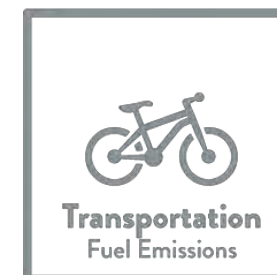
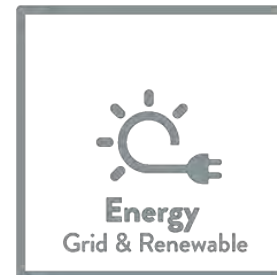




#BeBetterTogether

Climate Action Collaborative Stakeholders Meeting

June 17, 2019





Agenda

- I. Welcome & Meeting Goals
- II. Session 1: Administrative Updates
- III. Session 2: Sector Working Group Updates
- IV. Session 3: Community-Wide Initiatives
- V. BREAK
- VI. Session 4: The Water and Climate Change Nexus
- VII. Session 5: Green Building Presentation
- VIII. Adjourn!



Meeting Goals

- #1 Identify priorities from re-forecasting
- #2 Share updates on working group initiatives
- #3 Talk through Collaborative efforts coming up in the next year that will require full Collaborative partner support
- #4 Learn about the Water and Climate Change Nexus
- #5 Learn about green building best practices
- #6 Keep Up Momentum!

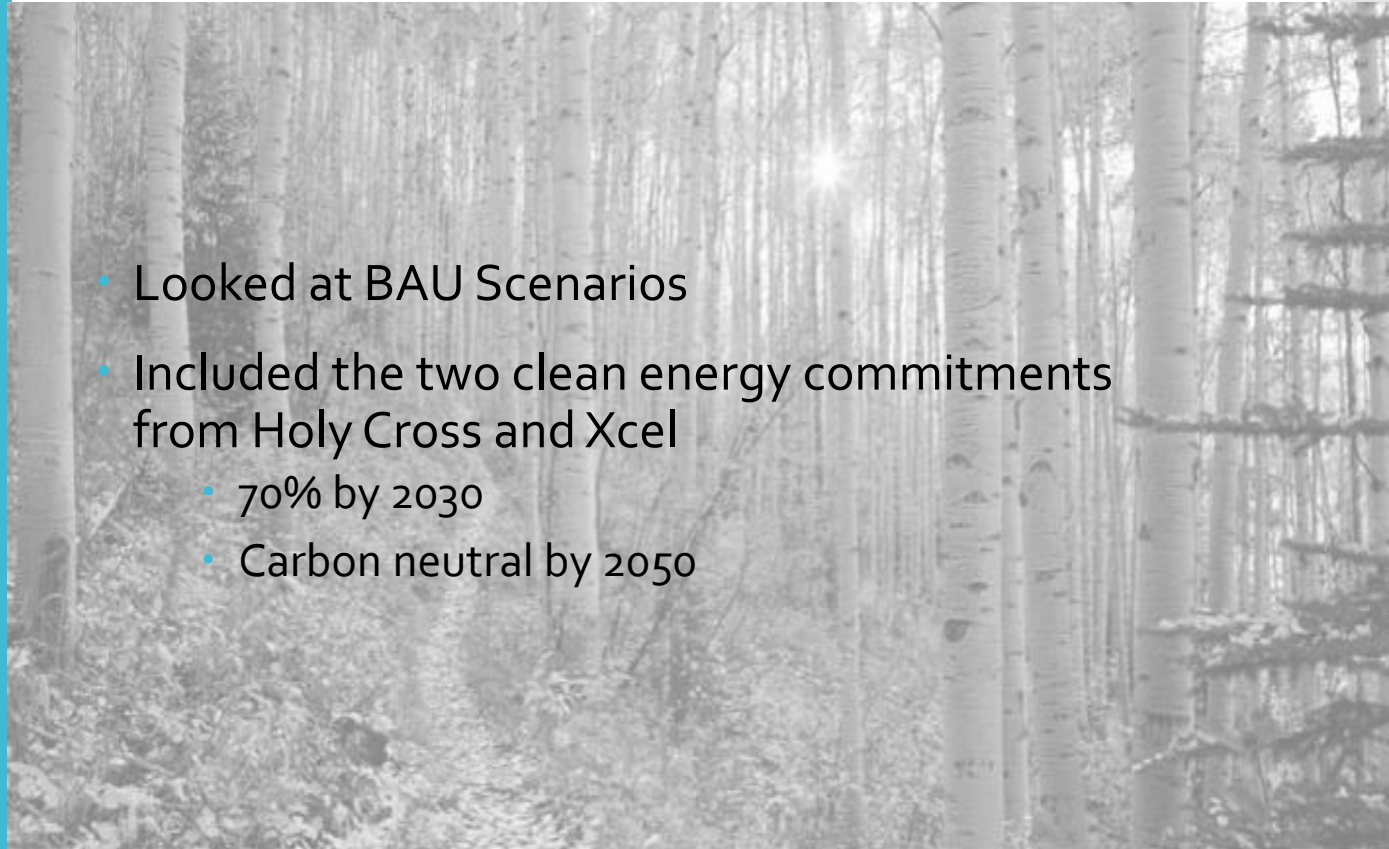


Session #1

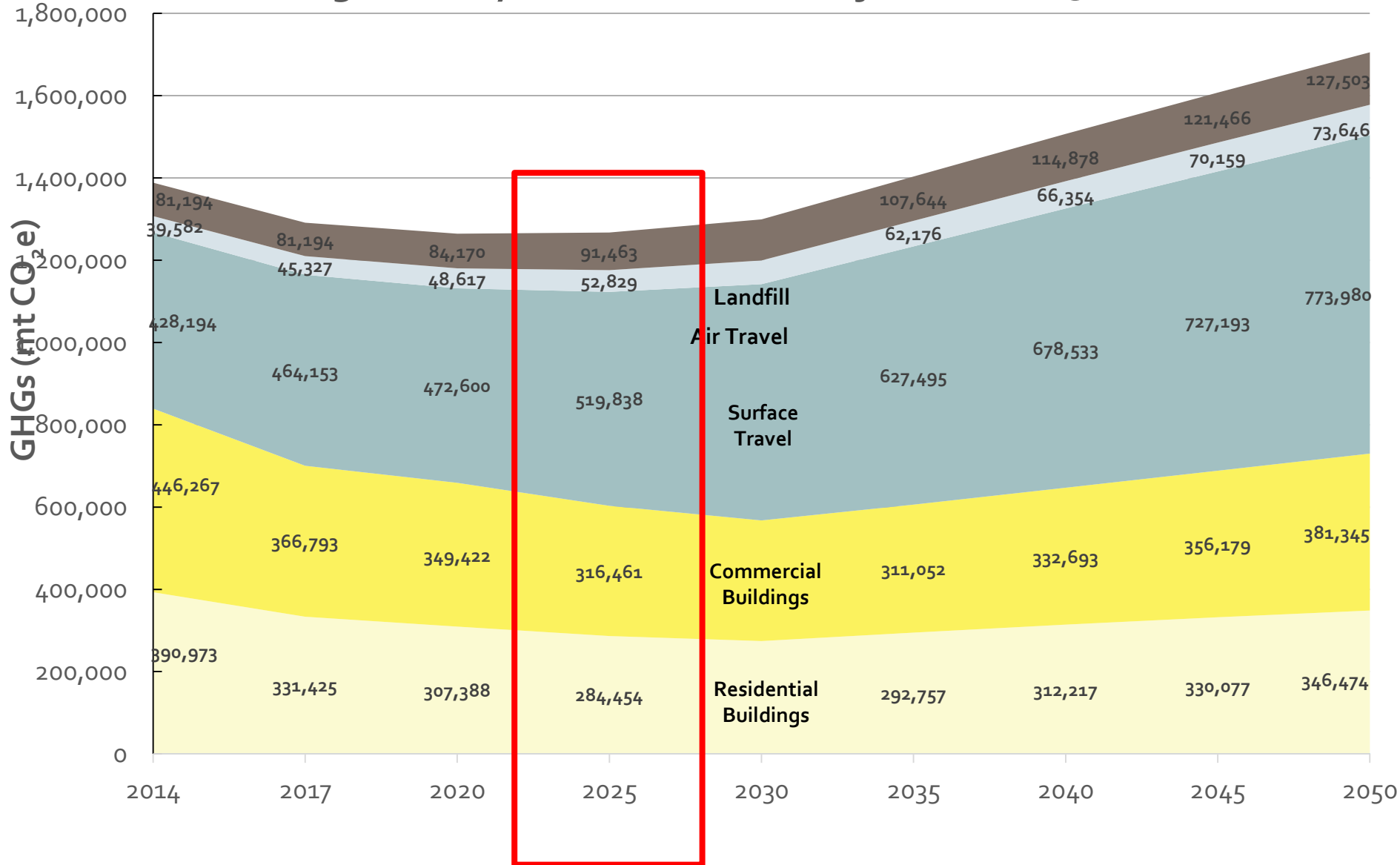
Updated GHG Forecast
&
Regional Clean Energy
Corridor

Updated Inventory

- Looked at BAU Scenarios
- Included the two clean energy commitments from Holy Cross and Xcel
 - 70% by 2030
 - Carbon neutral by 2050



Eagle County GHG Emissions: Projection to 2050



Takeaways

Total BAU + Clean Energy Commitments will be a 9% reduction in emissions by 2025 and a 6% reduction by 2030

- **Buildings** By 2025 with the Clean Energy Commitments by 2030, we will have achieved a **28% reduction** in Residential & Commercial Building Emissions
- **Transportation** By 2025 with BAU transportation emissions **will increase by 21%**
- **Air Travel** By 2025 with BAU air travel emissions **will increase by 33%**
- **Landfill** By 2025 with BAU landfill emissions **will increase by 13%**

Takeaways

Good news - we're moving in the right direction - GHG reduced slightly. Thanks to Western Colorado State University for providing the tools to track our results, and forecast the results of strategies moving forward.

- Reduction so far is mostly from power supply - HCE + Xcel emissions factor.
- We need to continue GHG reduction efforts in landfill and buildings
- **But.. Transportation is #1 target** - the biggest emissions source, and growing. Also the most difficult to change - all communities share this same problem



Regional Clean Energy Corridor

Effort to align Renewable Energy, Electrification (buildings and transportation), and Resiliency efforts between the 3 counties served by Holy Cross Energy; Garfield, Pitkin, & Eagle

Priorities

- Public Sector RE Development
- Benchmarking / Data Management & Tracking
- Electrification of Transportation



Session #2

Sector Working Group Updates

Updates from Sector Groups

- Materials Management – Melissa
- Transportation – Jared
- Buildings – Nikki
- Energy Supply – Mike
- Education & Outreach - Paul

Materials Management Task Force

- Annual Waste Education Blitz
- Lake Creek Village Clean Up
 - 575 lbs of trash collected
 - 79 lbs of recycling collected



Eagle County Diversion Rates

Recycled Material (Residential & Commercial)	2010 Tons	2011 Tons	2012 Tons	2013 Tons	2014 Tons	2015 Tons	2016 tons	2017 tons	2018 tons
MSW Residential and Commercial ^{ab}	4,188	7,036	7,595	8,284	9,535	13,683	11,735	10,743	14,038
Organics ^c	5,907	4,231	3,856	4,808	6,432	4,798	5,134	4,175	4,007
HHW and Ewaste ^d	34	55	60	102	125	138	130	144	101
			-	-	-	-	-	-	-
Total MSW Recycled	10,129	11,322	11,510	13,194	16,092	18,619	16,998	15,061	18,146
Total MSW Disposed ^e	58,547	47,472	47,336	46,246	48,693	50,549	51,430	52,676	51,583
Total MSW Generated	68,676	58,794	58,846	59,440	64,785	69,168	68,428	67,737	69,729
MSW Recycling Rate ^f	14.7%	19.3%	19.6%	22.2%	24.8%	26.9%	24.8%	22.2%	26%
Diverted Materials (Industrial)	2010 Tons	2011 Tons	2012 Tons	2013 Tons	2014 Tons	2015 Tons	2016 Tons	2017 tons	2018 tons
Diverted Materials (non-MSW)	855	1,595	2,669	1,583	1,734	521	96	92	4,159
Total Recovered Material (Residential, Commercial, and Industrial) ^g	10,984	12,917	14,179	14,777	17,826	19,140	17,094	15,153	22,305
Total Solid Waste Disposed	86,988	82,539	68,480	69,552	78,862	78,505	82,770	84,022	107,736
Total Solid Waste Generated	97,972	95,456	82,659	84,329	96,688	97,645	99,863	99,175	130,041
Diversion Rate	11.2%	13.5%	17.2%	17.5%	18.4%	19.6%	17.1%	15.3%	17%

^a Includes: Glass, Plastics #1 - #7, OCC, ONP, OP, steel, tires, aluminum

^b Sources: Vail Resorts, Waste Management, Honeywagon, Costco & City Market, Eagle County MRF, Eagle County Landfill

^c Sources: Honeywagon, EverGreen Zero Waste, TOV, Grub Dump, Eagle County Landfill

^d Sources: Eagle County HHW, ERI, Metech, Blue Star

^e Total MSW disposed is total landfill tonnage minus diverted materials and industrial (C&D) waste

^f Total MSW recycled/total MSW generated

^g Total MSW recycled + total industrial diverted

CAC Transportation Group Update

- Bike to Work Day - June 26th
- EV Subcommittee to establish a roadmap for deploying DC fast chargers in Eagle County using Charge Ahead grant funding
- Bike Share - TOV may pilot e-assist bike share. Meanwhile, TOA & County are looking to expand the Zagster system into Eagle-Vail & Edwards
- FLM - plan for outreach to communities
- ECO Updates
 - Marketing Plan
 - Bikes on buses





CAC Buildings Update

- LED Swaps for Summer 2019
 - June: Eagle Pool
 - July: Bonfire (FREE BEER)
 - August: Town of Avon Rec Center
 - September: Town of Minturn Town Hall
 - Eagle Flight Days: R&H Mechanical
- USGBC Eagle Valley Green Building Group
 - August 19th: LEED GA Training
 - October 3rd: Green building challenge – mini-presentations

CAC Buildings Update

- Sustainable Building Code Task Force
- CAC Energy Services Program
 - ERWSD
 - R&H Mechanical
- Benchmarking



CAC Buildings Update - EnergySmart

2019 to date (through 6/4)

- Residential Assessments:
 - 75 assessments with direct installs projecting 20.68 MtCO₂e annual savings
- Residential Rebates & Savings:
 - 63 rebates issued (efficiency, solar, radon) projecting 227.71 MtCO₂e annual savings
- Commercial Rebates & Savings:
 - 14 rebates issued (lighting, water heating) projecting 381.19 MtCO₂e annual savings
- CARE (Income-Qualified) Assessments & Upgrades:
 - 13 educational visits to homes; savings from projects TBD

Total projected annual savings YTD: 629.58 MtCO₂e

Remember...

In the Town of Vail - FREE home energy assessments & double rebates for homes and businesses!

CAC businesses - FREE energy visit with Energy Smart + Eagle County, report with recommendations, energy coaching, & rebates!



CAC Energy Supply Update

- Clean Energy Corridor Effort with CLEER & CORE & HCE
- 100% RE Resolutions from CAC Partners
- PuRE Calculator
- RPF for local renewable resource ready by end of year
- Update on new things from HCE
 - New rates
 - New Board Member
 - Priorities for this year
 - Basalt Vista

CAC Education & Outreach Update

- Update on summer campaigns
 - REC Calculator / June 5 – Labor Day
 - Quarter & Half Page VD (23 runs)
 - :30 radio spot
 - Digital (Facebook, re-targeting local ZIP)
 - Waste Wizard / June 20 – Sept
 - Quarter Page Vail Daily (41 runs)
 - :15 radio spot
 - Digital (Facebook, re-targeting local ZIP)
- Behavior Change Update
 - Roadmap & Milestones
 - Business/CAC Partner Engagement for Alternative Commuting
 - Hill Avieum or Agency Partner

Update Summer Campaigns



CLIMATE ACTION COLLABORATIVE

Cut Your Carbon Footprint!

Go 100% renewable by purchasing Renewable Energy Credits to offset your electricity use through Holy Cross!

Visit:
www.REC.ClimateActionCollaborative.org
to calculate your cost!

The Climate Action Plan for the Eagle County Community is our community's plan to address local climate change. The plan sets a goal for Eagle County to reduce its carbon pollution 25% by 2025 and 80% by 2050.

#BeBetterTogether

walking mountains sustainability



Photo: Matt Inden Photography



walking mountains sustainability

CLIMATE ACTION COLLABORATIVE

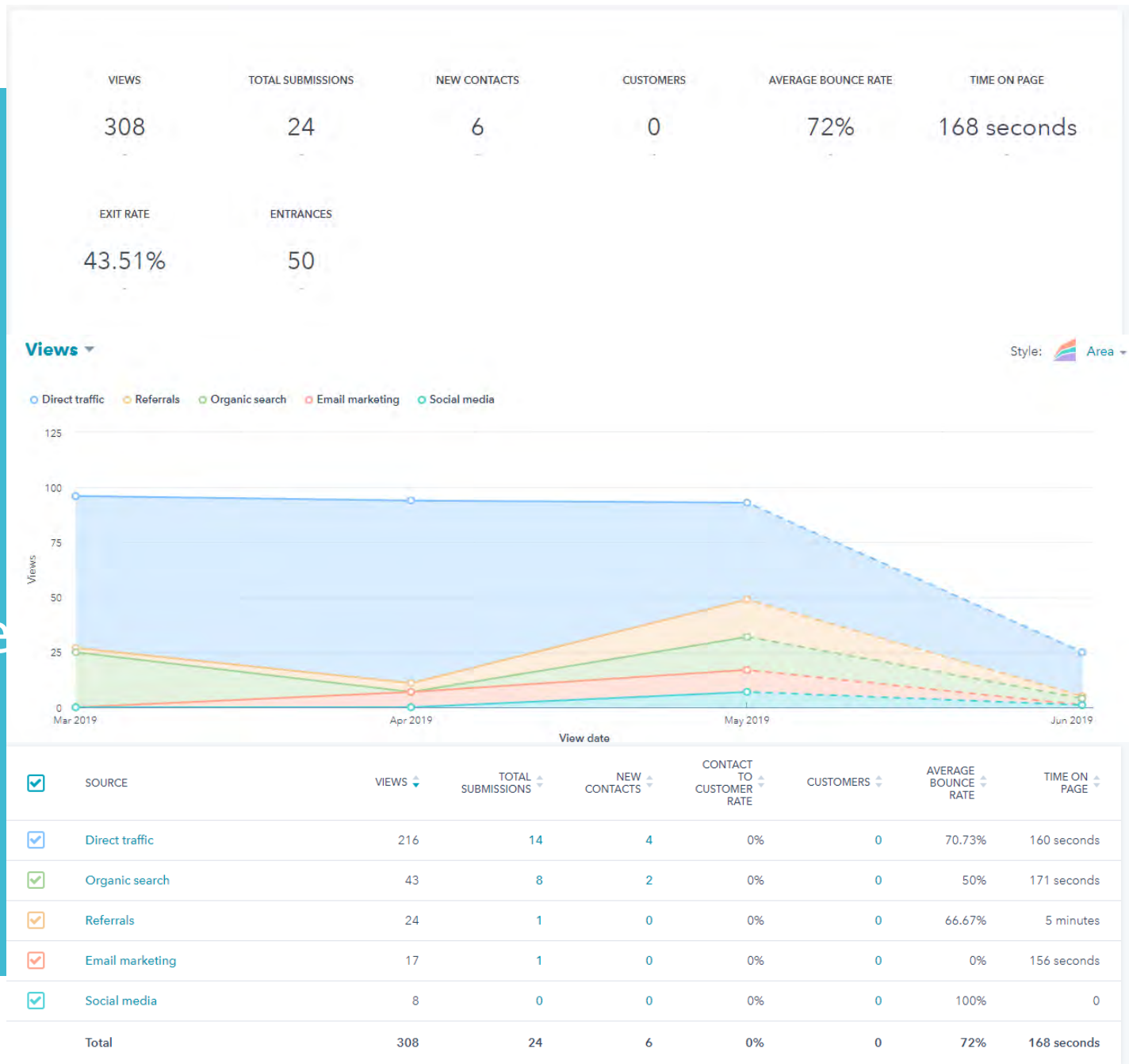
Are you struggling to know what you can recycle and where to drop it off?

We have your answers.

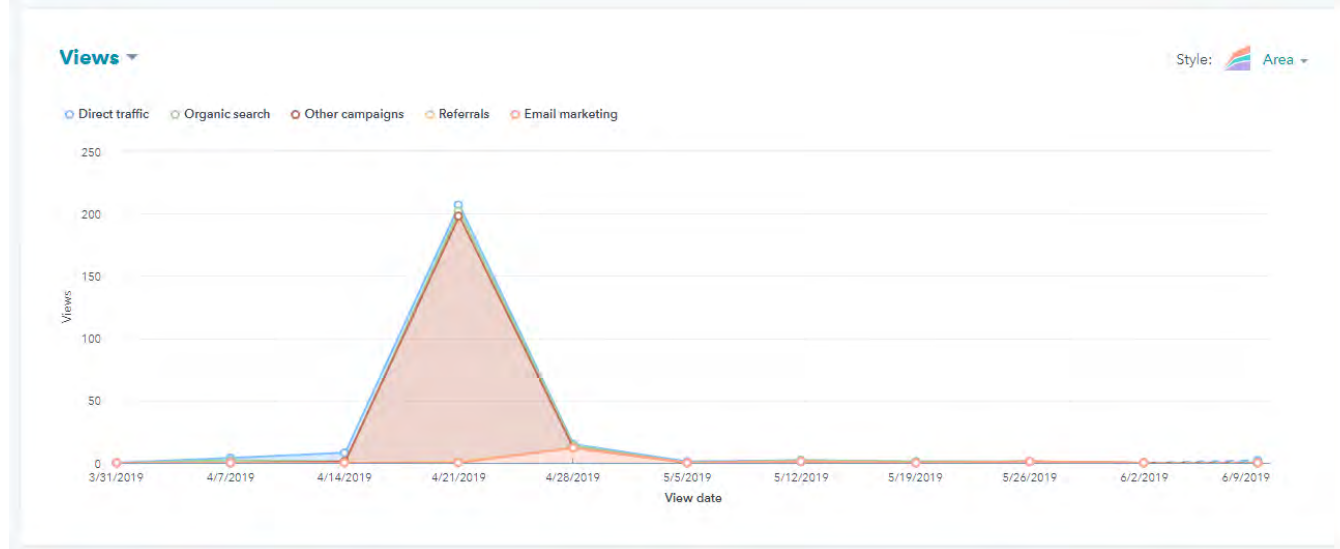
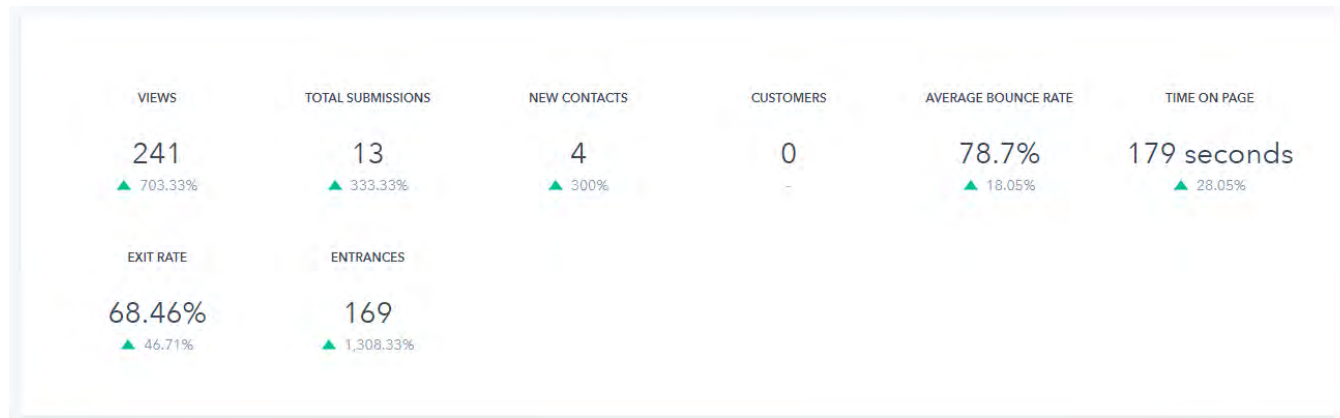
Download the Eagle County Waste Wizard app today!



Rec Calculator Campaign Performance



Climate Action Pledge Earth Day



<input checked="" type="checkbox"/>	SOURCE	VIEWS	TOTAL SUBMISSIONS	NEW CONTACTS	CONTACT TO CUSTOMER RATE	CUSTOMERS	AVERAGE BOUNCE RATE	TIME ON PAGE
<input checked="" type="checkbox"/>	Other campaigns	198	6	4	0%	0	79.19%	170 seconds
<input checked="" type="checkbox"/>	Direct traffic	18	4	0	0%	0	100%	3 minutes
<input checked="" type="checkbox"/>	Email marketing	14	2	0	0%	0	69.23%	4 minutes
<input checked="" type="checkbox"/>	Organic search	10	1	0	0%	0	0%	170 seconds
<input checked="" type="checkbox"/>	Referrals	1	0	0	0%	0	0%	0
	Total	241	13	4	0%	0	78.7%	179 seconds

Email Performance Last Three Months

	EMAIL	DELIVERY RATE	OPEN RATE	CLICK RATE	SENT
	Climate Action Collaborative Newsletter Q1 19 🔗	99.79%	22.34%	5.64%	480
	Free Bus for Earth Week! 🔗	99.59%	52.42%	0.97%	726
	Renewable Energy Calculator - Your Results 🔗	100%	72.73%	18.18%	11
	Climate Action Pledge FU - Renewable Energy Credits 🔗	100%	58.33%	16.67%	12
	Climate Action Pledge FU - Energy Smart 🔗	100%	57.14%	14.29%	7
	Climate Action Pledge FU - Composting Resources (Clone) 🔗	100%	69.23%	15.38%	13
	Climate Action Pledge FU - Recycling Resources 🔗	100%	71.43%	28.57%	7
	Climate Action Pledge FU Personal 🔗	93.33%	64.29%	0%	15
	Climate Action Pledge FU - Rebates 🔗	100%	45.45%	0%	11
	Climate Action Pledge - Internal Dependent Field Notification 🔗	100%	50%	0%	8

Web Metrics

Page	Pageviews	Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate	% Exit
	1,495 % of Total: 1.96% (75,560)	1,226 % of Total: 1.97% (62,372)	00:01:52 Avg for View: 00:01:52 (0.62%)	736 % of Total: 1.62% (40,467)	65.22% Avg for View: 66.51% (-1.94%)	48.63% Avg for View: 53.56% (-9.20%)
1. /climate-action-collaborative/	457 (30.57%)	367 (29.93%)	00:01:57	233 (31.66%)	60.94%	46.17%
2. /sustainability-2/climate-action-plan/	197 (13.18%)	158 (12.89%)	00:01:47	135 (18.34%)	45.93%	45.18%
3. /climate-action-collaborative/resources/waste-materials-management/	106 (7.09%)	96 (7.83%)	00:03:55	72 (9.78%)	73.61%	69.81%
4. /climate-action-collaborative/about-climate-action-collaborative/	92 (6.15%)	71 (5.79%)	00:01:37	11 (1.49%)	72.73%	30.43%
5. /climate-action-collaborative/led-light-bulb-swaps/	54 (3.61%)	45 (3.67%)	00:02:57	25 (3.40%)	56.00%	42.59%
6. /climate-action-collaborative/get-involved/	49 (3.28%)	27 (2.20%)	00:01:29	7 (0.95%)	85.71%	20.41%
7. /climate-action-collaborative/newsletter-archive/	49 (3.28%)	34 (2.77%)	00:01:54	9 (1.22%)	55.56%	53.06%
8. /climate-action-collaborative/resources/energy-supply-renewables/	41 (2.74%)	36 (2.94%)	00:00:44	10 (1.36%)	70.00%	24.39%
9. /climate-action-collaborative/events/	38 (2.54%)	29 (2.37%)	00:01:11	3 (0.41%)	100.00%	26.32%
10. /climate-action/bring-nature-back-into-your-landscape	34 (2.27%)	21 (1.71%)	00:02:03	12 (1.63%)	66.67%	47.06%
11. /climate-action	31 (2.07%)	29 (2.37%)	00:00:49	22 (2.99%)	59.09%	51.61%
12. /climate-action-collaborative/resources/buildings/	28 (1.87%)	26 (2.12%)	00:00:52	7 (0.95%)	100.00%	46.43%
13. /climate-action-collaborative/resources/transportation-fuel-emissions/	26 (1.74%)	25 (2.04%)	00:02:28	11 (1.49%)	81.82%	57.69%
14. /climate-action-collaborative-thank-you	19 (1.27%)	8 (0.65%)	00:03:01	5 (0.68%)	80.00%	26.32%
15. /climate-action/new-compost-facility-in-the-eagle-valley	19 (1.27%)	18 (1.47%)	00:01:37	18 (2.45%)	72.22%	73.68%
16. /climate-action-collaborative/resources/water-conservation-energy/	15 (1.00%)	15 (1.22%)	00:01:09	9 (1.22%)	100.00%	80.00%
17. /climate-action/author/mercedes-quesada-embid	12 (0.80%)	7 (0.57%)	00:00:12	7 (0.95%)		
18. /climate-action/why-shop-local	11 (0.74%)	11 (0.90%)	00:00:00	11 (1.49%)	100.00%	100.00%

New Site?

The screenshot shows the homepage of the Walking Mountains Sustainability Hub. At the top, there is a navigation bar with links for 'MEMBERSHIP', 'LOCATIONS / HOURS', and '(970) 857-8775'. The main header features the 'walking mountains sustainability' logo and a menu with 'visit', 'things to do', 'initiatives', 'about', 'give', and 'sustainability hub'. A 'CALENDAR' button is also present. The hero section is an aerial view of a building with solar panels, with the text 'Walking Mountains Sustainability Hub' overlaid. Below this is a 'Sustainability Hub' section with a paragraph of placeholder text. A green bar contains four circular icons representing different metrics: 67,000 Eagle County Watershed Children reached since 1999, 2,100 Home Energy Assessments performed in Eagle County, 234,000 Pounds of waste diverted from landfill, and 380,000+ Program participants on public lands. The lower section features an 'EnergySmart' program overview with a photo of a building with solar panels and a 'Read More' button. Below that is the 'activelygreen' logo and a paragraph about their services, also with a 'Read More' button. A final photo shows a building at night with lights.

MEMBERSHIP | LOCATIONS / HOURS | (970) 857-8775

walking mountains sustainability

visit | things to do | initiatives | about | give | sustainability hub

CALENDAR

Walking Mountains Sustainability Hub

MORE

Sustainability Hub

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

67,000
Eagle County Watershed Children reached since 1999

2,100
Home Energy Assessments performed in Eagle County

234,000
Pounds of waste diverted from landfill

380,000+
Program participants on public lands

EnergySmart

Energy Smart Colorado is a program that assists residents and business owners in Arapahoe, Carbon, Grant, and Summit Counties in understanding the benefits, safety and efficiency of their homes and/or businesses.

Read More

activelygreen

Actively Green provides a variety of services to help you and your business become more sustainable, reduce costs, and create a greener future. We offer a wide range of services to help you and your business become more sustainable, reduce costs, and create a greener future.

Read More

New Site?

walking mountains sustainability

visit things to do initiatives about give sustainability hubs

MEMBERSHIP LOCATIONS / HOURS (303) 821-9725

Energy Smart

Talk with an Energy Coach

EnergySmart Colorado

introduoory paragraph - locals and visitors from pre-k to gray with opportunities to explore nature, gain a scientific understanding, and learn about the many wonders of our mountain environment through natural science and sustainability programs. We invite you to come explore your curious nature with us!

For My Home

Build Sub Title Here - a program that assists residents and business owners in Pitkin, Garfield, Grand, Summit, Eagle, and Lake Counties in improving the comfort, safety and efficiency of their homes and businesses.

Apply for Rebates | Energy Assessment Sign-Up

Learn More

For My Business

Build Sub Title Here - is committed to increasing comfort, creating a better living environment, and lowering energy bills for home-qualified Colorado, CARE. It leverages FCC funding, utility rebates and local resources to provide FREE energy efficiency services to increase qualified participants' home energy upgrades and air sealing which helps reduce energy bills.

Sign Up | Apply for Rebates

Learn More

Free Energy Assistance

Build Sub Title Here in Pitkin, Garfield, Grand, Summit, Eagle, and Lake Counties in improving the comfort, safety and efficiency of their homes and/or businesses.

Learn More



Session 3: Community (Collaborative) -Wide Efforts

Education & Outreach

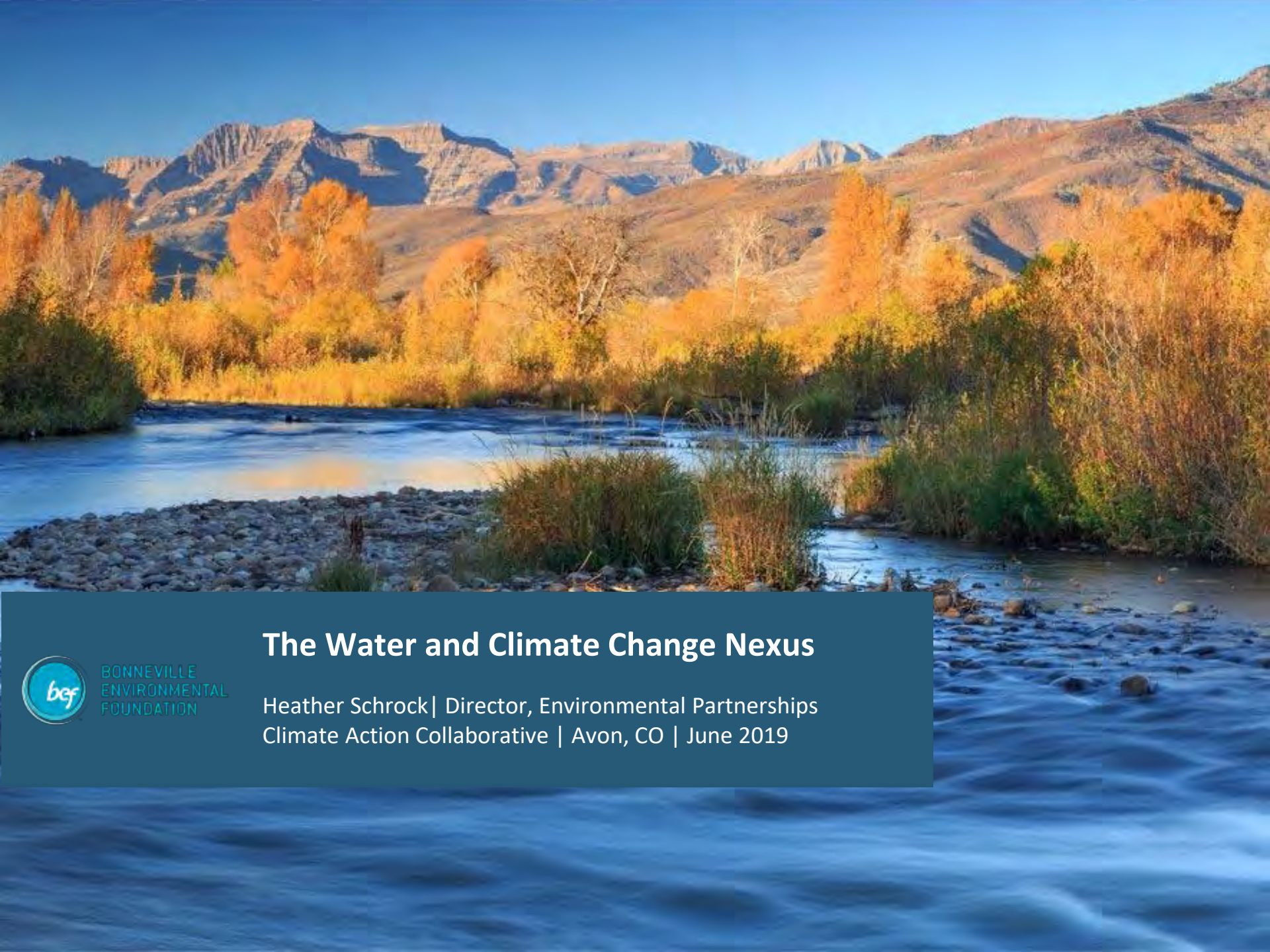
- Annual Recycling Blitz
- Behavior Change – Alternative Commuting

Implementation

- Building Code Task Force
- Benchmarking
- Local PV Development

Time for a BREAK!





The Water and Climate Change Nexus

Heather Schrock | Director, Environmental Partnerships
Climate Action Collaborative | Avon, CO | June 2019

BEF Water Programs



Solutions that catalyze business engagement and leadership in environmental water stewardship



Bringing together the public, corporations, and on-the-ground conservation organizations to raise awareness about freshwater, reduce water footprints, and restore flows and health to vital freshwater ecosystems



Volumetric market-based solution for water restoration - 1 WRC = 1,000 gallons of water restored, improved or replenished to endangered freshwater systems



Adaptive, best-practices funding model designed to remove barriers and achieve sustained, effective restoration and stewardship



nexus **noun**

nex·us | \ 'nek-səs  \

plural **nexuses** \ 'nek-sə-səz  \ or **nexus** \ 'nek-səs , -süs \

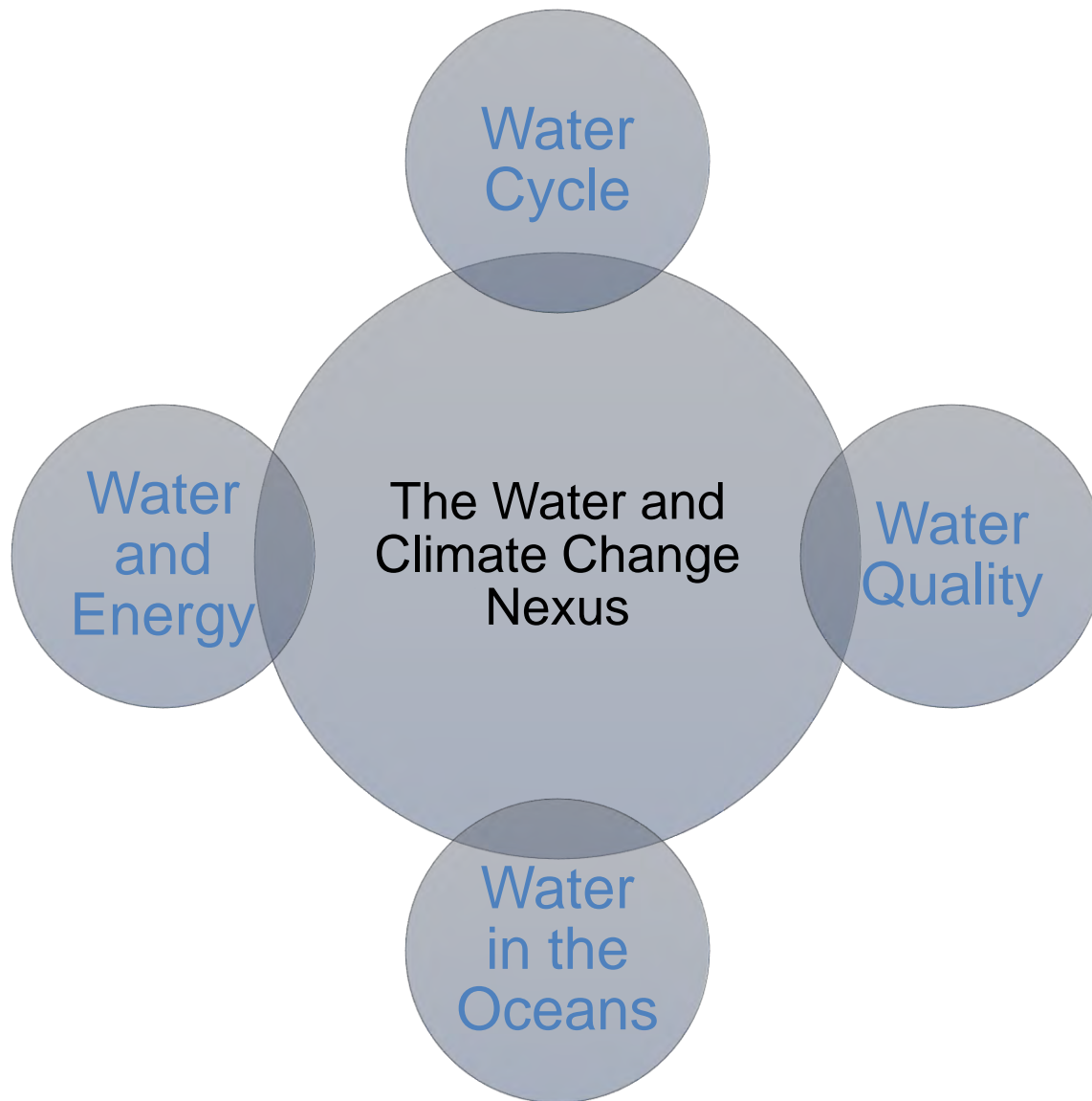
Definition of *nexus*

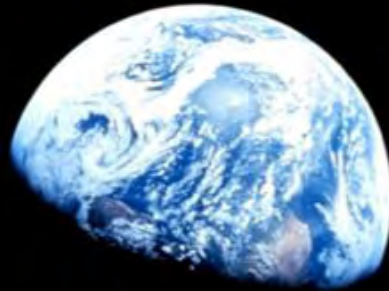
1 : CONNECTION, LINK

// the *nexus* between teachers and students

also : a causal link

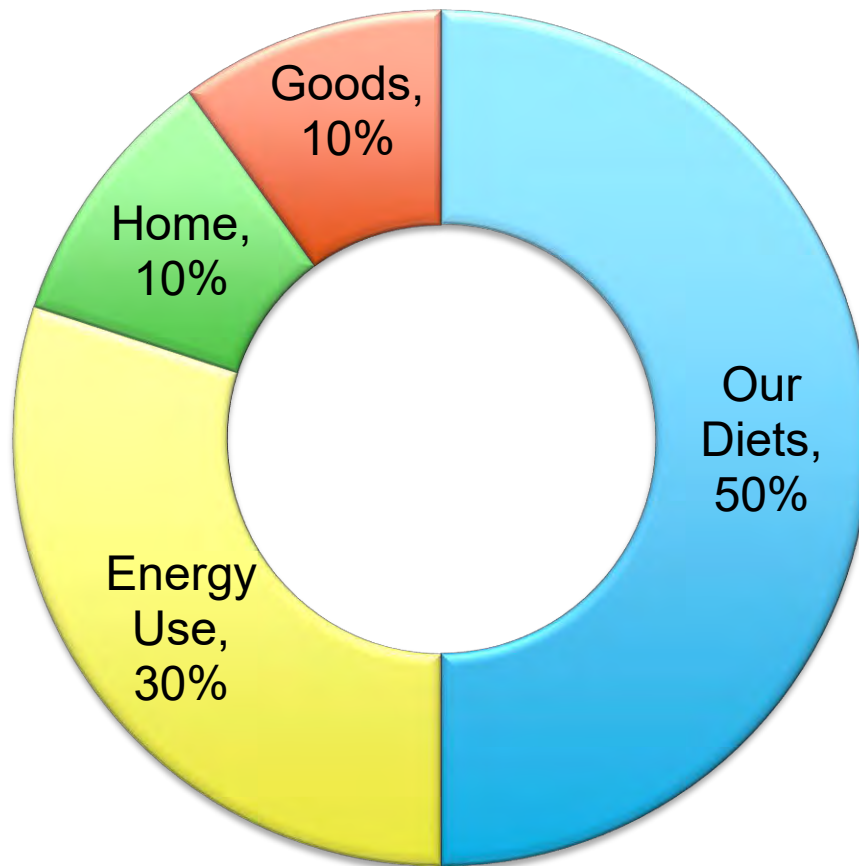
// the *nexus* between poverty and crime





**<1% OF
EARTH'S WATER IS
BOTH FRESH &
ACCESSIBLE**

Embedded Water in Our Everyday Lives

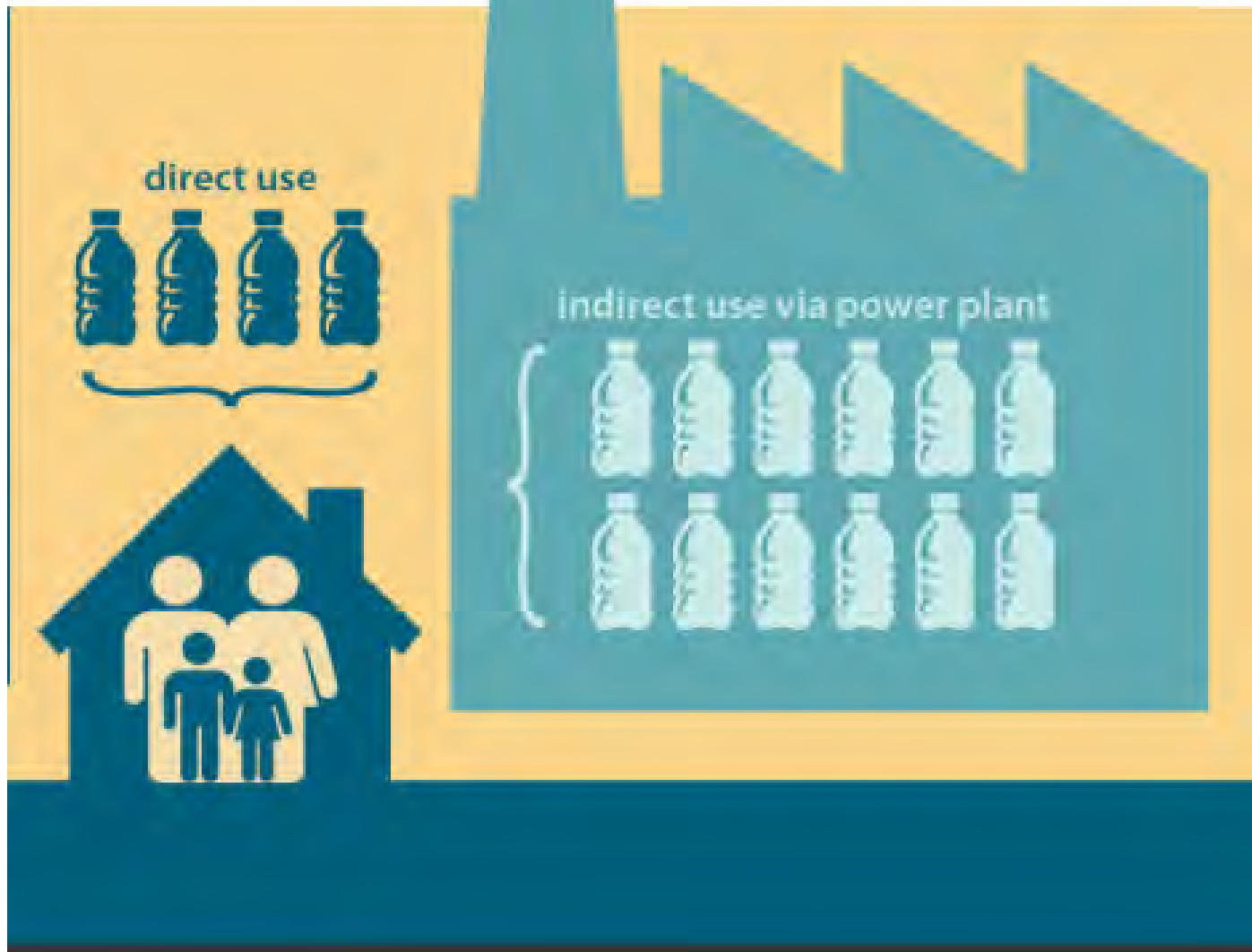


- ◆ **5 GALLONS/HOUR** for a 60-watt light bulb
- ◆ **13 GALLONS** to make 1 gallon of gasoline
- ◆ **37 GALLONS** for one cup of coffee
- ◆ **634 GALLONS** to make a burger
- ◆ **700 GALLONS** to make a cotton T-shirt
- ◆ **2,900 GALLONS** for a pair of jeans
- ◆ The average American has a **2000 GALLON embedded water footprint** per day

Source: National Geographic Water Footprint Calculator

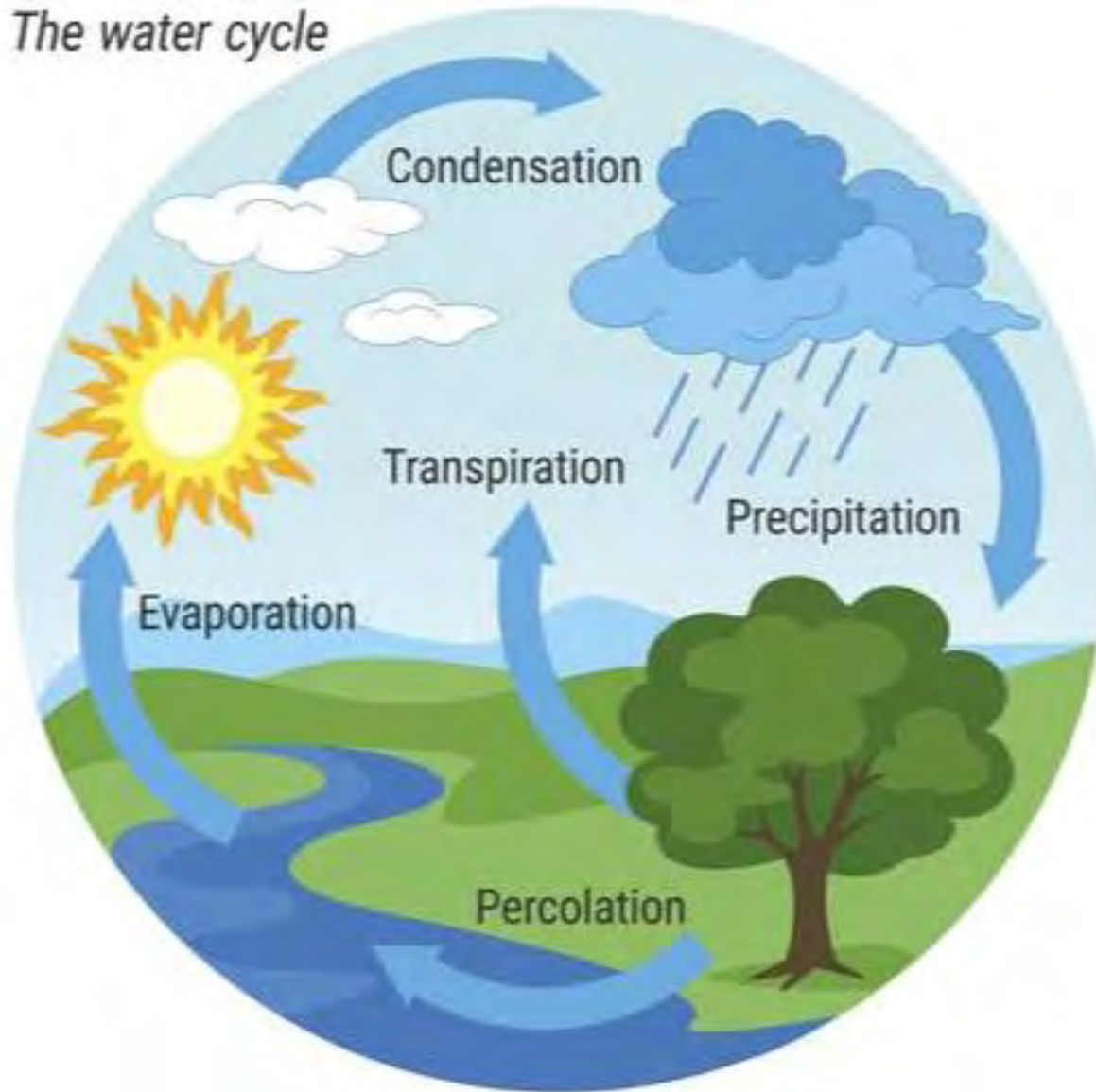


Water/Energy Connection



Water/Energy Connection

The water cycle



HOW CLIMATE CHANGE IMPACTS WEATHER

THE SCIENCE

CHANGES IN THE WATER CYCLE ARE INCREASING THE RISK OF DROUGHTS AND FLOODS.



Higher temperatures mean there is more evaporation from the land and sea into the atmosphere.



As air gets warmer, it can hold more water vapor. This can lead to more intense rainstorms.



Intense rainstorms increase the risk of flooding. Much of the water runs off into rivers and streams, doing little to dampen soil.



This, combined with increased temperatures, increases the risk of drought.



Extreme Rain and Extreme Drought

Snowpack Decline

Snowpack Declines Over Three Decades

This map shows the change in the annual peak snowpack, as measured by the amount of water in it.

1982 to 1986

2012 to 2016

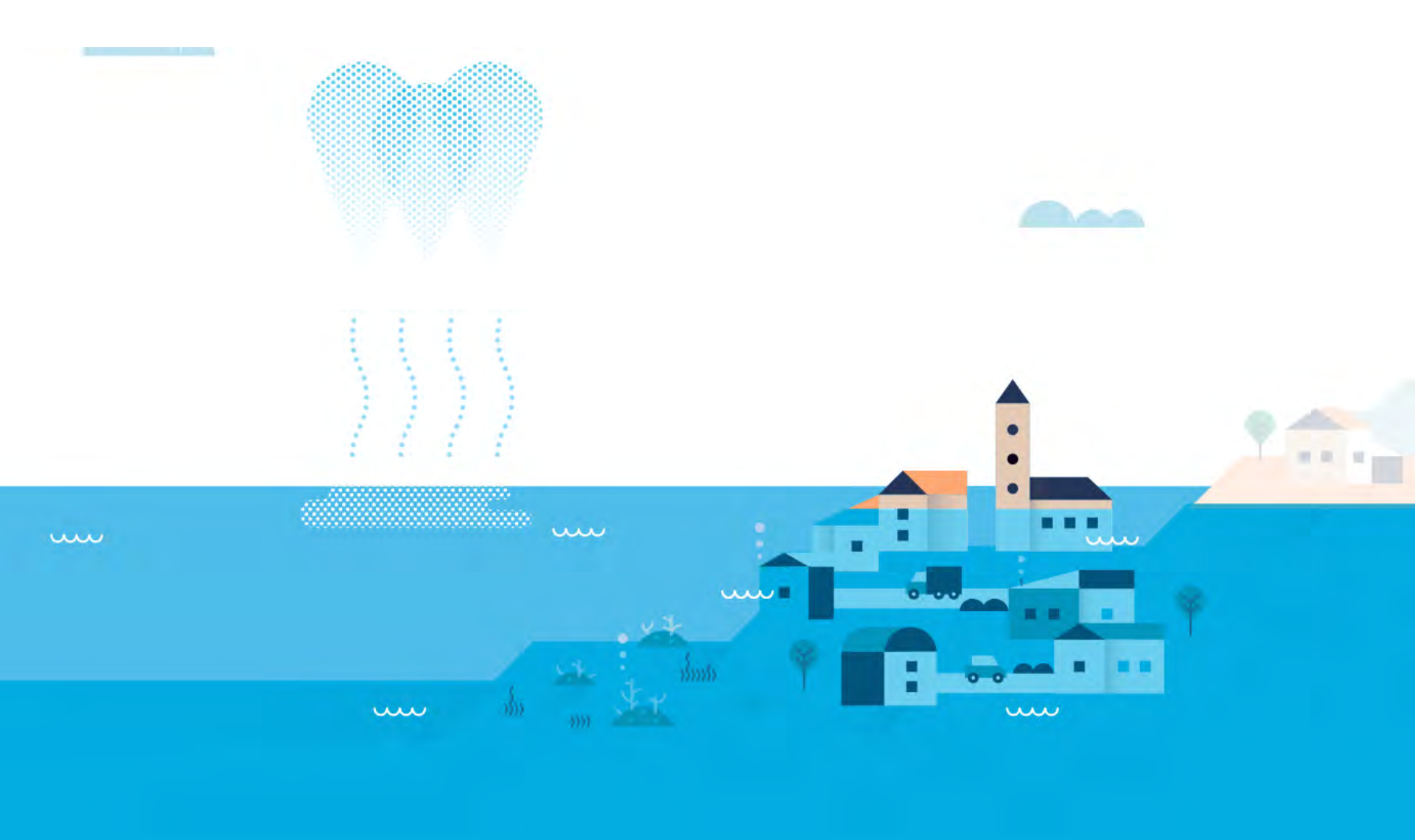




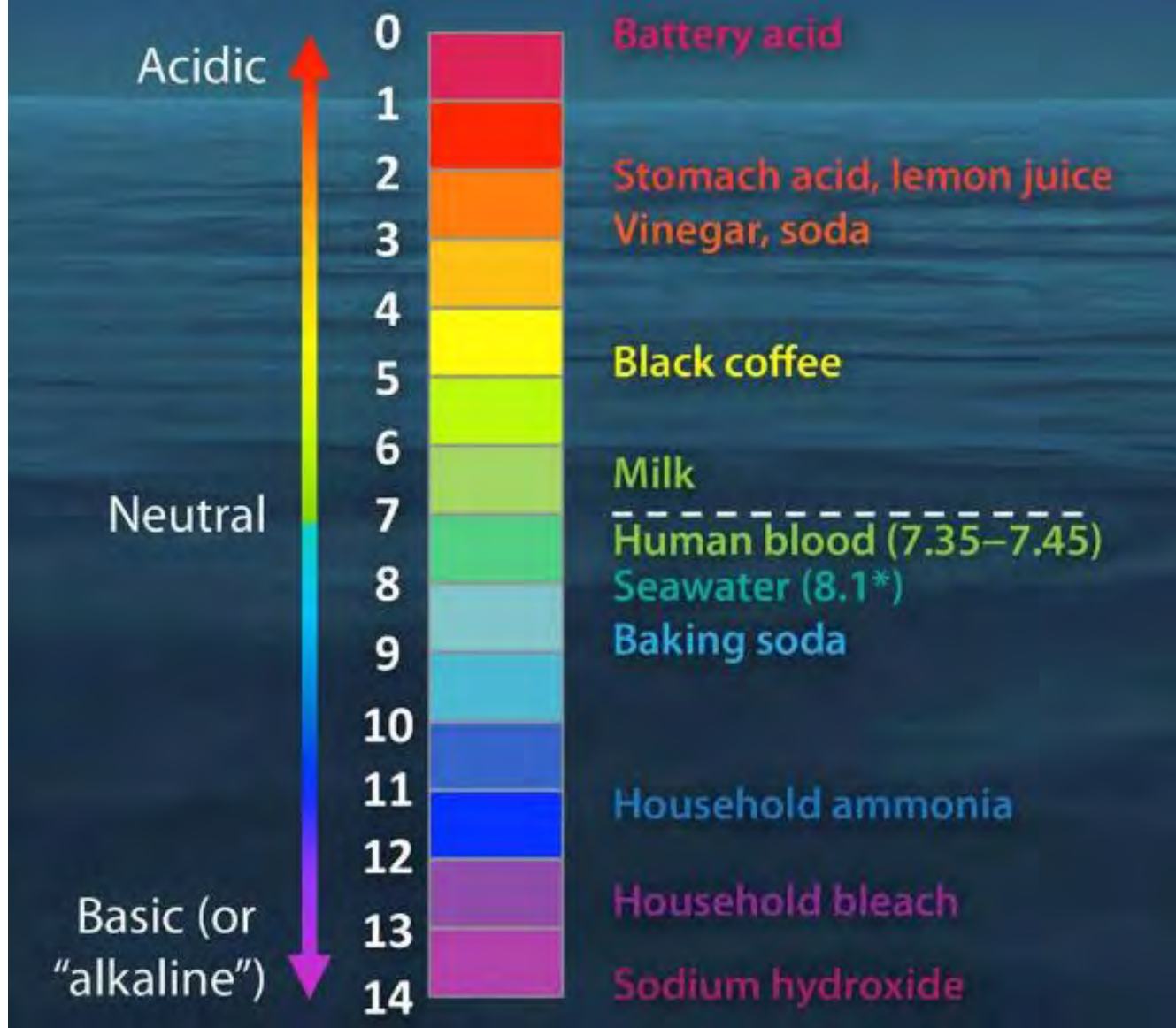
Water Quality and Pollution



Drawdown of stores



Sea Level Rise



Ocean Acidification

The
Colorado River
generates **\$1.4 trillion**
in economic benefits annually



16 million jobs

THE COLORADO RIVER IS THE LIFEBLOOD OF COLORADO'S ECONOMY

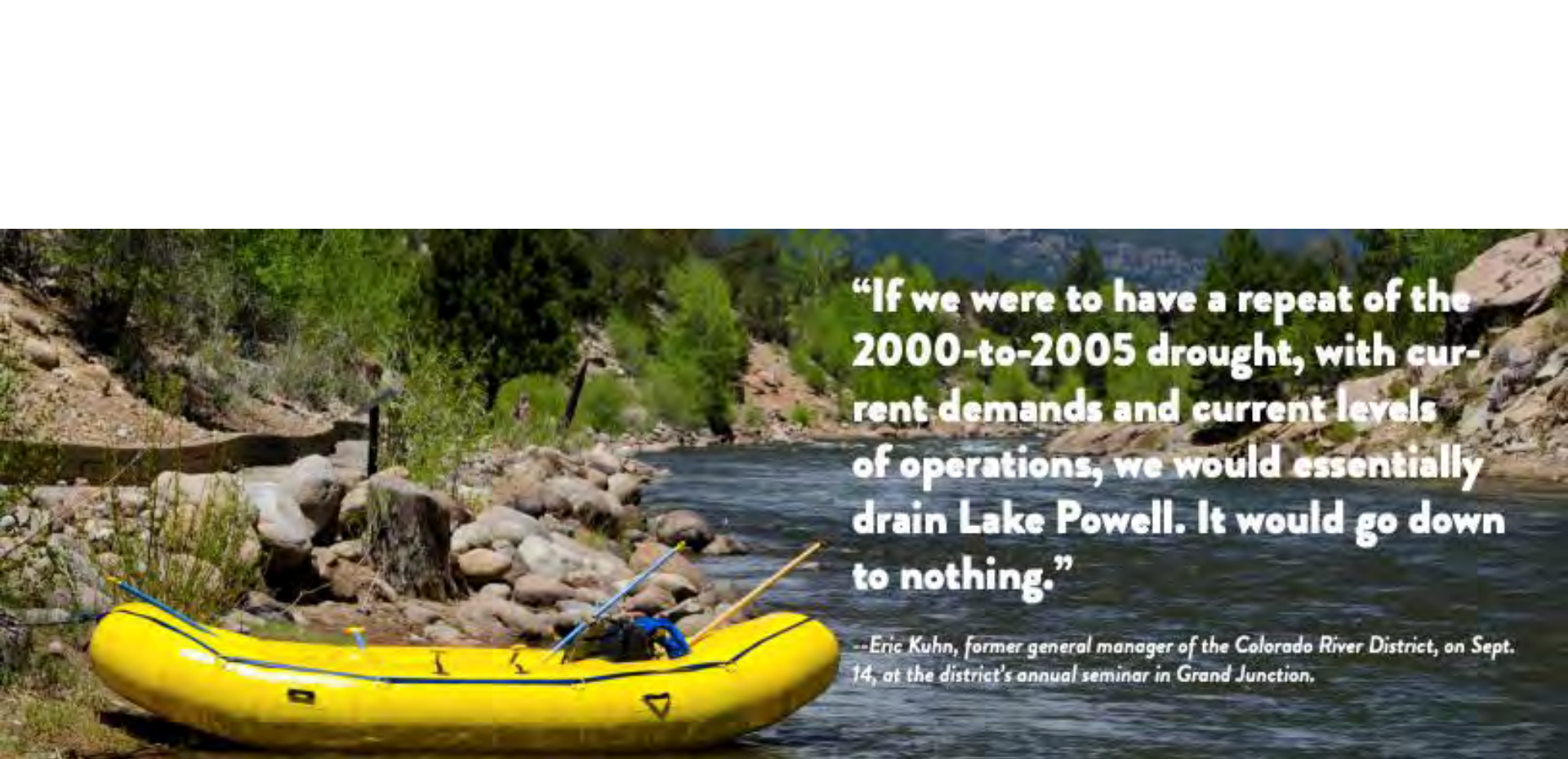
IN COLORADO, MORE THAN
2 MILLION JOBS RELY ON A HEALTHY
COLORADO RIVER SYSTEM.



ACCORDING TO AN ARIZONA STATE UNIVERSITY STUDY,

59% (\$189 billion)

OF COLORADO'S GROSS STATE PRODUCT DEPENDS
ON THE COLORADO RIVER.

A photograph of a yellow inflatable raft on a riverbank. The raft is positioned in the foreground, partially on the rocky shore. The river flows in the background, surrounded by green trees and a rocky hillside. The sky is clear and blue. A quote is overlaid on the right side of the image.

“If we were to have a repeat of the 2000-to-2005 drought, with current demands and current levels of operations, we would essentially drain Lake Powell. It would go down to nothing.”

--Eric Kuhn, former general manager of the Colorado River District, on Sept. 14, at the district's annual seminar in Grand Junction.



Historic Colorado River Reconnection

BUSINESS FOR WATER

STEWARDSHIP



ENGAGEMENT



RESTORATION



ADVOCATING



CONNECTING

Contact us



Heather Schrock

Director, Environmental Partnerships

hschrock@b-e-f.org

BUILDINGS & CLIMATE CHANGE

green line
ARCHITECTS

65 North 4th Street, Suite 5
Carbondale, Colorado

970.963.6689

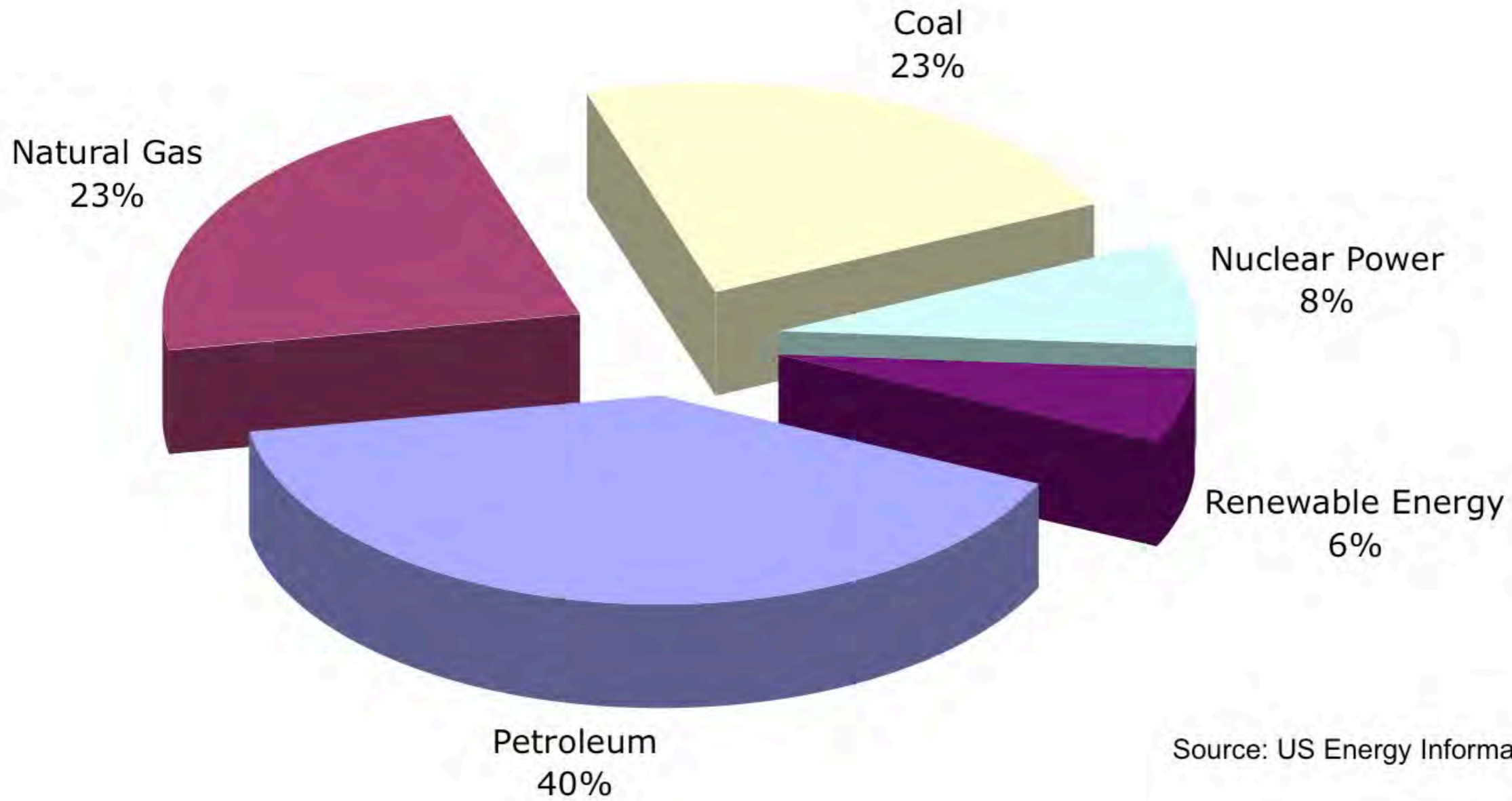
Beautiful
Sustainable
Functional Architecture



STEVEN A. NOVY, AIA

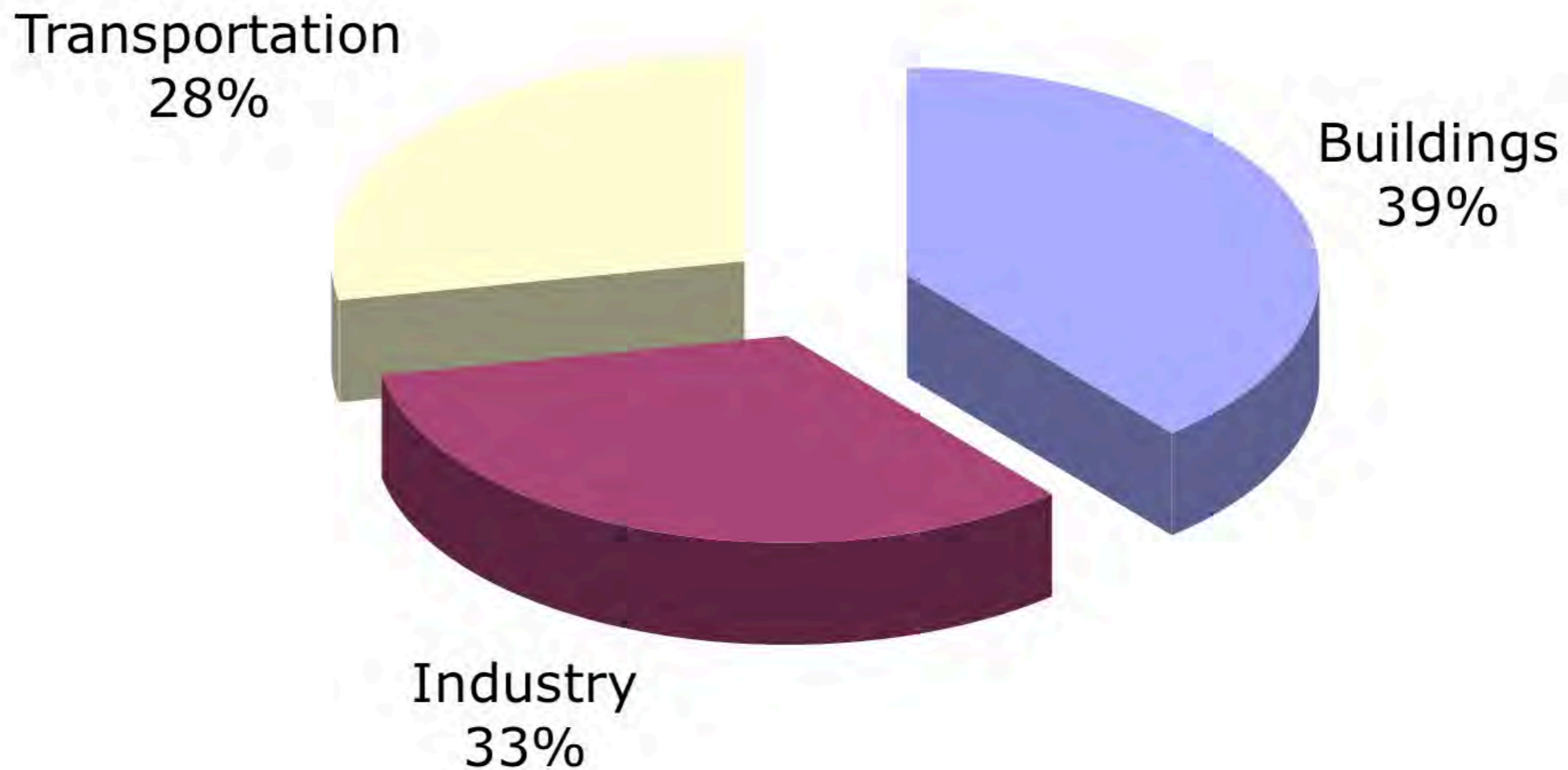
**ARE BUILDINGS CONTRIBUTING
TO CLIMATE CHANGE?**

Figure 1: 86% of US Energy Consumption Is Fossil Fuels



Source: US Energy Information Agency

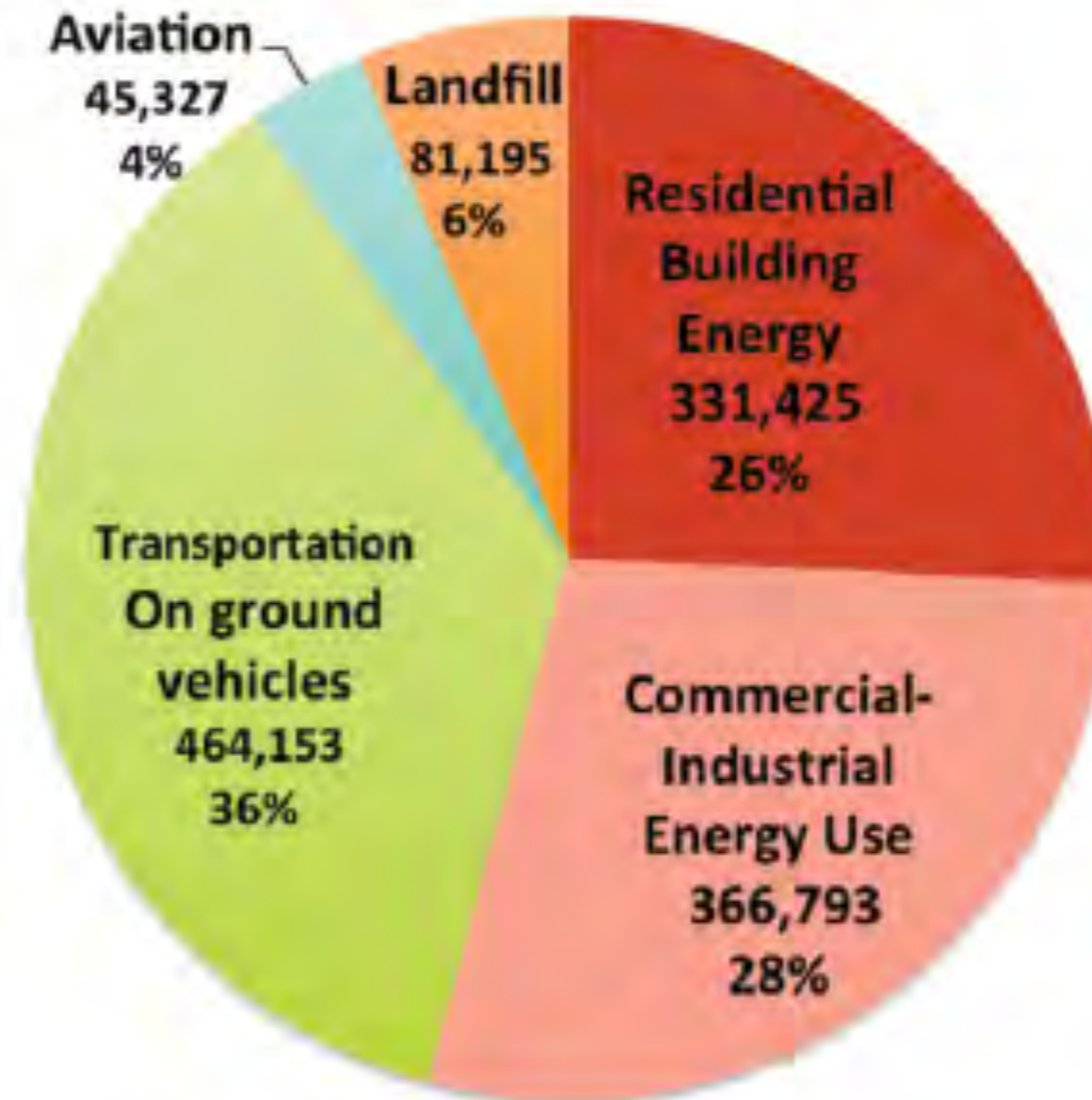
Figure 2: Buildings and Industry Consume More Energy than Transportation



Source: US Energy Information

3. Emissions by Sector, 2017

Metric tons of CO₂e



FROM EAGLE COUNTY CLIMATE ACTION PLAN - DEC. 2016

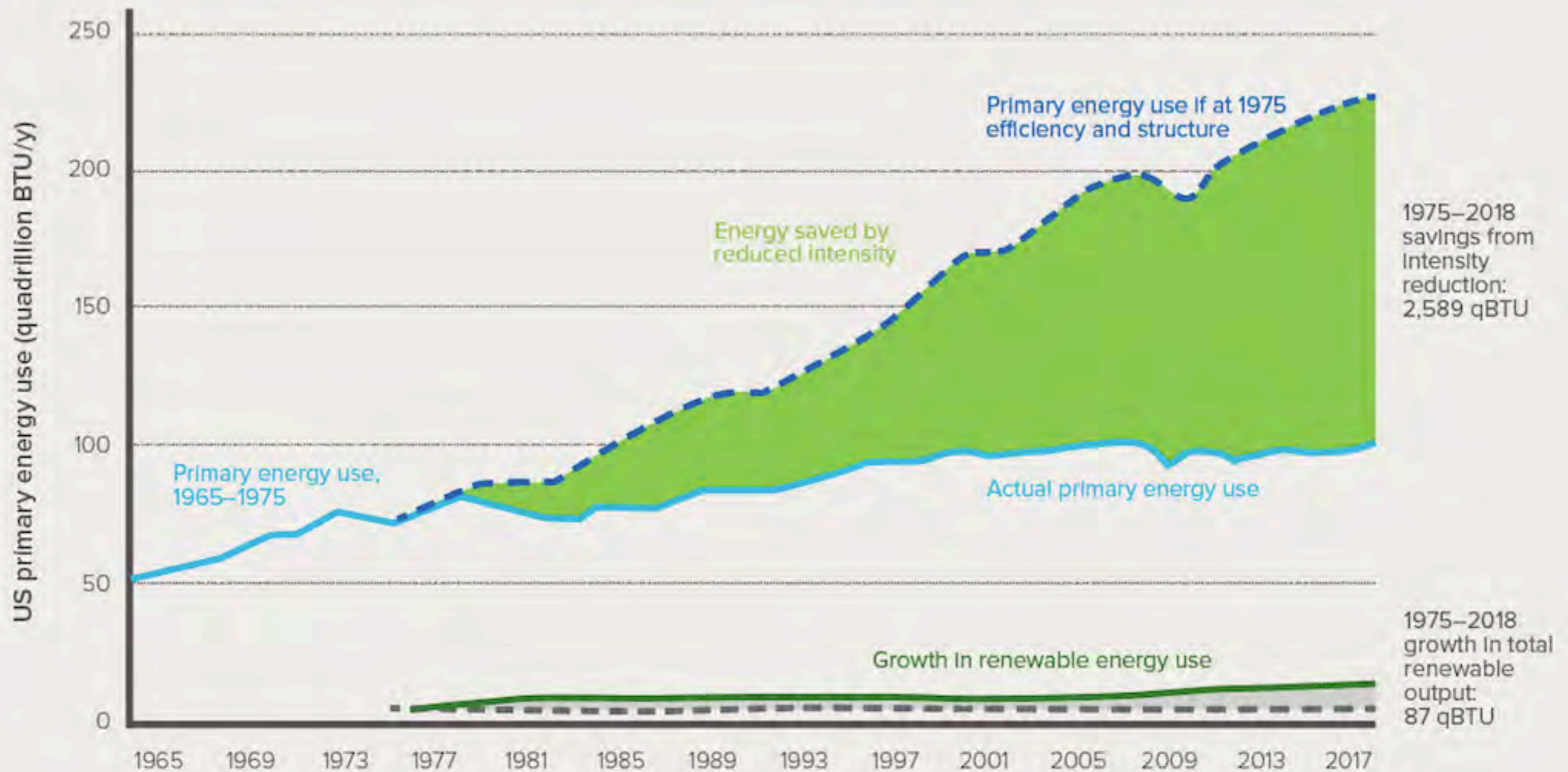
WHY IS ENERGY EFFICIENCY SO IMPORTANT?

**CAN'T WE JUST ADD RENEWABLE ENERGY
SYSTEMS?**

AMORY LOVINS - MAY 24, 2019

“THE INVISIBLE ENERGY BONANZA - CREATING WEALTH OUT OF NOTHING”

Exhibit 1: Reduced Energy Intensity Has Had 30 Times the Impact of Growth in Renewables (United States, 1965–2018, Not Weather-Normalized)



Source: Rocky Mountain Institute analysis of US Energy Information Administration annual data

GRPAH SHOWS 20 TIMES AS MUCH ENERGY FROM SAVINGS AS FROM DOUBLING RENEWABLE OUTPUT

“Millions of small improvements over the past few decades—all the myriad fruits of careful engineering—add up to efficiency gains that now provide more global energy services than oil or any other fuel.”

AMORY LOVINS - MAY 24, 2019

“THE INVISIBLE ENERGY BONANZA - CREATING WEATH OUT OF NOTHING”

“This second shoe to drop in the efficiency-and-renewables revolution is the best news in many years for climate, health, prosperity, and national security.”

Lighter, more streamlined cars need smaller engines, and if electric, they save costly batteries, partly paying (or, in my carbon-fiber car, entirely paying) for the lightweighting. Redesigning energy-using devices as whole systems, not as a pile of isolated parts, can offset efficiency’s costs not just with avoided energy costs over time but also with lower capital costs up-front. Integrative design thus creates a new normal: bigger savings at lower capital costs. That’s called increasing returns. It makes traditional economic models blow up. It deeply disrupts energy markets.

AMORY LOVINS - MAY 24, 2019

“THE INVISIBLE ENERGY BONANZA - CREATING WEALTH OUT OF NOTHING”

HOW DO YOU DESIGN A HIGH-PERFORMANCE BUILDING?

THROUGH A **WHOLE SYSTEMS APPROACH,**

AKA INTEGRATIVE DESIGN

1. SHELL

2. MECHANICAL SYSTEMS

3. RENEWABLE ENERGY SYSTEMS



DESIGN CHARRETTE

CAN BE AS SIMPLE AS OWNER, CONTRACTOR, ARCHITECT

COLLABORATE!



DOUG GRAYBEAL

ARCHITECT

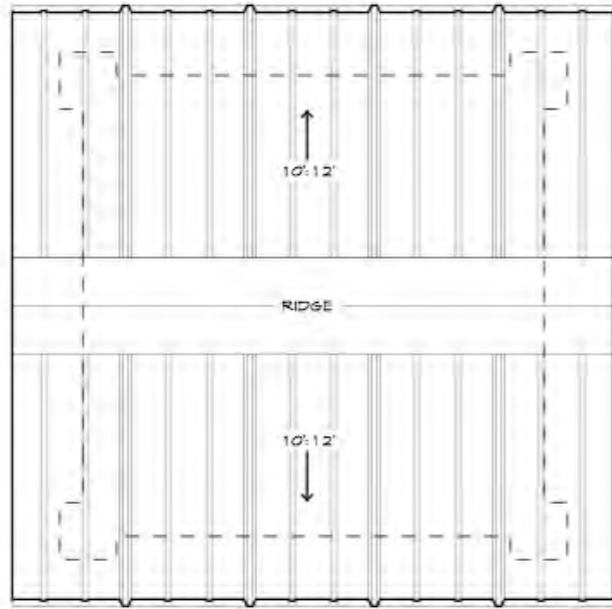
GRAYBEAL ARCHITECTS



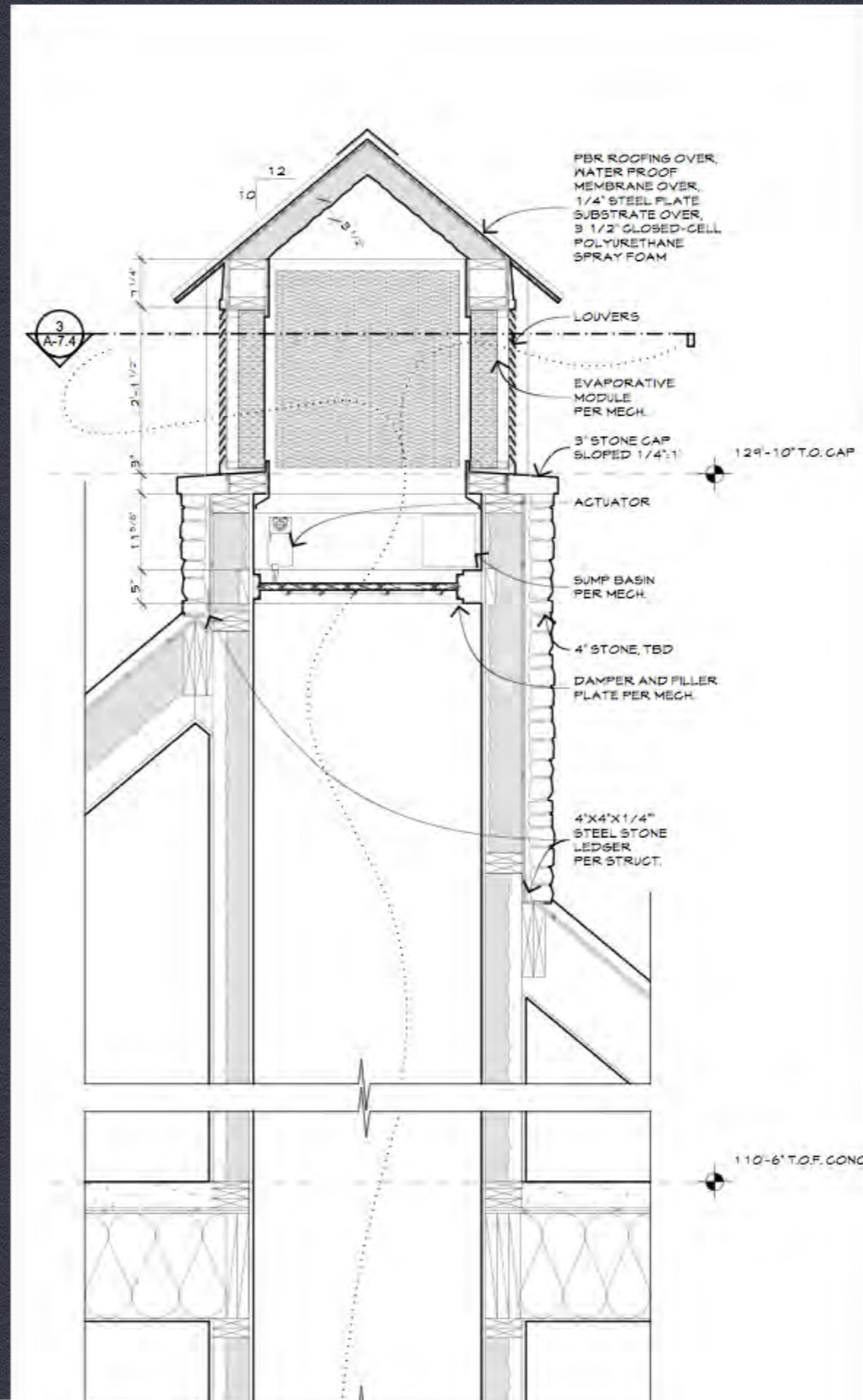
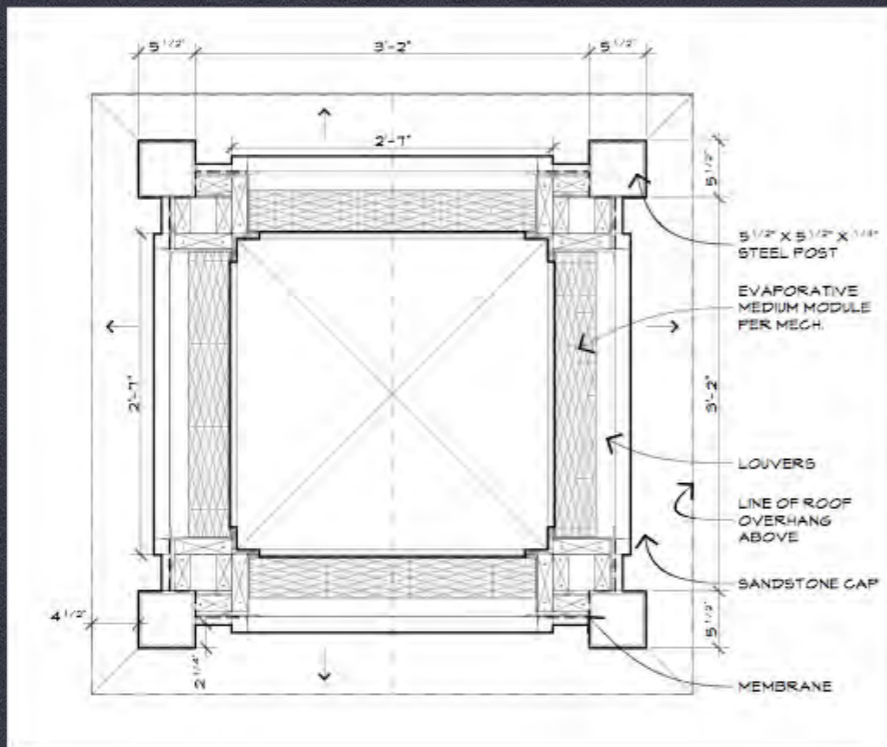
ANGELA LOUGHRY

ARCHITECT, LEED AP

CONFLUENCE ARCHITECTURE



2 ROOF PLAN
SCALE 1" = 1'-0"



OVERALL GOAL - REDUCE ENERGY REQUIREMENTS

USE NON-ENERGY SUCKING DESIGNS LIKE COOL TOWERS, PASSIVE SOLAR! (AT LEAST, I THINK THEY'RE COOL, TOWERS...)

Milvenan Residence
O Road & Thompson Road
Paonia, CO



JOE LSTIBUREK SAYS TO USE SCIENCE! (BUILDING SCIENCE)

“BUILD TIGHT, INSULATE RIGHT.”

WHAT ABOUT EXISTING BUILDINGS?

**(ROUGHLY 50 MILLION US HOMES NEED ENERGY
RETROFITS)**

STANDARDS FOR HIGH PERFORMANCE HOMES

LEED - LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

PASSIVHAUS - REDUCTION OF SPACE HEATING AND COOLING

ENERGY STAR - PRODUCTS, CERTIFICATION

HERS - HOME ENERGY RATING SYSTEM

GREEN BUILDING CODES - COMMERCIAL & RESIDENTIAL

2018 IGCC - INTERNATIONAL GREEN CONSTRUCTION CODE

2018 IECC - INTERNATIONAL ENERGY CONSERVATION CODE

LOCALLY ADOPTED CODES - EXAMPLE: CARBONDALE'S EFFICIENT BUILDING PROGRAM

CASE STUDIES

“30% ENERGY USE REDUCTION IN BUILDINGS IS A HUGE LIFT.”

SUSTAINABLE BUILDING CODE TASK FORCE - MAR. 25, 2019



NEXT GEN HOMES - MILLION SOLAR ROOFS - CORE - NREL

TWO COMPETING HIGH PERFORMANCE AFFORDABLE HOMES



SMART DESIGN: AFFORDABLE GREEN-BUILDING

JOB SITE TRAININGS

APRIL 16
FOUNDATIONS

MAY 14
FRAMING +
BUILDING
ENVELOPE

JUNE 11
ENERGY
SYSTEMS

TIME: 5-7PM

LOCATION: ACES URBAN FARMHOUSE
418 GARFIELD AVE
CARBONDALE

RSVP: ASPENCORE.ORG/EVENTS
970.925.9775

Free!

\$25 TO RECEIVE AIA CREDITS



PRESENTED BY:

green line
ARCHITECTS

35
CORE
25 YEARS OF HELPING YOU SAVE ENERGY

50
YEARS
ACES

CLEER
CONSTRUCTION MANAGEMENT

ACES URBAN FARMHOUSE - CARBONDALE, CO

TEACHER HOUSING FOR A LOCAL ENVIRONMENTAL NON-PROFIT



**WHOLE SYSTEMS APPROACH
SFPF**

INSULATION, AIRTIGHTNESS AND VENTILATION

HEAT EXCHANGE (HRV'S)

ROOF VENTING

HERS RATING

ADVANCED FRAMING

ALL-ELECTRIC - WHY DOES IT MATTER?

ELECTRIC AIR SOURCE HEAT PUMP WITH RADIANT SLAB-ON-GRADE

PV SYSTEM - 7 KW (ROUGHLY HOME'S ELECTRICITY USE ON A YEARLY BASIS)

ACES URBAN FARMHOUSE - CARBONDALE, CO

TEACHER HOUSING FOR A LOCAL ENVIRONMENTAL NON-PROFIT



DEC 4 - EXCAVATION



DEC 17 - MECH. VAULT POURED



DEC 18 - GREEN LINE ARCHITECTS' DESIGN TEAM



FEB 19 - SLAB PREP



MARCH 5 - SLAB POUR



MARCH 5 - SLAB POUR



MAR 14 - MAIN LEVEL WALL FRAMING



MAR 14 - MAIN LEVEL WALL FRAMING



MAR 19 - UPPER LEVEL WALL FRAMING



MAR 19 - UPPER LEVEL TRUSS INSTALLATION



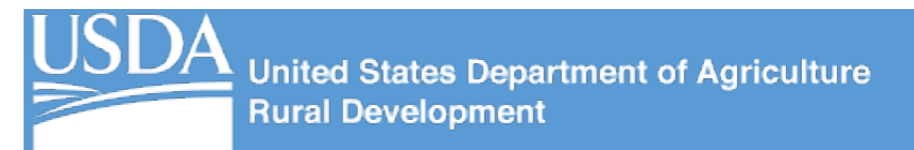
MAR 26 - UPPER LEVEL TRUSS INSTALLATION



JUNE 12 - SIDING & MEP ROUGH-IN



THE FUTURE OF ReSTORE RFV- A 'HOME' FOR HABITAT





- ❑ ReSTORE ROARING FORK VALLEY STARTED IN 2007 OUT OF A STORAGE FACILITY TO AID AFFILIATE IN BECOMING MORE SELF SUFFICIENT AND LESS DEPENDENT ON DONATIONS
- ❑ HAS GROWN TO BE SECOND LARGEST ReSTORE OPERATION IN COLORADO AND CONSISTENTLY RANKED IN TOP 25 IN UNITED STATES
- ❑ SINCE INCEPTION HAS SAVED OVER 1,000,000 + POUNDS OF WASTE FROM AREA LANDFILLS
- ❑ MULTI- FUNCTION OPERATIONS
 - ❑ LANDFILL IMPACTS
 - ❑ PROVIDES DONORS WITH TAX DEDUCTIONS FOR ITEMS WHICH OTHERWISE WOULD ADD COST TO REMOVE FROM A PROJECT
 - ❑ PROCEEDS FUND HABITATFOR HUMANITY HOME CONSTRUCTION (25 HOMES COMPLETED AND COUNTING)
 - ❑ PROVIDES FURNISHINGS FOR PEOPLE WITH URGENT NEEDSD (E.G. VICTIMS OF HOME FIRE)
 - ❑ CREATES GOOD, PERMANENT JOBS





ReSTORE '2.0'

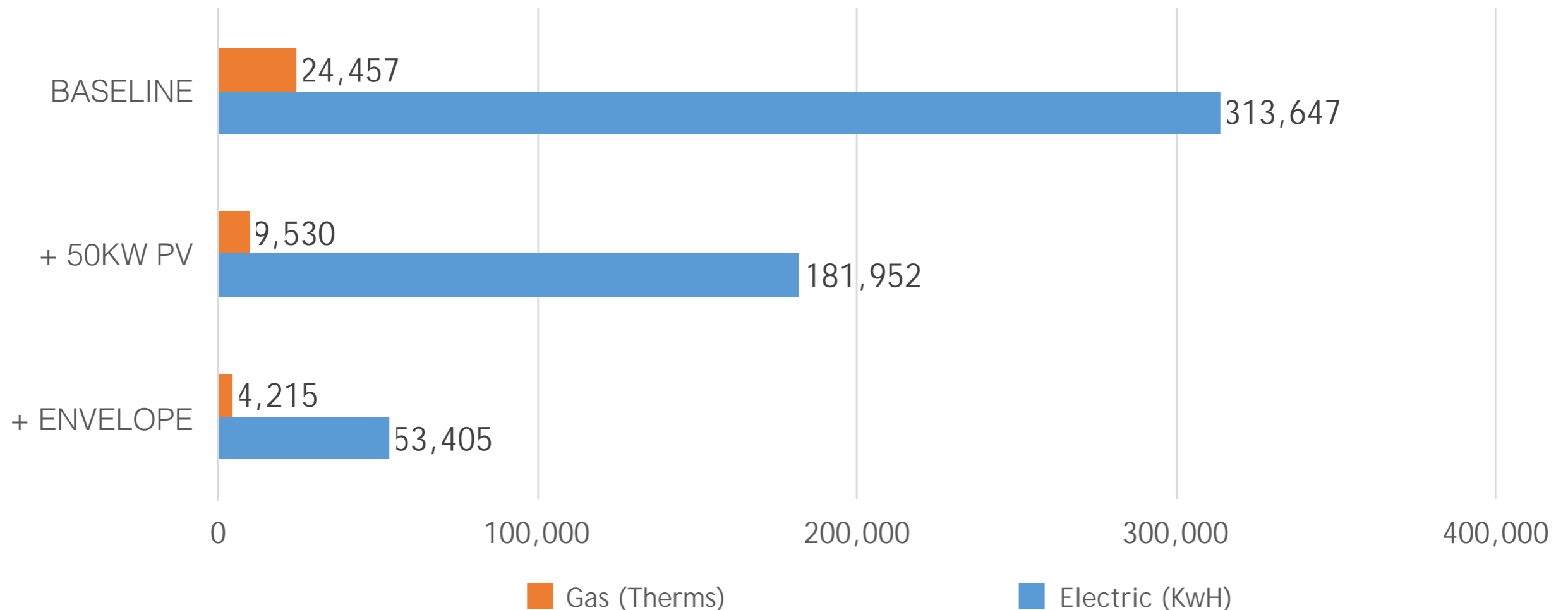
- ❑ ~40,500 SF CONSOLIDATED FACILITY
 - ❑ DEDICATED, LONG TERM 'HOME' WITH FIXED OPERATIONAL COSTS AND STABLE LOCATION
 - ❑ EFFICIENT OPERATIONS = ADDITIONAL FUNDING DIRECTED TOWARDS HOMEBUILDING FUND
 - ❑ BETTER CUSTOMER EXPERIENCE FOR SHOPPERS AND DONORS- ONE STOP SHOP
- ❑ PRE-ENGINEERED STEEL BUILDING SELECTED FOR OVERALL EFFICIENCY OF CONSTRUCTION AND COST...BUT BUILDING TYPE IS NOTORIOUSLY FOR OUTDATED TECHNOLOGY. HABITAT'S PROPOSED IMPROVEMENTS INCLUDE:
 - ❑ SIGNIFICANTLY IMPROVED BUILDING ENVELOPE UTILIZING INSULATED METAL PANELS FOR IMPROVED AIR SEALING AND THERMAL PERFORMANCE.
 - ❑ INSULATED METAL PANELS MINIMIZE THERMAL BRIDGING CHALLENGE OF STEEL BUILDINGS
 - ❑ 50 kW SOLAR ARRAY
 - ❑ EFFICIENT LIGHTING- ALL LED FIXTURES
 - ❑ EFFICIENT BUT COST EFFECTIVE MECHANICAL SYSTEMS, 'FREE-AIR' ECONOMIZER COOLING
 - ❑ PERMABLE SURFACES AROUND BUILDING TO MNIMIZE IMPACTS TO STORMWATER

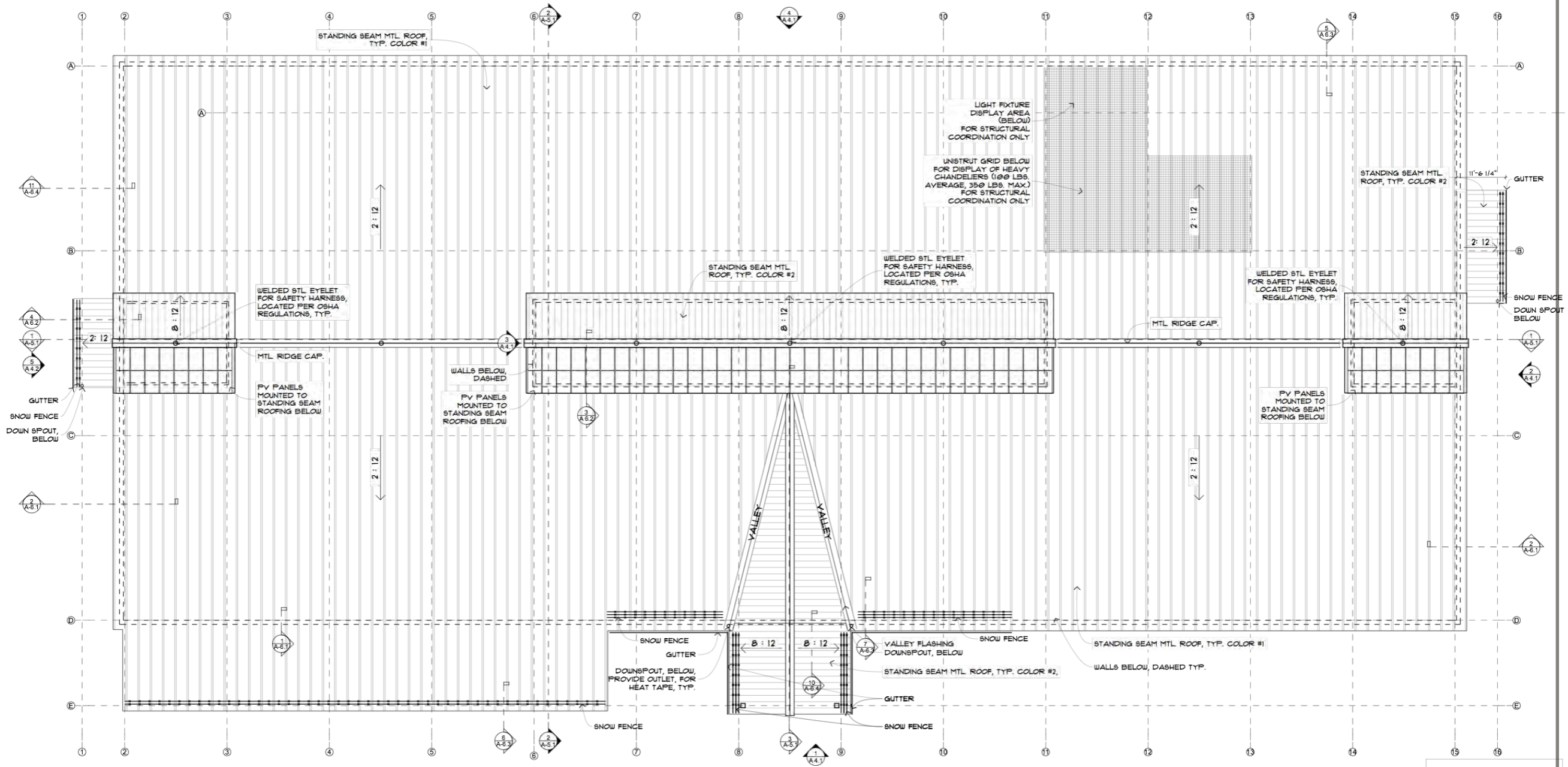


THANK YOU- COMMUNITY OFFICE FOR RESOURCE EFFICIENCY

- ❑ HABITAT FOR HUMANITY IS A TWO-TIME RECIPIENT OF THE RANDY UDALL ENERGY PIONEER GRANT FROM CORE FOR ENERGY EFFICIENCY PROJECTS THAT WILL HAVE A COMMUNITY WIDE IMPACT
- ❑ THE COMBINED IMPACT OF THE SOLAR INSTALLATION AND IMPROVED ENVELOPE WILL RESULT IN AN ANNUAL SAVINGS OF 175 METRIC TONS OF CO EMISSIONS AND \$25k/YR UTILITY COSTS

ReSTORE 2.0: ENERGY UPGRADE UTILITY SAVINGS, YEARLY





1 ROOF PLAN
SCALE: 3/32" = 1'-0"

NOTES:
1. GENERAL CONTRACTOR TO COORDINATE FINAL LOCATION OF PV ARRAY(S) WITH SOLAR CONTRACTOR.

MARK	DATE	DESCRIPTION
	3.3.2011	CD / PERMIT

DATE PRINTED: 3/2/11
FILE: RESTORE2-0-9

HABITAT RESTORE

HABITAT FOR HUMANITY -
ROARING FORK VALLEY

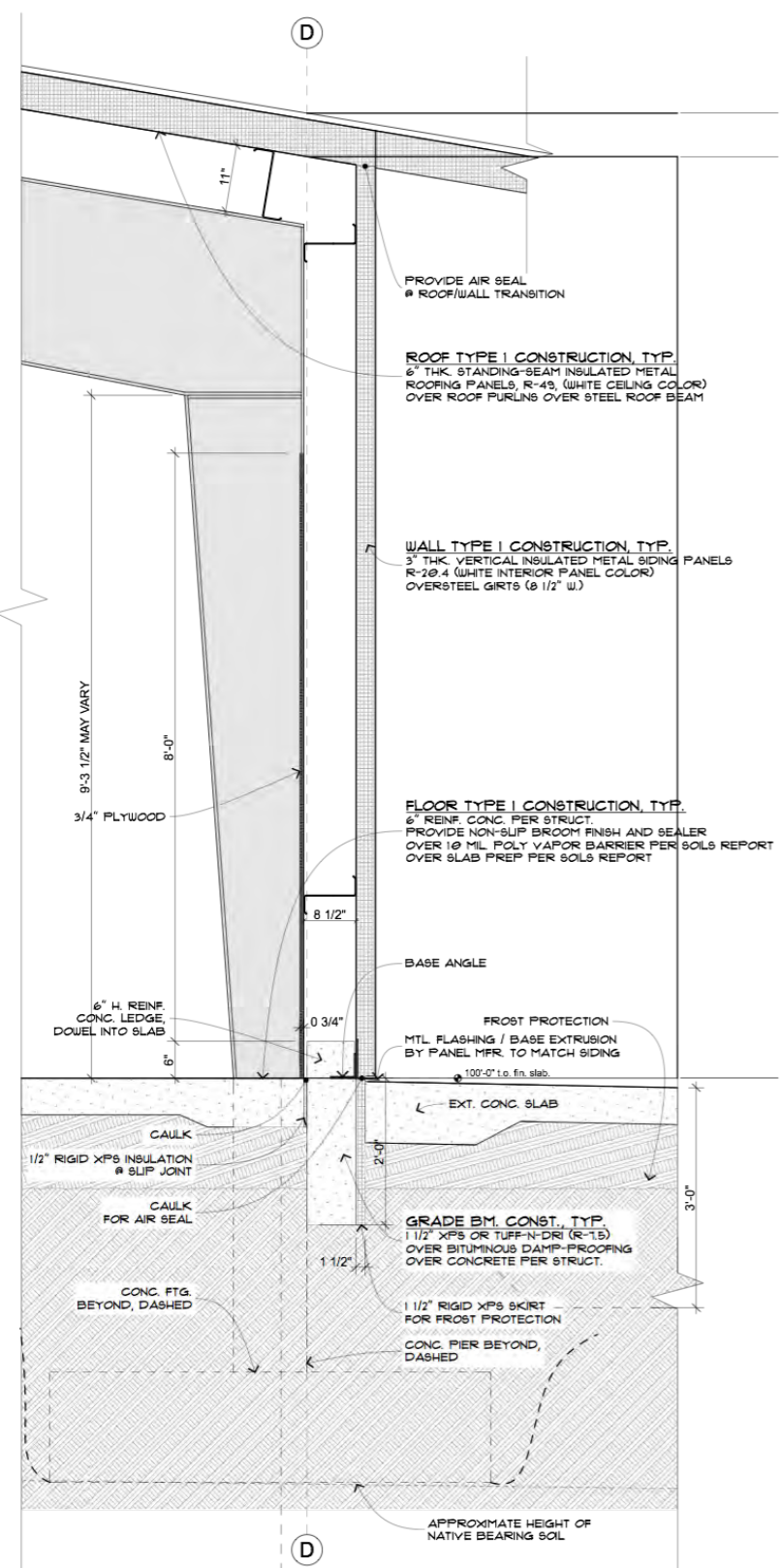


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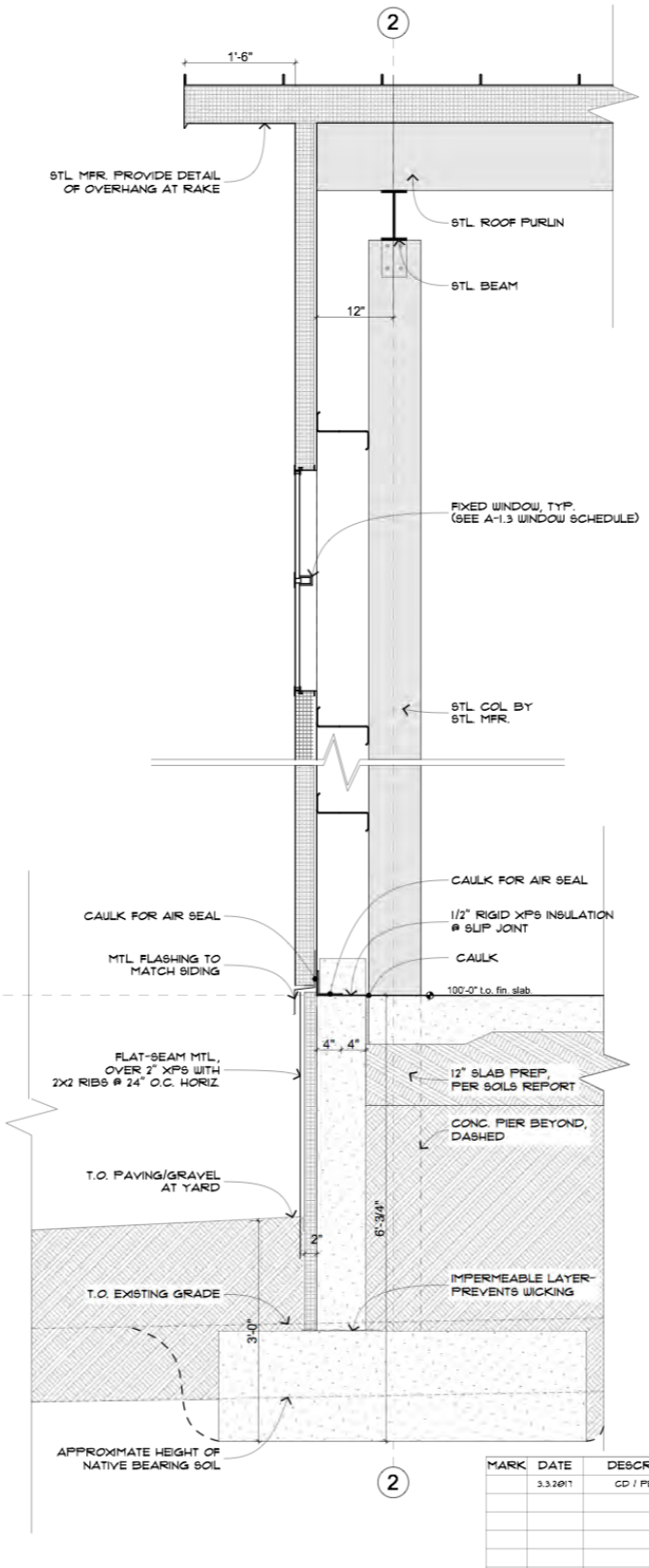
ROOF PLAN

A-3.3





1 WALL SECTION @ EXT. SLAB
SCALE: 1" = 1'-0"



2 WALL SECTION @ END WALL
SCALE: 1" = 1'-0"

BUILDING ENVELOPE PERFORMANCE CHECKLIST

THE BUILDING HAS BEEN DESIGNED, AT SIGNIFICANT ADDED INITIAL EXPENSE, TO INCLUDE INSULATED METAL PANELS FOR THE WALL AND ROOF SKIN OF THE BUILDING. THE TARGET INFILTRATION RATE FOR THE PROJECT IS:

.40 CFM/10F @ 75 PA, BASED ON THE STANDARD ESTABLISHED BY THE 2009 IECC.

AT A MINIMUM, THE BUILDING MUST ACHIEVE:

.65 CFM/10F @ 75 PA - WHICH IS EQUIVALENT TO THE REQUIREMENT NOTED WITHIN THE BID DOCUMENTS. TESTING IS NOT REQUIRED BY CODE FOR THIS PROJECT, BUT WILL BE COMPLETED IN COORDINATION WITH GENERAL CONTRACTOR AT THE OWNER'S COST. SEE NOTE 6 BELOW.

THE PANELS WILL ONLY PERFORM AS WELL AS THEY ARE INSTALLED. THE FOLLOWING INFORMATION AND DETAILS PROVIDED ARE INTENDED TO SERVE AS A GUIDE TO HIGHLIGHT KEY AREAS WHERE EXTRA ATTENTION IN THE FIELD CAN ACHIEVE THE BEST PERFORMANCE WITH MINIMAL, IF ANY ADDED COST.

1. CONTRACTOR TO CAREFULLY REVIEW AND FOLLOW THE INSTALLATION GUIDES ISSUED BY KINGSPAN FOR INSULATED METAL WALL AND ROOF PANELS. ANY DEVIATIONS FROM STANDARD MANUFACTURER'S DETAILS SHOULD BE CALLED OUT AND APPROVED BY ARCHITECT PRIOR TO WORKING BEING PUT IN PLACE.
2. CONTRACTOR SHALL SCHEDULE, AND PROVIDE ADEQUATE NOTICE TO OWNER AND OWNER'S CONSULTANTS TO ATTEND A PRE-CONSTRUCTION MEETING WITH THE CREW RESPONSIBLE FOR INSTALLATION AND SEALING OF THE INSULATED METAL PANELS. CONTRACTOR AND INSTALLERS SHALL DISCUSS THE FEASIBILITY OF STRICTLY ADHERING TO THE INSTALLATION GUIDELINES AND REVIEW ANY DETAILS WHICH ARE NOT PRACTICALLY ACHIEVABLE PRIOR TO ANY DEVIATION IN THE FIELD.
3. PRIOR TO COMMENCING INSTALLATION OF THE PANEL SYSTEM, THE KINGSPAN REPRESENTATIVE SHALL REVIEW AND APPROVE AS-BUILT CONDITIONS OF THE STEEL FRAME TO CONFIRM IT IS WITHIN ALLOWABLE TOLERANCES TO FACILITATE ALIGNED INSTALLATION OF PANELS WITHOUT EXCESSIVE DEFLECTION, GAPPING OR OTHER CONDITIONS WHICH WOULD PRECLUDE PROPER JOINTS BETWEEN THE PANELS.
4. CAULKING - CAREFUL ATTENTION, PER THE DETAILS NOTED IN SHEETS A6.1 TO A 6.5 AND AS REDLINED ON THE APPROVED STEEL SHOP DRAWINGS SHALL BE TAKEN AT THE FOLLOWING AREAS TO ENSURE PROPER APPLICATION OF CAULKING DURING ASSEMBLY:
 - A. PANEL TO PANEL CONNECTION
 - B. WALL PANEL TO SLAB/CURB CONNECTION
 - C. HORIZONTAL JOINT BETWEEN PANEL TYPES (VERTICAL TO HORIZONTAL FINISH)
 - D. CORNER CONDITION- CONTRACTOR TO TAPE JOINTS BETWEEN CORNER PANELS BEFORE APPLYING FINISH METAL TRIM
 - E. WINDOW AND DOOR FRAMES
 - F. WALL TO ROOF CONNECTION
 - G. ROOF RIDGE CONDITION

KINGSPAN RELIES ON CAULKING IN MANY CASES TO SEAL JOINTS BETWEEN PANELS. THE FOLLOWING SHALL BE ADHERED TO:

- I. A NON-SKINNING BUTYL CAULK, AS RECOMMENDED BY KINGSPAN SHALL BE USED
- II. JOINTS SHOULD BE NO DEEPER THAN 3/8". A CLOSED CELL FOAM BACKER ROD MUST BE USED FOR JOINTS WHICH EXCEED THIS DEPTH (OR ADHESIVE BACKED POLYETHYLENE TAPE WHERE BACKER ROD IS NOT POSSIBLE)
- III. JOINTS SHOULD BE AT A MINIMUM 1/4" WIDE TO ALLOW THE PROPER AMOUNT OF MATERIAL TO BE USED TO ALLOW MOVEMENT OF CAULKING. CAULK JOINTS MAY NOT EXCEED 3/4" IN WIDTH, ALTERNATE MATERIALS (SUCH AS BUILDING TAPES) SHOULD BE USED TO SEAL LARGE GAPS OVER 3/4" AFTER FIRST FILLING AND CUTTING BACK GAPPED AREA WITH CLOSED CELL POLYURETHANE SPRAY FOAM OR PACKED WITH MINERAL WOOL (WHERE APPROPRIATE OR OTHERWISE SPECIFIED. OWNER IS NOT AWARE OF ANY CONDITIONS WHICH REQUIRE LARGE GAPS PER SHOP DRAWINGS- ANY SUCH FILLING OR REMEDIAL WORK TO CORRECT GAPS OVER 3/4" WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- IV. MATERIALS SHALL BE CLEAN AND DRY, WITH SOLVENTS IF NECESSARY, PRIOR TO CAULKING TO ENSURE ADHESION
- V. CAULKING SHOULD BE COMPLETED OUTSIDE OF EXTREME TEMPERATURES AND MAY NOT BE USED WHEN TEMPERATURES ARE 40 DEGREES OR LESS
- VI. CONTRACTOR SHALL CLEAN UP EXCESS OR POORLY TOOLED CAULKING JOINTS IMMEDIATELY TO AVOID CURING ON A FINISHED SURFACE.

5. CAREFUL ATTENTION SHALL BE TAKEN AROUND ANY FIELD PENETRATIONS MADE FOR MECHANICAL EQUIPMENT OR OTHERWISE. ANY SUCH PENETRATIONS, WHETHER CREATED IN THE FIELD OR DUE TO A FACTORY CONDITION (I.E. UNUSED HOLES IN HM DOOR FRAMES) SHALL BE CAULKED, TAPED OR OTHERWISE SEALED TO MAINTAIN THE INTEGRITY OF THE STRUCTURE. THE BUILDING TAPES (OR EQUIVALENT AS APPROVED BY ARCHITECT) SUCH AS:
 - A. BLUESKIN® BUTYL FLASH
 - B. GOLDENSEAL BUTYL TAPE
6. CONTRACTOR TO COOPERATE WITH OWNER IN CONDUCTING A BLOWER DOOR TEST AS SOON AS REASONABLY POSSIBLE IN THE CONSTRUCTION PROCESS SUCH THAT CORRECTIONS COULD BE MADE BEFORE FINAL COMPLETION, TO IMPROVE THE ENVELOPE PERFORMANCE.

MARK	DATE	DESCRIPTION
	3.3.2011	CD / PERMIT

HABITAT RESTORE

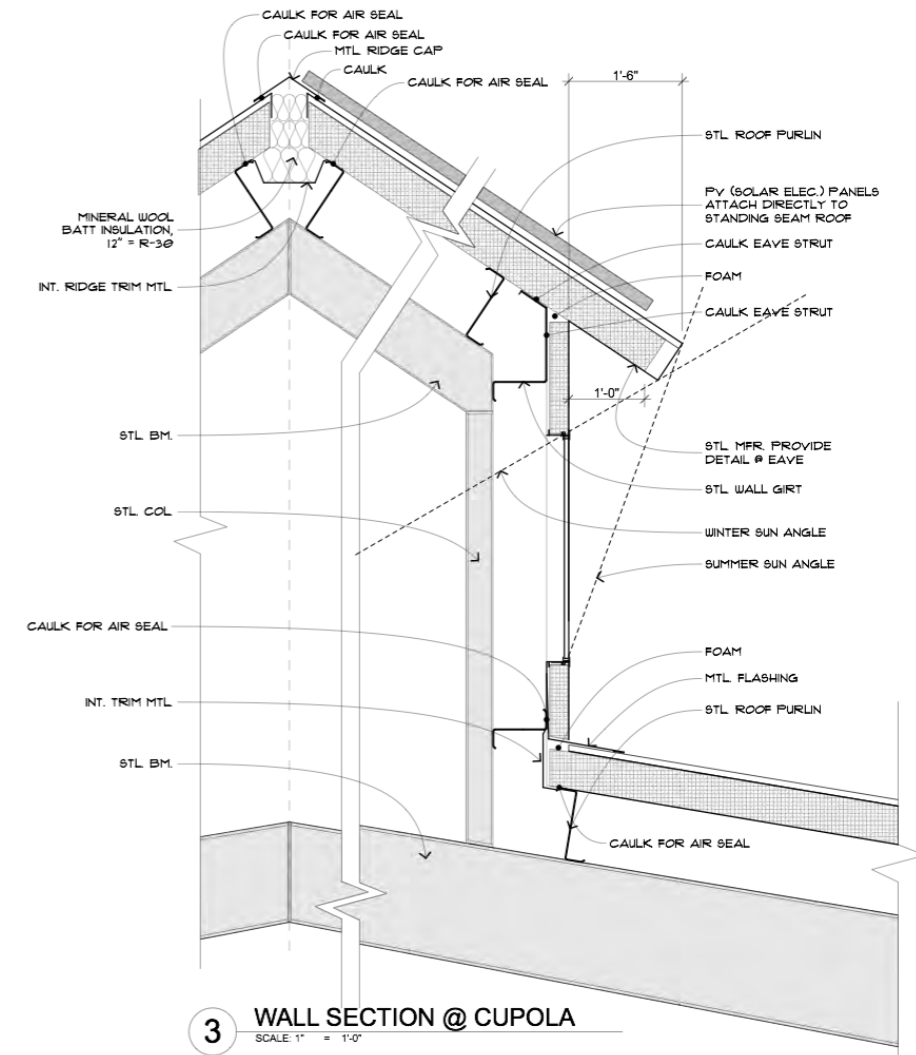
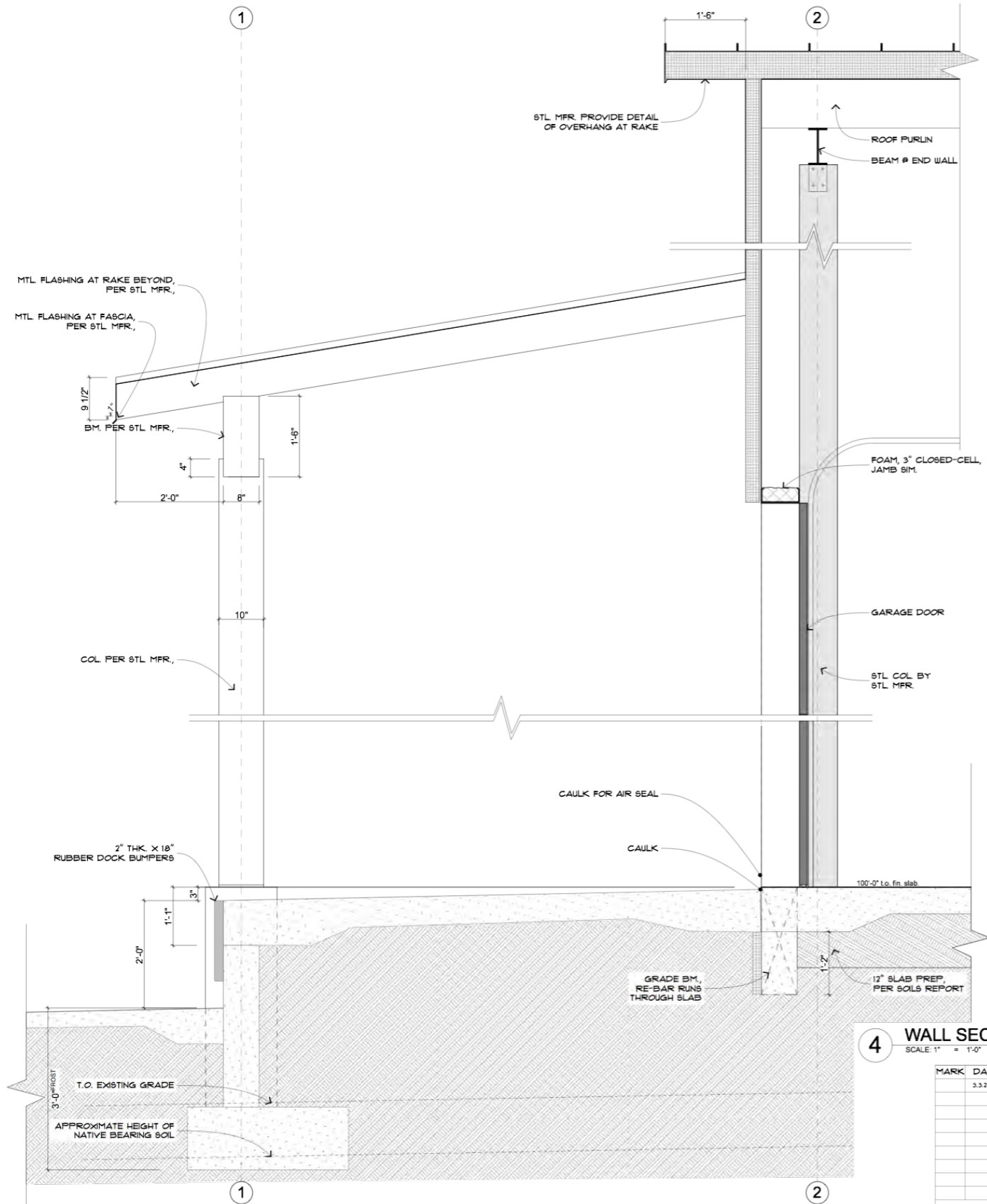
HABITAT FOR HUMANITY - ROARING FORK VALLEY



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WALL SECTIONS

A-6.1



3 WALL SECTION @ CUPOLA
SCALE: 1" = 1'-0"

4 WALL SECTION AT LOADING DOCK
SCALE: 1" = 1'-0"

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	3.3.2011	CD / PER:MT

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FILE: RESTORE2-0-1 WALL SECTIONS.FLN

HABITAT RESTORE

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WALL SECTIONS
A-6.2





















OFF-GRID HOMES - NEED TO PRODUCE ALL OF THEIR OWN ENERGY

(ALL OF THE TIME!) HERS -5, LEED GOLD



THANKS!



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That's a wrap!

Next meeting: September, 30th 2019



#BeBetterTogether