WATER

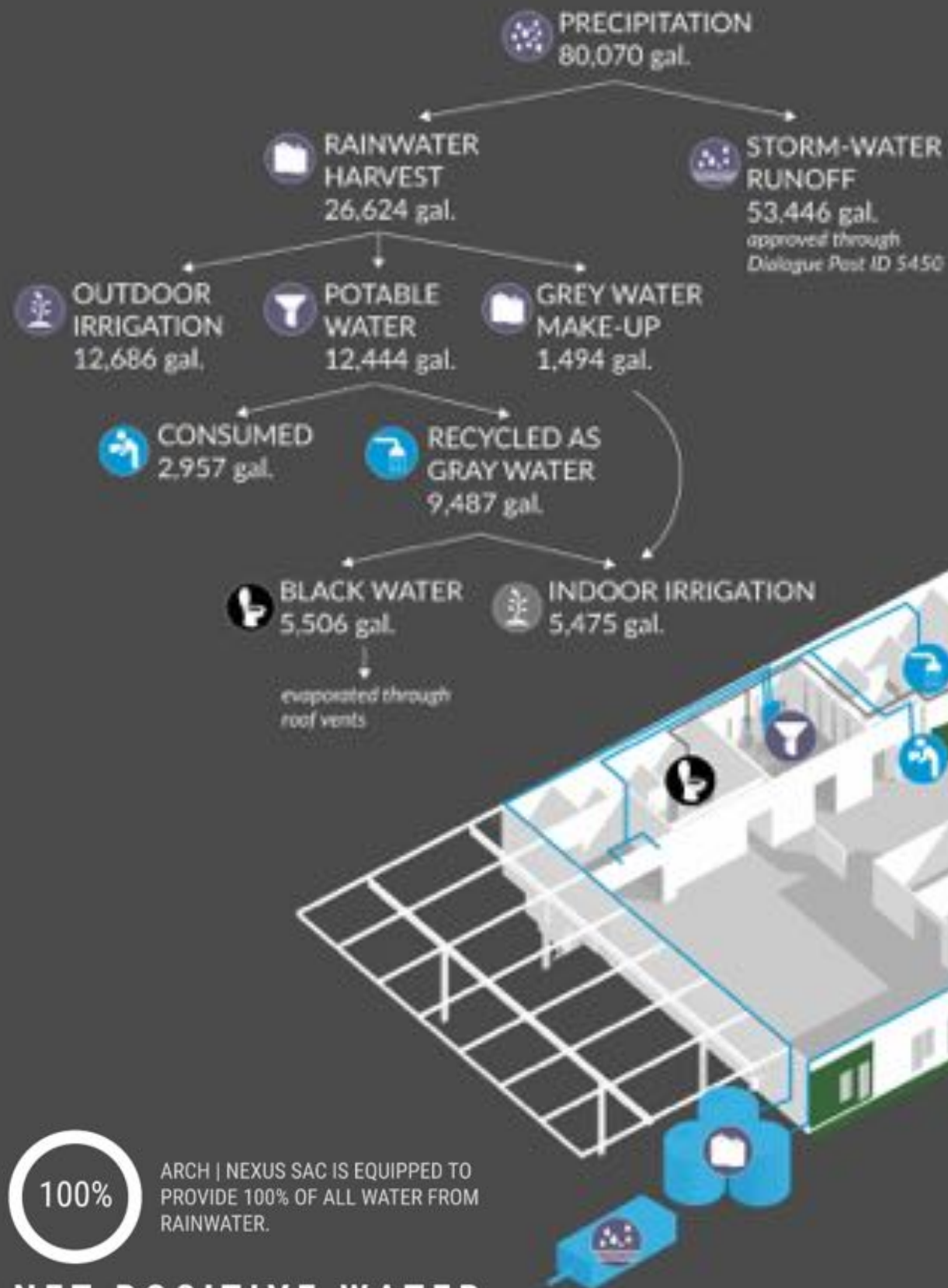


WATER IS REUSED FOR TOILETS AND GREEN WALL IRRIGATION

4 BLACK WATER



ALL WASTEWATER IS TREATED ON-SITE



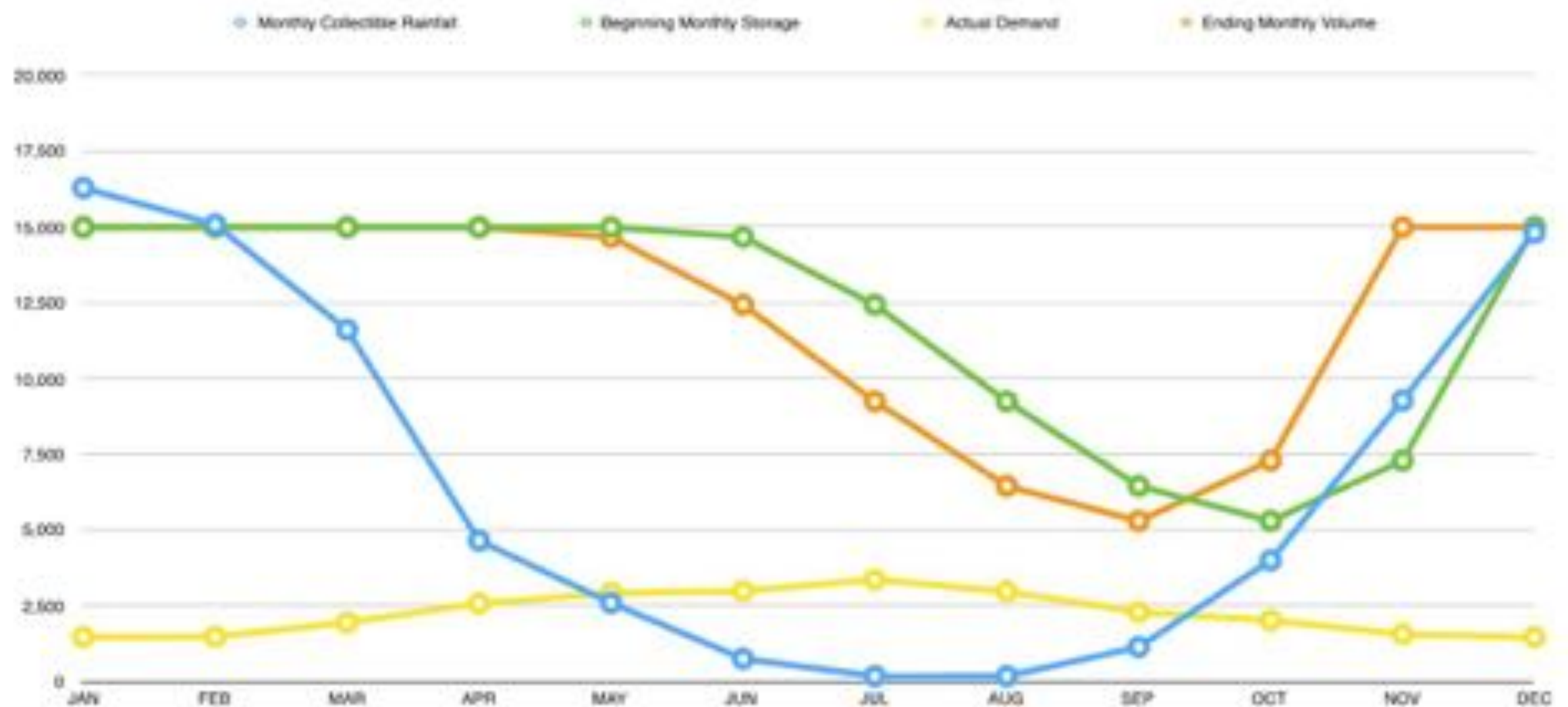
100%

ARCH | NEXUS SAC IS EQUIPPED TO PROVIDE 100% OF ALL WATER FROM RAINWATER.

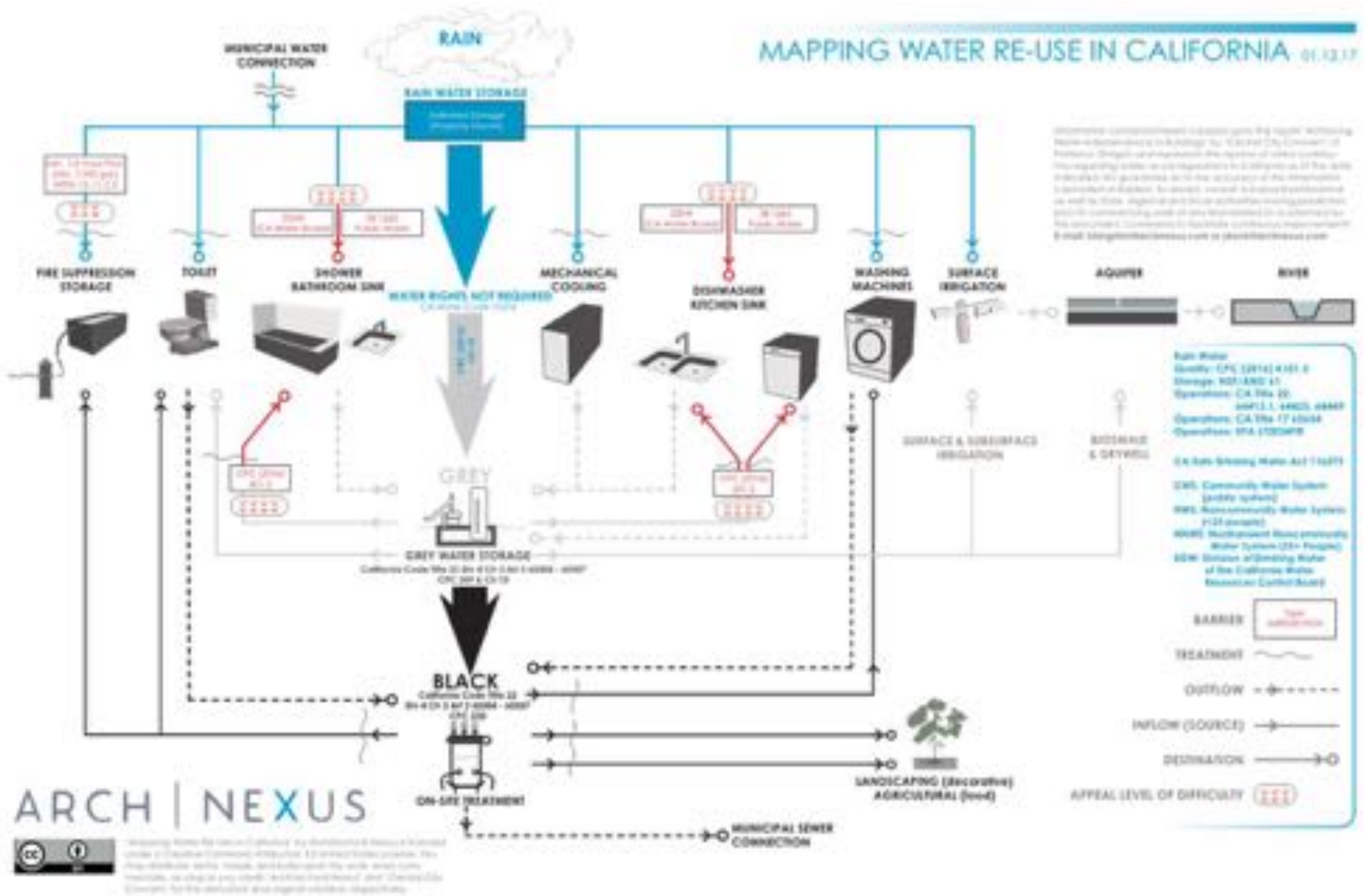
NET POSITIVE WATER



RAINWATER SUPPLY AND WATER USAGE



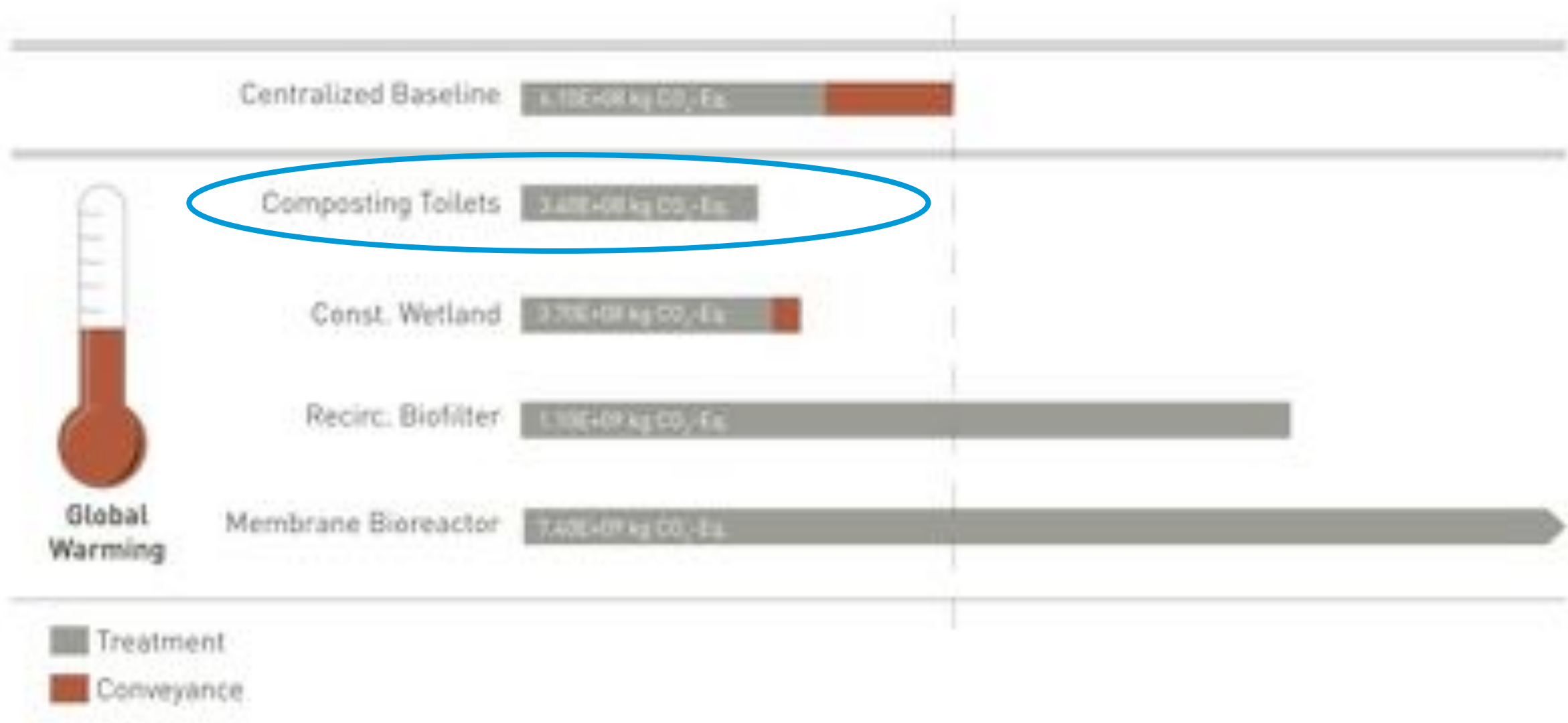
MAPPING WATER RE-USE IN CALIFORNIA 01.12.17











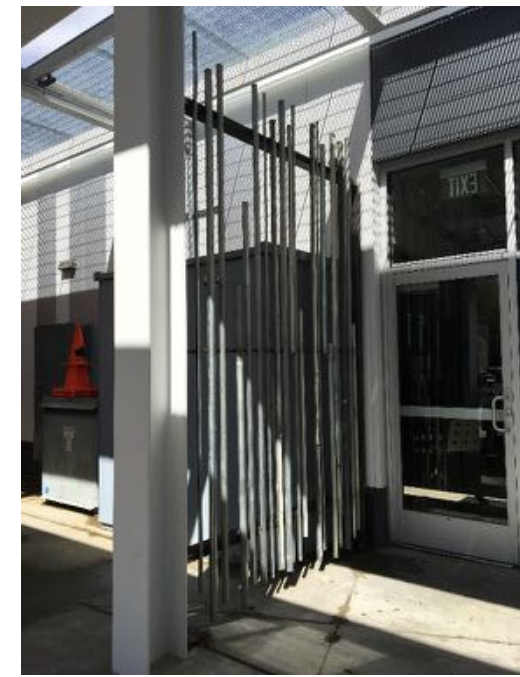
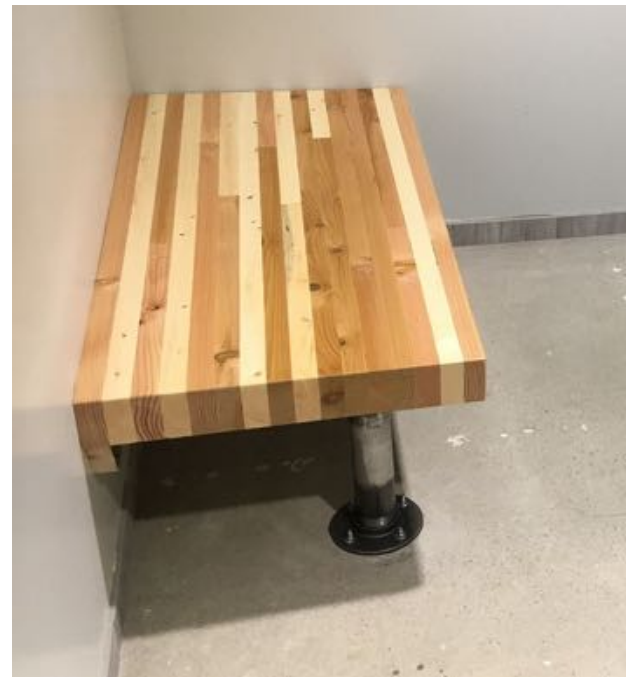
CLIMATE IMPACTS OF VARIETY OF SEWAGE TREATMENT SYSTEMS

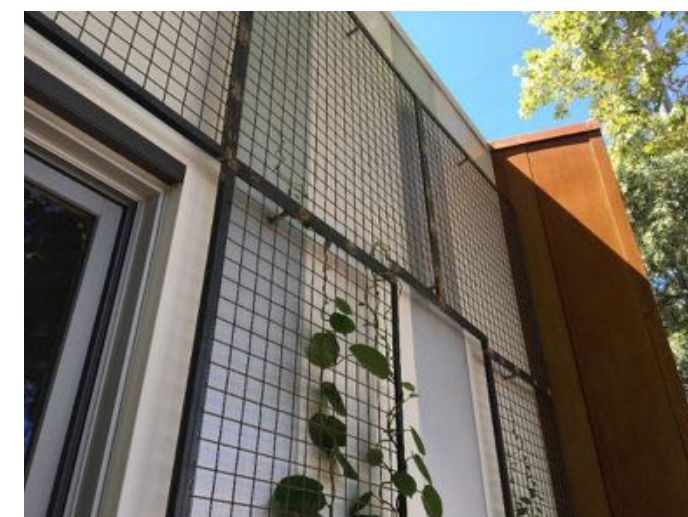
- Slide courtesy: Brad Liljequist, International Living Futures Institute

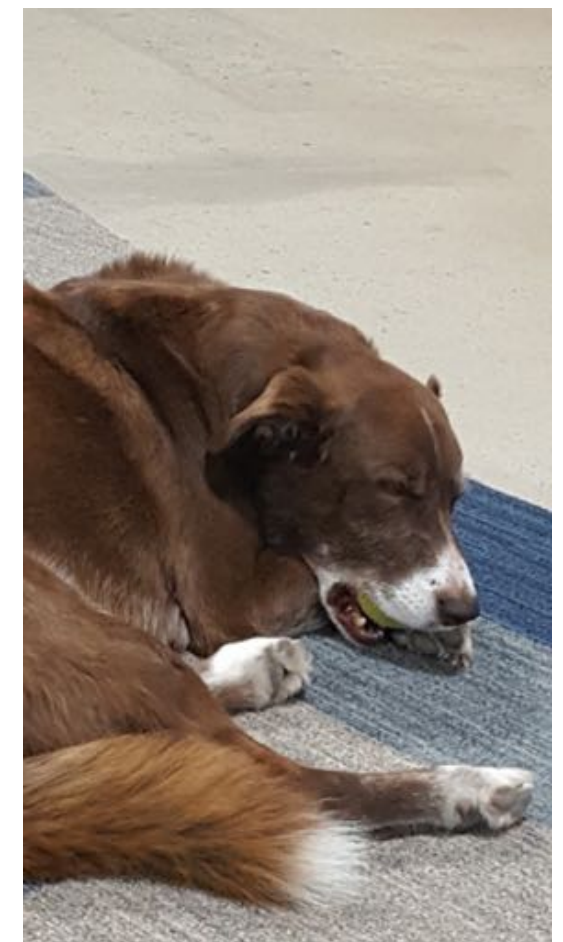
NET ZERO WASTE

Construction Waste Diversion: 99%
Occupant Waste Diversion 2017: 82%

SALVAGE







MATERIALS

Embodied Carbon: Existing Building

Red List Compliant

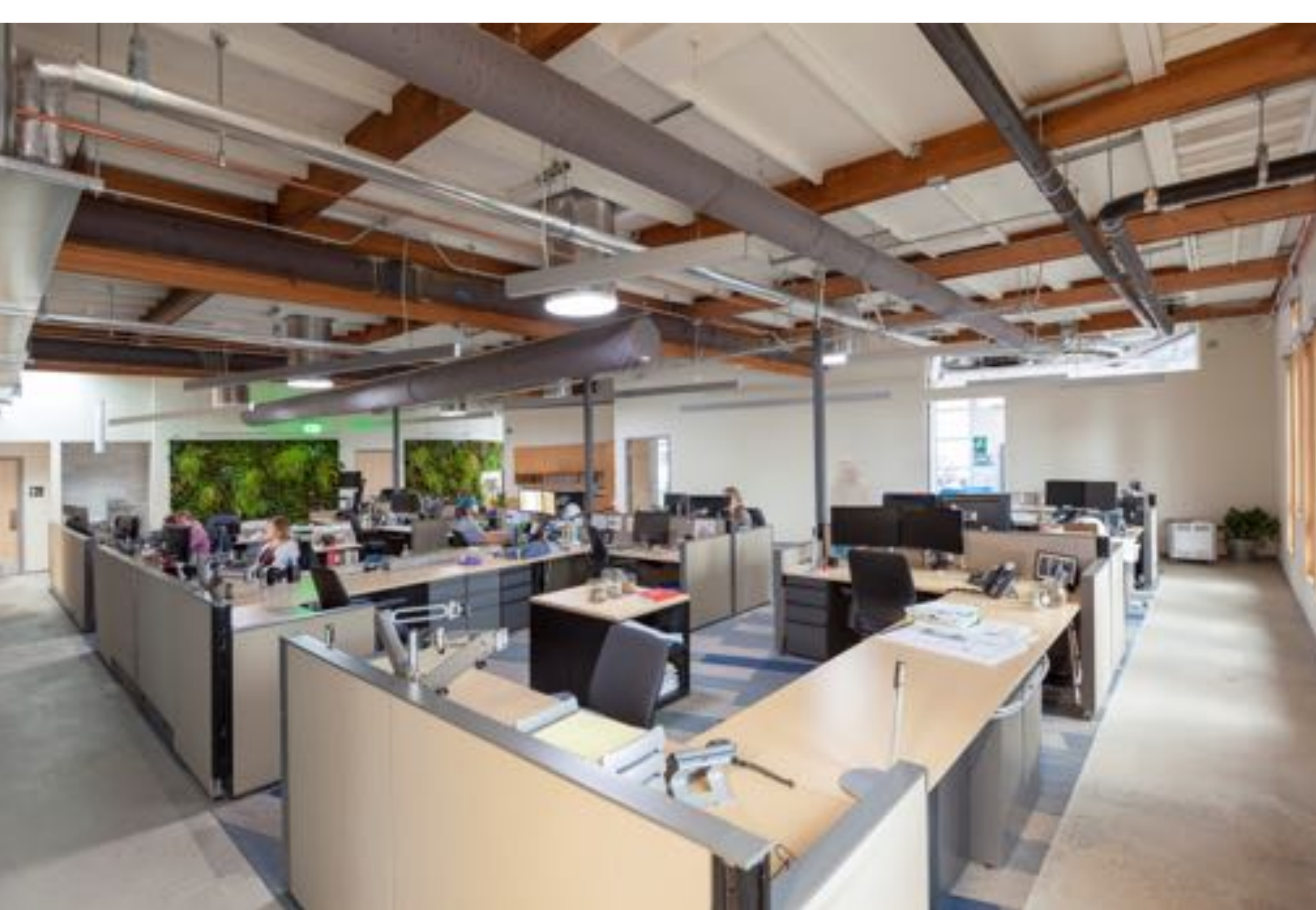
37 Declare Labels

Salvage

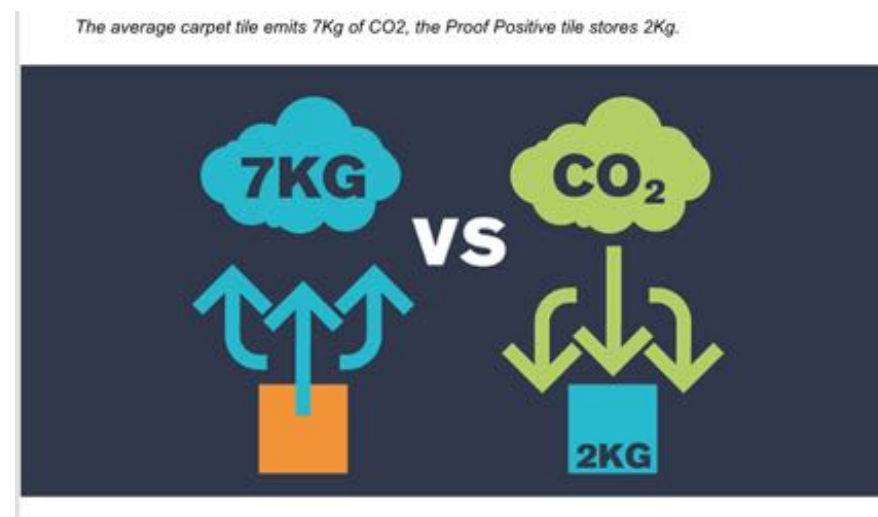
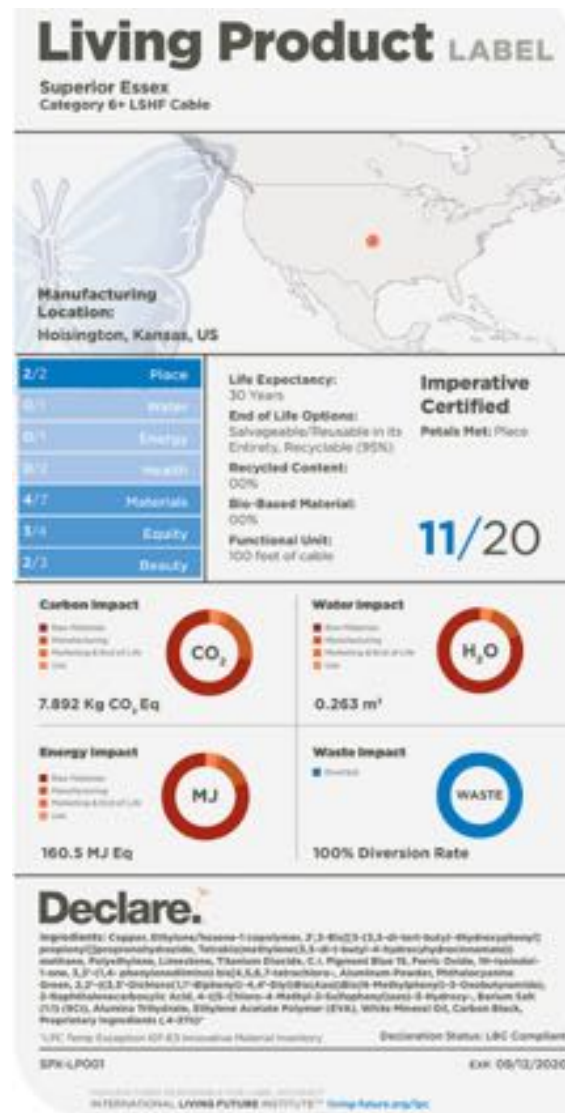
34% Regional Materials (500 km)

91% 3rd Party VOC Emissions Testing

100% FSC Wood



SUPPORT PRODUCT INNOVATION



Interface Climate Takeback Initiative

OCCUPANT ENGAGEMENT

Engaged Occupants are using
26% Less Energy
Than Expected in an Already High
Performance Building

Just.

Organization Name: Architectural Nexus, Inc
Organization Type: Service Provider
Headquarters: Salt Lake City, Utah
Satellite Facilities: Sacramento, California
Number of Employees: 126

Social Justice and Equity Indicators:

Diversity

- ■ ■ Non-Discrimination
- ■ ■ Gender Diversity
- ■ ■ Ethnic Diversity

Equity

- ■ ■ Full Time Employment
- ■ ■ Pay-Scale Equity
- ■ ■ Employee Friendly
- ■ ■ Living Wage
- ■ ■ Gender Pay Equity
- ■ ■ Family Friendly

Safety

- ■ ■ Occupational Safety
- ■ ■ Hazardous Chemicals

Worker Benefit

- ■ ■ Worker Happiness
- ■ ■ Employee Benefit
- ■ ■ Continuing Education

Local Benefit

- ■ ■ Local Control
- ■ ■ Local Sourcing

Stewardship

- ■ ■ Responsible Investing
- ■ ■ Community Volunteering
- ■ ■ Positive Products
- ■ ■ Charitable Giving
- ■ ■ Animal Welfare
- ■ ■ Transparency

THE SOCIAL JUSTICE LABEL

ARC-001

EXP. 10/30/2019

MAKING SOCIAL JUSTICE OUR BUSINESS

The JUST program is a voluntary disclosure tool for organizations.

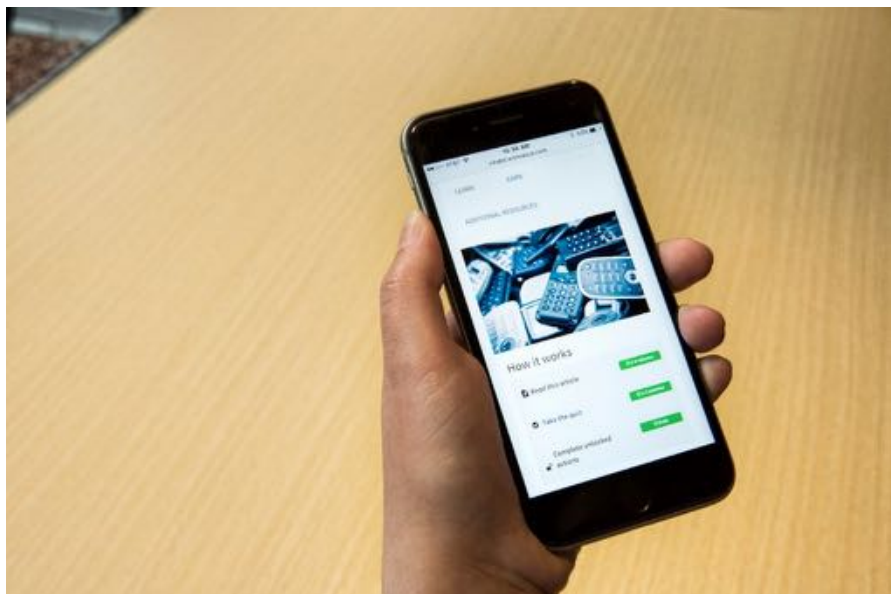
JUST is not a certification program, it is a transparency platform for organizations to disclose their operations, including how they treat their employees and where they make financial and community investments.

JUST is a nutrition label for socially just and equitable organizations.

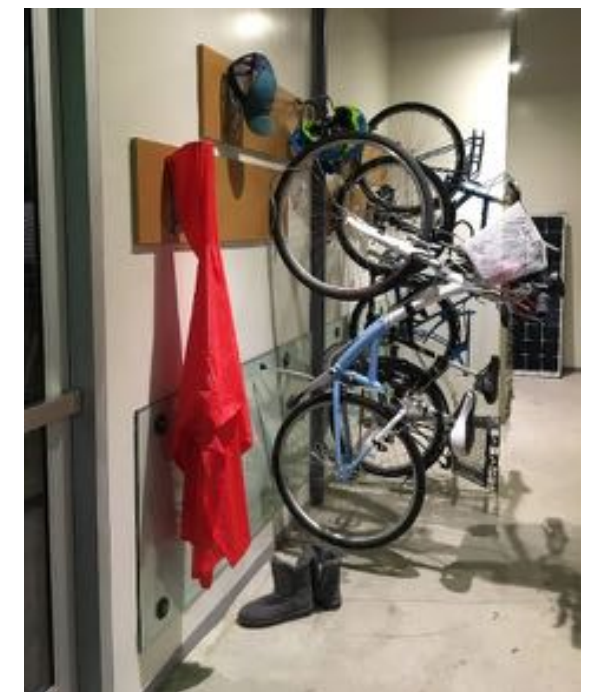
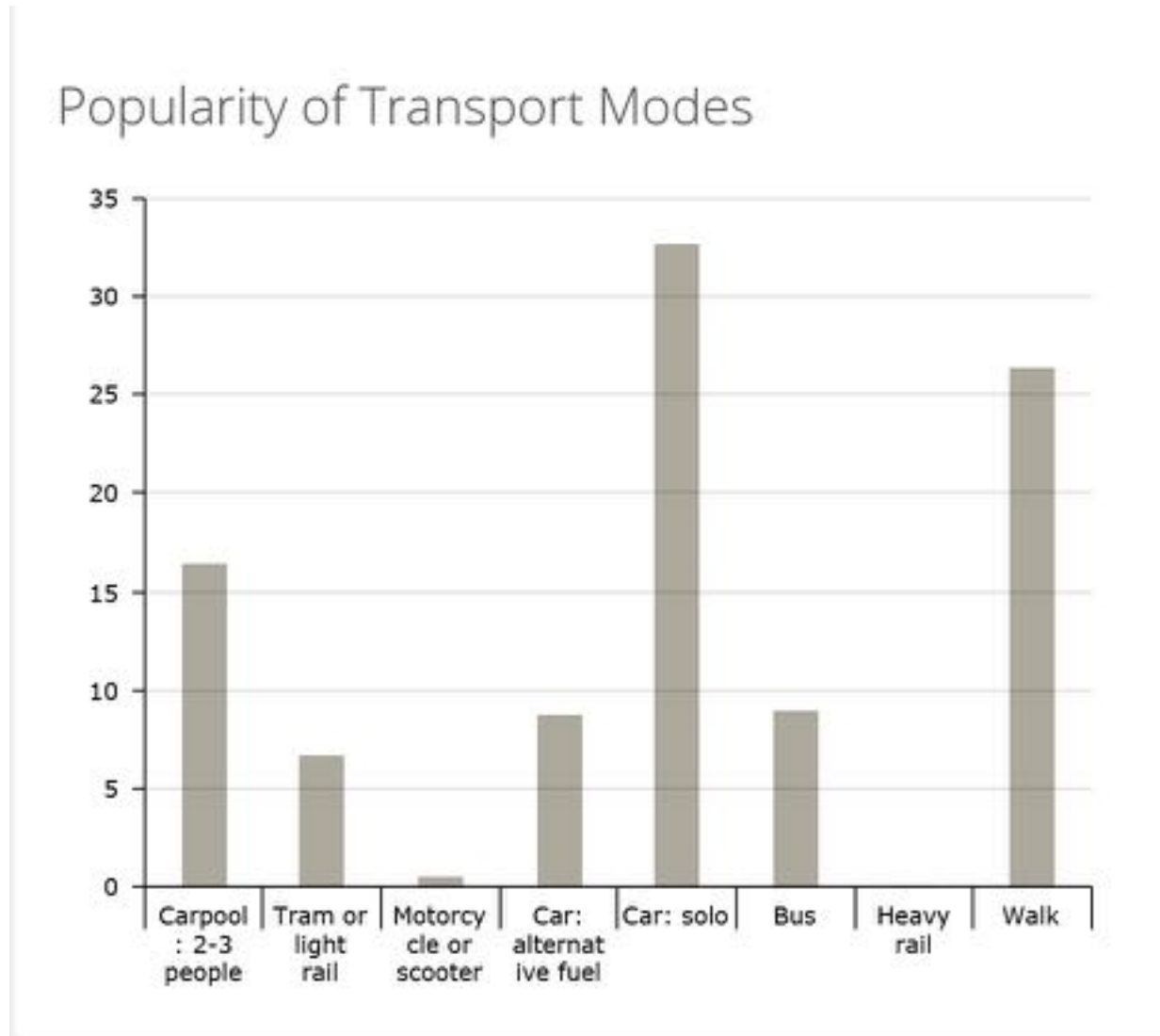
This approach requires reporting on a range of organization- and employee-related indicators. Each of the indicator metrics asks for simple yet specific and measurable accountabilities in order for the organization to be recognized at a One, Two, or Three Star Level, which is then summarized elegantly on a label.

Organizations can use the label on their website or marketing to demonstrate their commitments to these issues. The Institute also transparently posts the detailed information in a publicly viewable database.

JUST marks the beginning of a new era of corporate transparency. The Institute invites organizations everywhere to evaluate themselves through this social justice and equity lens and become a JUST organization.



TRANSPORTATION



BEHAVIORAL CHANGE



In Tucson, Subsidies for Rainwater Harvesting Produce Big Payoff

The Arizona city has spent more than \$2 million subsidizing rainwater harvesting systems. Consultant Gary Woodard explains that results from a new study he is leading show such systems don't just collect water, they also change behavior.

-Water Deeply, Jan. 12, 2018



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Patty Karapinar

AIA, LEED-APP BD+C, O+M

Director of Sustainability

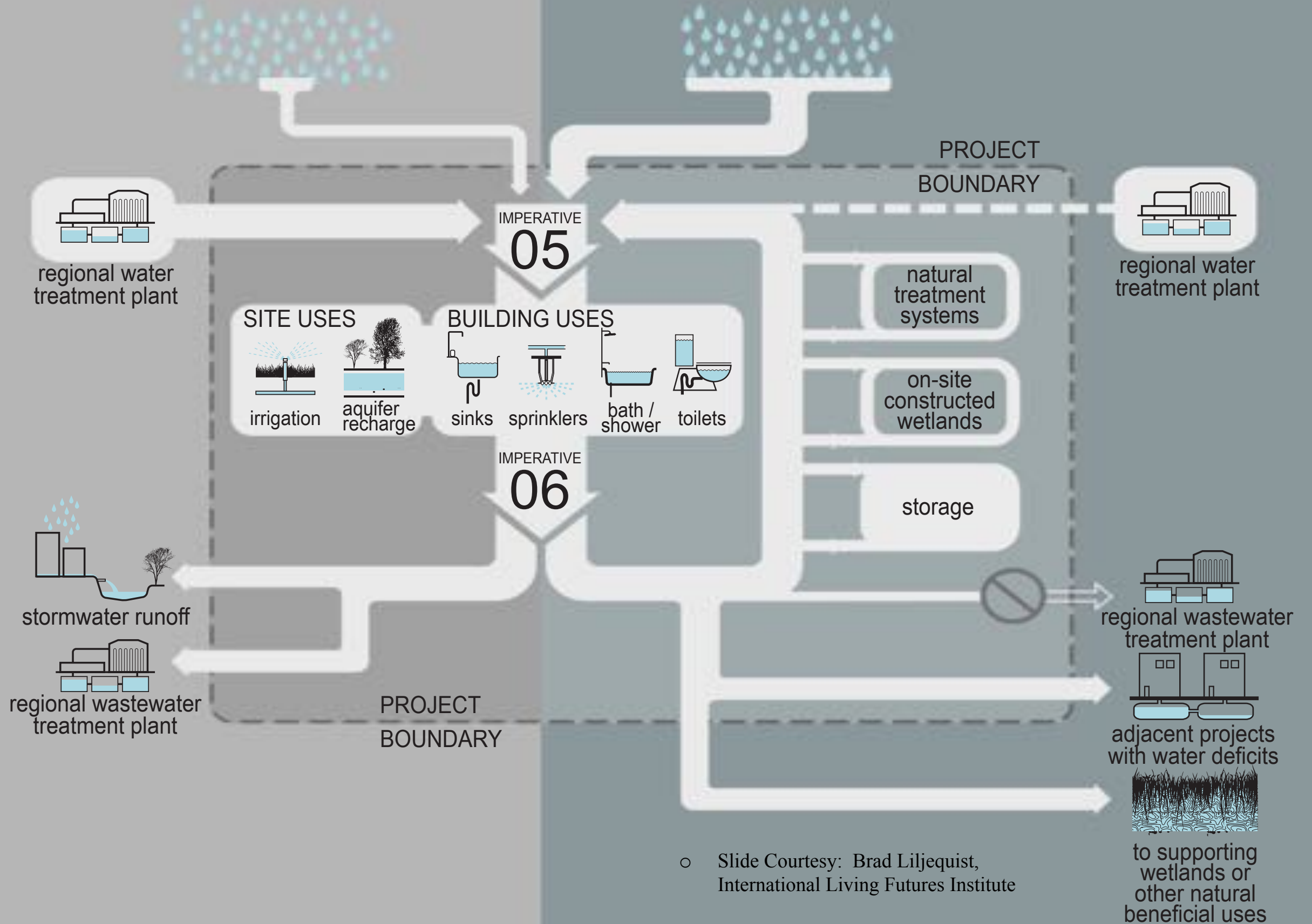
pkarapinar@archnexus.com

TRADITIONAL MODEL

ONE-WAY MODEL

LIVING BUILDING CHALLENGE

CYCLICAL MODEL



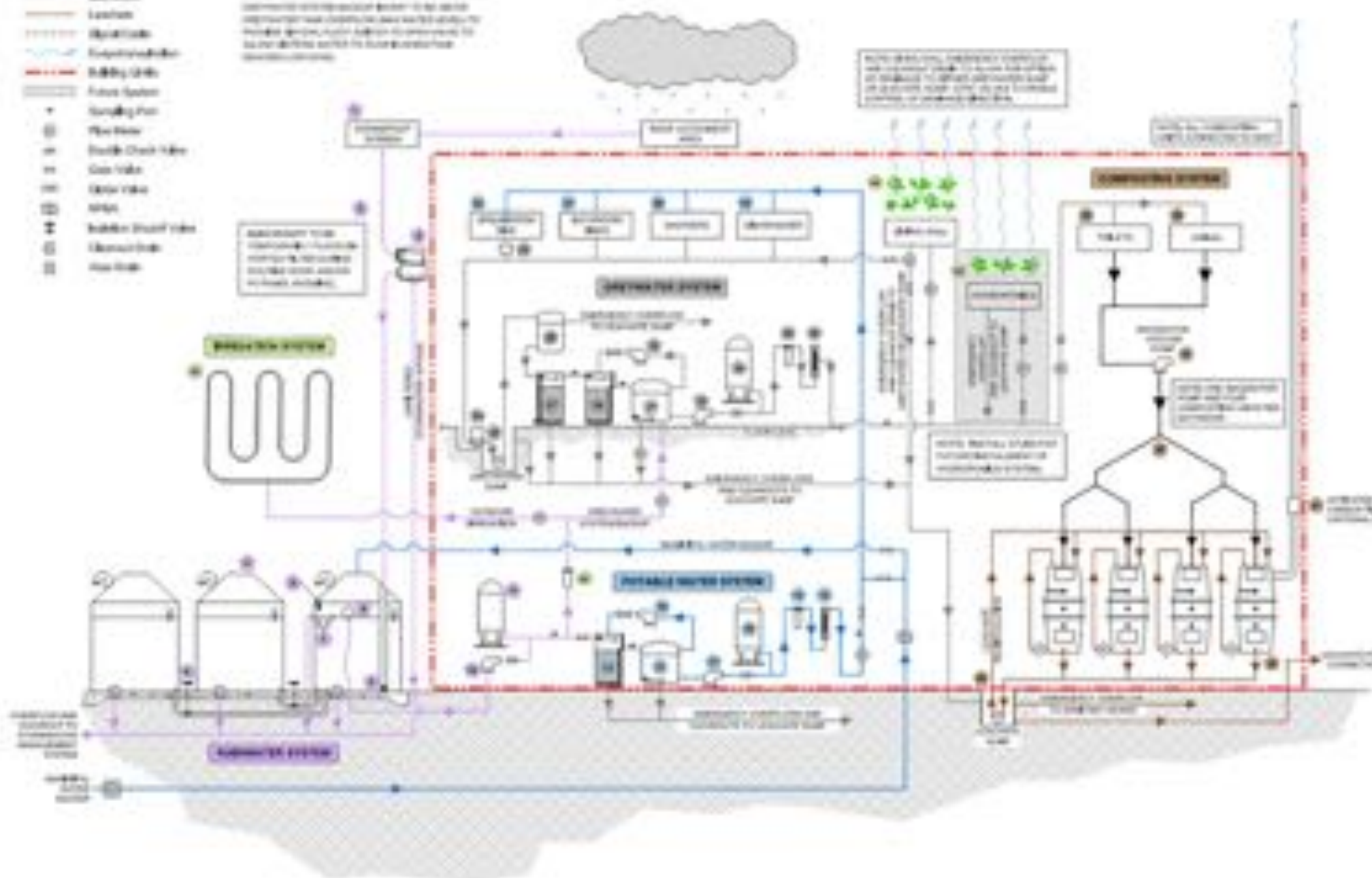
LEGEND

- Red/Orange Line: Red/Orange Water
- Blue Line: Potable Water
- Grey Line: Sewer
- Black Line: Wastewater
- Green Line: Leachate
- Yellow Line: Effluent
- Light Blue Line: Recycled Water
- Dark Blue Line: Reclaimed Water
- Red Dashed Line: Utility Lines
- Red Solid Line: Future System
- Green Circle: Sampling Point
- Blue Circle: Flow Meter
- Black Circle: Double Check Valve
- Black Circle: Gate Valve
- Black Circle: Isolation Valve
- Black Circle: Isolation Shutoff Valve
- Black Circle: Isolation Valve
- Black Circle: Flow Valve

NOTES

1. All flow rates are based on the design flow rate of the system. Flow rates may vary due to changes in the design flow rate or changes in the design flow rate.

2. All flow rates are based on the design flow rate of the system. Flow rates may vary due to changes in the design flow rate or changes in the design flow rate.



MAJOR COMPONENTS LIST

NO.	DESCRIPTION	QTY
WASTEWATER SYSTEM		
1	Wastewater Pump	1
2	Wastewater Pump Motor	1
3	Wastewater Pump Motor	1
4	Wastewater Pump Motor	1
5	Wastewater Pump Motor	1
6	Wastewater Pump Motor	1
7	Wastewater Pump Motor	1
8	Wastewater Pump Motor	1
9	Wastewater Pump Motor	1
10	Wastewater Pump Motor	1
POTABLE WATER SYSTEM		
11	Potable Water Pump	1
12	Potable Water Pump Motor	1
13	Potable Water Pump Motor	1
14	Potable Water Pump Motor	1
15	Potable Water Pump Motor	1
16	Potable Water Pump Motor	1
17	Potable Water Pump Motor	1
18	Potable Water Pump Motor	1
19	Potable Water Pump Motor	1
20	Potable Water Pump Motor	1
RECYCLED WATER SYSTEM		
21	Recycled Water Pump	1
22	Recycled Water Pump Motor	1
23	Recycled Water Pump Motor	1
24	Recycled Water Pump Motor	1
25	Recycled Water Pump Motor	1
26	Recycled Water Pump Motor	1
27	Recycled Water Pump Motor	1
28	Recycled Water Pump Motor	1
29	Recycled Water Pump Motor	1
30	Recycled Water Pump Motor	1
RECLAIMED WATER SYSTEM		
31	Reclaimed Water Pump	1
32	Reclaimed Water Pump Motor	1
33	Reclaimed Water Pump Motor	1
34	Reclaimed Water Pump Motor	1
35	Reclaimed Water Pump Motor	1
36	Reclaimed Water Pump Motor	1
37	Reclaimed Water Pump Motor	1
38	Reclaimed Water Pump Motor	1
39	Reclaimed Water Pump Motor	1
40	Reclaimed Water Pump Motor	1
SEWER SYSTEM		
41	Sewer Pump	1
42	Sewer Pump Motor	1
43	Sewer Pump Motor	1
44	Sewer Pump Motor	1
45	Sewer Pump Motor	1
46	Sewer Pump Motor	1
47	Sewer Pump Motor	1
48	Sewer Pump Motor	1
49	Sewer Pump Motor	1
50	Sewer Pump Motor	1
LEACHATE SYSTEM		
51	Leachate Pump	1
52	Leachate Pump Motor	1
53	Leachate Pump Motor	1
54	Leachate Pump Motor	1
55	Leachate Pump Motor	1
56	Leachate Pump Motor	1
57	Leachate Pump Motor	1
58	Leachate Pump Motor	1
59	Leachate Pump Motor	1
60	Leachate Pump Motor	1

DRAFT JUNE 20, 2019