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
BUILDINGS ARE THE PROBLEM

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

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
<th>Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>24.4%</td>
<td>(23.2 QWtu)</td>
</tr>
<tr>
<td>Transportation</td>
<td>28.1%</td>
<td>(26.7 QWtu)</td>
</tr>
<tr>
<td>Buildings</td>
<td>47.6%</td>
<td>(45.2 QWtu)</td>
</tr>
</tbody>
</table>

U.S. Energy Consumption by Sector

Buildings are responsible for nearly half of US CO2 emissions

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
<th>CO2 Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>21.1%</td>
<td>(1116 MMT CO2e)</td>
</tr>
<tr>
<td>Transportation</td>
<td>34.3%</td>
<td>(1816 MMT CO2e)</td>
</tr>
<tr>
<td>Buildings</td>
<td>44.6%</td>
<td>(2358 MMT CO2e)</td>
</tr>
</tbody>
</table>

U.S. CO2 Emissions by Sector
BUILDINGS ARE THE SOLUTION
“Oz didn’t give nothing to the Tin Man that he didn’t, didn’t already have…”
-Amercia
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
ARCH | NEXUS SAC

LEED v4 Platinum Certified 4/20/17
LEED v4 Existing Buildings - Submitted
WELL Registered
Living Building Challenge - Submitted
JUST Certified Employee-Owned Company
PLACE:
COMMUNITY ENGAGEMENT IN DESIGN
COMMUNITY INTEGRATION
URBAN AGRICULTURE

SCALE JUMP
NET POSITIVE ENERGY

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

ACTUAL USE (kWh)  Actual PV Production (kWh)
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
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

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**Water Balance - Design**

- **Precipitation**: 80,070 gal.
- **Rainwater Harvest**: 26,624 gal.
- **Storm-Water Runoff**: 53,446 gal. approved through Dialogue Post ID 5450
- **Outdoor Irrigation**: 12,686 gal.
- **Potable Water**: 12,444 gal.
- **Grey Water Make-Up**: 1,494 gal.
- **Consumed**: 2,957 gal.
- **Recycled as Grey Water**: 9,487 gal.
- **Black Water**: 5,506 gal.
- **Indoor Irrigation**: 5,475 gal.
  - Evaporated through roof vents

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**NET POSITIVE WATER**

**ARCH | NEXUS SAC is equipped to provide 100% of all water from rainwater.**
RAINWATER SUPPLY AND WATER USAGE
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
On average, approximately 70 percent of a material’s carbon footprint is attributed to raw material extraction and processing.”

-John Bradford, Interface Carpet
SUPPORT PRODUCT INNOVATION

Interface Climate Takeback Initiative

The average carpet tile emits 7kg of CO2, the Proof Positive tile stores 2kg.
OCCUPANT ENGAGEMENT

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

<table>
<thead>
<tr>
<th>Diversity</th>
<th>Worker Benefit</th>
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<tr>
<td>- Non-Discrimination</td>
<td>- Worker Happiness</td>
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<tr>
<td>- Gender Diversity</td>
<td>- Employee Benefit</td>
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<tr>
<td>- Ethnic Diversity</td>
<td>- Continuing Education</td>
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<th>Equity</th>
<th>Local Benefit</th>
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<tr>
<td>- Full Time Employment</td>
<td>- Local Control</td>
</tr>
<tr>
<td>- Pay-Scale Equity</td>
<td>- Local Sourcing</td>
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<tr>
<td>- Employee Friendly</td>
<td></td>
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<tr>
<td>- Living Wage</td>
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<td>- Gender Pay Equity</td>
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<td>- Family Friendly</td>
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<th>Safety</th>
<th>Stewardship</th>
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<td>- Occupational Safety</td>
<td>- Responsible Investing</td>
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<td>- Hazardous Chemicals</td>
<td>- Community Volunteering</td>
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**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

Popularity of Transport Modes

- Carpool: 2-3 people
- Tram or light rail
- Motorcycle or scooter
- Car: alternative fuel
- Car: solo
- Bus
- Heavy rail
- Walk

SALT LAKE CITY  I  SACRAMENTO
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
Patty Karapinar
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Director of Sustainability
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SITE USES
- irrigation
- aquifer recharge

BUILDING USES
- sinks
- sprinklers
- bath/shower
- toilets

PROJECT BOUNDARY

REGIONS
- regional water treatment plant
- stormwater runoff

IMPERATIVE 05
- to supporting wetlands or other natural beneficial uses

IMPERATIVE 06
- on-site constructed wetlands

CYCLICAL MODEL
- natural treatment systems
- storage

ONE-WAY MODEL
- regional wastewater treatment plant

PROJECT BOUNDARY

ADJACENT PROJECTS
- with water deficits

Slide Courtesy: Brad Liljequist, International Living Futures Institute