



INTERNATIONAL LIVING FUTURE INSTITUTE



CASCADIA
GREEN BUILDING
COUNCIL



ECOTONE
PUBLISHING



LIVING
BUILDING
CHALLENGE



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Executive Director



**LIVING
BUILDING
CHALLENGE**



INTERNATIONAL
LIVING FUTURE
INSTITUTESM

THE METAPHOR OF THE FLOWER

ROOTED IN PLACE AND YET:

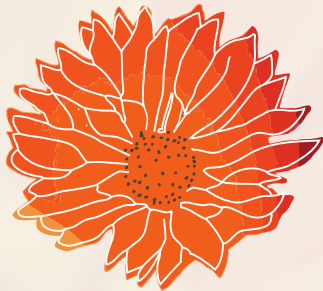
Harvests all energy + water

Is adapted to climate and site

Operates pollution free

Is comprised of integrated systems

Is beautiful



**LIVING
BUILDING
CHALLENGE** SM



Why a challenge?

Infusing inspiration and poetry

Rewarding early adopters

Creating new models

Stirring the pot

Pulling the market forward



RENOVATION



LANDSCAPE &
INFRASTRUCTURE



BUILDINGS

THREE TYPOLOGIES

PETALS

PLACE

WATER

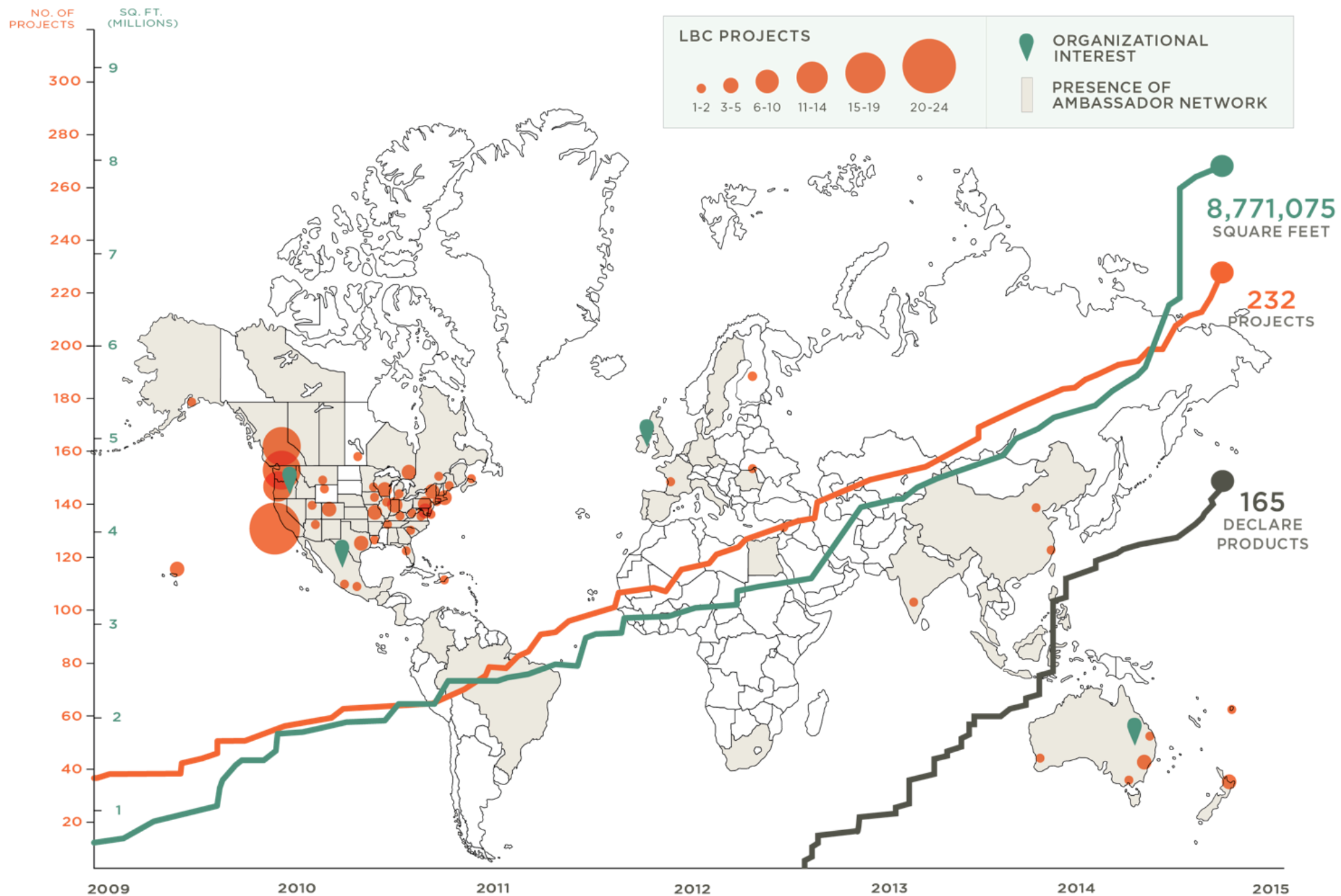
ENERGY

HEALTH &
HAPPINESS

MATERIALS

EQUITY

BEAUTY





LIVING
BUILDING
CHALLENGE™

FULL CERTIFICATION

All Imperatives are
mandatory

Certification is based
on actual
performance



PETAL CERTIFICATION

Three Petals or more

One of which must be
either Water, Energy
or the Materials Petal
&

01: Limits to Growth

20: Inspiration +
Education



NETZERO
ENERGY BUILDING
CERTIFICATION™

NET ZERO ENERGY BUILDING CERTIFICATION

Four Imperatives

01: Limits to Growth

07: Net Positive
Energy (100% only)

19: Beauty + Spirit

20: Inspiration +
Education



NETZERO

ENERGY BUILDING
CERTIFICATIONSM

PROVEN PERFORMANCE / INDEPENDENT AUDITS / TRANSPARENT RESULTS

WWW.LIVING-FUTURE.ORG/NETZERO



NET ZERO ENERGY BUILDING (NZEB) CERTIFICATION IMPERATIVES

PLACE

LIMITS TO GROWTH



01

Project teams must document site conditions prior to the start of work. On-site landscape must be designed so that as it matures and evolves it increasingly emulates the functionality of indigenous ecosystems with regard to density, biodiversity, plant succession, water use, and nutrient needs. It shall also provide wildlife and avian habitat appropriate to the project's transect through the use of native and naturalized plants and topsoil. No petrochemical fertilizers or pesticides can be used for the operation and maintenance of the on-site landscape.

REQUIRED
IMPERATIVE



ENERGY

NET POSITIVE ENERGY



One hundred and five percent of the project's energy needs must be supplied by on-site renewable energy on a net annual basis, without the use of on-site combustion. Projects must provide on-site energy storage for resiliency.

Solar array at The Hawaii Preparatory Academy Energy Lab, Kamuela, HI
Photo: Matthew Millman Photography / Courtesy: Flansburgh Architects

BEAUTY

BEAUTY & SPIRIT



19

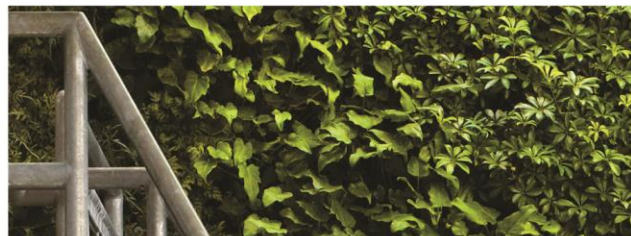
The project must contain design features intended solely for human delight and the celebration of culture, spirit and place appropriate to its function and meaningfully integrate public art.

REQUIRED IMPERATIVE



BEAUTY

INSPIRATION & EDUCATION



REQUIRED
IMPERATIVE



NETZERO

ENERGY BUILDING
CERTIFICATIONSM

Living wall at Bertch School
Seattle, WA
Photo: Benjamin Benschneider

Educational materials about the operation and performance of the project must be provided to the public to share successful solutions and to motivate others to make change.

Projects must provide:

- An annual open day for the public.
- An educational web site that shares information about the design, construction, and operation of the project.
- A simple brochure describing the design and environmental features of the project, as well as ways for occupants to optimize project function.
- A copy of the Operations and Maintenance Manual.
- Interpretive signage that teaches visitors and occupants about the project.
- A Living Building Case Study to be posted on the Institute website.

ENERGY



06: NET POSITIVE ENERGY



Rooftop Solar Array at The Bullitt Center
Seattle, WA

Photo: Ben Benschneider

NO COMBUSTION ALLOWED

Why?

No direct CO₂ production

Local air quality

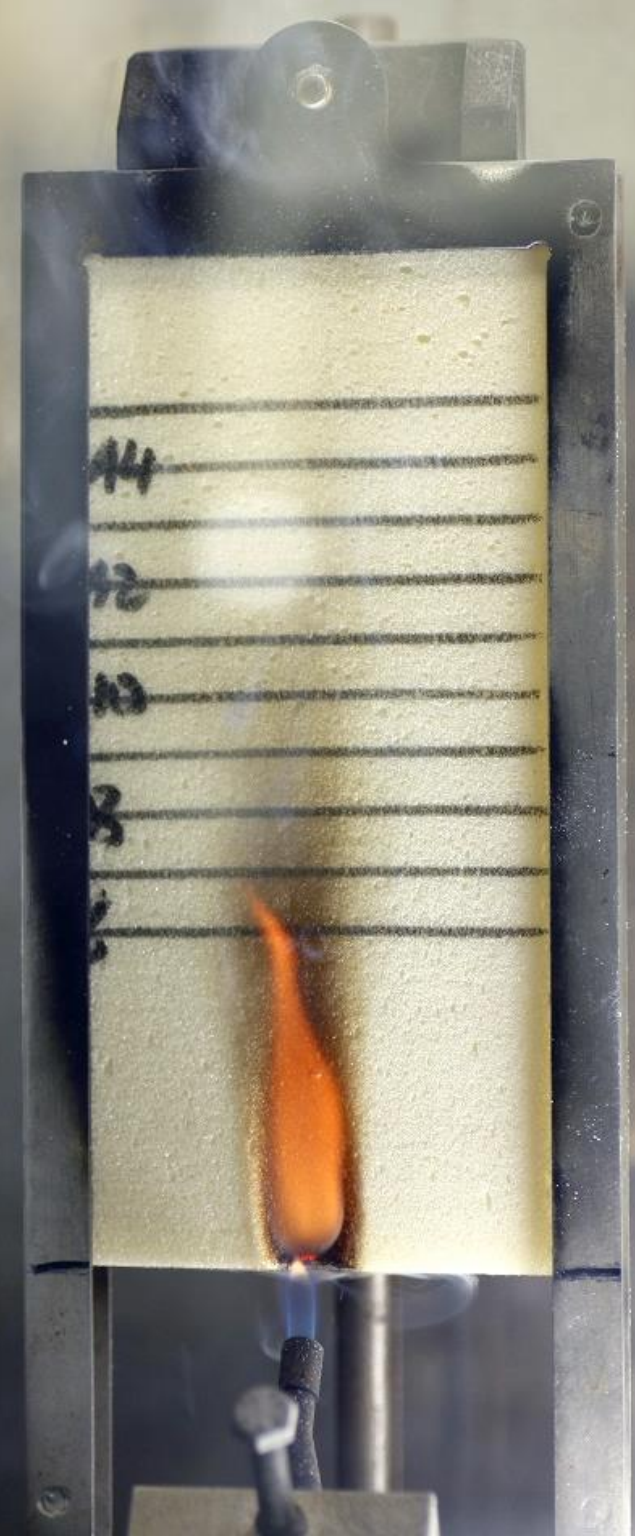
Self limiting growth

Mining, drilling, and fracking impacts

Don't feed the machine

Diversified energy infrastructure – resiliency

Loss of biomass – habitat impacts





EXCEPTIONS

Specialized combustion, lab bunsen burners

Ornamental fireplace or wood-stove in
Transects L1 and L2

Temporary heat during construction

Emergency back-up energy systems that
use combustion

The background of the slide features a close-up, slightly blurred view of architectural blueprints spread across a desk. A silver laptop is partially visible on the left side, with its keyboard and screen area shown. A green pen lies horizontally across the middle of the blueprints. The blueprints themselves contain various technical drawings, including floor plans, sections, and dimension lines with numerical values like '3600' and '4070'.

DOCUMENTATION REQUIREMENTS

Narrative written by consulting engineers






















Photographs of systems

Energy bills over continuous 12-month performance period

Monthly meter readings showing total energy produced and consumed

Adequate sub-metering is required to document total energy consumption by end use (heating, cooling, lighting, fans + pumps, plug loads, domestic hot water)

NET ZERO CHALLENGE

	SINGLE FAMILY NEW 	RETROFIT 	MULTI- FAMILY 	LOW RISE OFFICE 	MID & HIGH RISE OFFICE 	EDUCATIONAL 	INSTITUTIONAL 	HEALTHCARE 
HOT HUMID	 Zero Energy House	 Willowbrook				 HPA	 AS-EPA	
MIXED HUMID						 Tyson		
HOT DRY				 DPR Phoenix				
MIXED DRY				 Integral Office				
TEMPERATE	 Eco-sense Residence		 zHome	 Packard Foundation HQ		 Bertschi School	 Painter's Hall	
COLD						 Omega Institute		
VERY COLD / SUB ARCTIC								



The Packard Foundation Headquarters

embodies the core work
of conserving and
restoring the earth's
natural systems.

[see case study](#)



PHOTO © JEREMY BITTERMAN, COURTESY EHDD

Case Studies

Since its public launch in November 2006, the Living Building Challenge™ has inspired thousands of people throughout the world to action. Project teams are innovating solutions to create net zero energy, water independent, non-toxic, and culturally rich projects. To date, thirteen projects have achieved certification through the Living Building Challenge, five of which have achieved Full Certification, and many others have entered the twelve-month operational phase required prior to audit. Learn more about the certified projects:

REGISTER YOUR
PROJECT

[LIVING-FUTURE.ORG/LBC](https://living-future.org/lbc) RESOURCES
CASE STUDIES



**LIVING
BUILDING
CHALLENGE™**

zHome | **ISSAQUAH, WA**

PETAL CERTIFIED



DAVID BAKER
ZERO COTTAGE
San Francisco, CA



EPA HEADQUARTERS
Pago Pago, American Samoa



ZERO ENERGY
HOUSE
Auckland,
New Zealand

EXAMPLES OF COMPLETED PROJECTS
NET ZERO ENERGY (NZEB) CERTIFIED

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

PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES

Pittsburgh, PA

Photo Credit: Paul G. Weigman



WILLOWBROOK HOUSE Austin, TX



IdEAS Z2 DESIGN FOUNDATION San Jose, CA




EXAMPLES OF COMPLETED PROJECTS
NET ZERO ENERGY (NZEB) CERTIFIED



BERTSCHI SCHOOL
Seattle, WA




HAWAII PREPARATORY ACADEMY
Kamuela, HI



TYSON LIVING
LEARNING CENTER
Eureka, MO
Photo Credit: Joe Angeles

EXAMPLES OF COMPLETED PROJECTS
LIVING CERTIFIED

A photograph of the Omega Center building in Rhinebeck, NY. The building is a long, low structure with a dark metal roof and large glass windows. A wide, covered walkway with a white metal frame and a dark roof extends from the building across a grassy area. The sky is clear blue.

OMEGA CENTER
Rhinebeck, NY

A photograph of the Smith College Classroom in Whately, MA. The building is a long, low structure with a dark metal roof and large glass windows. A wide, paved walkway leads from the foreground towards the building. The sky is overcast.

SMITH COLLEGE CLASSROOM
Whately, MA

EXAMPLES OF COMPLETED PROJECTS
LIVING CERTIFIED



**LIVING
BUILDING
CHALLENGE™**

BULLITT CENTER | SEATTLE, WA

PURSUING LIVING CERTIFICATION

ENVELOPE

R-35 walls – rigid mineral wool outside envelope + expanded polystyrene (EPS)

R-60 roof

R-10 EPS under slab

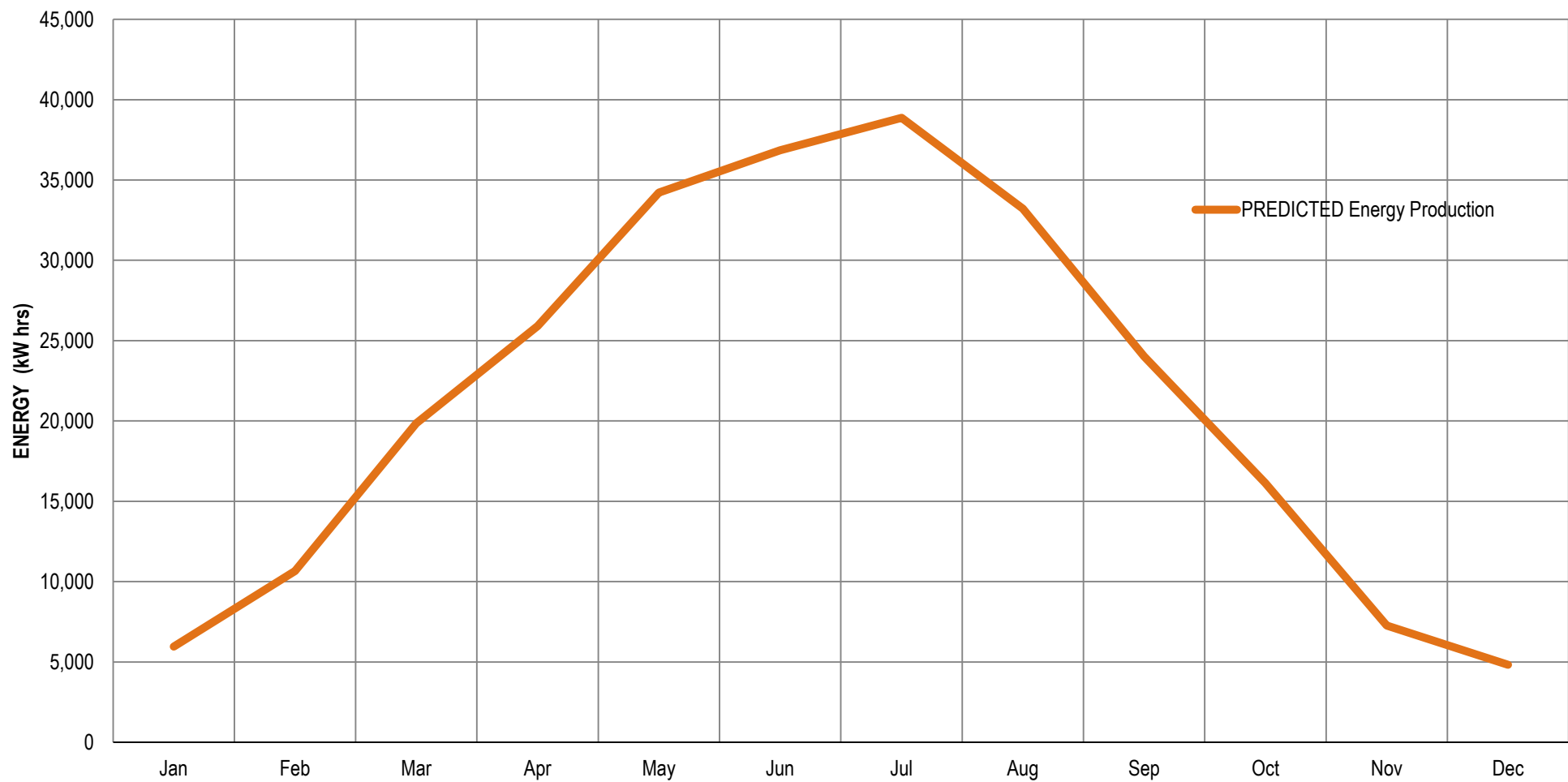
U-0.18 triple paned windows – tuned solar heat gain coefficient

Air sealing tested with air and water pressure

Air barrier = water barrier

Exterior window flanges/air barrier integrated

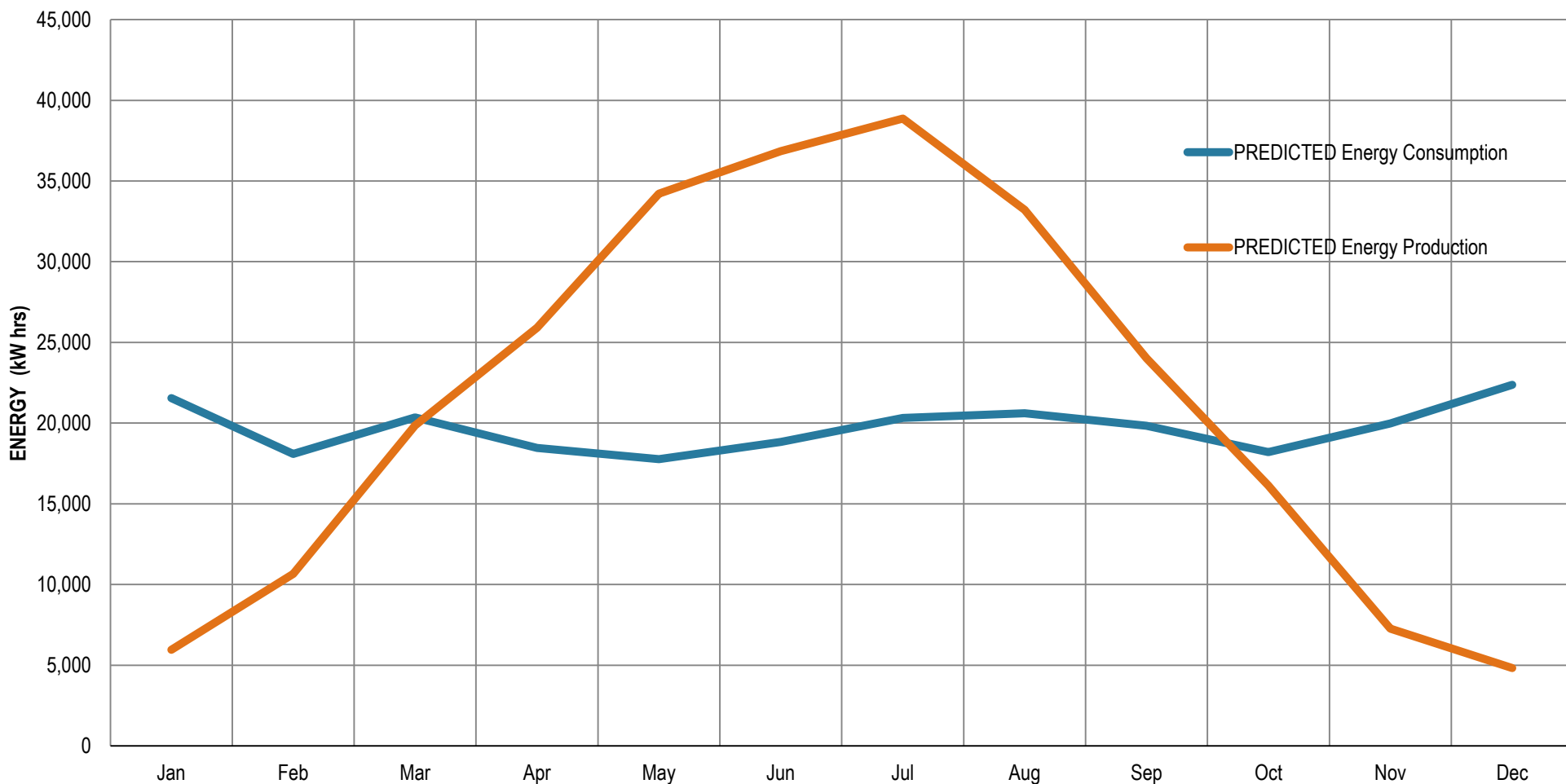




PREDICTED ENERGY PRODUCTION (2013)

BULLITT CENTER

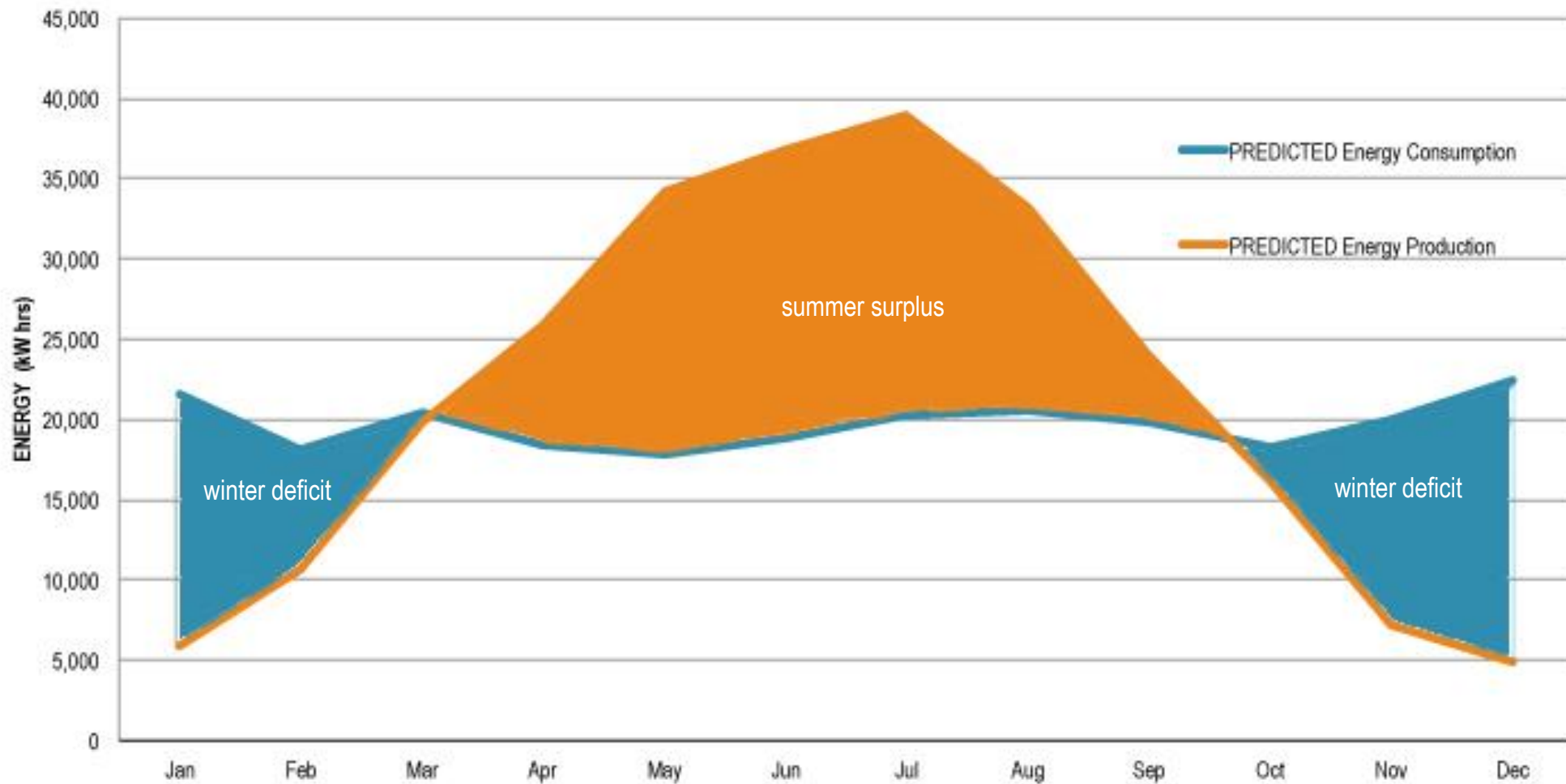
University of Washington Integrated Design Lab (UWIDL)



PREDICTED ENERGY PRODUCTION & CONSUMPTION (2013)

BULLITT CENTER

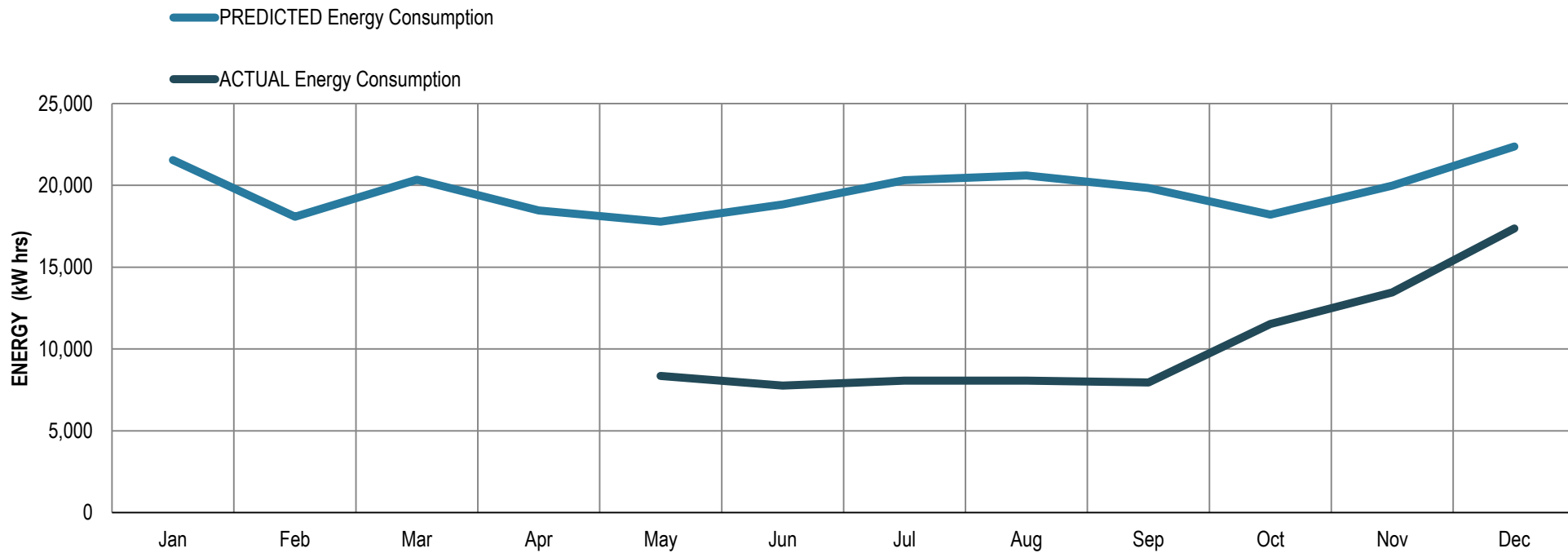
University of Washington Integrated Design Lab (UWIDL)



PREDICTED SUMMER SURPLUS & WINTER DEFICIT (2013)

BULLITT CENTER

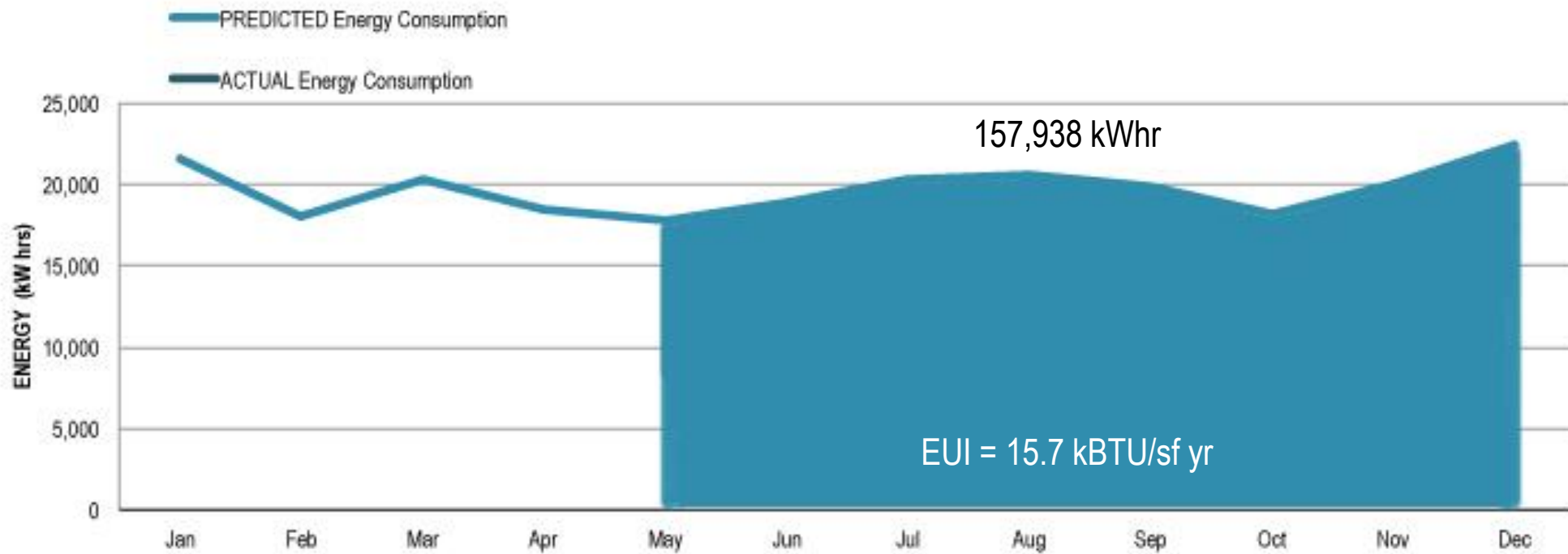
University of Washington Integrated Design Lab (UWIDL)



PREDICTED VS. ACTIAL ENERGY CONSUMPTION (2013)

BULLITT CENTER

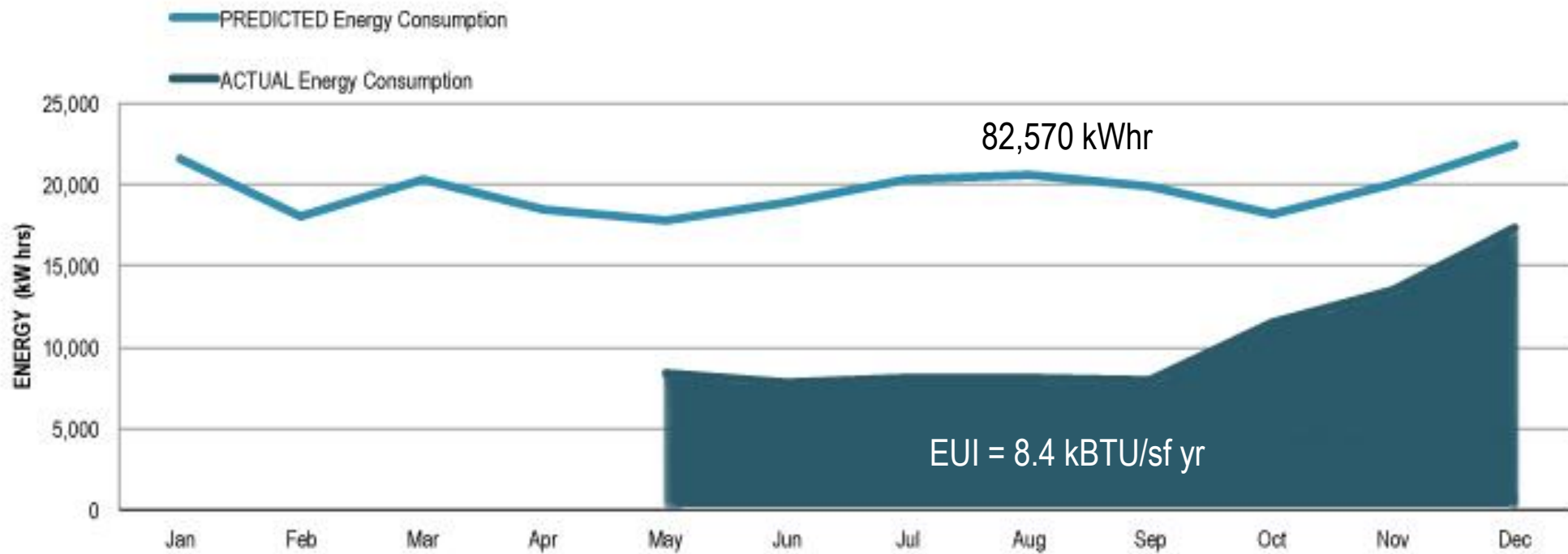
University of Washington Integrated Design Lab (UWIDL)



PREDICTED ENERGY CONSUMPTION (2013)

BULLITT CENTER

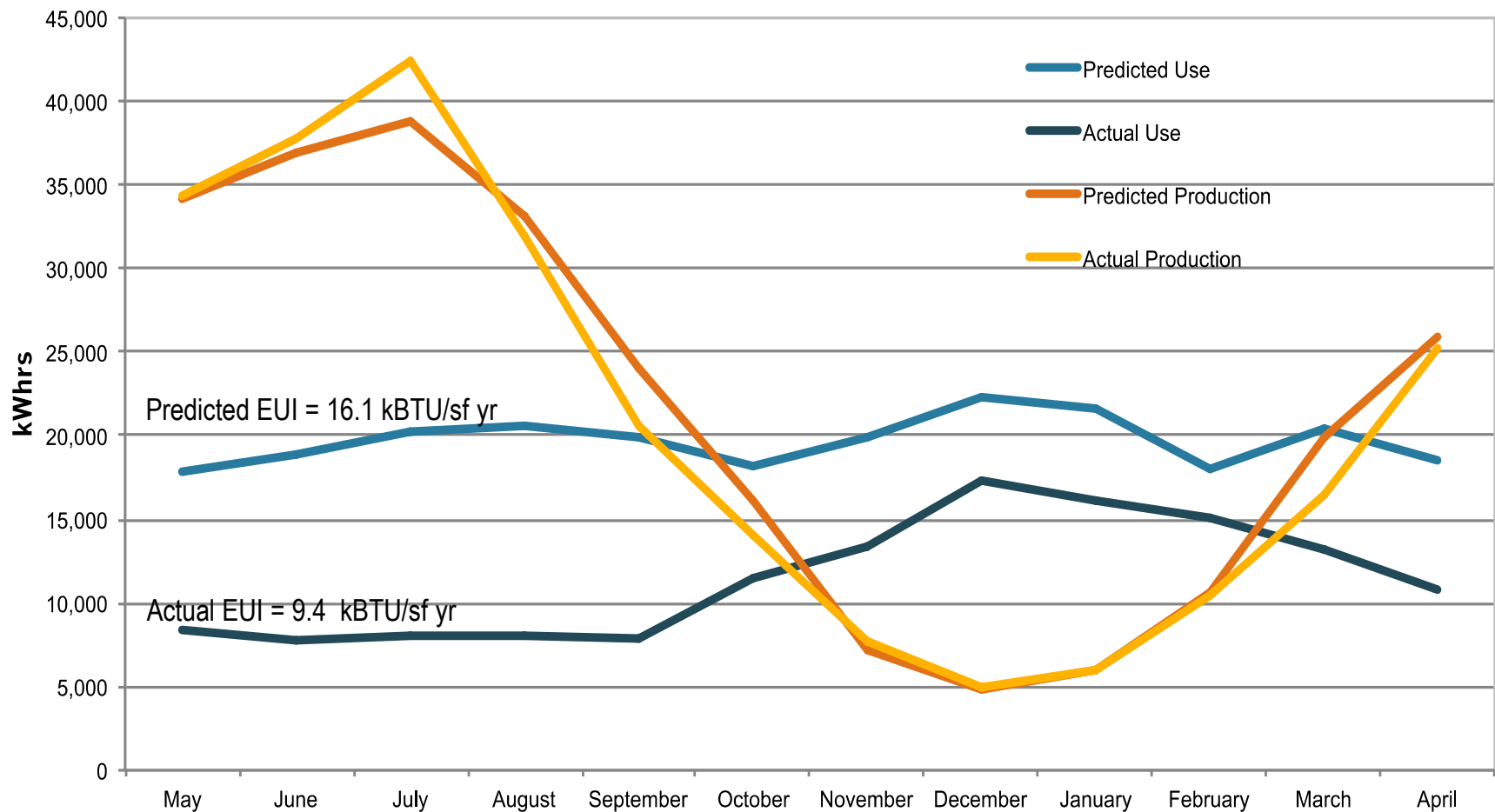
University of Washington Integrated Design Lab (UWIDL)



ACTUAL ENERGY CONSUMPTION (2013)

BULLITT CENTER

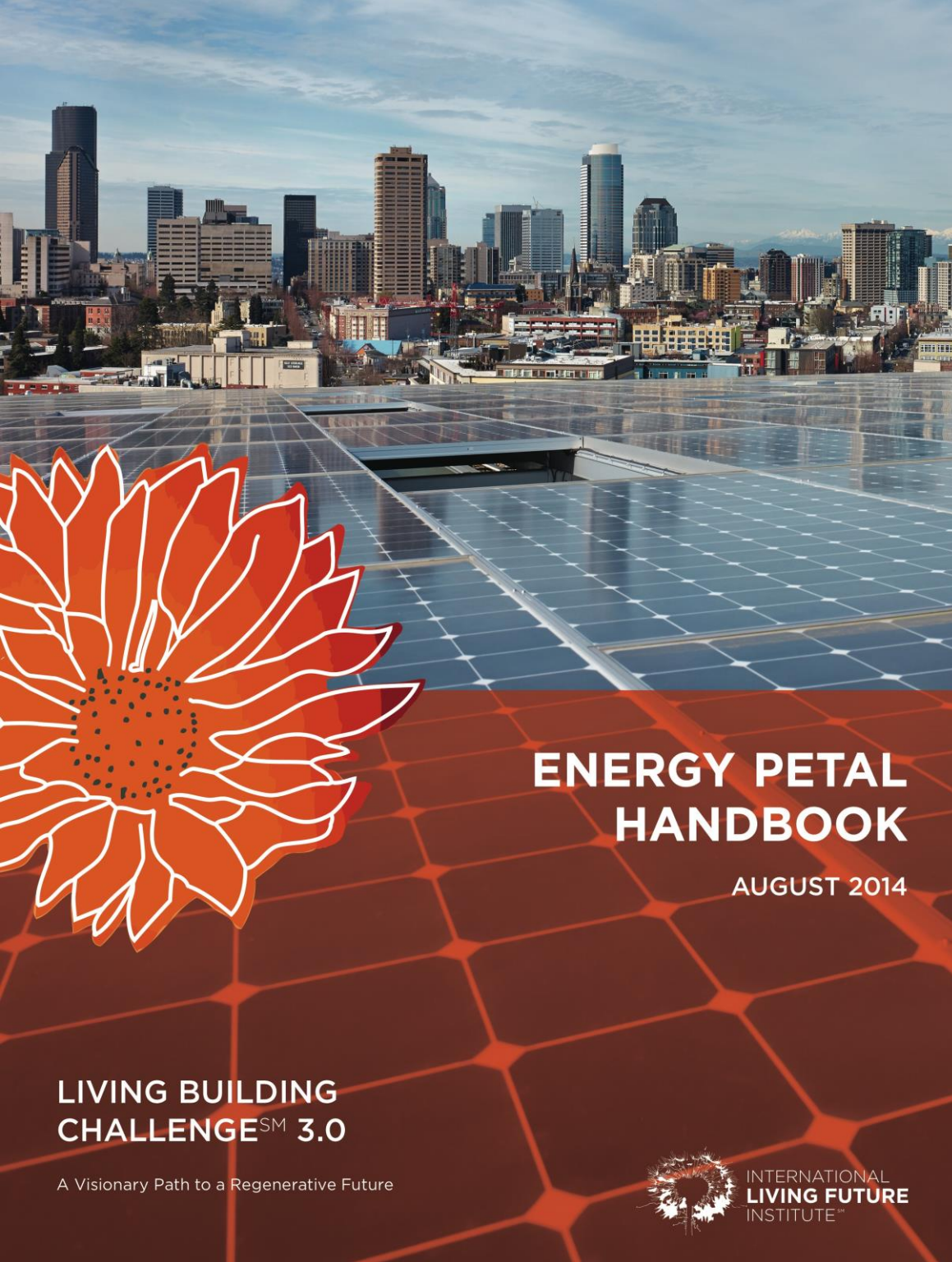
University of Washington Integrated Design Lab (UWIDL)



PREDICTED VS. ACTUAL ENERGY PRODUCTION & CONSUMPTION (YEAR ONE: 2013-2014)

BULLITT CENTER


University of Washington Integrated Design Lab (UWIDL)



Resource for all 3.0 projects

Summarizes all requirements and exceptions for each Imperative within the Petal

Updated periodically; consolidates Dialogue rulings and clarifications up to publishing date

An underwater photograph showing sunlight rays filtering down through the water, creating a serene blue atmosphere. Bubbles are visible rising from the bottom. The text is overlaid on this background.

NE+ POSITIVE

ENERGY + WATER CONFERENCE

JANUARY 22-23, 2015 | HYATT REGENCY EMBARCADERO | SAN FRANCISCO

living-future.org/netpositive

PLACE AND COMMUNITY

THE END OF INCREMENTALISM
and the BEGINNING OF BEING

LIVING
FUTURE
2015

APRIL 1-3, 2015
SEATTLE, WA



A CALL TO ACTION:

living.

building.

challenge.

www.livingbuildingchallenge.org