

America's oldest net positive home remodel.
How did they do it?



www.AllianceES.org



“USGBC” is a Registered Provider with the American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES records for AIA members. Certifications of Completion for non-AIA members are available upon request.

This program is registered with AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



**EDUCATION
PARTNER**



We are now GreenHome Institute!



Formerly



www.AllianceES.org



- Founded 2000
- Midwest LEED for Homes Provider
- 501(c)3 non-profit; mission:



Providing professionals and homeowner's with education, resources and programing to ensure greener & healthier home new construction, existing hone remodeling across single and multi family residential projects and developments.



- US LEED for Homes “LEED”er provider
- 25 + Green Rater Partners in the Midwest
- LEED facilitators in Ohio, Indiana & Chicago
- Nearly 10,000 Registered Units
- *Over 5,000 Certified Homes & Multi Family Units!*

LEED for Homes aligns with AES’s Mission of holistic green building and remodeling



www.AllianceES.org



Platinum +
3 YEAR SPONSORS

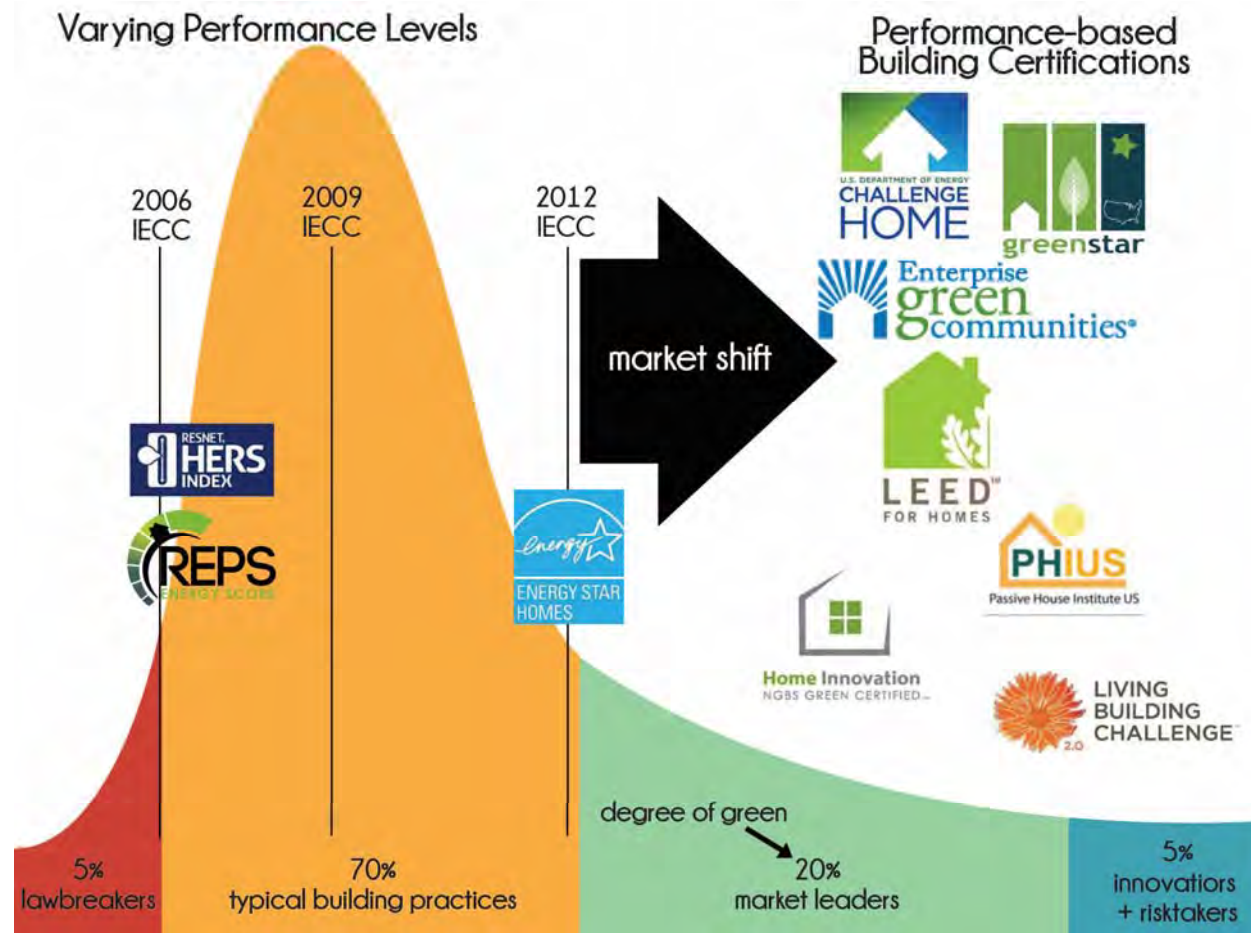


www.AllianceES.org



Understanding GreenHome Certifications and Labels 101 – 2 part free webinar

September 24th Noon est – CEUS





LIVE 8-WEEK WEBINAR SERIES

**UNDERSTANDING LEED V4 FOR HOMES
JOIN INSTRUCTOR @ LEED, LEAD REVIEWER JAY HALL**

THIS FALL, EVERY WEDNESDAY 4:30-6:00PM

CONTINUING EDUCATION: AIA LU/HSW, GBCI, NARI GREEN

Get Involved

WWW.ALLIANCEES.ORG/GET-INVOLVED/

- Becoming a member
- Become a sponsor
- Volunteer / Intern
- Watch free recorded webinars on demand
- Submit Professional Articles & Blogs

alliancees.org/continuing-education-webinars/





GreenStar® Certified Green Homes and Remodeling

HEREBY CERTIFIES THAT

Mission Zero

Ann Arbor, Michigan

Was completed in compliance with GreenStar standards and has earned the following level:

GOLD

9/10/14

Name: Marc Sloom
Quality Assurance Director

Name: Harvey Sherman
Chair, MN GreenStar Technical Committee

THE HAPPY HOME: IT'S ZERO OR NOTHING



MATTHEW GROCOFF
ESQ., LEED-GA, LFA
PRINCIPAL, THRIVE

MGROCOFF@GMAIL.COM

MATTGROCOFF.COM



July 2006





The National Ownership of S

ARTS
CR

IT DANKS HU

LE SUNDAY



NEW YORK TRIBUNE SUNDAY SIXTEEN
w Invention



LE FEUILLE

Y'S ANGELS



TIMELY THOUGHTS
FOR EARNEST WOMEN

SUGGESTIONS FOR THE HOME
THE CHILD AND MOTHER
EDUCATIONAL IDEAS
SOCIAL OBSERVANCES
ANIMAL PETS





















**HISTORIC
PRESERVATION AWARD**





THRIVE

creating life enhancing buildings



POLYMATH DEVELOPMENT



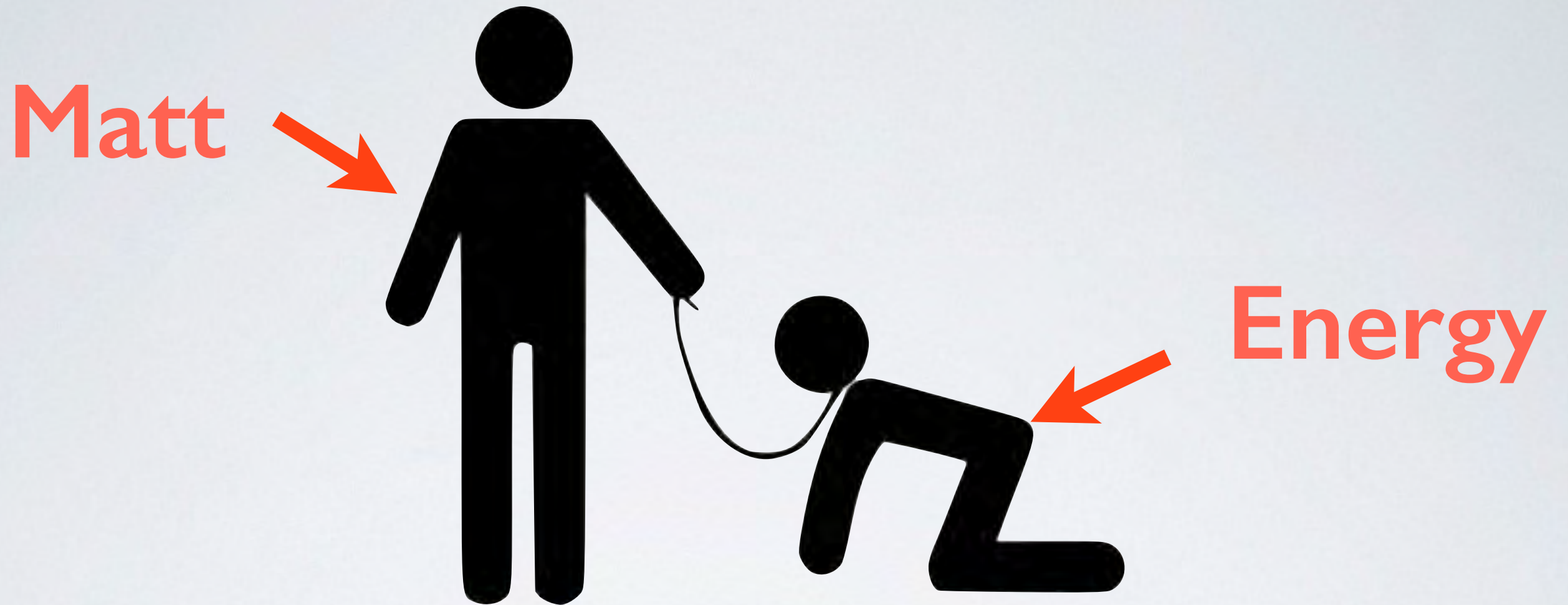
the Atlantic





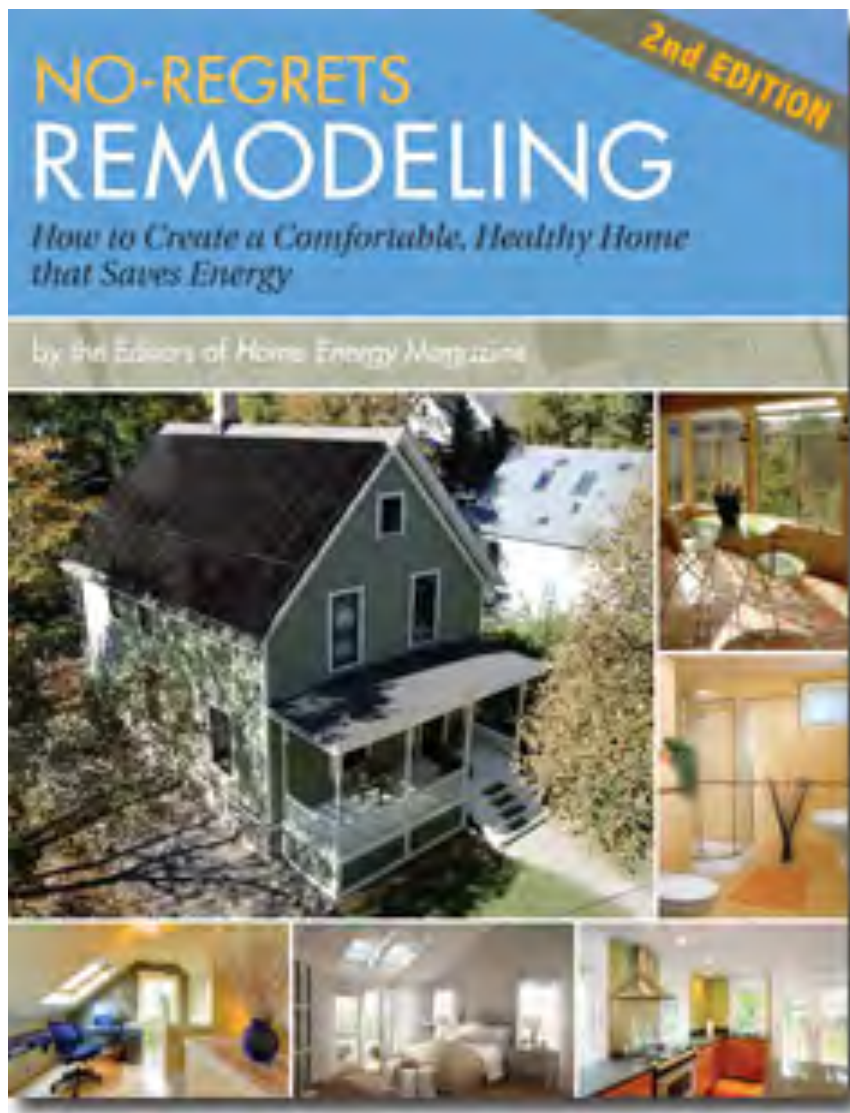
1 ALL-ELECTRIC INNOVATOR

- MY FORD MAGAZINE



**“PROVEN ZERO
ENERGY MASTER”**

- GREEN BUILDING ELEMENTS



Detroit Free Press

The
Washington
Post





**IT'S ALL ABOUT
LOVE**

Google



MY FORD MAGAZINE

SEE & DO

INNOVATION

FACES OF FORD

NEWS



FACES OF FORD

Q: Why should I demand OEM parts after an accident?

ASK FORD



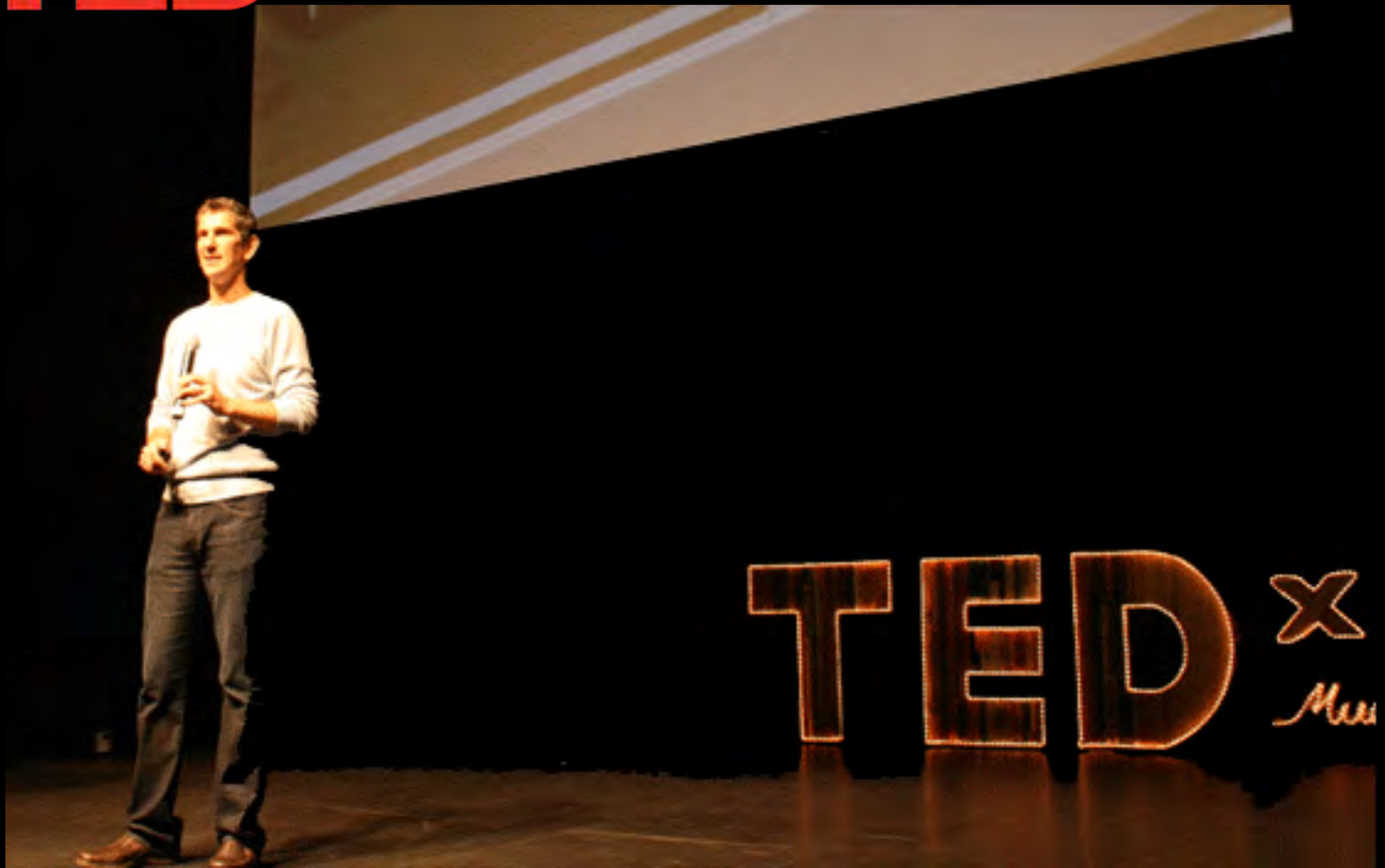
FORWARD FOCUS ▶

INNOVATION



TANK FULL O' SUNSHINE

TEDx



HOW TO DESTROY THE PLANET ...



USA TODAY

USA TODAY

the Atlantic

treehugger

THE HUFFINGTON POST

Detroit Free Press

SOLAR TODAY
ADVANCING SOLAR
of Colorado State

This Old House
47 low-cost makeover ideas

Green Building Advisor

natural HOME
ENERGY EFFICIENT
5 GREEN GADGETS FOR ENERGY SAVINGS YOU CAN GET OFF-THE GRID

GOOD

Photon
A CLIMB TO THE WEST

The Washington Post

grist

FOX BUSINESS

ENERGY-SMART Homes
25 ways to save

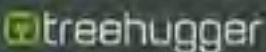
2011 Restaurant Year
HOUR



“LIFESTYLE GREENER THAN GRASS”

The collage on the right side of the image features a variety of logos and magazine covers. At the top, there is a blue logo for USA TODAY. Below it is the Atlantic logo. Further down are logos for treehugger and THE HUFFINGTON POST. A large, stylized logo for Detroit Free Press is also present. Below these are several magazine covers: SOLAR TODAY, This Old House (with the headline '47 low-cost makeover ideas'), natural HOME (with the headline 'ENERGY EFFICIENT'), GOOD (with the headline '5 GREEN GADGETS FOR ENERGY SAVINGS'), Photon (with the headline 'A CLIMB TO THE WEST'), The Washington Post, grist, FOX BUSINESS, and Homes (with the headline '25 ways to save'). At the bottom right, there is a cover for HOURS featuring a dish of food.

ENVIRONMENTAL AWARENESS AWARD





the Atlantic

USA TODAY

the Atlantic

treehugger

PRESERVATION
THE POWER OF PATRIOTISM

THE HUFFINGTON POST

Detroit Free Press

SOLAR TODAY
ADVANCING SOLAR
in Colorado State

This Old House
47 low-cost makeover ideas

Green Building Advisor

natural HOME
ENERGY EFFICIENT
5 GREEN GADGETS FOR ENERGY SAVINGS YOU CAN GET OFF-THE GRID

GOOD

Photon
A CLIMB TO THE WEST

The Washington Post

grist

FOX BUSINESS

ENERGY-SMART Homes
25 ways to save

2011 Restaurant Year
HOUR

ALL BULLSHIT.

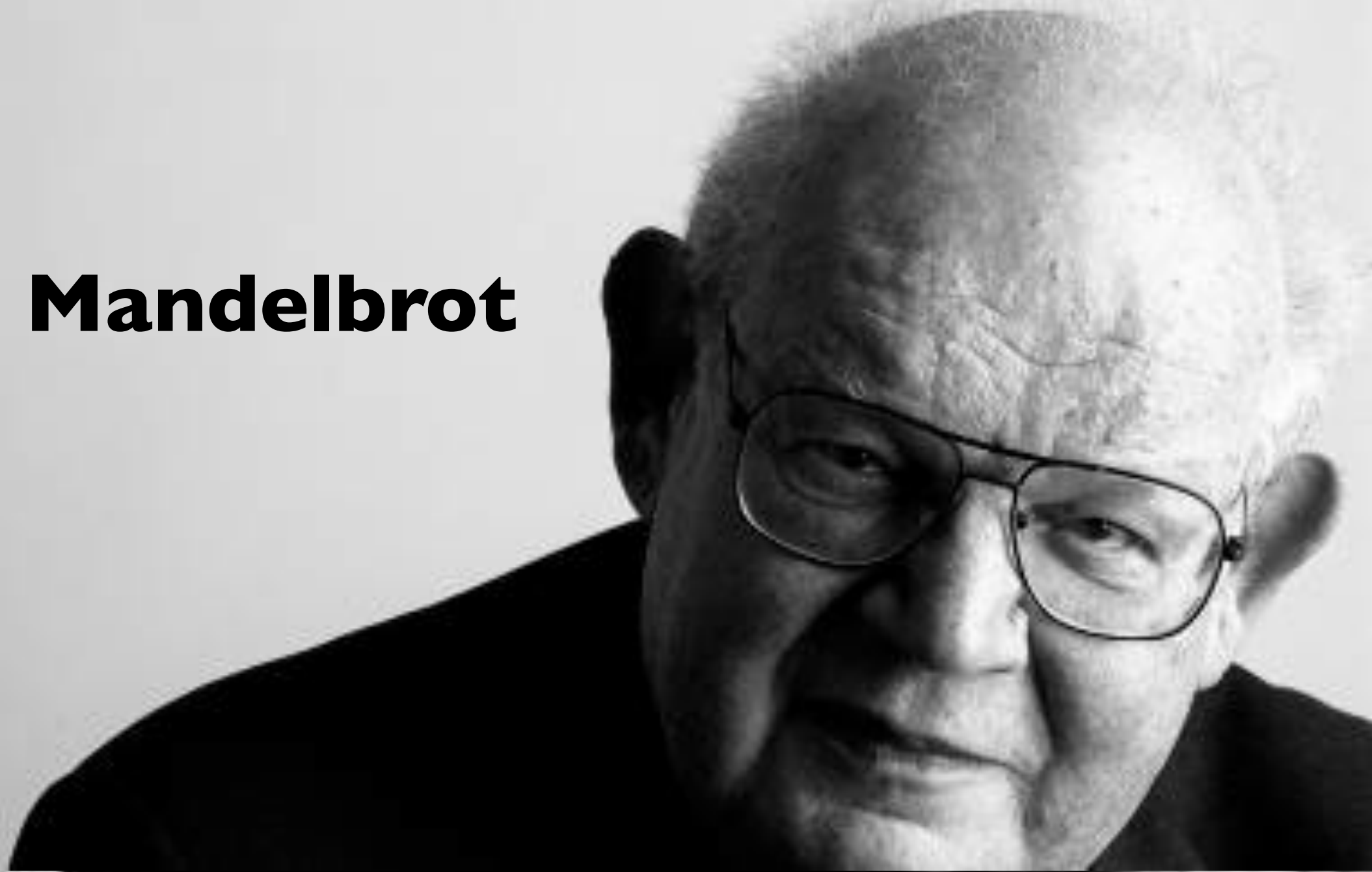


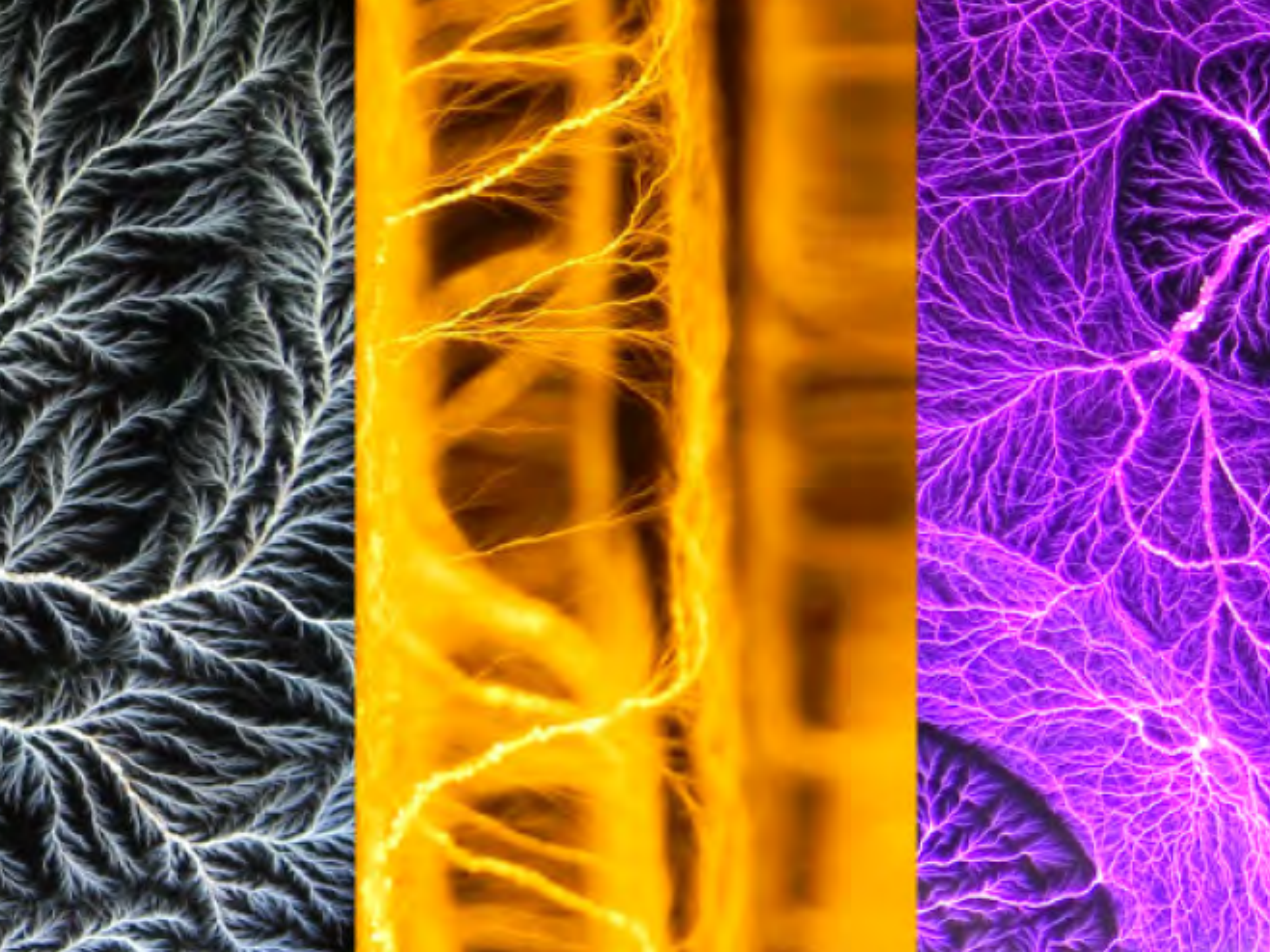
SUSTAINABLE BUILDING

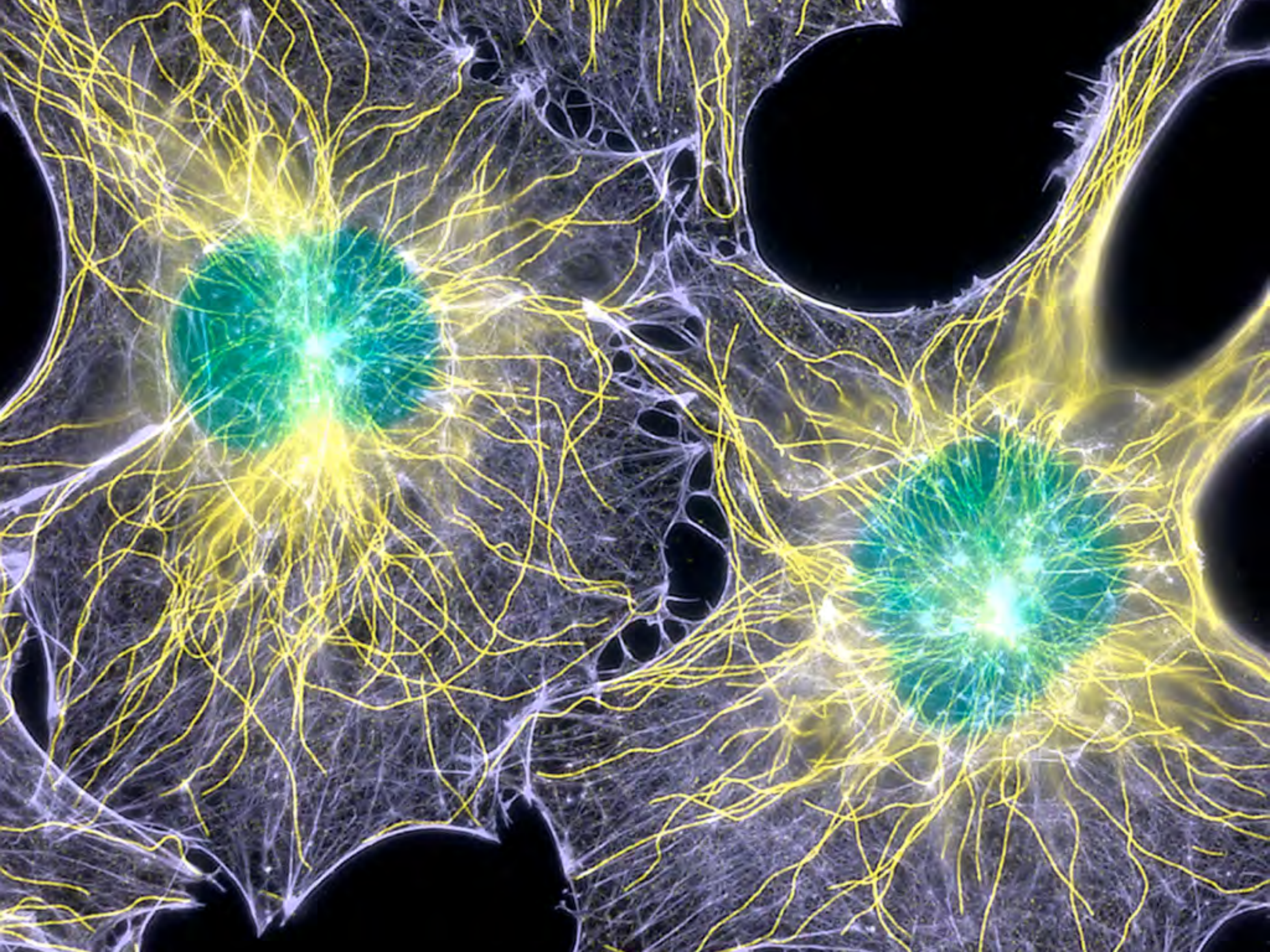
**ALL LIFE IS
SUSTAINED
BY UNDERLYING
NETWORKS**

“Think not of what you see, but what it took to produce what you see.”

- Benoit Mandelbrot

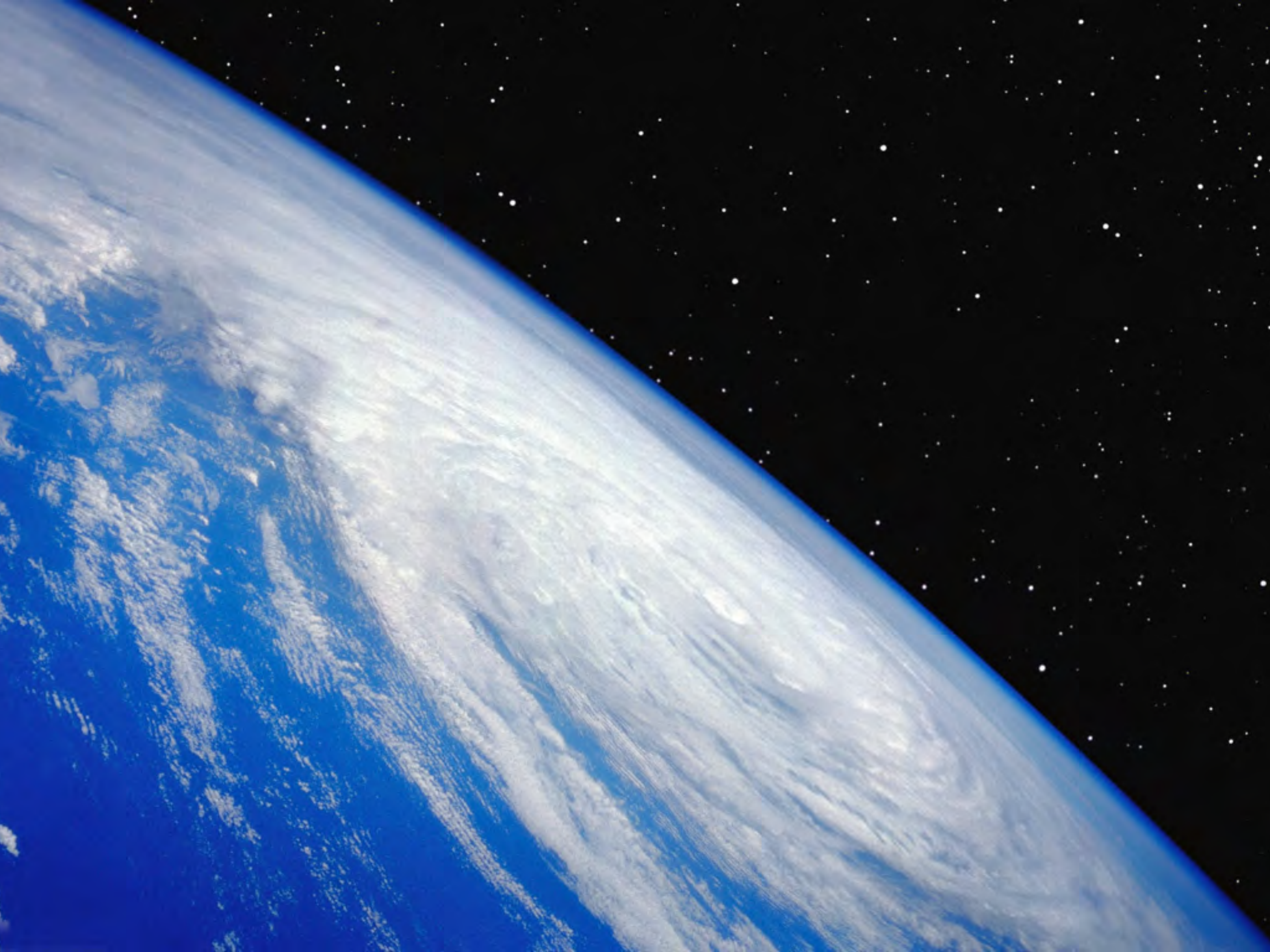












BIG “WHAT”



A man wearing a dark hat, sunglasses, and a dark jacket over a white shirt is looking to the right. The background shows a beach with people and the ocean under a blue sky. The text 'I LIKE BIG WHATS' is overlaid in large, bright blue letters.

I LIKE
BIG
WHAT'S

SIR MIX-A-LOT

NET ZERO ENERGY

Not a challenge. It's a choice.

“Stabilizing atmospheric CO2 and climate requires that net CO2 emissions approach zero”

- J Hansen et al.





REMOTE BURNING



**RECONNECT
WITH ENERGY**

THE METAPHOR OF THE FLOWER

ROOTED IN PLACE AND YET:

Harvests all energy + water

Is adapted to climate and site

Operates pollution free

Is comprised of integrated systems

Is beautiful



**LIVING
BUILDING
CHALLENGE™**

ENERGY



06: NET POSITIVE ENERGY

“Net Zero Energy requires that all energy used by the project over the course of the year be offset by at least 100% of that use by on-site renewable energy generation.”

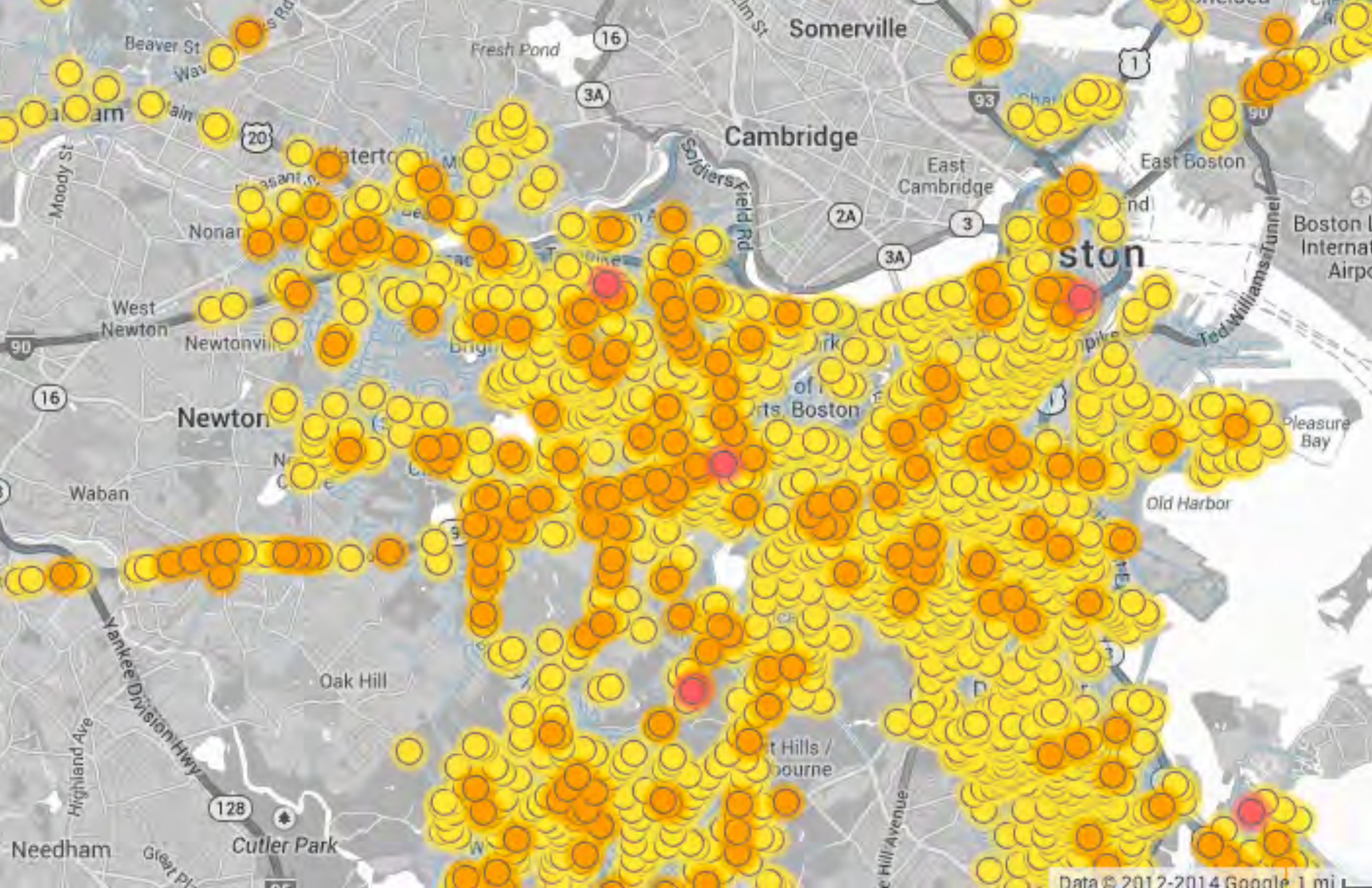
Rooftop Solar Array at The Bullitt Center
Seattle, WA

Photo: Ben Benschneider



WARNING:
The Gas is the property of the
gas utility company. It is not
to be used for any purpose other
than that for which it is intended.
It is highly flammable and explosive
and should be handled with care.
If you smell gas, do not touch
any electrical switches, do not
use any open flames, and do not
use any telephones. Call the
gas utility company immediately.
If you are unsure, call the
gas utility company for advice.





CLEAN NATURAL GAS?



Methane is
84x more potent
than CO₂ in the short term

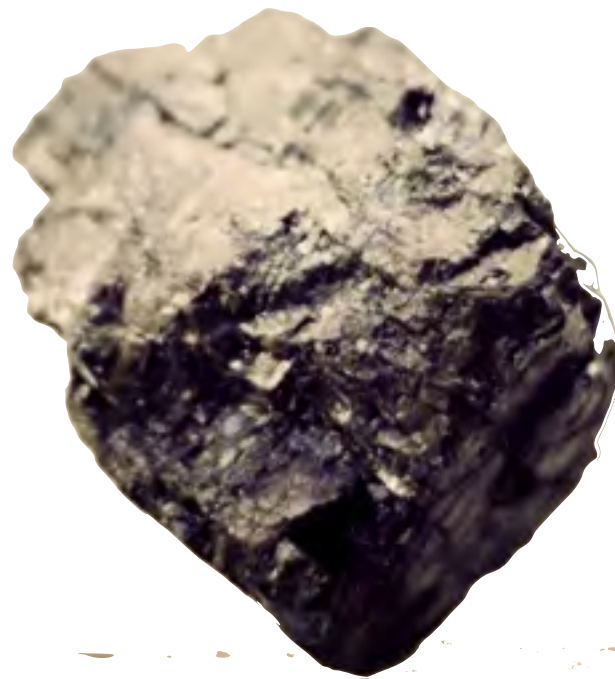


CLEAN NATURAL GAS?

WHAT'S POSSIBLE



9,840



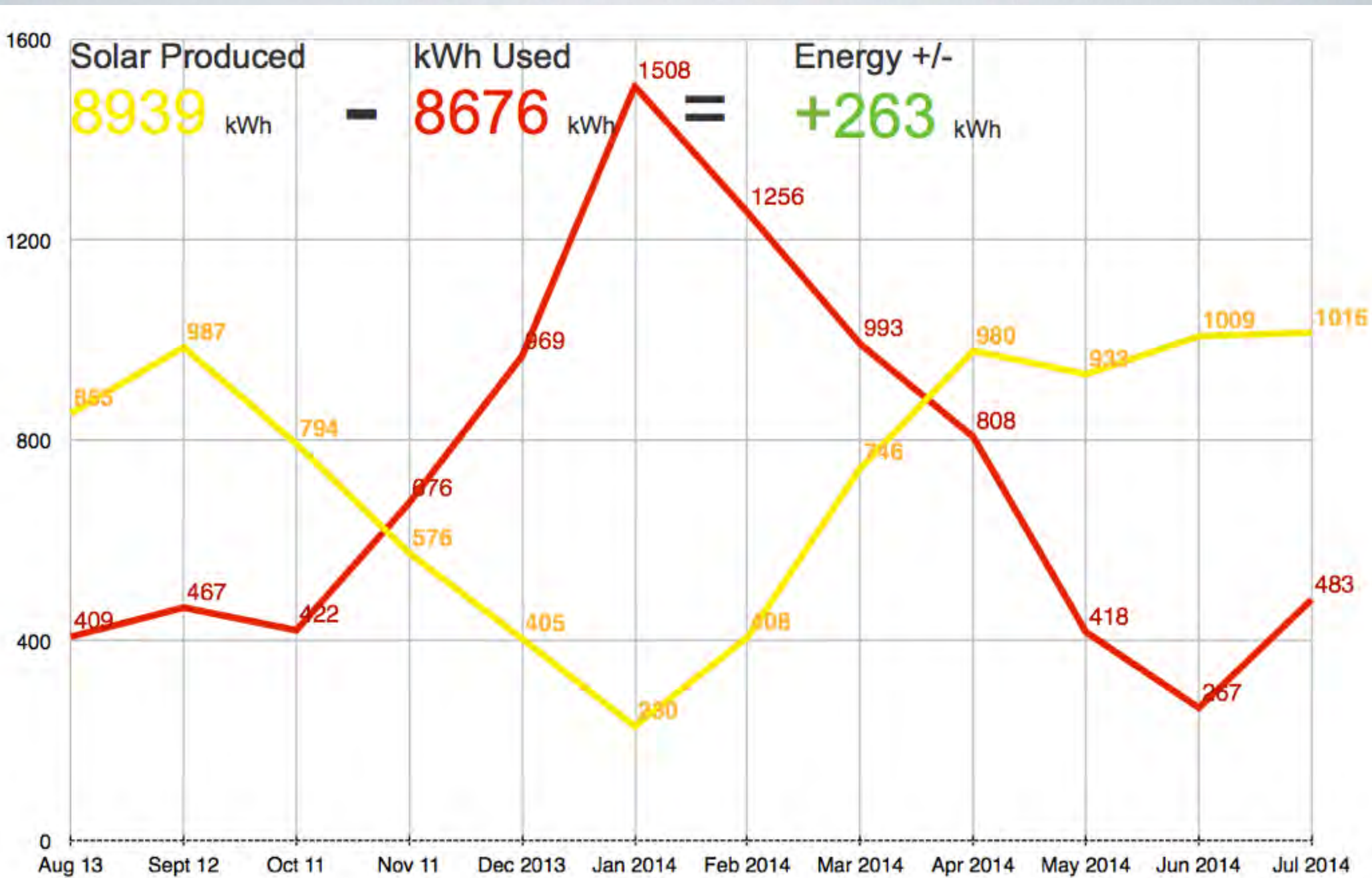
9,089

mission

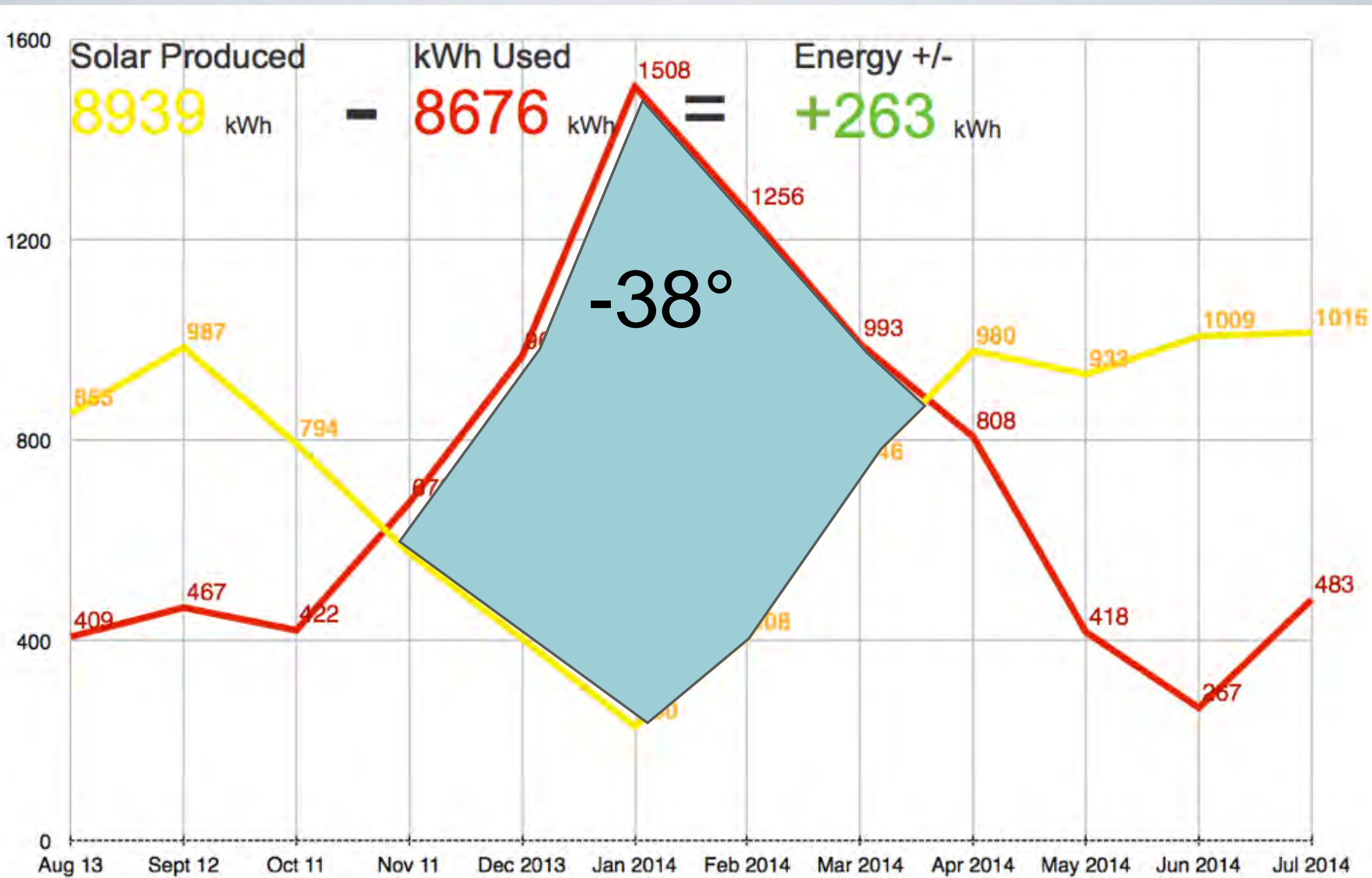


+751

July 15 thru Present



TOTAL SINCE Aug 2013 billing period. Data From DTE Energy Bills for Aug 2013 through Jul 2014



TOTAL SINCE Aug 2013 billing period. Data From DTE Energy Bills for Aug 2013 through Jul 2014

Detail of Current Charges

| | |
|---|-------------------|
| Account Balance as of Jul 15, 2014 | - 321.25 |
| Payment Received | 0.00 |
| | <hr/> |
| Balance Prior to Current Charges | - 321.25 |
| Current Charges | |
| DTE Electric Company Residential Electric Service with Net Mtr Cat1 | - 93.28 |
| DTE Electric Company Experimental Vehicle Service - Time of Day | 15.33 |
| Total Current Charges | - 77.95 |
| Account Balance as of August 13, 2014 | - \$399.20 |

Account Balance 8/13 - \$399.20

AUG 2014 ENERGY BILL - \$93.28

WARNING: THIS DOCUMENT HAS A COLORED BACKGROUND ON THE REVERSE SIDE.
DTE Electric Company
ONE ENERGY PLAZA DETROIT, MI 48226
KEYBANK NATIONAL ASSOCIATION

PAY ONLY **\$501.41**

VOID OVER \$501.41

McR...

PAY TO THE ORDER OF
MATTHEW GROCOFF
24... MI 48103

0000533943 1:04 207040: 3509935 2564



\$283,004



30 YEARS

7% (\$234,000 AT 5.5%)





**ONLY
R-13
WALLS**

ONLY
R-29
ATTIC



RESTORE



| | Pre-window restoration | Post-window restoration | Post storm windows |
|--------------|-------------------------------|--------------------------------|---------------------------|
| CFM50 | 4400 | 1530 | 1330 |
| ACH50 | 15.7 | 5.46 | 4.75 |
| ACHn | 1.02 | 0.35 | 0.31 |

2012 IECC <3 ACH50

HERS

SCORE

37

WHAT'S

THE

SECRET?



WHICH USES MORE ENERGY?

BUILDING

DESIGN

VS.

BEHAVIORAL

DESIGN

**STOP
BLAMING
THE
OCCUPANT**





SWOLLEN JOINTS



1 KILO = 1 YEAR



3%



SECRET?

IT'S NOT JUST

THE ENVELOPE

KNOW

HOW TO

TARGET



**LIVING
BUILDING
CHALLENGE**

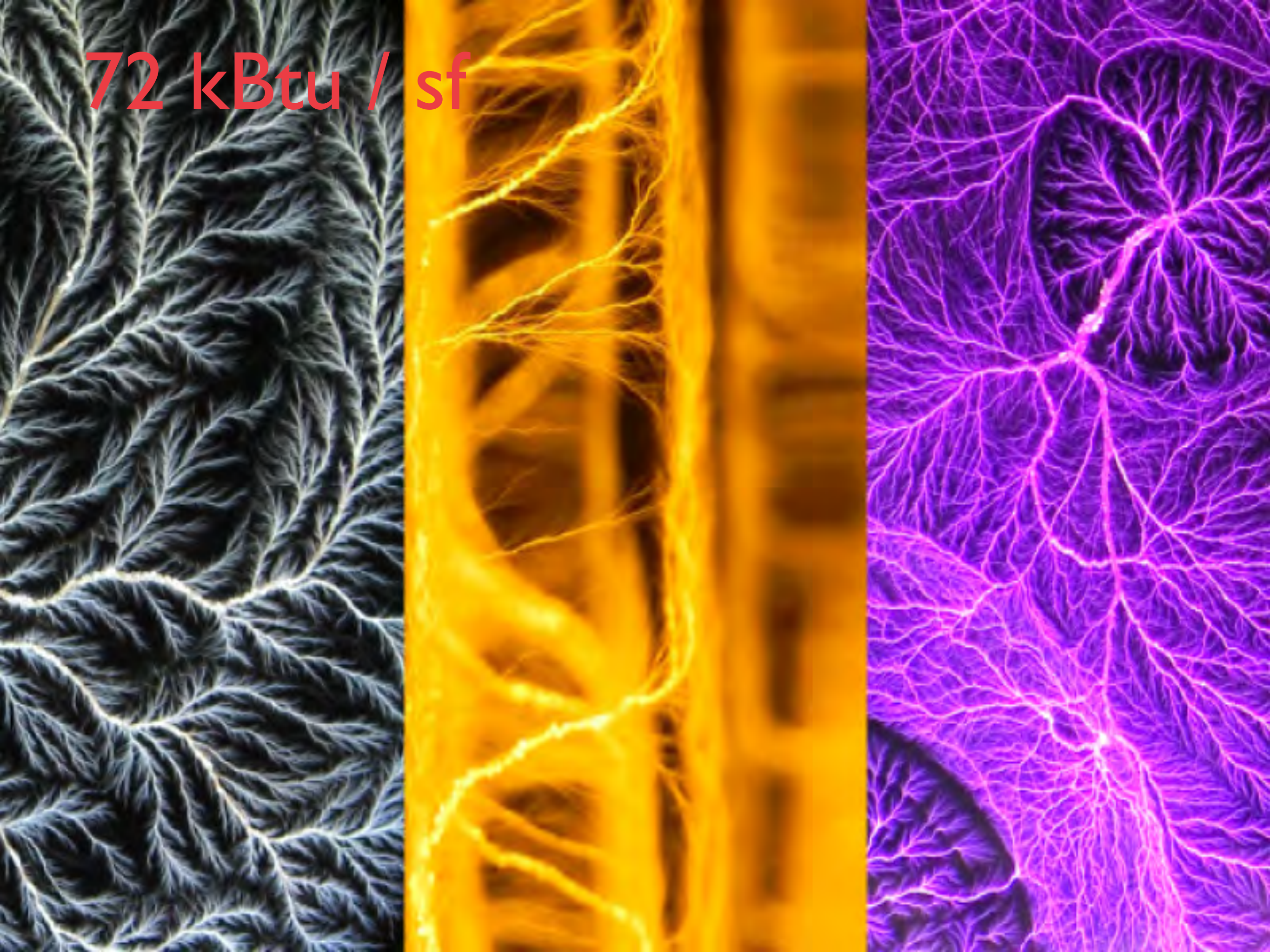
2.1

ENERGY CASE STUDY I Bullitt Center

Seattle, Washington, USA

PURSUING 2.1

72 kBtu / sf



5 | kBtu / sf

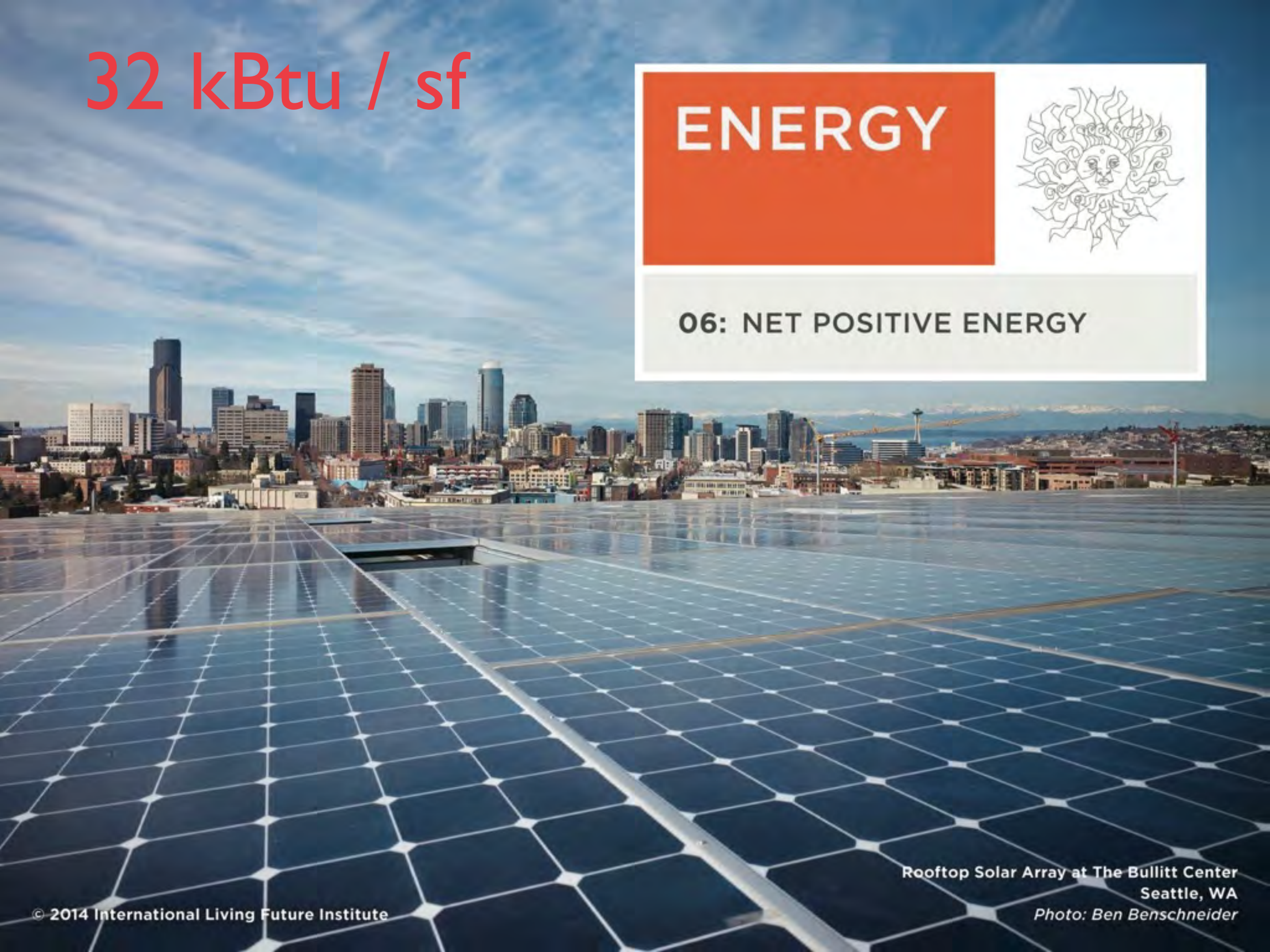


32 kBtu / sf

ENERGY



06: NET POSITIVE ENERGY



Rooftop Solar Array at The Bullitt Center
Seattle, WA

Photo: Ben Benschneider

16 kBtu / sf

The proposed building, meeting the Living Building Challenge has an **Energy Use Intensity of 16 kBtu/ft²/year**.

A PV array with an area of **14,303 ft²** is required to meet its energy needs.



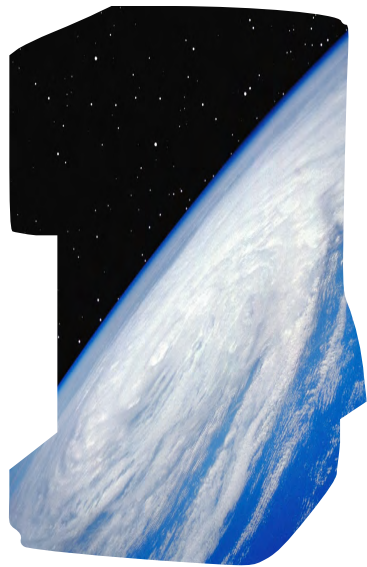
PV OFFSET – BULLITT CENTER AS BUILT
FOR NET ZERO ENERGY

THE MATH

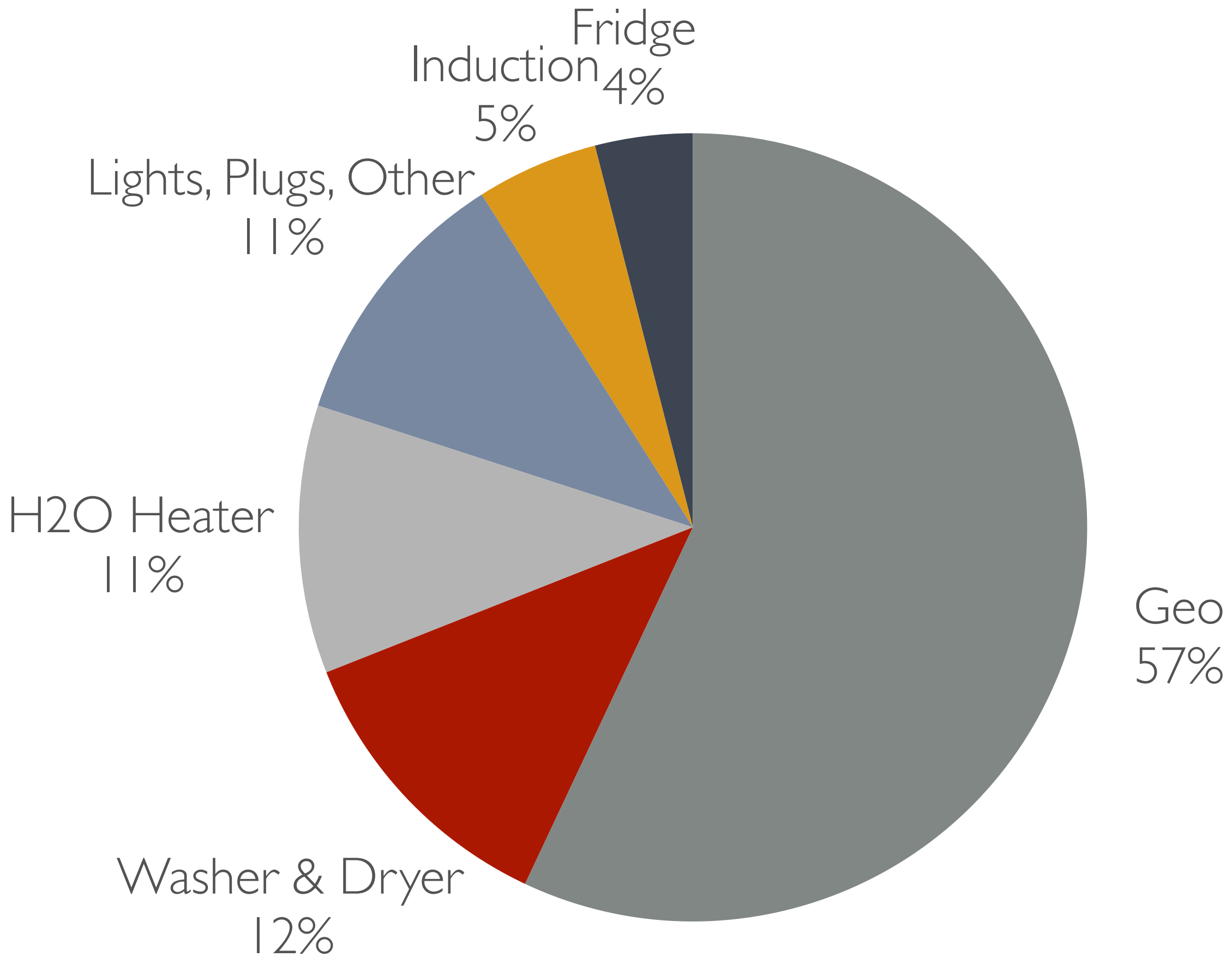
$$\begin{aligned} \text{Production} &= 9,100 \text{ kWh} \\ \times .90 \text{ (variability)} &= 8,190 \end{aligned}$$

$$\begin{aligned} \text{Energy Use Intensity (EUI)} \\ &= 5.46 \text{ kWh / sf} \\ &\text{or} \\ &= 18.6 \text{ kBtu / sf} \end{aligned}$$

Average kBtu / sf = 62



**DECENTRALIZE
THINKING**

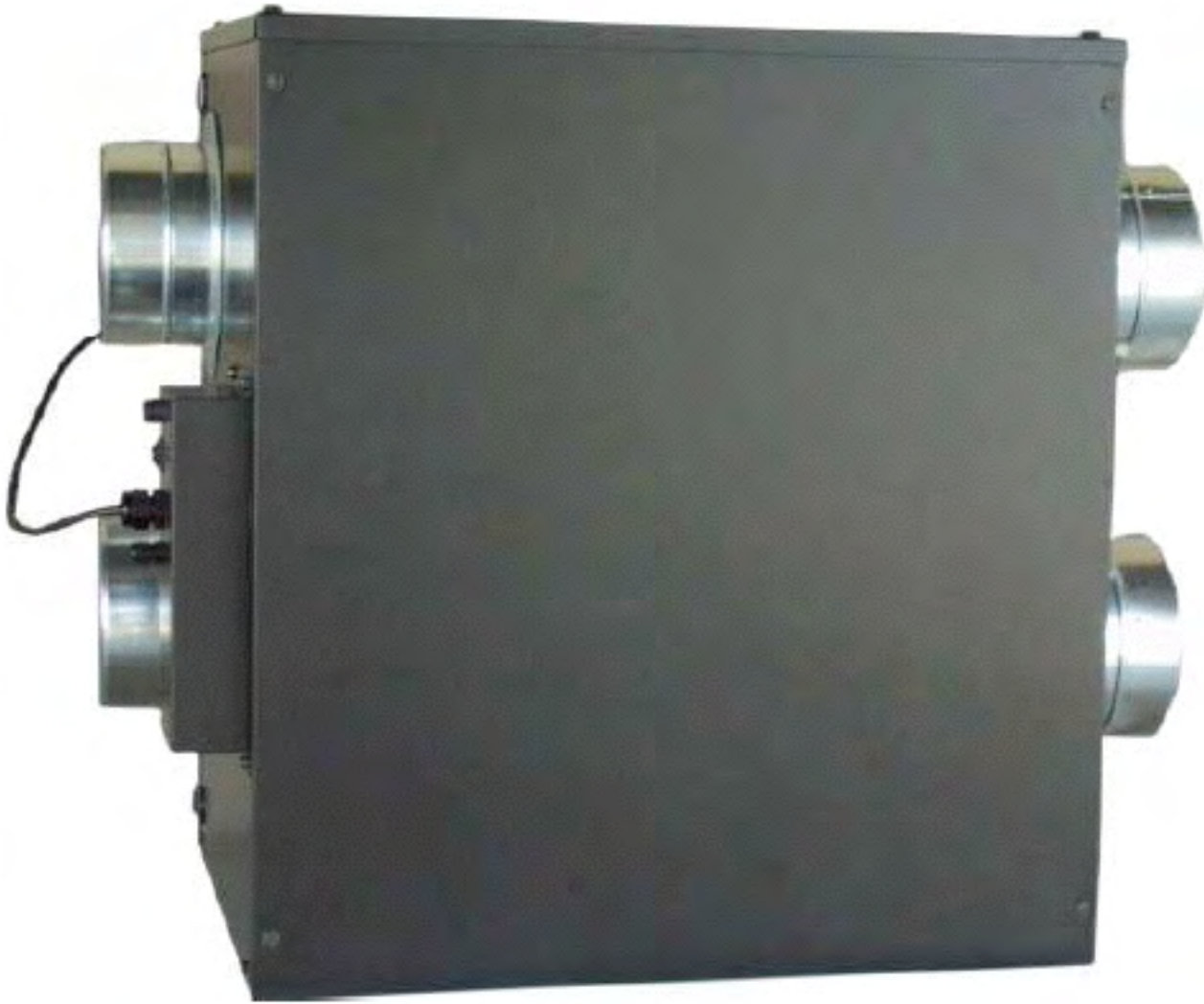


JULY 2013 - PRESENT



WATERFURNACE

This year over half of our home energy



ERV

**UltimateAir Recouperator
95% Heat Recovery**

50%



+



SMART TANKS



SMART STATS

controls 50% of home energy

Snooki Syndrome



LIGHTS ARE ON
BUT NOBODY'S
H O M E

Watch the Clock



WATTS x 8,760



TV USES LESS



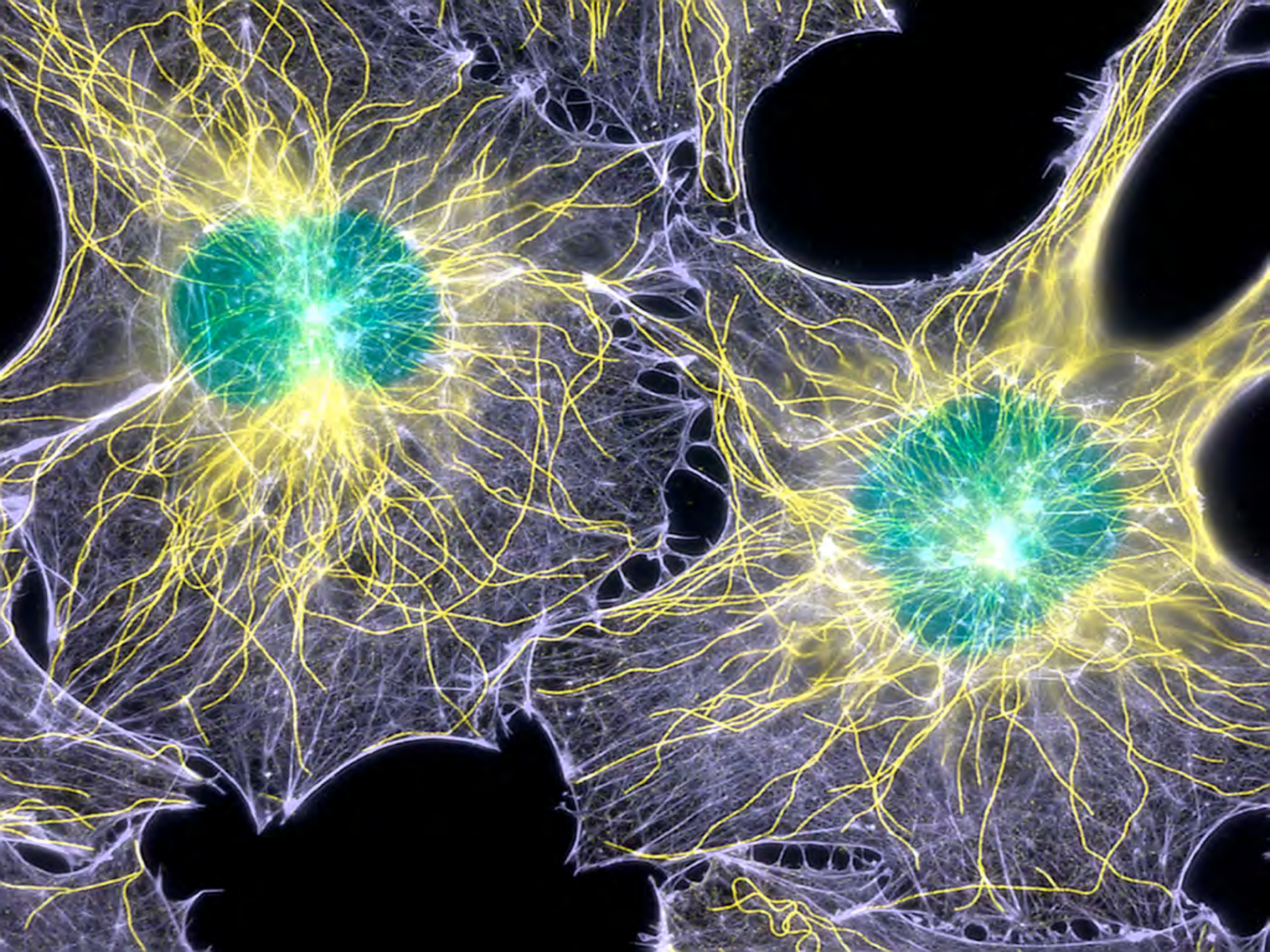


**MOWER
USES LESS**

1990
1,211 kWh



DEER FRIDGE



Past Year

Past Month



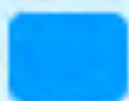
kWh



Cost



Usage (kWh)



Prod(kWh)



Temp

3,000

2,000

1,000

0

100°

75°

50°

25°

May

Jul

Sep

Nov

Jan

Mar

May

Oh shit!!!



FAULT DETECTION



**OLD SCHOOL
APPLIANCES**

60%

HEAT PUMP



50%

INDUCTION



60%

PHASE CHANGE



Same Service - Less Energy



SIGNS OF AGEING
SWOLLEN JOINTS



CALIFORNIA CODE 2020

Bakersfield

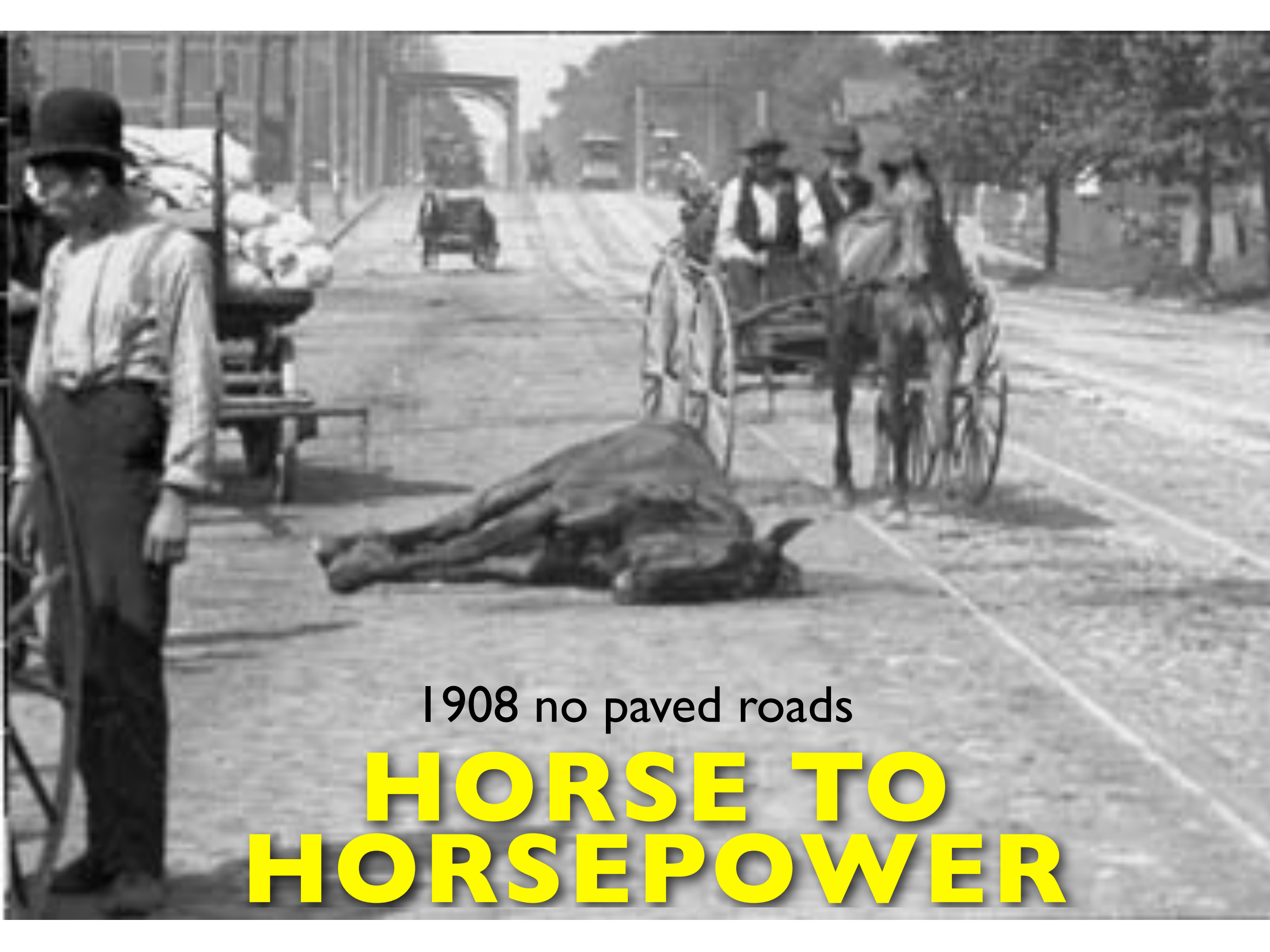


**BELOW CODE IN
BAKERSFIELD**



LEED

ZERO BY 2030?



1908 no paved roads

HORSE TO HORSEPOWER

2.5 MILLION CARS IN 8 YEARS

**HORSE TO
HORSEPOWER**





NET ZERO ENERGY



NET ZERO WATER



LIFE ENHANCING



LIVING BUILDINGS CHALLENGE





PACKARD FOUNDATION HEADQUARTERS

Los Altos, CA

Photo Credit: Terry Lorant



HOOD RIVER MIDDLE SCHOOL Portland, OR



DPR REGIONAL OFFICE Phoenix, AZ

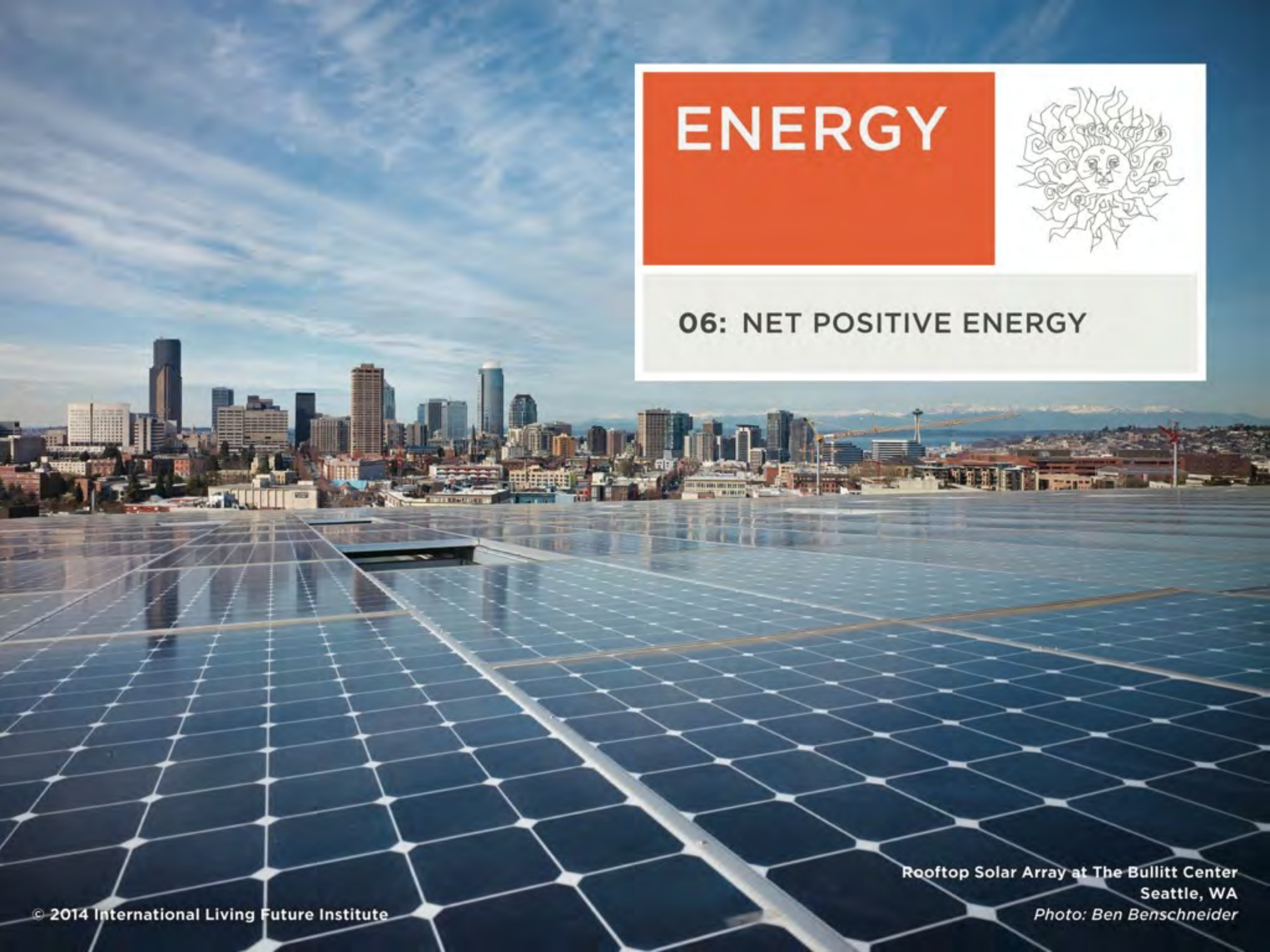


**EXAMPLES OF COMPLETED PROJECTS
NET ZERO ENERGY (NZEB) CERTIFIED**

ENERGY



06: NET POSITIVE ENERGY



Rooftop Solar Array at The Bullitt Center
Seattle, WA

Photo: Ben Benschneider



GO NUCLEAR
93 MILLION MILES

GO NUTS



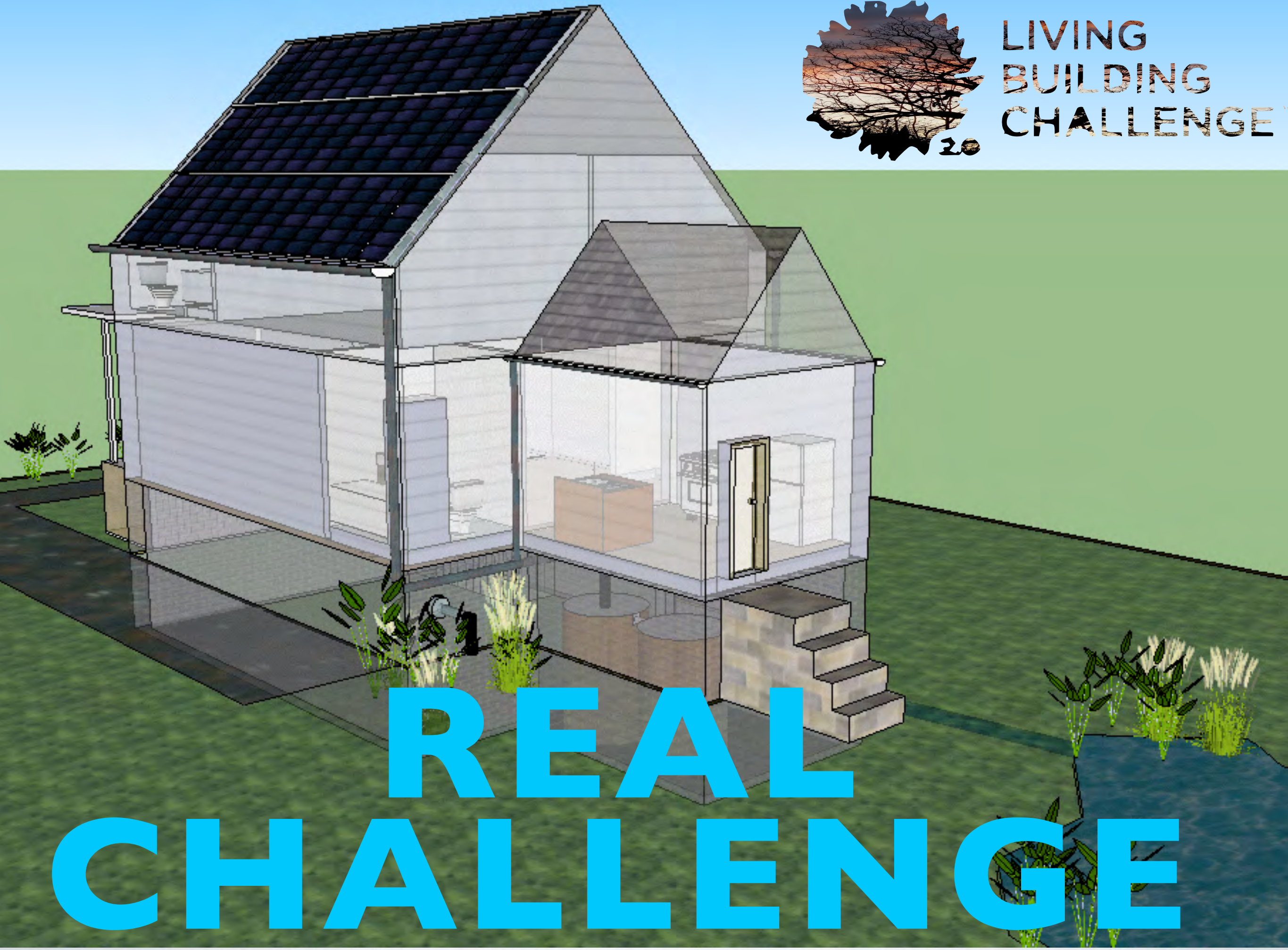
MICHIGAN ENGINEERING

UNIVERSITY of MICHIGAN ■ COLLEGE of ENGINEERING

BLUElab



LIVING
BUILDING
CHALLENGE



REAL CHALLENGE

**NET
ZERO**

WATER . . .

STAY TUNED

DIALOGUE



MATTHEW GROCOFF
ESQ., LEED-GA, LFA
PRINCIPAL, THRIVE

TO ARRANGE SPEAKING ENGAGEMENTS,
CONTACT:
MATT SANDSTROM, RUSTBELT GROUP
MATT@RUSTBELTTRANSPORT.COM

MATTGROCOFF.COM

