Walk-in Slide: AU 2014 Social Media Feed

1. Click on the link below, this will open your web browser

http://aucache.autodesk.com/social/visualization.html

2. Use “Extended Display” to project the website on screen if you plan to work on your computer. Use “Duplicate” to display same image on screen and computer.

SUPPORTING THE
DESIGN-LED REVOLUTION

Design for Zero and Beyond: Opportunities to Create Future-Relevant Solutions in a Climate-Constrained World

Susan Gladwin

@susangladwin

Welcome


SUPPORTING THE
DESIGN-LED
REVOLUTION

Class summary

This session offers an opportunity for discussion about how the next 40 years impact the future of humanity more than any before. It will survey solutions that are on the path to net zero carbon and how they were created from the people making them. Hear from a futurism expert on the imperatives and opportunities in designing for zero.

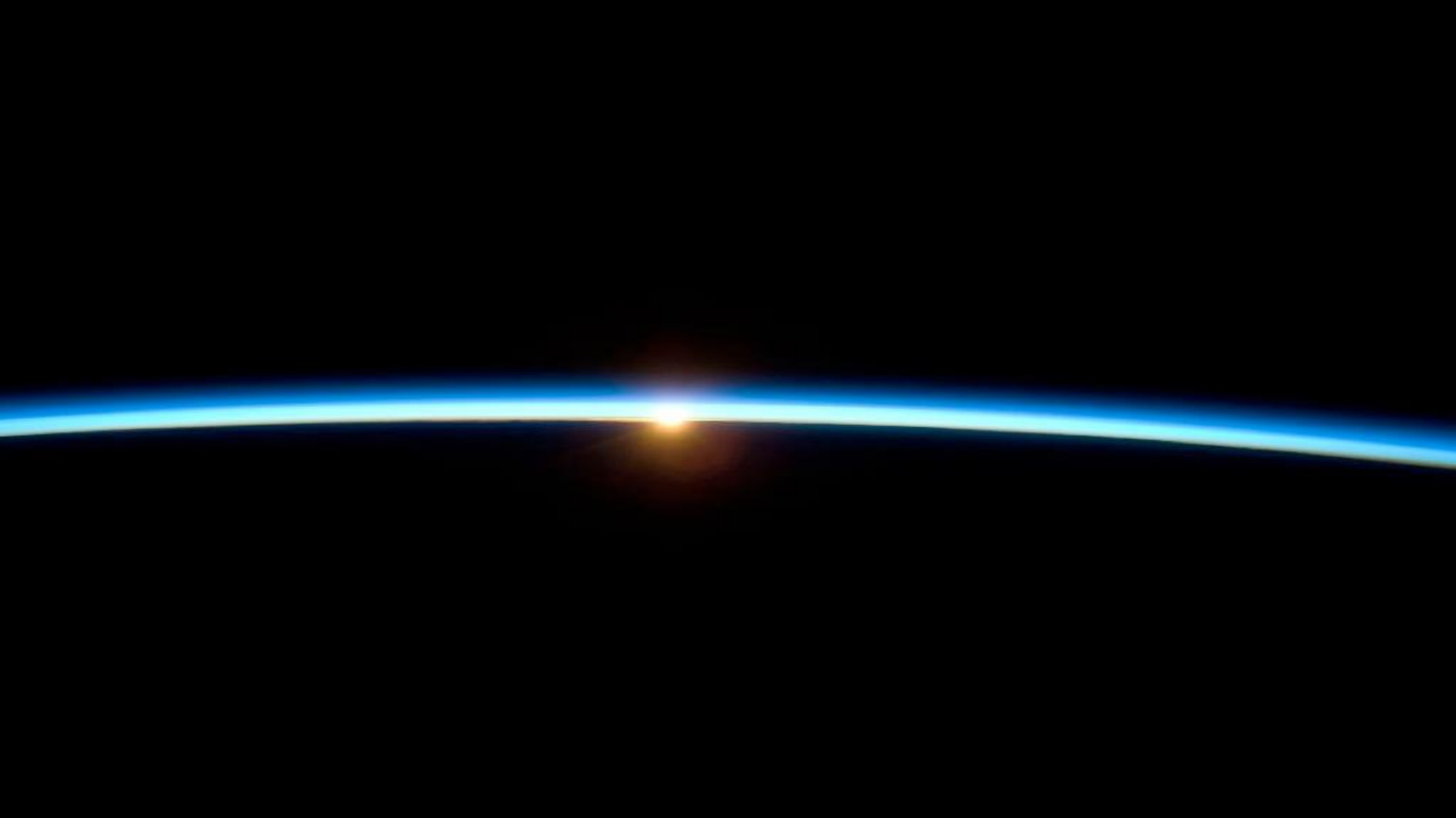
Key learning objectives

SUPPORTING THE
DESIGN-LED REVOLUTION

At the end of this class, you will be able to:

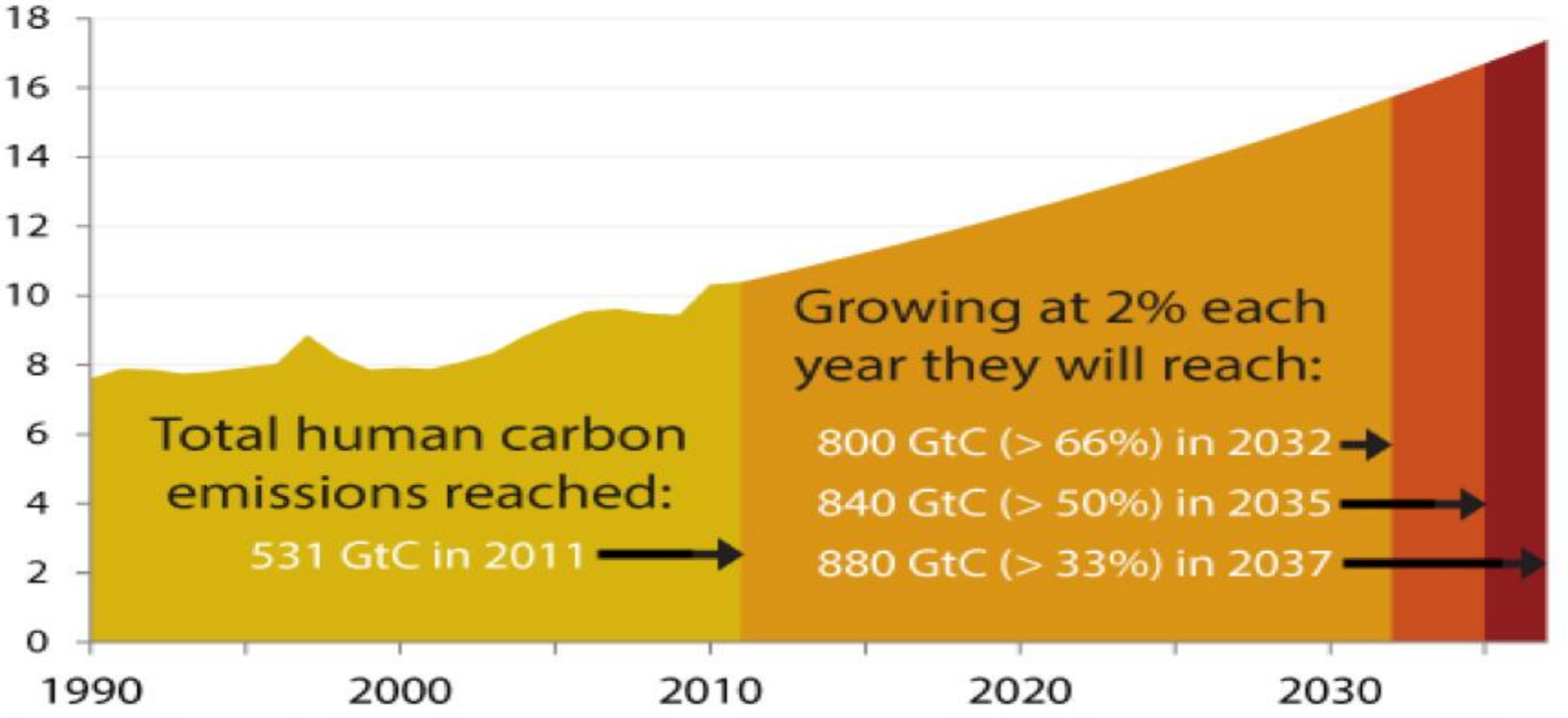
- See the connection between design and the impact it can have on the world's most pressing challenges
- Understand how technology and revolutionary mindsets are now converging, empowering designers everywhere to create solutions
- Understand the core principles of future-relevant design: impact modeling, rapid iteration, massive collaboration
- Understand the importance of embracing the world's constraints, and how this creates focus and potential to solve epic challenges
- Understand the business opportunities in designing for zero

Alex Steffen
on Twitter @ alexsteffen



Reaching the 2°C Carbon Budget

Business as Usual carbon emissions in GtC/year



Note: the % in brackets are the chances of limiting warming to 2°C

Data: Budget - IPCC WGI AR5. Historical - Global Carbon Project

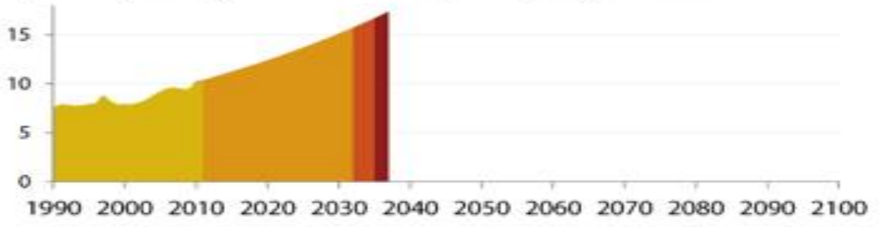
Note: assumes limited further non-CO2 forcings as per RCP 2.6

shrinkthatfootprint.com

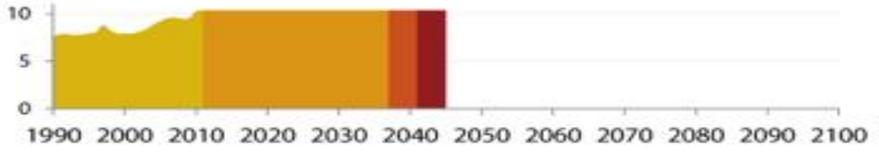
The 2°C Carbon Budget and Emissions Growth

Annual global carbon emissions GtC by yearly emissions growth rate

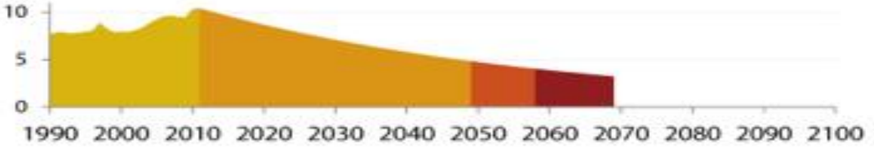
a) Growing at 2%/year we hit the 2 °C (> 50%) budget in 2035



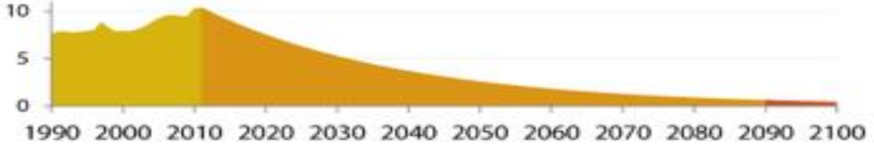
b) With constant 2011 emissions we hit the 2 °C (> 50%) budget in 2041



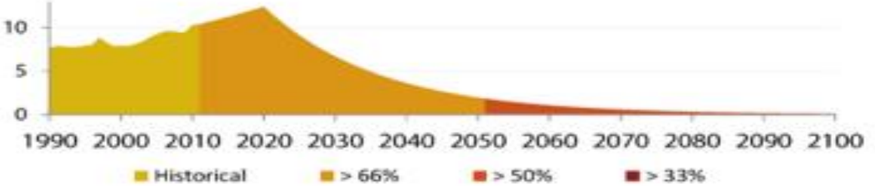
c) Declining at 2%/year we hit the 2 °C (> 50%) budget in 2058



d) Declining at 3.5%/year we avoid the 2 °C (> 50%) limit narrowly



e) If we wait till 2020 to begin annual reductions of 6%/yr are required



Note: the % is the chances of limiting warming to 2°C

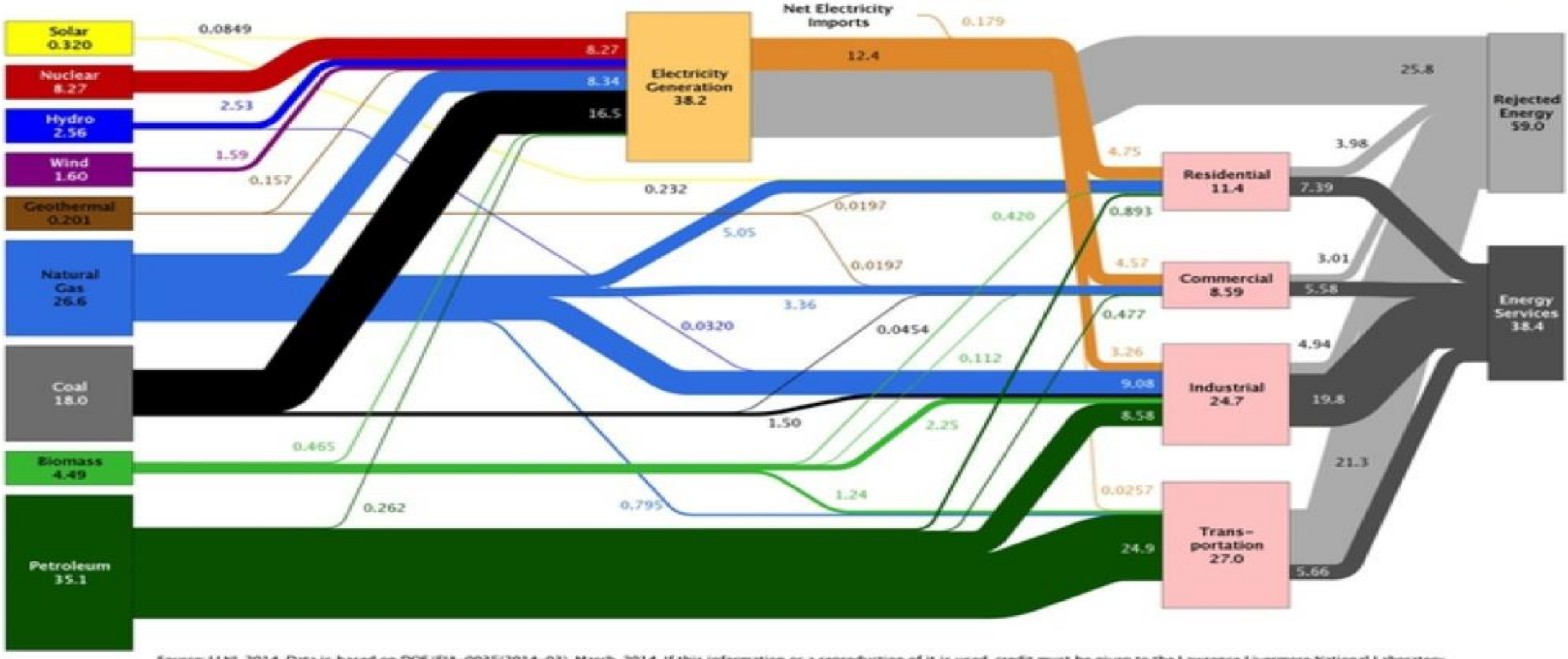
Data: Budget - IPCC WGI AR5. Historical - Global Carbon Project

Note: assumes limited non-CO2 forcing changes (RCP 2.6)

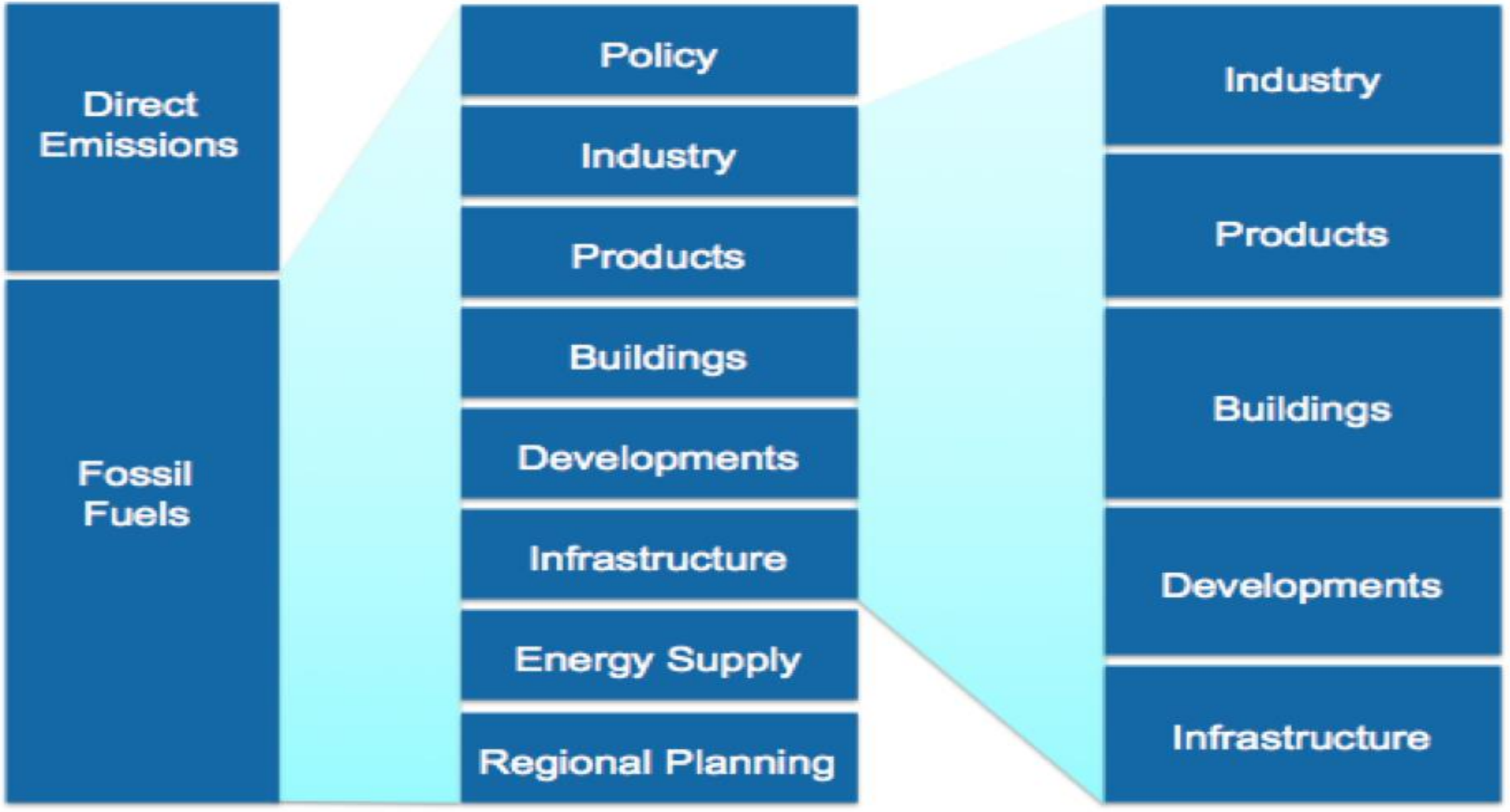
shrinkthatfootprint.com

Estimated U.S. Energy Use in 2013: ~97.4 Quads

Lawrence Livermore National Laboratory



Source: LLNL 2014. Data is based on DOE/EIA-0035(2014-03), March, 2014. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports consumption of renewable resources (i.e., hydro, wind, geothermal and solar) for electricity in BTU-equivalent values by assuming a typical fossil fuel plant "heat rate." The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 65% for the residential and commercial sectors 80% for the industrial sector, and 21% for the transportation sector. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527


Direct Emissions
Fossil Fuels
Policy
Industry
Products
Buildings
Developments
Infrastructure
Energy Supply
Regional Planning
Industry
Products
Buildings
Developments
Infrastructure

John Andary
on Twitter: @johnandary

INTEGRAL

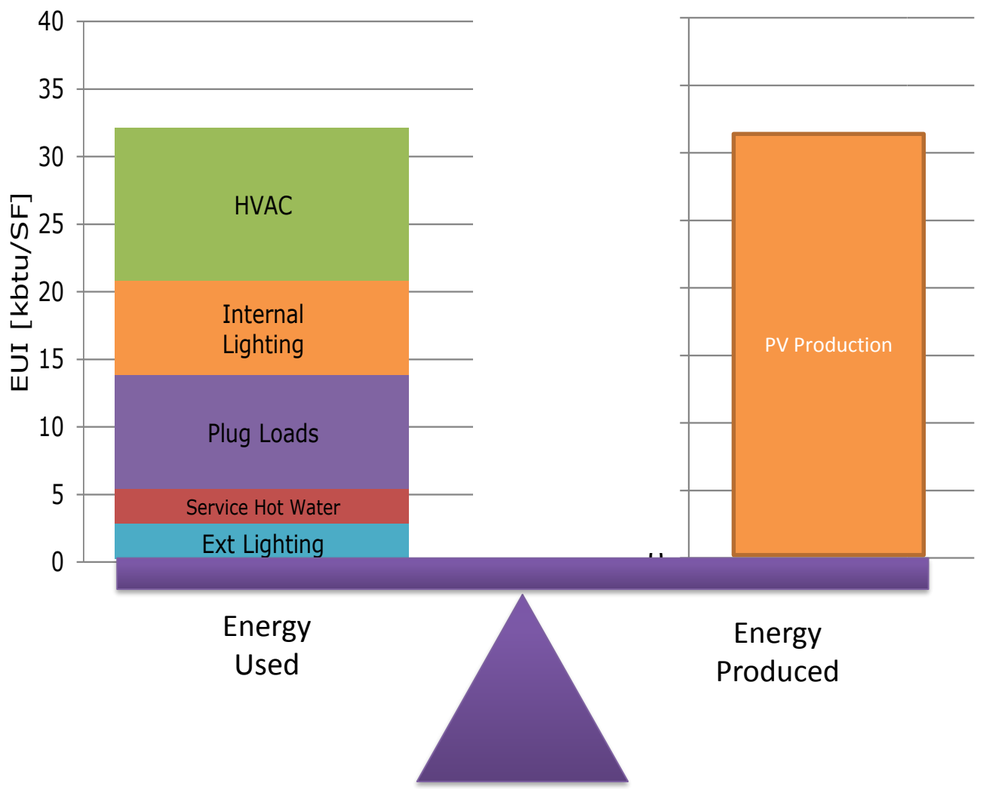
Revolutionary Engineering

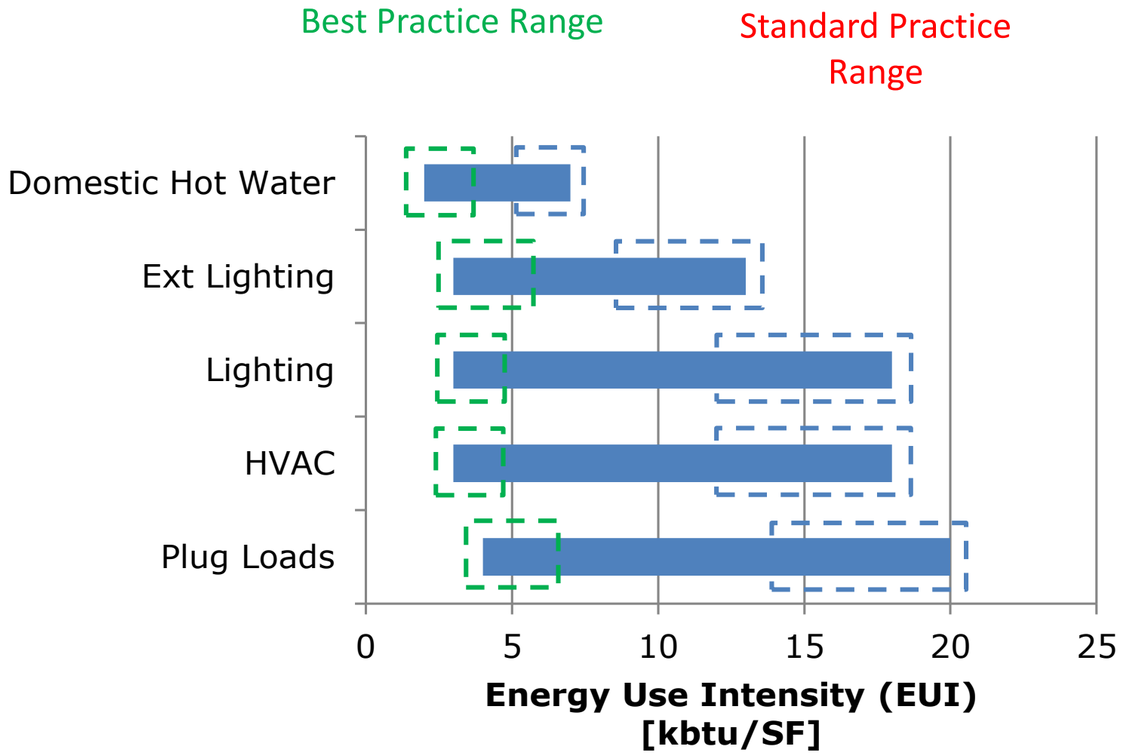
imagine | accelerate | perform |
sustain

JOHN ANDARY, PE, LEED AP

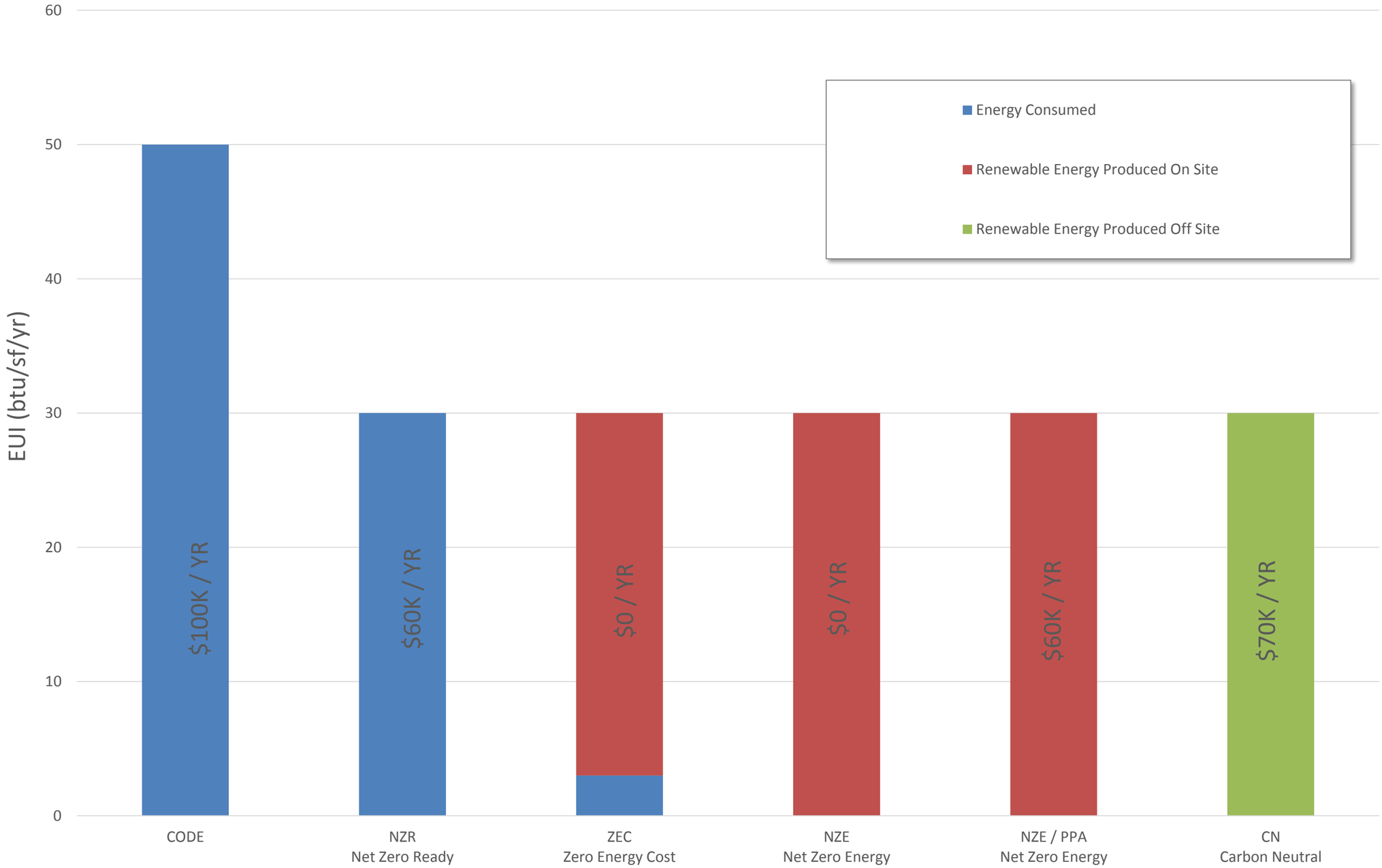
Principal :: Bioclimatic Design Leader

BALANCING THE ENERGY BUDGET





ZERO ENERGY OPTIONS

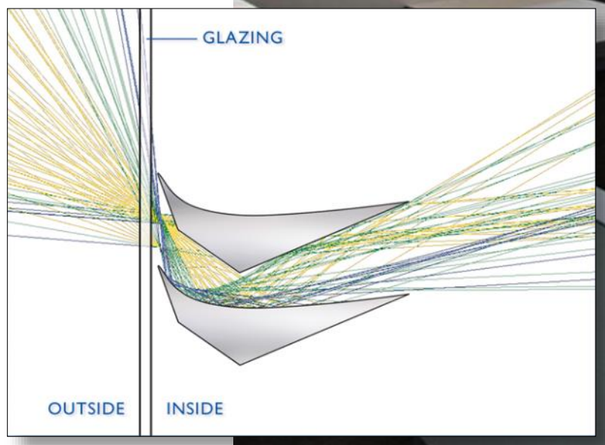


INTEGRAL GROUP SAN JOSE OFFICE :: EHDD ARCHITECTURE

INTEGRAL GROUP SAN JOSE OFFICE :: EHDD ARCHITECTURE

NREL RESEARCH SUPPORT FACILITY :: RNL DESIGN

NREL RESEARCH SUPPORT FACILITY :: RNL DESIGN


GLAZING
OUTSIDE
INSIDE

435 INDIO :: RMW ARCHITECTS

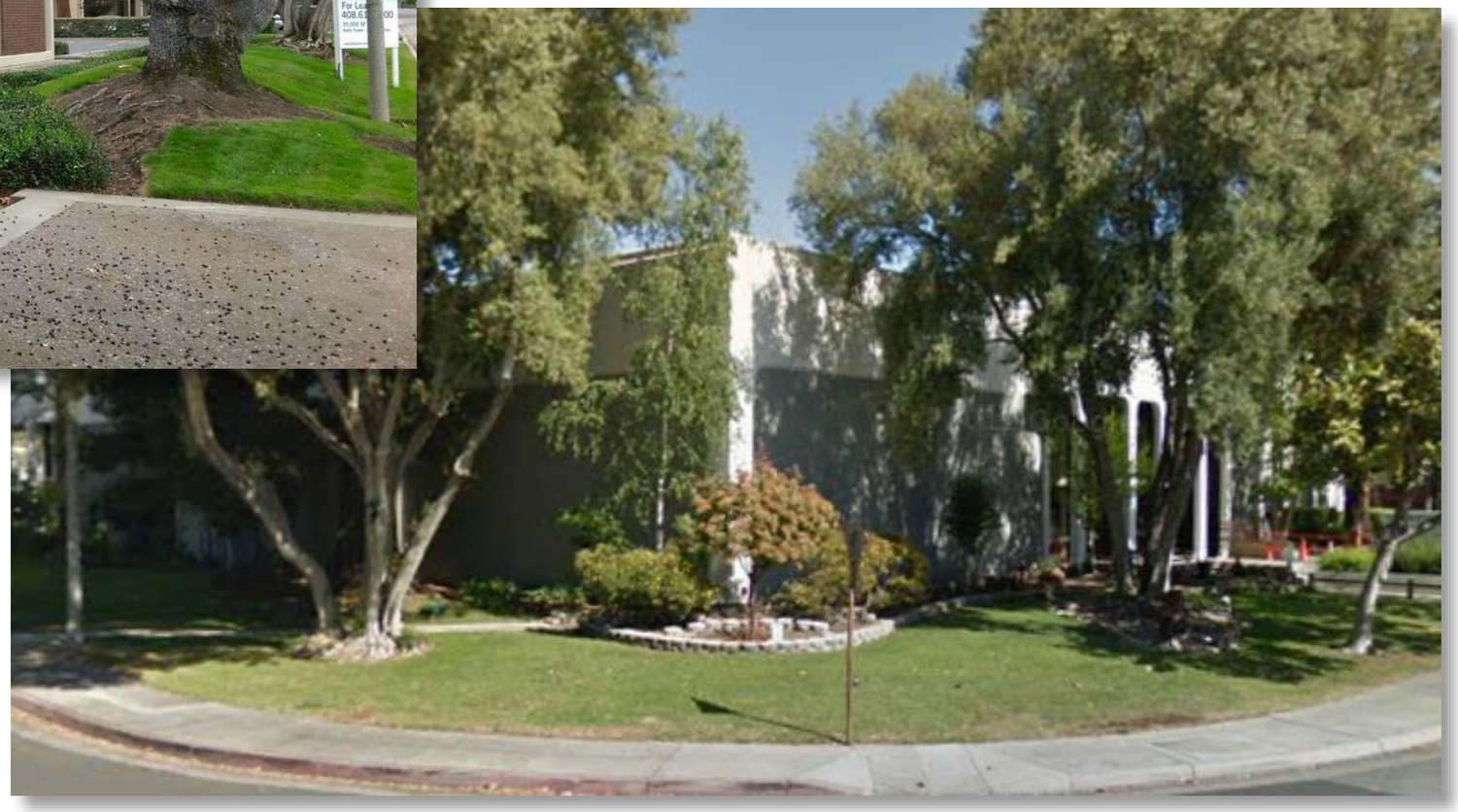
HIGH PERFORMANCE ENVELOPE

DAYLIGHTING DESIGN

PASSIVE THERMAL COMFORT

INTEGRATED ROOF PLANNING

ACCELERATION + REPLICATION



INTEGRAL

Revolutionary Engineering

imagine | accelerate | perform | sustain

Thank You!

Axel Bindel
on Twitter @ HSSMI

HIGH SPEED SUSTAINABLE MANUFACTURING INSTITUTE

WORLD CLASS RESEARCH

High Speed Sustainable Manufacturing Institute

Design for Zero and Beyond

Design for Zero and Beyond – Manufacturing context

Manufacturing challenge: Zero Carbon per gross value added

Factory of the future themes

1. Advanced Manufacturing Processes – new materials or products
2. Adaptive and Smart Manufacturing – mechatronics, robotics, photonics and monitoring
3. Digital and Virtual Factories – design, layout and planning
4. Resource Efficient Factories
5. Collaborative and Mobile Enterprises – networked factories, dynamic supply chain and local support
6. Human-Centred Manufacturing – enhancing the role of people through integration
7. Customer-Focused Manufacturing – product to process, innovative services

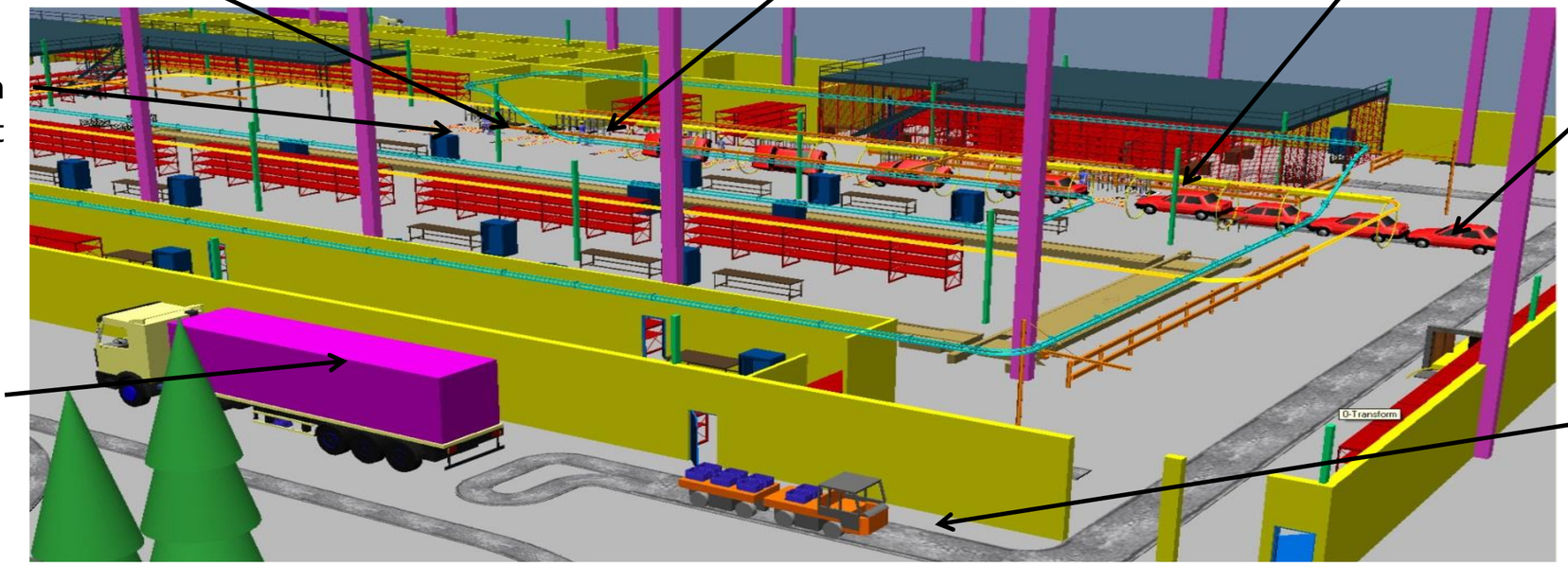
Applying Research – putting it all together

Low intensity VIRTUAL ENGINEERING; greater life cycle, lower cost

AUGMENTED REALITY to train and increase people skills and flexibility

Products designed in a VIRTUAL TEST and SPECIFICATION regime

Dynamic RESOURCE MONITOR; information on energy, vibration and heat



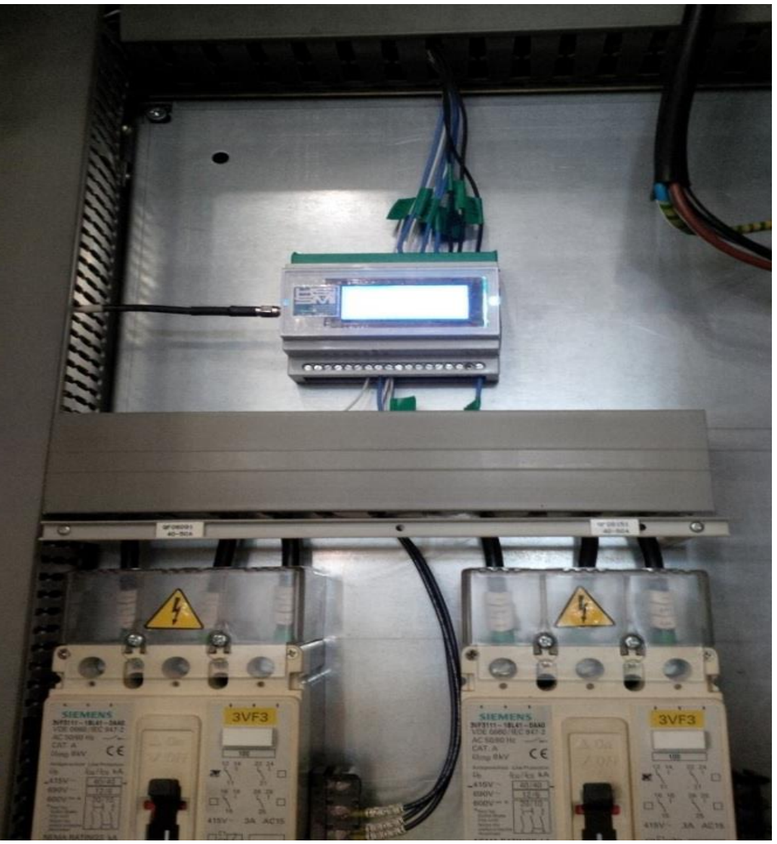
'Intelligent products' with full component knowledge for the lifecycle (RFID)

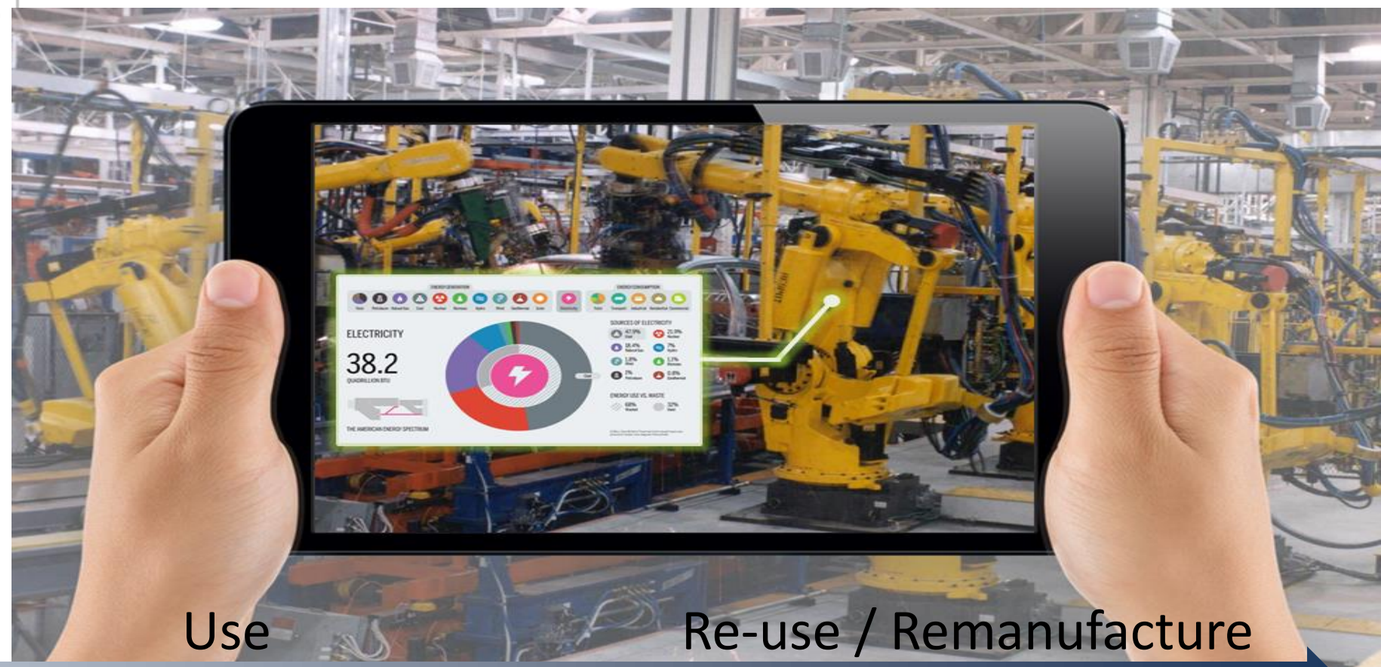
Resilient resources, components DESIGNED FOR REMANUFACTURE

FUEL CELL transit vehicles used as power stations to address peak grid demand

Design → Manufacture → Use → Re-use / Remanufacture

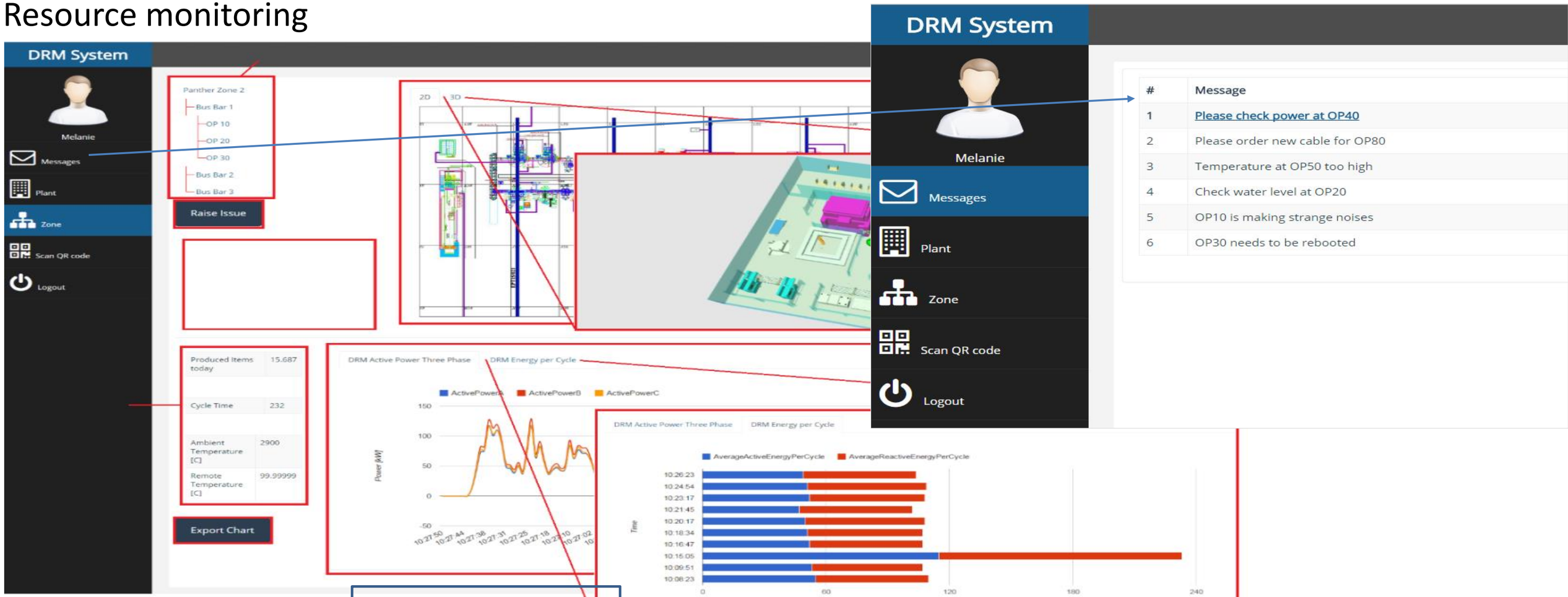
Resource Efficiency





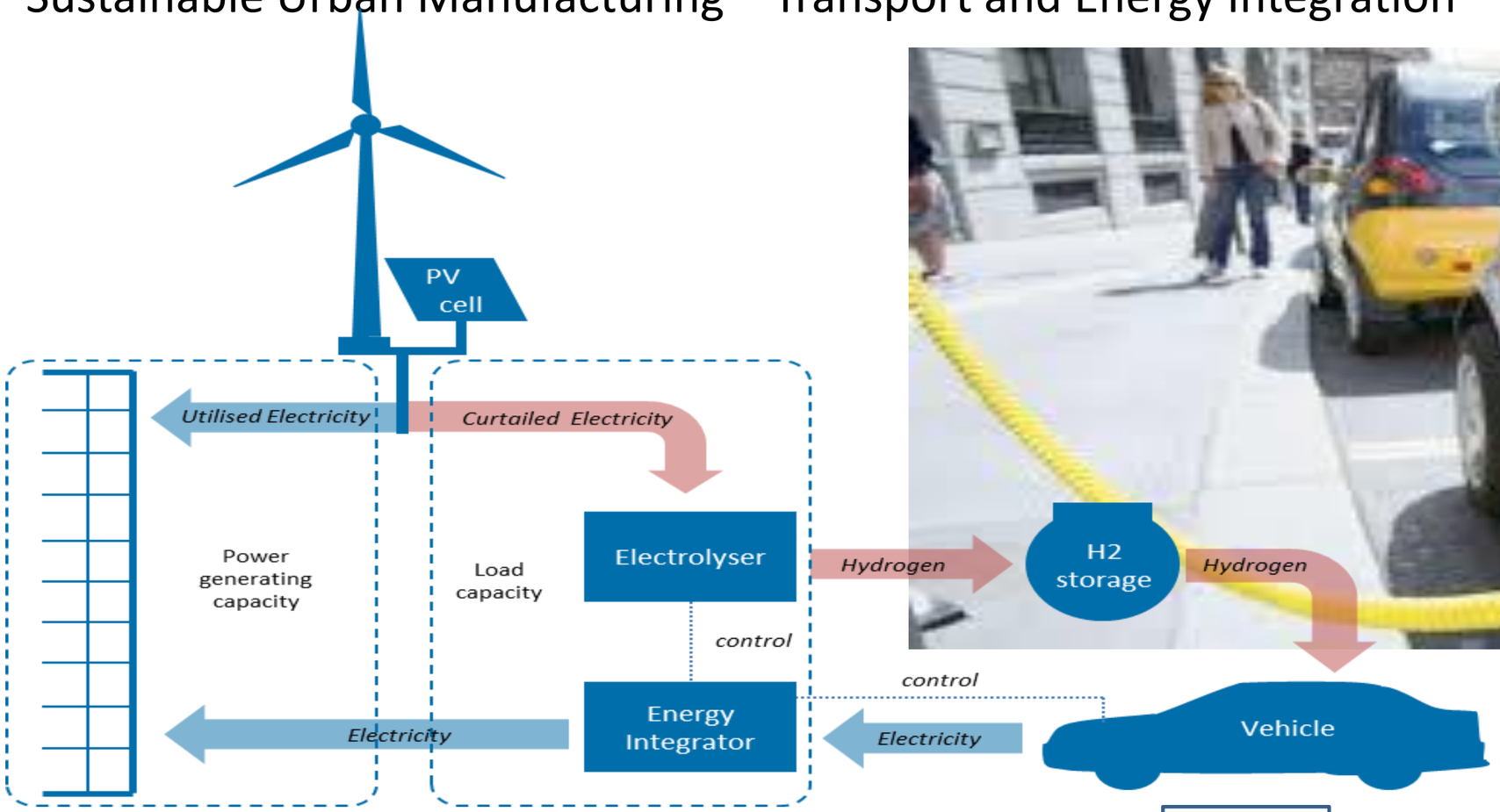
Design | Manufacture | Use | Re-use / Remanufacture

Resource monitoring



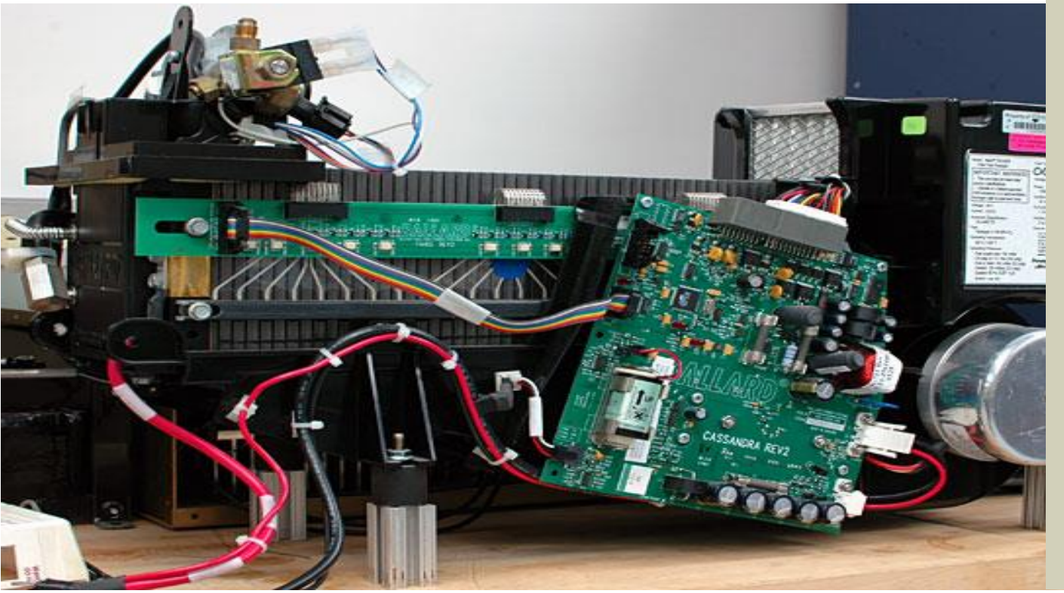
Design | Manufacture | Use | Re-use / Remanufacture

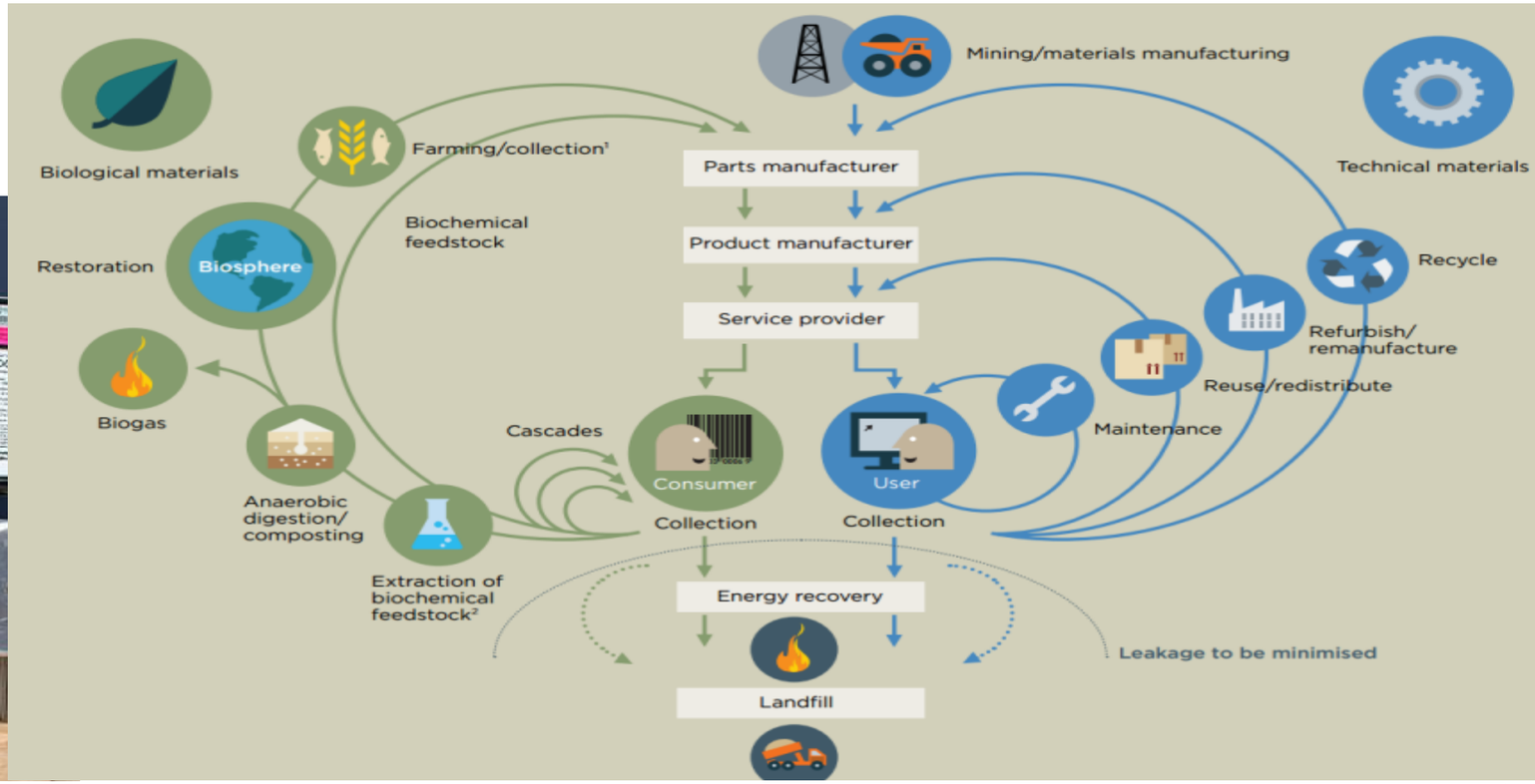
Sustainable Urban Manufacturing – Transport and Energy Integration



Design | Manufacture | Use | Re-use / Remanufacture

Re-use and Remanufacturing





Design → Manufacture → Use → Re-use / Remanufacture

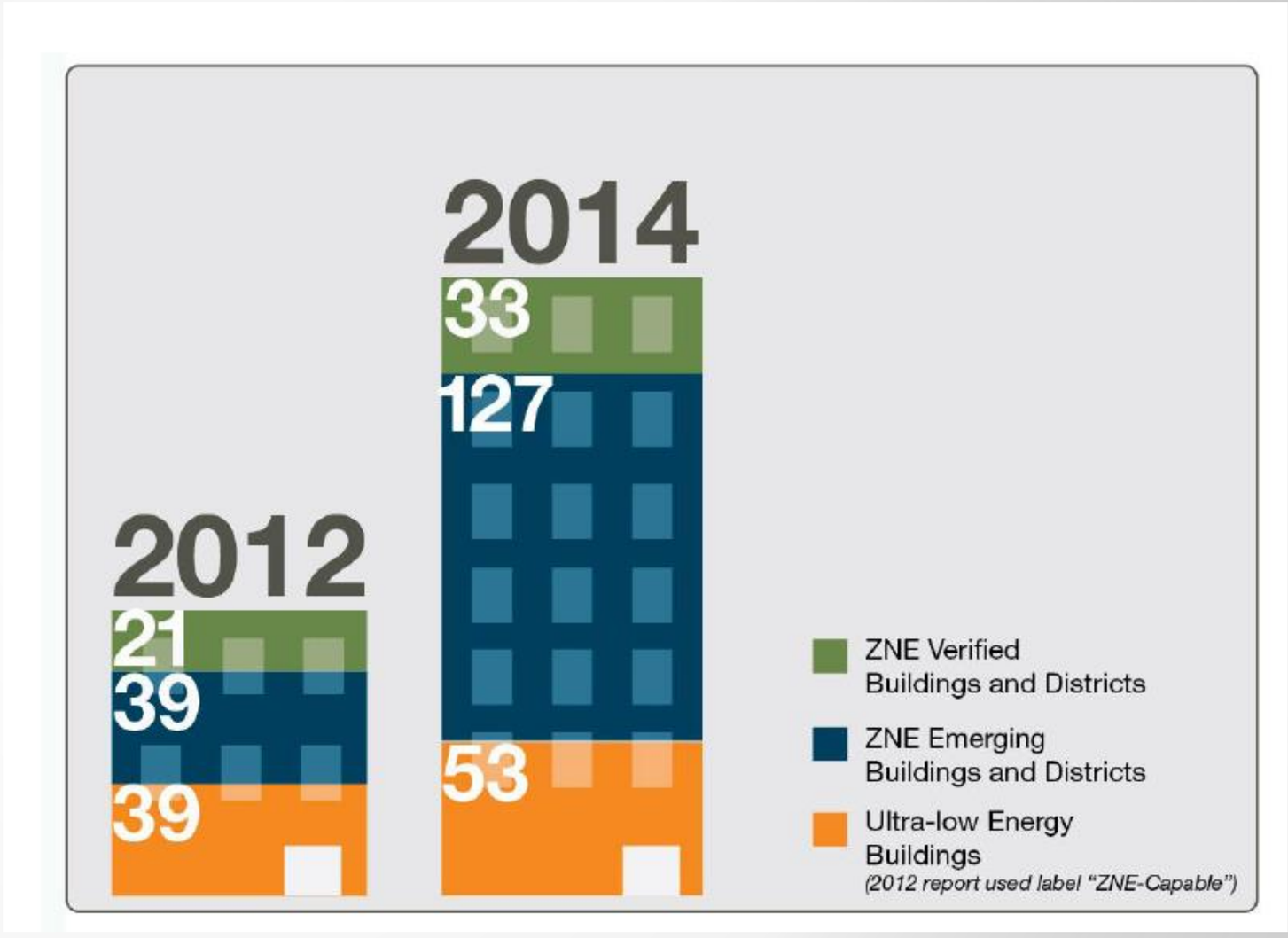
Jonathan Rowe
on Twitter @ JRoweSF

nbi new buildings institute

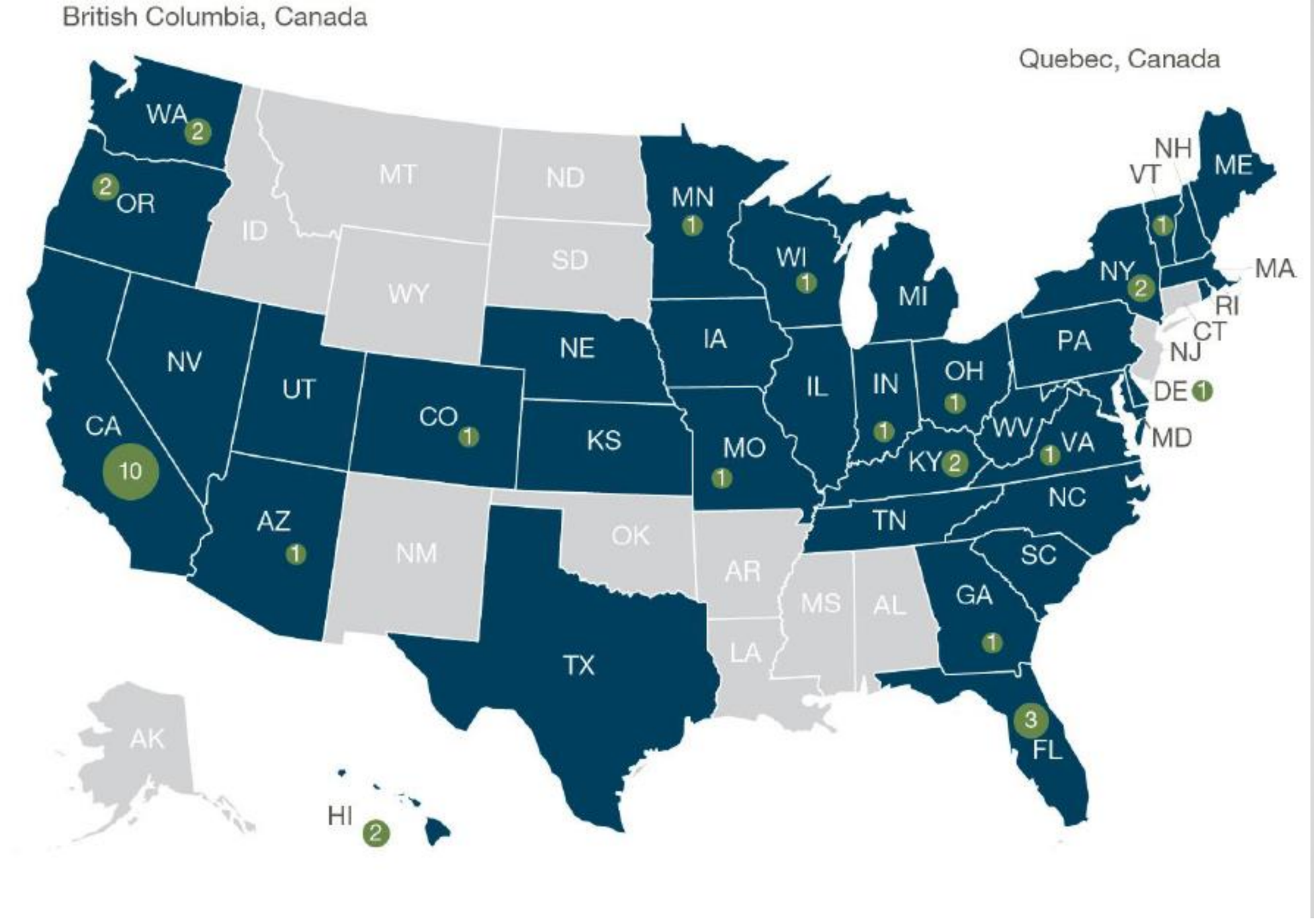
RESEARCH REPORT
January 2014

2014 Getting to Zero Status Update:

A look at the projects, policies and programs driving zero net energy performance in commercial buildings



99 213


British Columbia, Canada
Quebec, Canada
WA 2
OR 2
CA 10
NV
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AZ 1
CO 1
NM
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OH 1
KY 2
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FL 3
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VA 1
WV
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NY 2
VT 1
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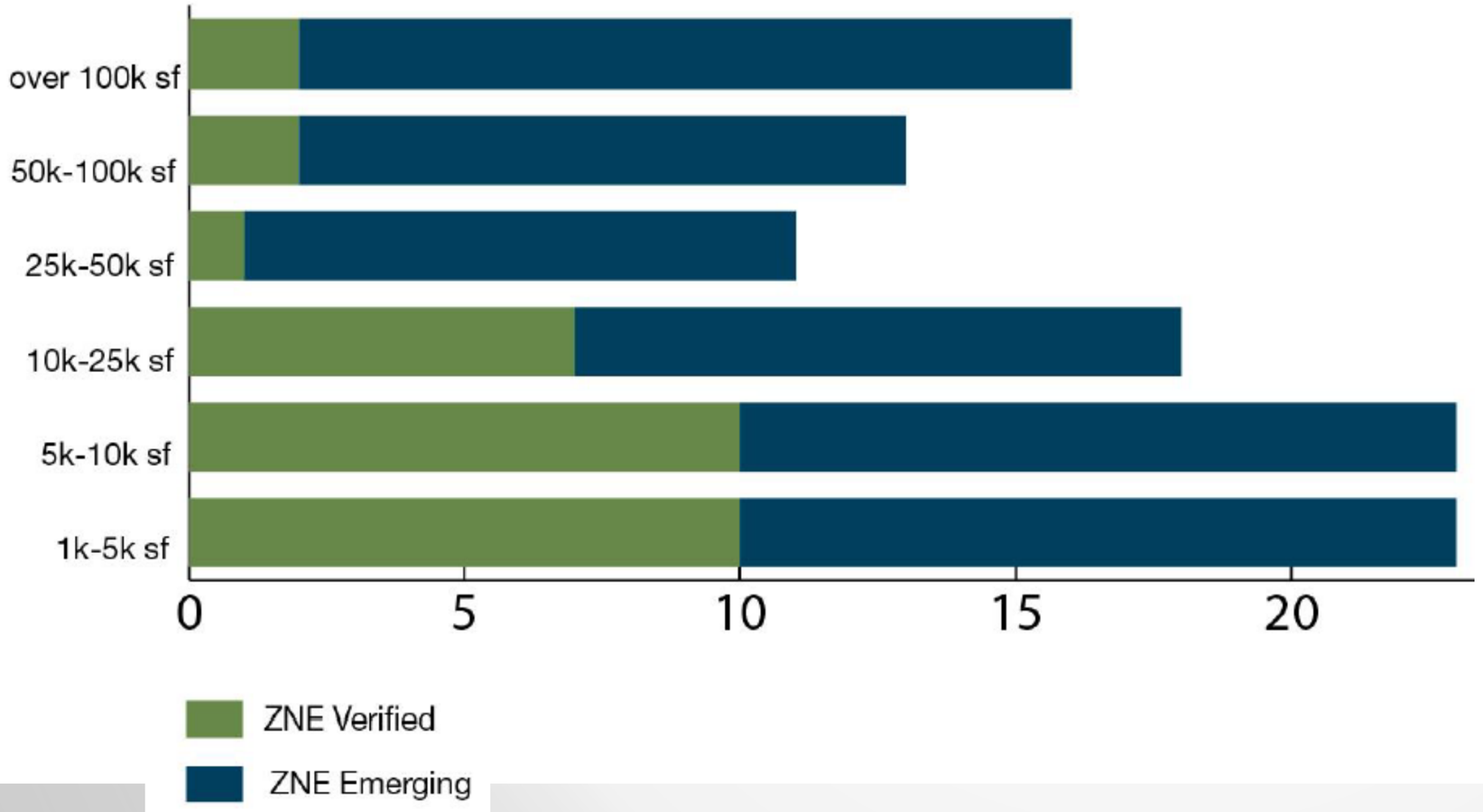
over 100k sf
50k-100k sf
25k-50k sf
10k-25k sf
5k-10k sf
1k-5k sf
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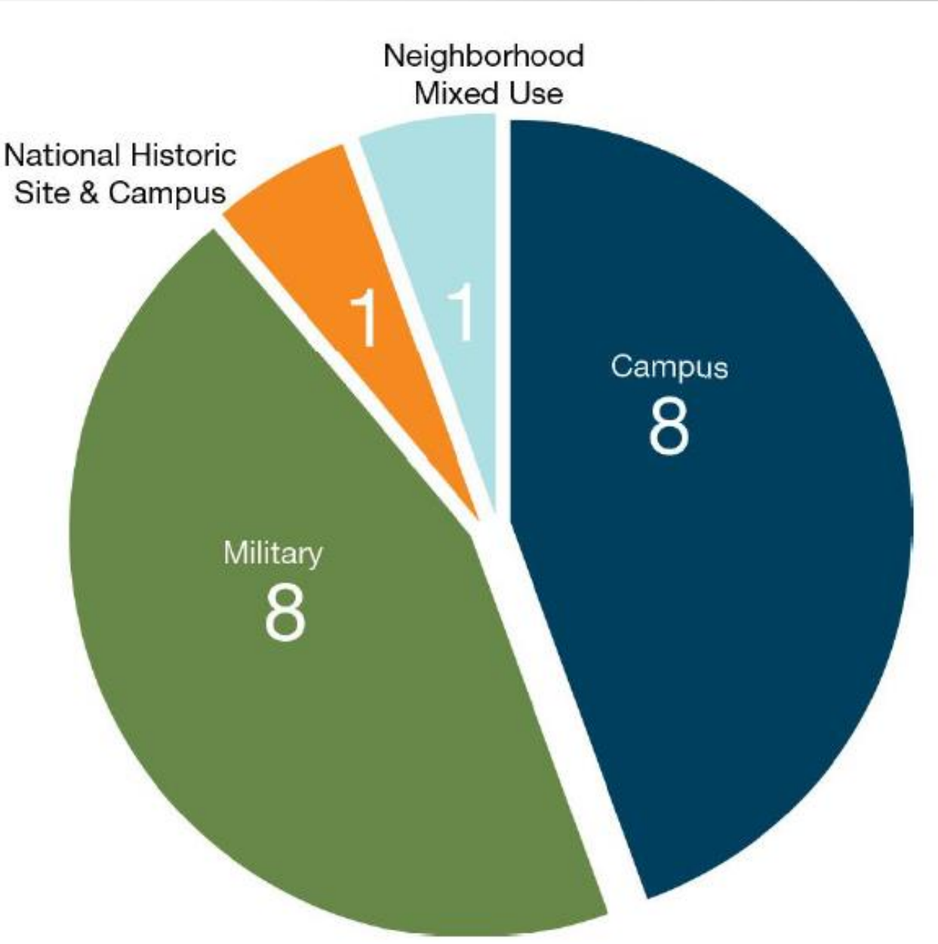
5
10
15
20
ZNE Verified
ZNE Emerging
n=109


Neighborhood
Mixed Use
National Historic
Site & Campus
1
1
Campus
8
Military
8

Building Information Model

Operational Energy Model

Embodied Energy Model

AUTODESK

ENGLISH

SEARCH

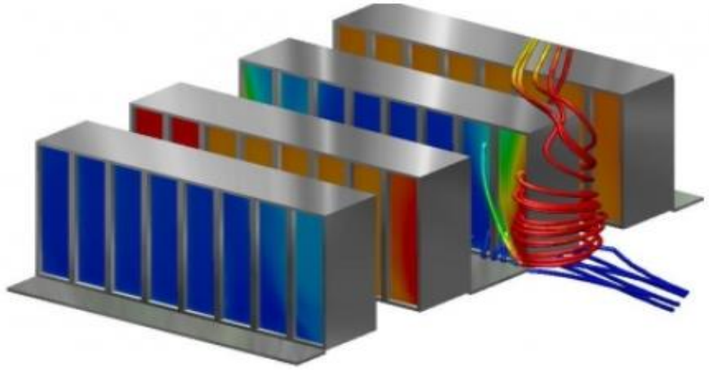
DESIGN ACADEMY BETA

DEPARTMENTS LIBRARY COURSES BLOG

Sustainable Design

http://academy.autodesk.com/sustainable-design

What's New

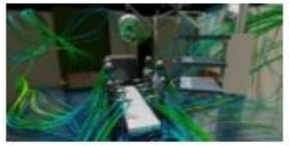


Free New Courses on Autodesk Simulation CFD for AEC Applications

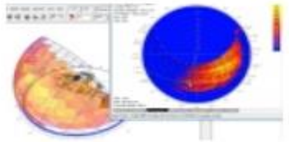
Developed for practicing engineers and advanced students, these courses can help you confidently get started with Simulation CFD today. After learning the fundamentals, dive into common AEC applications like datacenters and HVAC design.

In the Library

Building Science Fundamentals



Intro to Simulation CFD for AEC Applications



Vasari & Ecotect for High Performance Building Design

Whole Systems Thinking in Sustainable Design

WHERE IS CONTENT FROM AUTODESK SUSTAINABILITY WORKSHOP?

Find it now >

Sustainable Design Resources

Mr Imagination Videos

Quick, fun, and informative videos introduce sustainable design strategies and can be easily used in the classroom.

Content for Educators

Easily incorporate free sustainability materials into your existing curriculum.

Cradle to Cradle Design Course

Course from C2C Product Innovation Institute teaches Cradle to Cradle principles.

Ted van der Linden
on Twitter @ tedvanderlinden

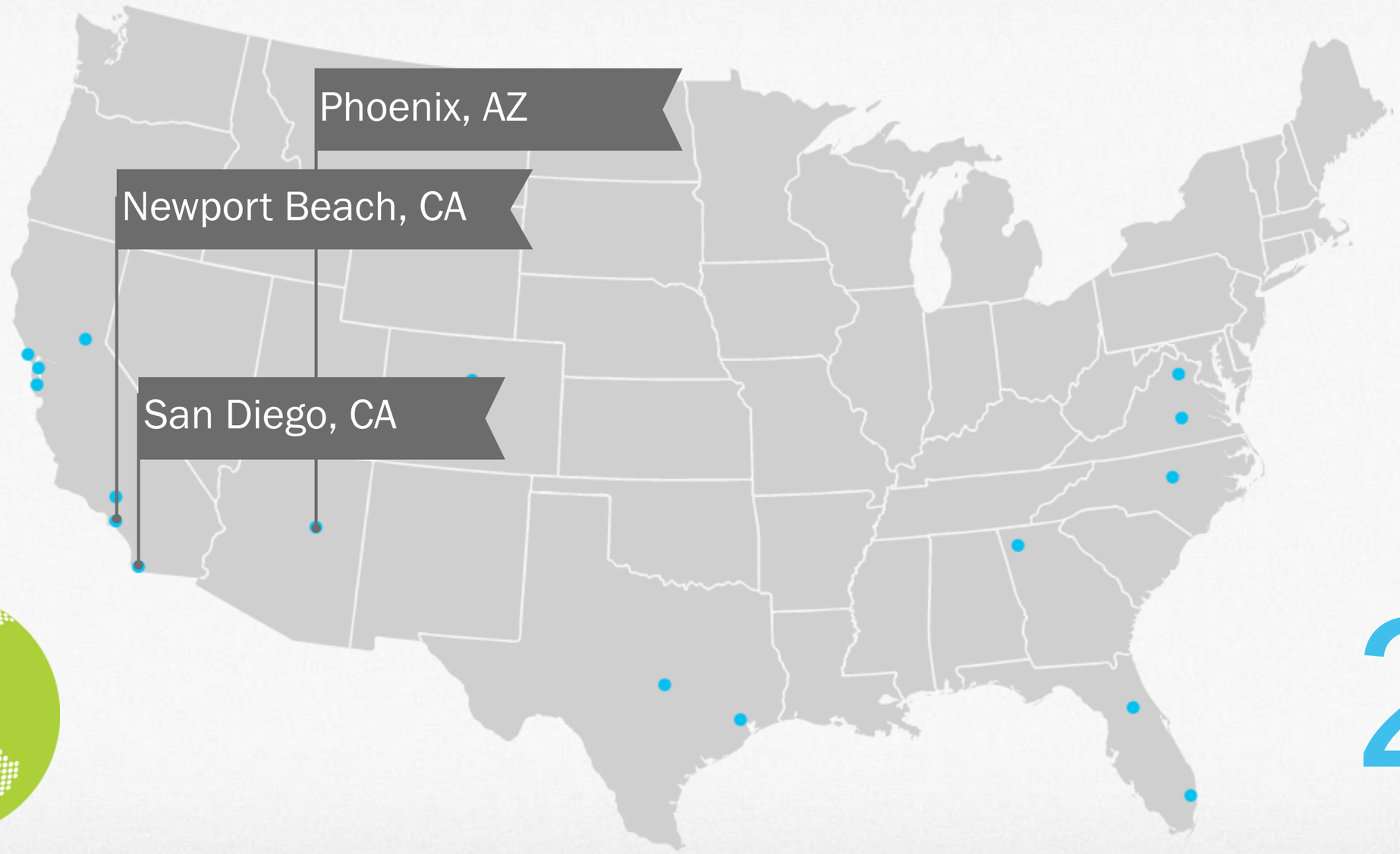
David & Lucile Packard Foundation

LOS ALTOS, CA

Deep Green Contracting:

how we interface & collaborate w/ design partners and new technologies

3 DPR PROJECTS / OFFICES



20

LOCATIONS

DPR San Diego

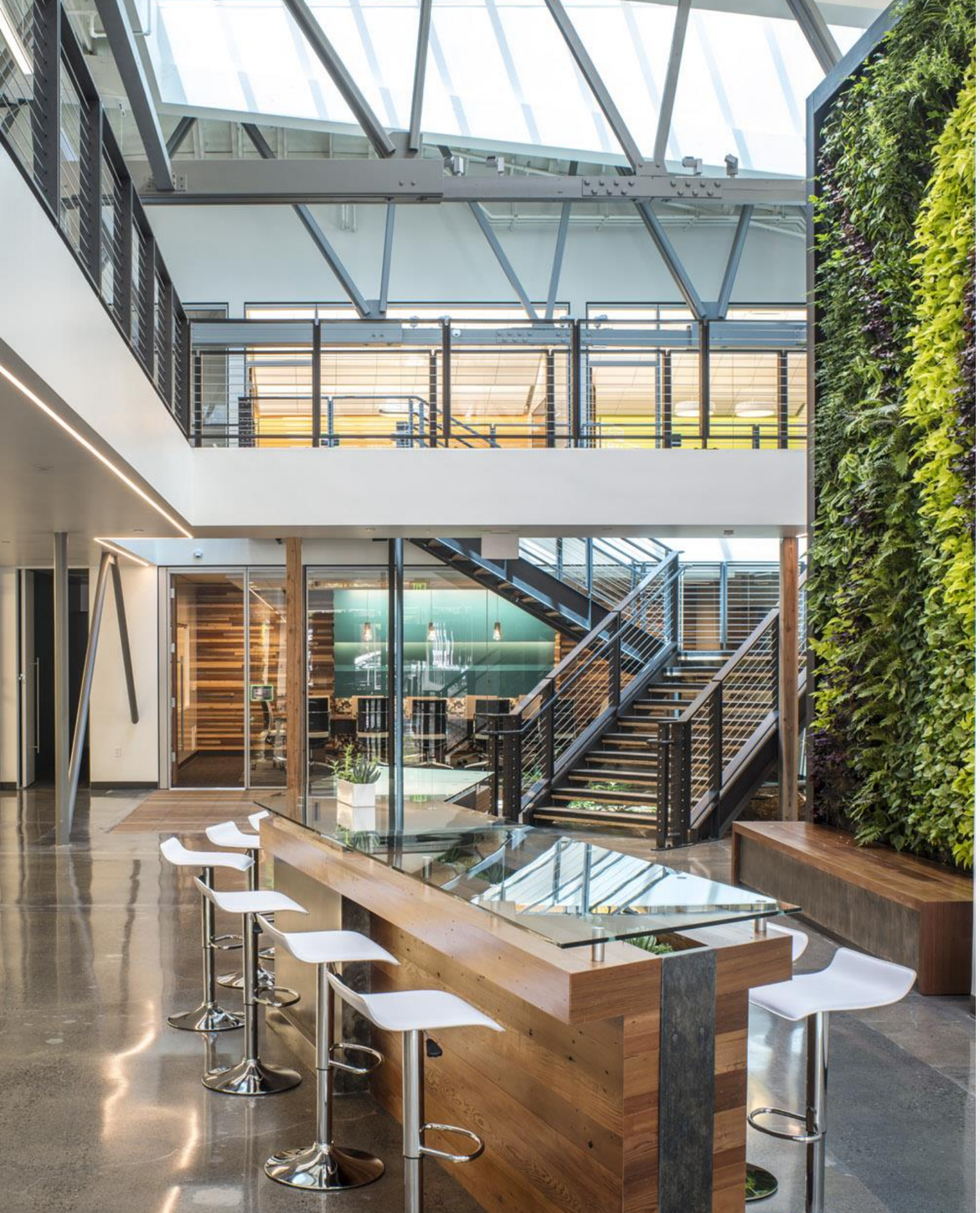
33,782 SF, RENOVATION, PV ON ROOF

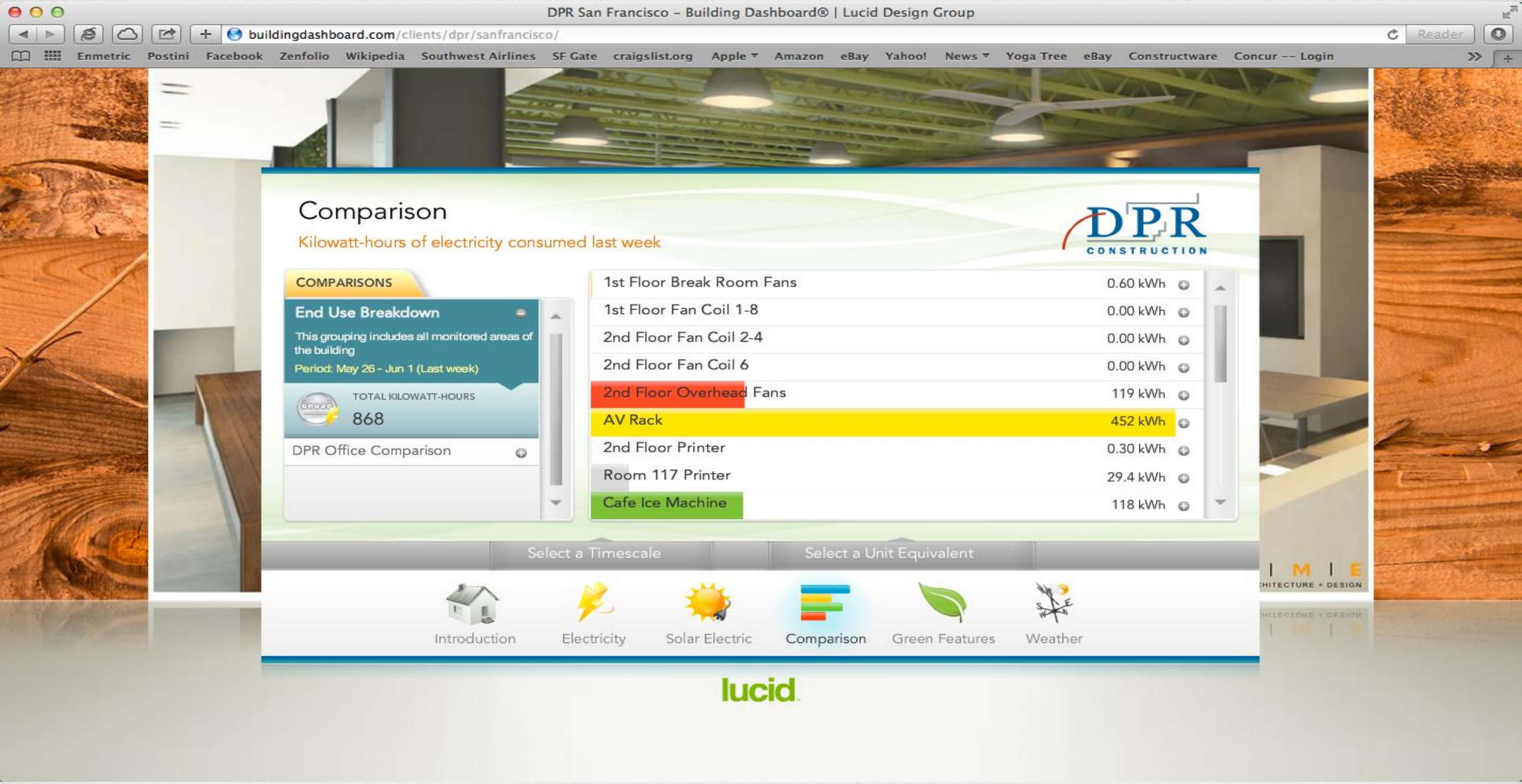
DPR Phoenix

16,533 SF, RENOVATION, PV OVER PARKING LOT

DPR San Francisco

24,000 SF, RENOVATION, PV ON ROOF




DPR San Francisco – Building Dashboard® | Lucid Design Group
buildingdashboard.com/clients/dpr/sanfrancisco/
Reader
Enmetric Postini Facebook Zenfolio Wikipedia Southwest Airlines SF Gate craigslist.org Apple Amazon eBay Yahoo! News Yoga Tree eBay Constructware Concur -- Login
Comparison
Kilowatt-hours of electricity consumed last week
DPR CONSTRUCTION
COMPARISONS
End Use Breakdown
This grouping includes all monitored areas of the building
Period: May 26 - Jun 1 (Last week)
TOTAL KILOWATT-HOURS
868
DPR Office Comparison
1st Floor Break Room Fans 0.60 kWh
1st Floor Fan Coil 1-8 0.00 kWh
2nd Floor Fan Coil 2-4 0.00 kWh
2nd Floor Fan Coil 6 0.00 kWh
2nd Floor Overhead Fans 119 kWh
AV Rack 452 kWh
2nd Floor Printer 0.30 kWh
Room 117 Printer 29.4 kWh
Cafe Ice Machine 118 kWh
Select a Timescale
Select a Unit Equivalent
Introduction
Electricity
Solar Electric
Comparison
Green Features
Weather
lucid

SOLUTIONS & IMPACTS VARY

	Main Sustainability Strategies Deployed		
	Expensive	Inexpensive	Most Impactful
	• Roof Monitors • Operable Windows • Controls System • PV Array (75kW)	• Bldg. Dashboard • Solatubes • Big Ass Fans	• Bldg. Dashboard • Operable Windows • PV Array
	• Solar Chimney • Operable Windows • PV Array (79kW)	• Vampire Switch • Solatubes • Bldg. Dashboard • Big Ass Fans	• Vampire Switch • Big Ass Fans • Solatubes • PV Array
	• Big Ass Fans • LED Lighting • PV Array (118kW) • Electrochomic Glass • BMS Controls	• Vampire Switch • Dimmable Lighting • Bldg. Dashboards • Solatubes	• Vampire (Kill) Switch • Bldg. Dashboard • Solatubes • Big Ass Fans • PV Array


SUPPORTING THE
DESIGN-LED
REVOLUTION

Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2014 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

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