

Human Element of LEED

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PEOPLE--PROFITS--PLANET



Break-Out Session Objectives

- NASA's GIANT LEAP
 - A Primer to USGBC's LEED Certification
 - NASA's Green Building Step
- BEYOND LEED
 - Beyond Energy and Environment
 - Shift from Green Buildings to Low-Risk Buildings



“Each new LEED building generates a contagious enthusiasm to move forward and do better”

Eugene Mazar
Facilities Engineering &
Real Property Division



Leadership in Energy and Environmental Design

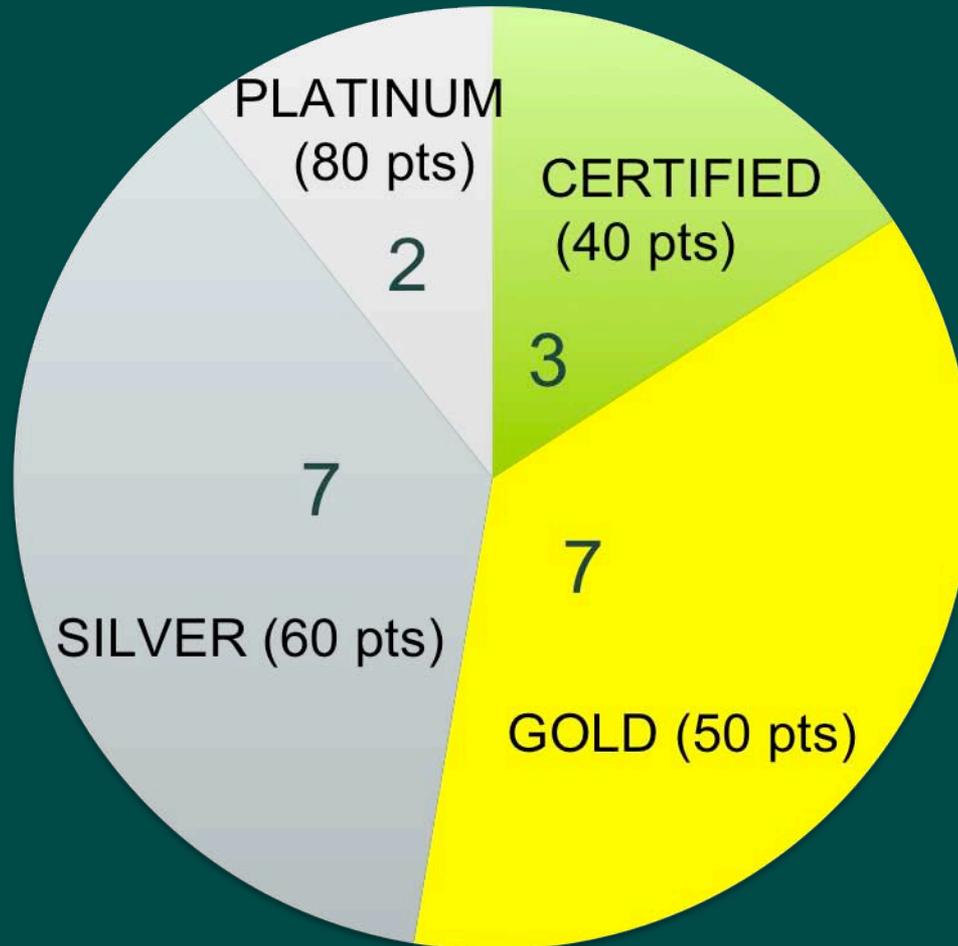
A leading-edge system
for certifying the
greenest performing
buildings in the world



LEED Point Categories

CATEGORY	POINTS
Sustainable Sites	26
Water Efficiency	10
Energy and Atmosphere	36
Material and Resources	14
Indoor Environmental Efficiency	15
Innovation in Design	10
Regional Priority	4

NASA's LEED Footprint





“GREEN BLING”

Flights Project
Center
(JPL)

Start with the
Boring Stuff

Propellants North
Admin & MX
(KSC)



End with the
Fancy Stuff





Trading Glass for the Office

JPL



What's Wrong
With This
Picture?



Near Future

Ames
Collaborative
Support Facility



Beyond LEED

Adding the Human to Energy and
Environment

Environmental Elements of Green: Milk

- Tradition Jug

- Ship in milk crates
- Crate washing required
- 5 deliveries a week
- 3.5 gallon of milk per cubic meter of truck space

- Square Milk Jug

- No Crates needed
- 67% reduction in water
- 2 Truck deliveries a week
 - 50% reduction in fuel
- Cheaper cost per gallon for consumer



Human Element of Green: Milk

- New design leads to
 - Difficult in pouring
 - Increased spills
- Classes to “teach” consumers to pour milk
- Jug fits in refrigerator door, and spoils quickly

For the IH Fundamentalists....

IV. First Aid Measures:

Inhalation: Remove to fresh air. If breathing is difficult, get medical attention.

Ingestion: If person is conscious wash out mouth with water. Get medical attention.

Skin exposure: Wash skin with soap and water. If irritation develops or persists, get medical attention.

Eye exposure: Immediately flush eyes water for at least 15 minutes lifting upper and lower lids. Get medical attention.

XI. Toxicological Information:

Routes of Exposure

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Eye: May cause eye irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

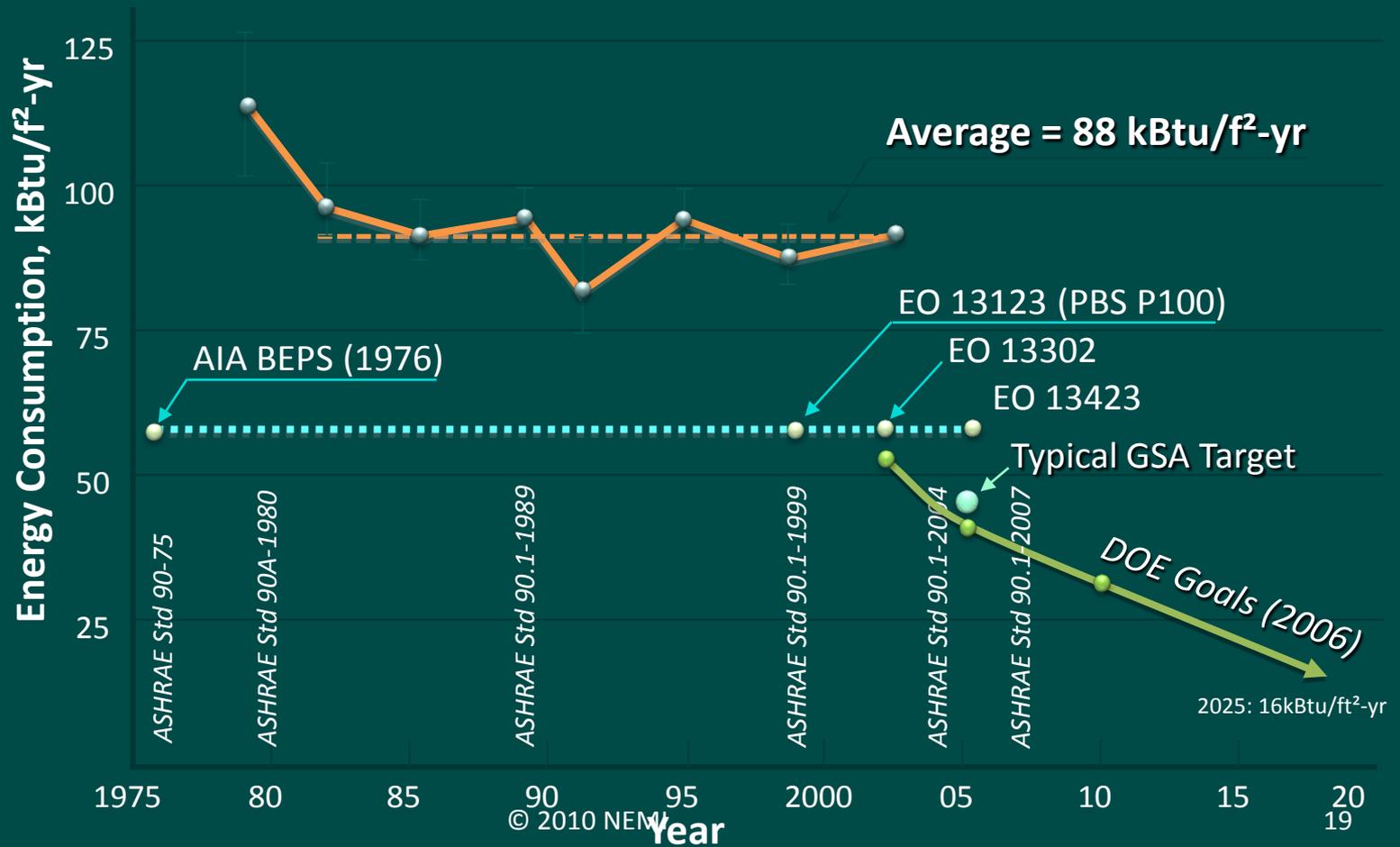
Ingestion: May be harmful if swallowed.

Environmental Element of Green: Building

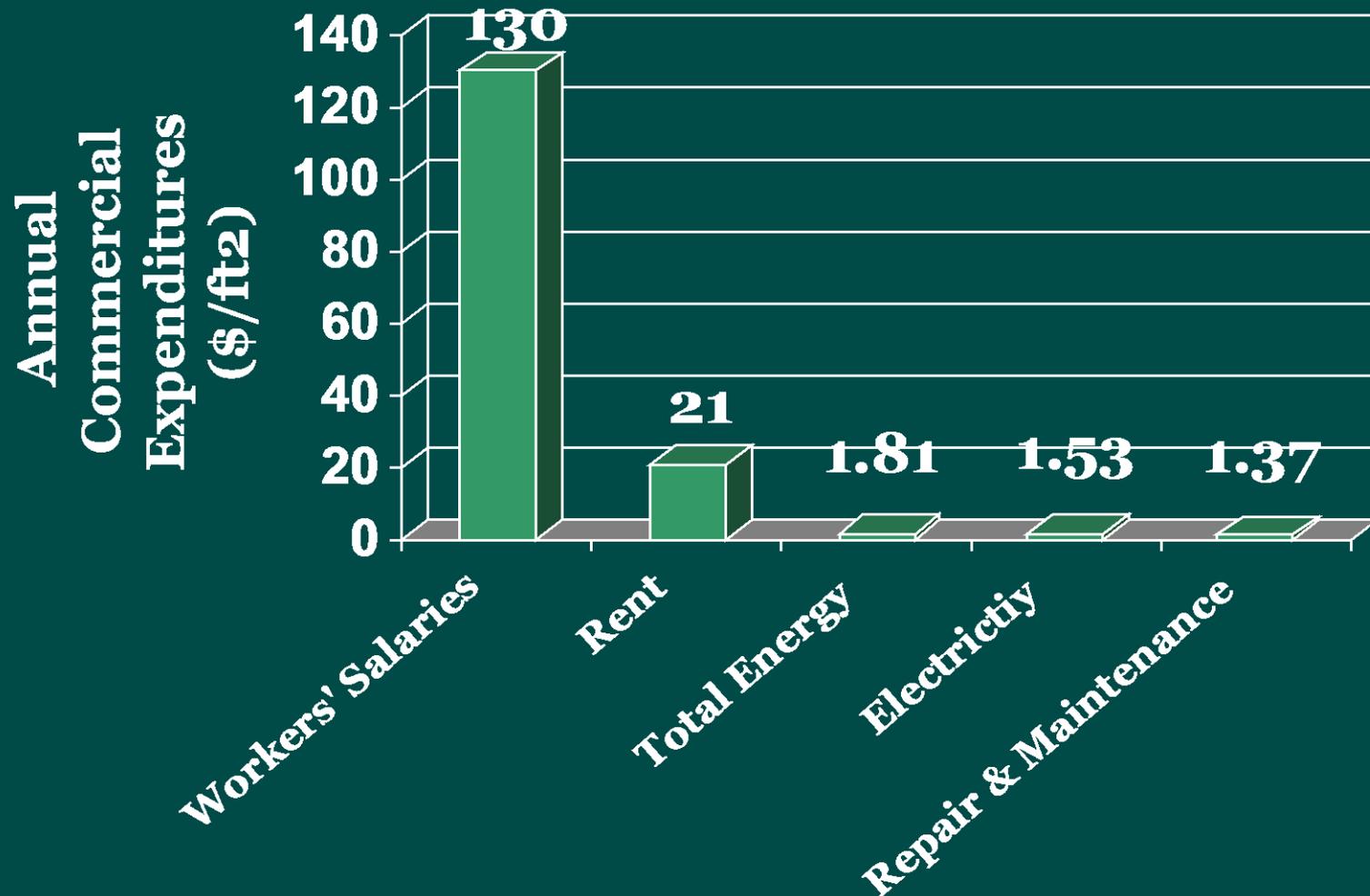
- Use less energy
- Use less water
- Reduce impact on natural environment
- Create less waste
- Create market for “green” products
 - Renewable materials (bamboo)
 - Recycled materials (carpet)
 - Green chemicals (paints, adhesives, cleaners)

Energy Elements of Green: Buildings

DOE/EIA CBECS Trend with 95% CI (June 2006)



Human Elements of Green: Buildings



Human Element of Green

- “Green Fuel”: Corn Ethanol
 - Higher water use
 - Affects prices of food worldwide
- “Green Cleaners” Pyrethrins
 - Pyrethrin-based cleaners: allergens
 - Energy efficient hand dryers: noise and infection transmission
- “Renewable Energy”: Construction
 - Blue collar to “green collar” workers
 - Construction safety

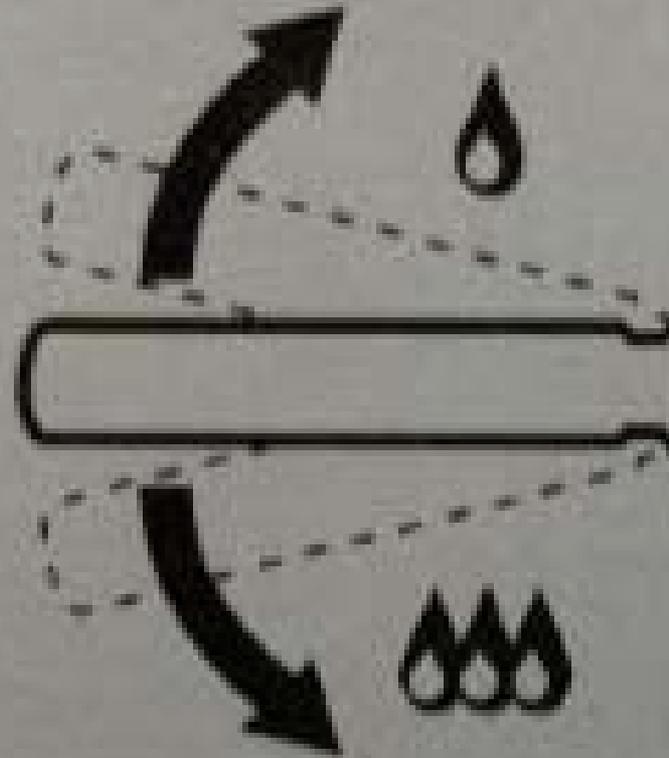


Human Design

Against
the
Flow?

Water-Saving Dual-Function Hand

UP for #1 (liquid waste)



Coated to protect
against germs

DOWN for #2 (solid waste)

By installing this water-saving hand with dual-function flush, this facility is committed to protect and preserve the environment. For the system to Please use it like at the diagram above and push the handle in the direction you needs. With your assistance, we can do our part to preserve the planet.



Beyond Green

Shift from “Green” to “Low-Risk”
Building



City Center Las Vegas

For every green
award won (6),
there was a
lost worker
life

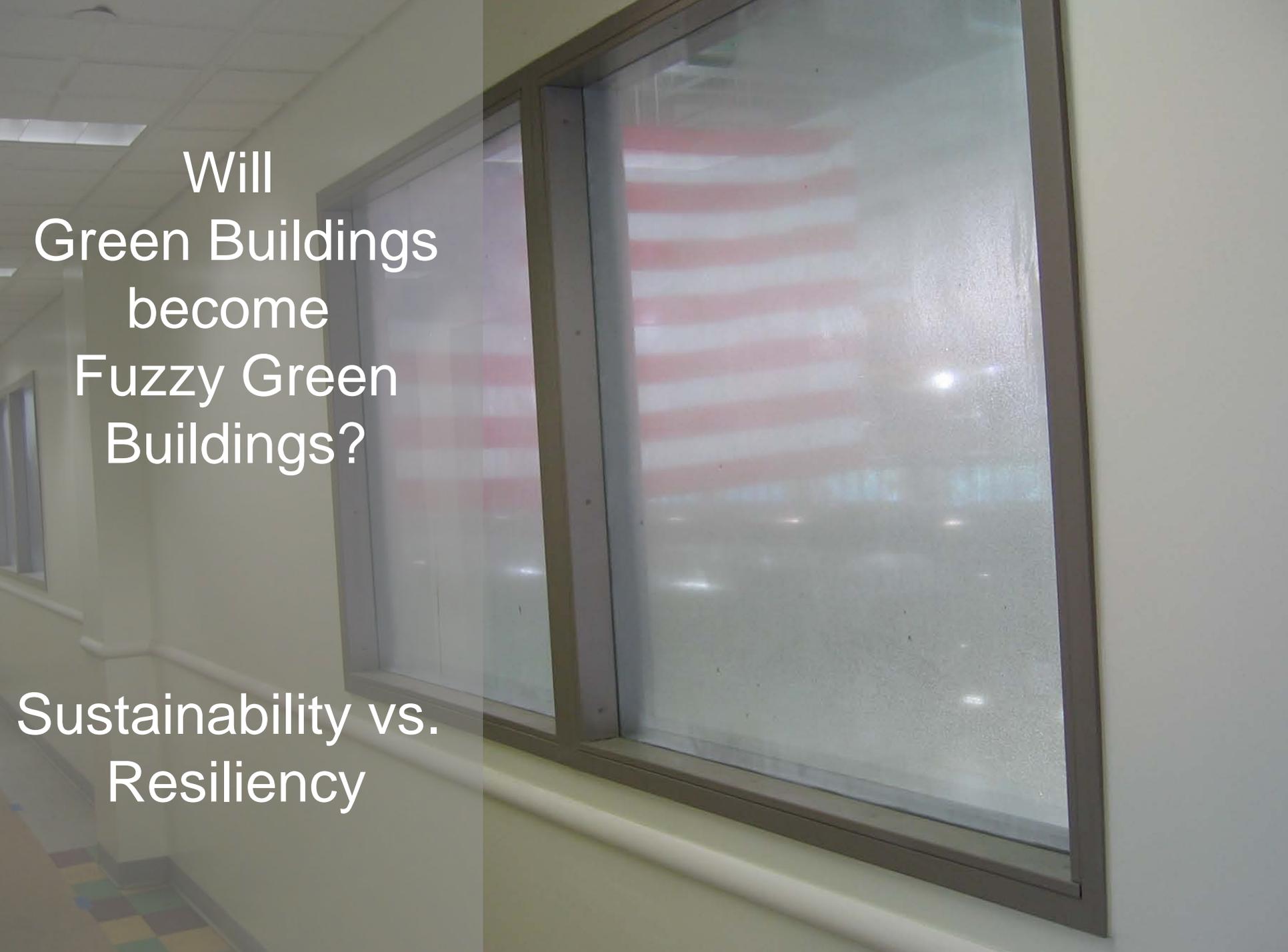








Green vs. Good? What do you see wrong?

A photograph of a hallway with a large window. The window reflects an American flag. The hallway has a white wall, a white handrail, and a tiled floor. The ceiling has recessed lighting.

Will
Green Buildings
become
Fuzzy Green
Buildings?

Sustainability vs.
Resiliency

Green Rooftops

Moisture
Management
Dream or
Nightmare?



Harvest Rainwater To Flush Toilets

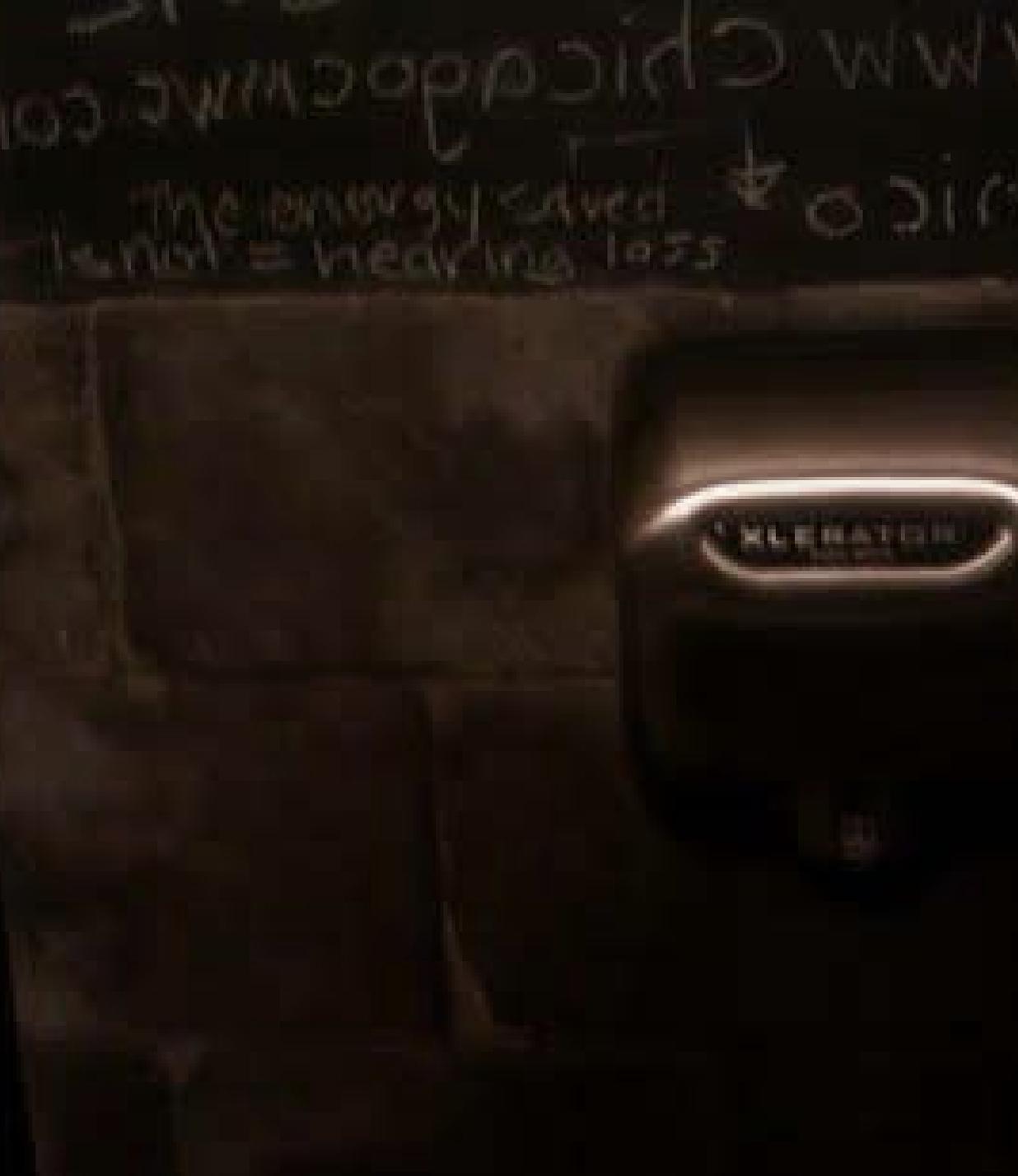




**Why is the
water
in the
toilet
glowing?**

Reuse Fungi?





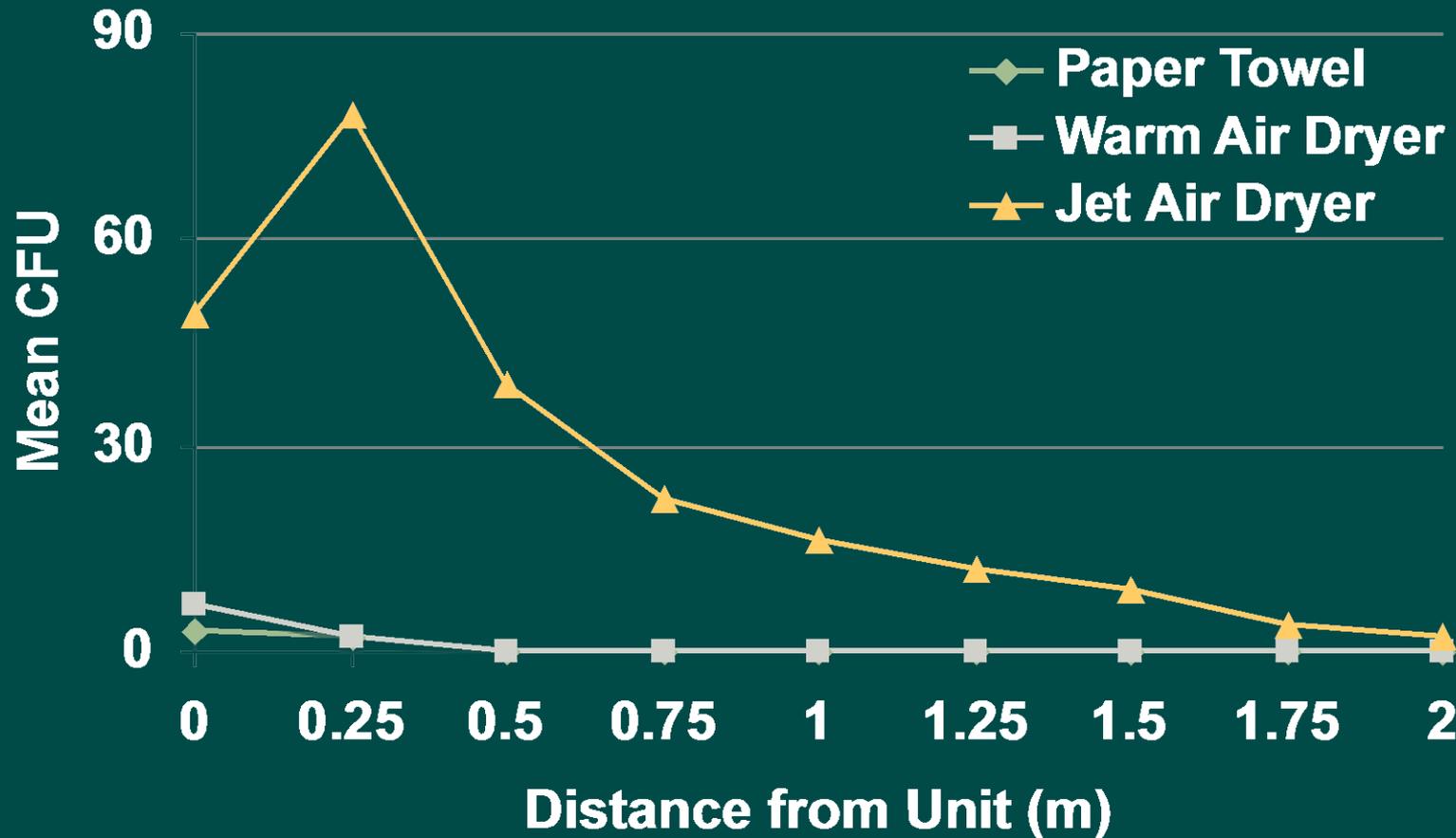
**Energy
efficient
hand-
drier...**

or...

Hand Dryer Noise Levels

Hand Dryer	Model #	Dry Time	Cost	Decibels
Xlerator	XL-W	12	418	95-100
Dyson Airblade	AB 02	10	1399	90
World Dryer AirForce	J-974	14	260	85
Electri-Aire	LE1-974	40	150	70
Fast Dry	HK-1800PA	45	91	58

Disease Transmission

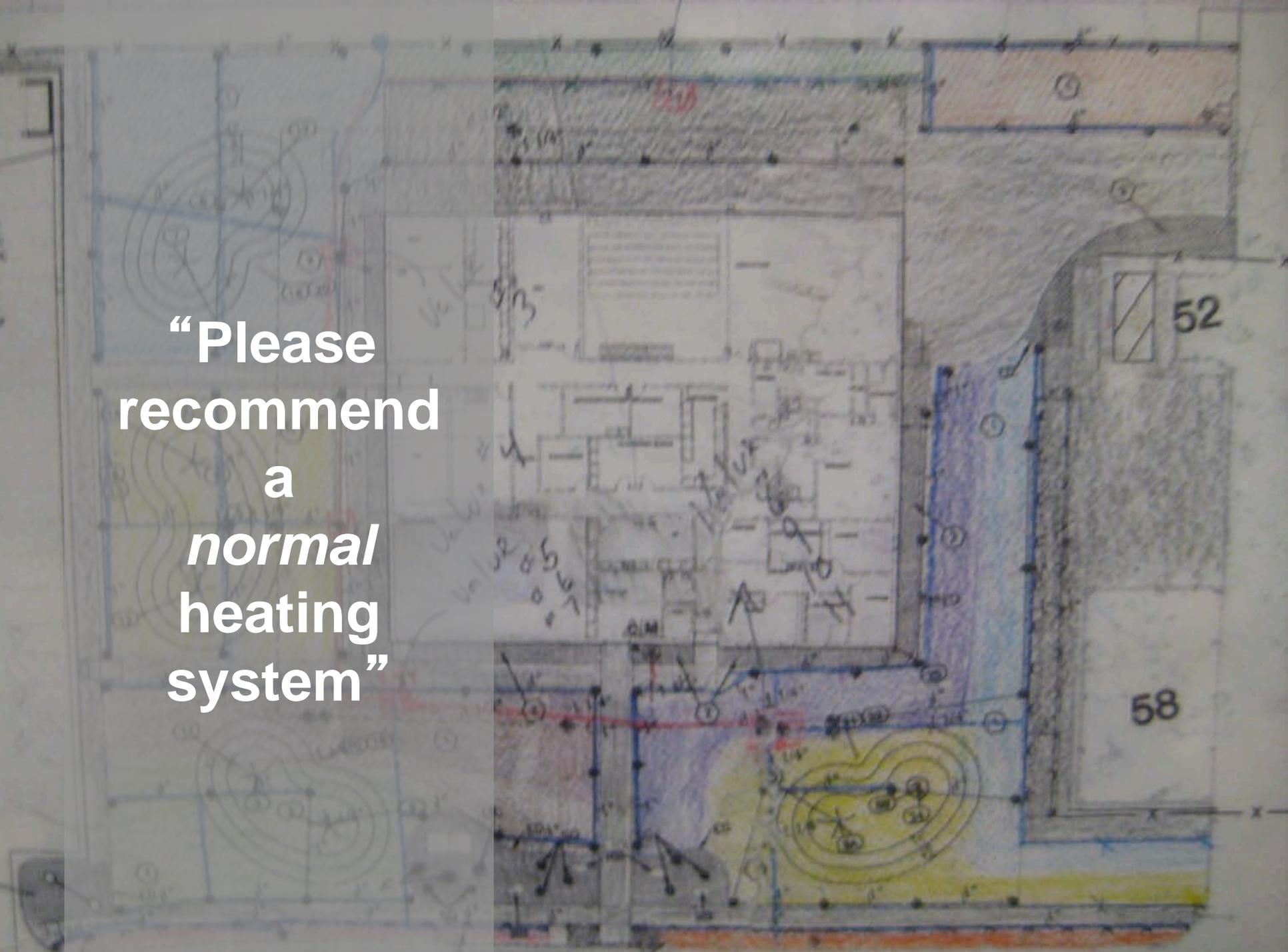


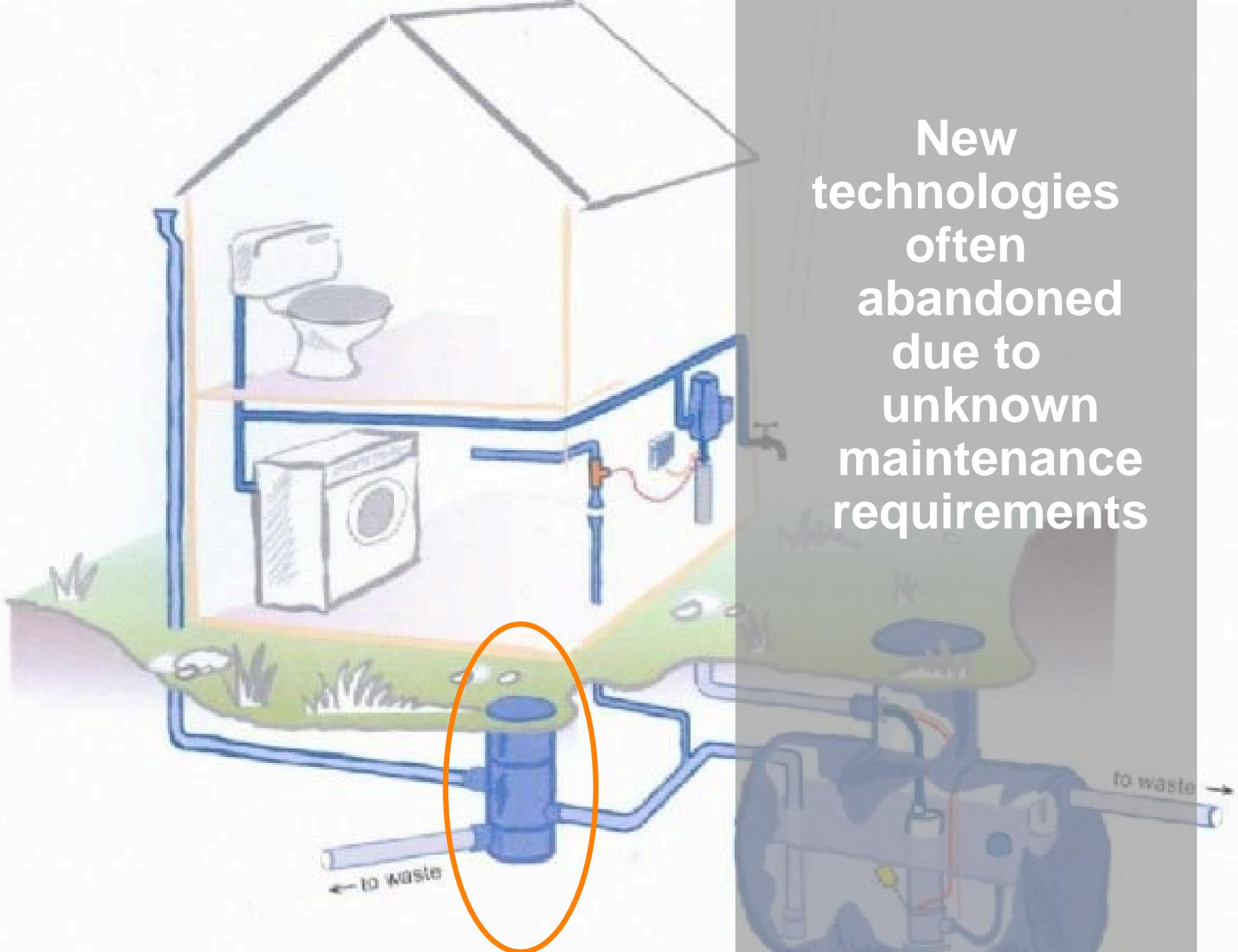
Sunshade?

**Paradise for
Birds?**



“Please
recommend
a
normal
heating
system”





New technologies often abandoned due to unknown maintenance requirements

OH = Risk Communication

- From Design to Operations
 - Engineer to Facility Manager
- From Intent to Usage
 - Architect to Occupants
- From Green Bling to Behavior Change
 - New Technology to Conservation Culture

IH & LEED: Beyond IEQ

- Morbidity/Mortality
 - Energy extraction/processing
 - Transportation/Building construction
- Behavior-based safety
 - Culture change for conservation
- Ergonomics
 - Human interaction with technology
- Training
 - Expectations with new processes

Take-aways

- Be proactive – get involved with the Eco-Charrette
- Realize you don't know what you don't know
- Culture change trumps technology
- Durability and usability cannot be overlooked for sustainability

Questions?

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