

One Path Toward Sustainability (Among Many):

Our Story at



John Leigh

Manager, Waste & Recycling Programs



DHMC: an academic medical center consisting of 3 major components: Hospital, Clinic, Med School

– Square feet, main facility	1.8 million
– Clinic outpatient visits	526,366
– Hosp. patients discharged	23,901
– OR Cases	18,000
– Employees	5,700
– Staffed beds	386
– Residents	360

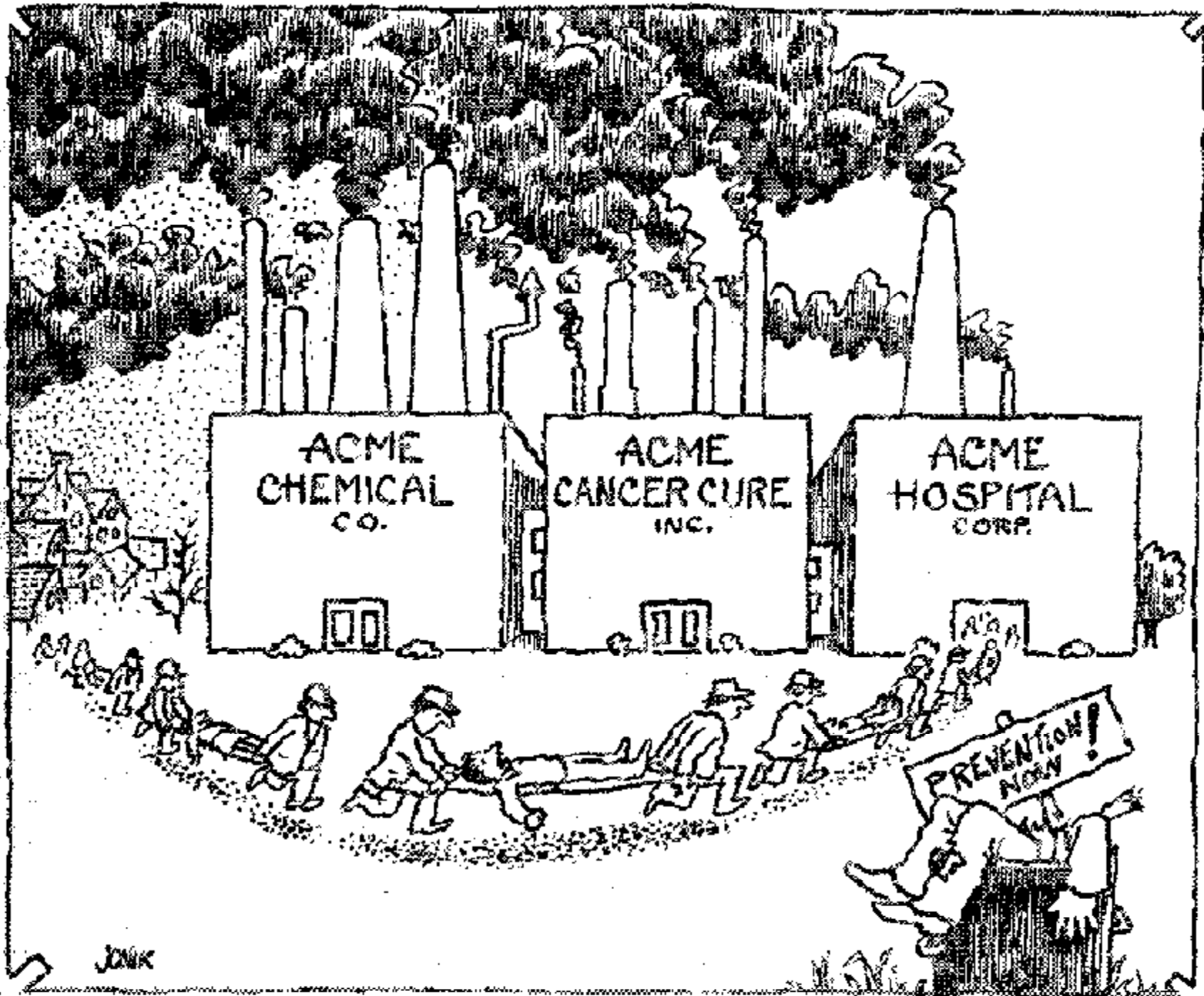
Agenda

- Why bother?
- DHMC's green operational elements
- Focus on measurement, data collection
- Wee bit of advice
- Q & A

Why are hospitals bothering to **green** their operations?

- Public Health Benefits
- Cost Savings
- Reg. Compliance/Liability
- Indoor Air Quality
- Community Relations
- Healing Environments
- Recognition of Our Large Environmental Footprint
- Mission & Ethic
- Precautionary Principle





ACME
CHEMICAL
CO.

ACME
CANCER CURE
INC.

ACME
HOSPITAL
CORP.

PREVENTION!
NOW!

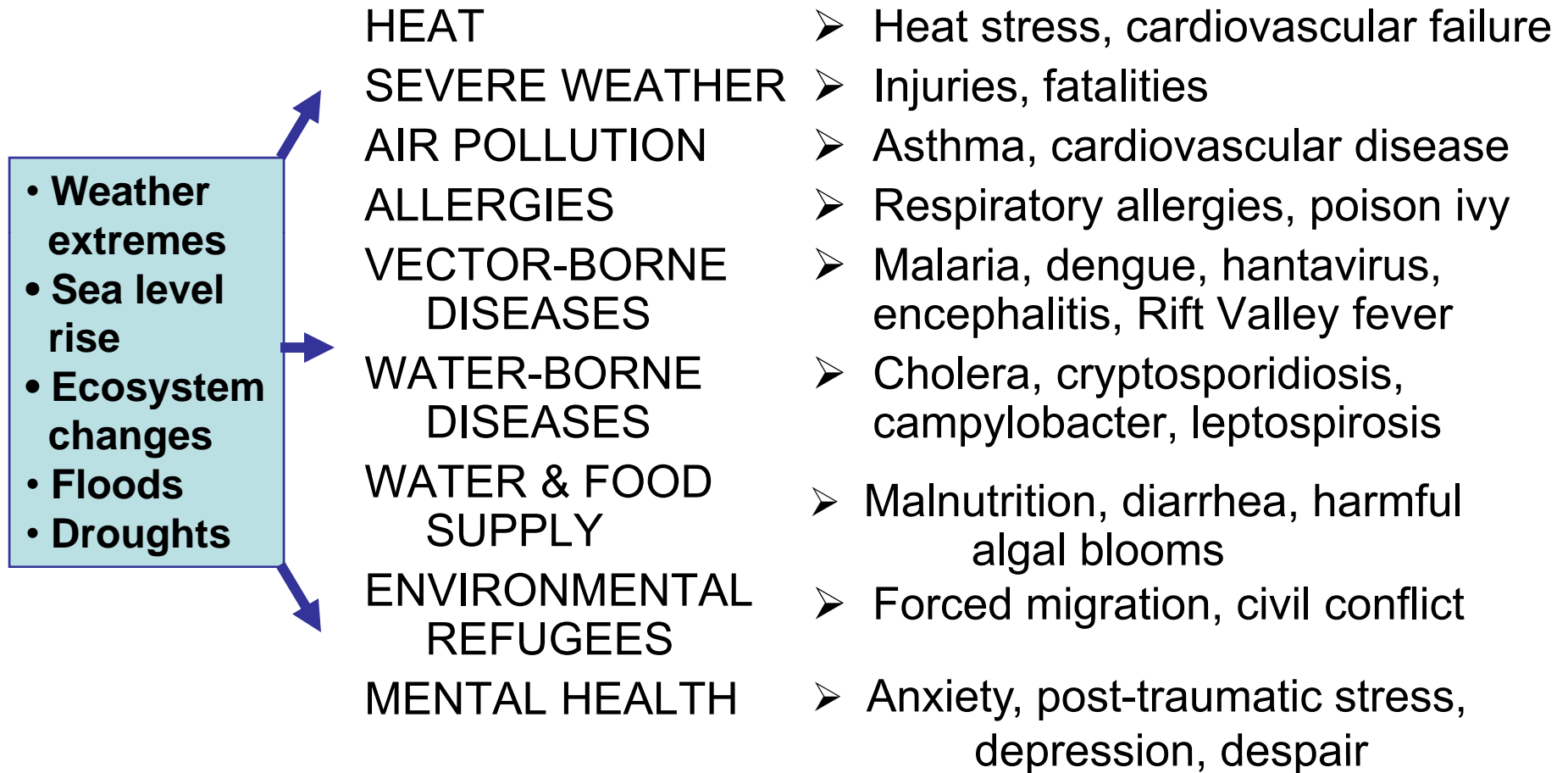
Jonik

Could these trends be connected?

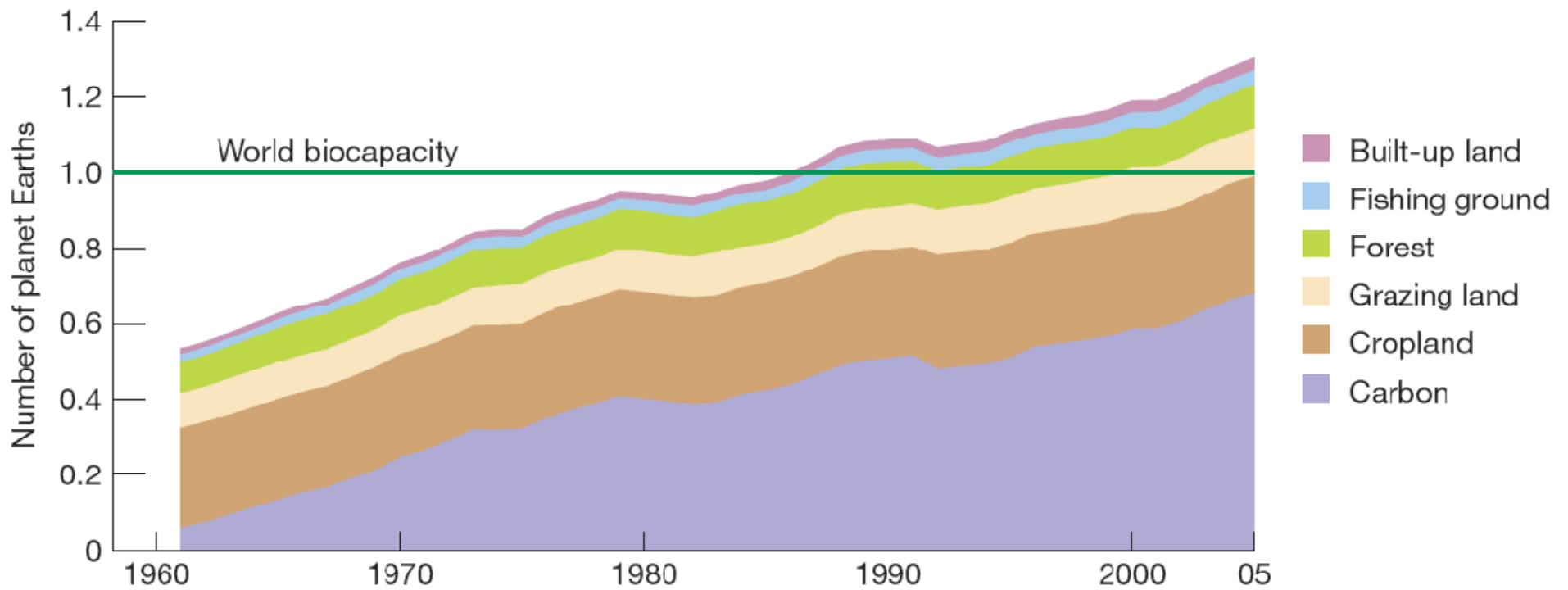
- ↑ Rise in chemical production & prevalence of chemicals in the products we use
- ↑ Rise in our toxic chemical body burden
- ↑ Rise in the incidence of cancer, asthma, diabetes, autism...

“Overall...the health effects of a rapidly changing climate are likely to be overwhelmingly negative.”

– World Health Organization



Depletion of Resources: We're drawing down natural capital



Source: *The Ecological Footprint Atlas 2008*. Oakland: Global Footprint Network.



Mary Hitchcock Memorial Hospital, founded 1893
(Hanover, NH)



Dartmouth-Hitchcock
Clinic
Founded 1927

DHMC 20 Years Ago





DHMC Statement of Environmental Principles

- Manage & minimize use of hazardous materials
- Use renewable natural resources and conserve non-renewables
- Practice pollution prevention
- Minimize waste through source reduction, re-use, and recycling programs
- Conserve energy and water, improve efficiencies
- Ensure health & safety of our employees by promoting safe work practices, reducing exposure, using safe technologies
- Train & educate employees in order for them to make work/practice decisions in support of these principles
- Monitor and evaluate our practices as they relate to environmental sustainability

DHMC Culture, Reputation



- Dartmouth's culture of excellence extends to environmental performance
- H2E/PGH top award winner since 2003
 - ✓ leads to good reputation
 - ✓ fosters workplace pride
 - ✓ builds community

Who Leads Which Program Components

- Energy, Water, Air Emissions – Engineering
- Toxicity Reduction, Haz. Waste – Safety Office
- All Other Waste Mgmt. – Housekeeping
- Green Building – Facilities Planning
- Traffic Demand Management – Security & Parking

Accomplishment Highlights

- Green Design & Construction
 - DOE award for efficiency of original power plant
 - Great use of daylighting
 - Recent expansion received informal rating of “LEED Certified” (just 1 point below LEED Silver)
- Conservation
 - Water conservation project: 28% reduction in water usage
 - High efficiency lighting retrofits
- Toxicity Reduction
 - Elimination of Mercury devices, Ethylene Oxide
 - Reduction of Glutaraldehyde through product substitution

Accomplishment Highlights (cont'd)

- Environmentally Preferable Purchasing (EPP)
 - Green cleaning chemicals, equipment
 - Flooring, roofing
 - Remanufactured toner cartridges
 - Recycled content items: copy paper, towels, napkins
 - Representation on Standards & Evaluation Committee

Greening of fleet vehicles



Using biodiesel fuel in all of our diesel fleet and grounds vehicles

Some green roofing



Accomplishment Highlights (cont'd)

Progressive Waste Reduction Programs

- Comprehensive recycling programs
- Compost our food waste
- Ongoing “red bag” reduction education
- Electronic forms, prescriptions, pay stubs, records
- Significant reuse and donation programs
- Reusables – food service ware, toters

It All Starts with Purchasing

Environmentally Preferable Products



Attributes to Request/Demand

- Non-toxic (or minimal toxicity)
- Durable and reusable
- Can be reprocessed
- Minimal packaging
- Take-back provisions
- Energy efficient
- Recyclable
- Recycled content
- Mercury free
- PVC or DEHP free
- Chlorine Free

“Single Use Device” Remanufacturing (Reprocessing)

- Arthroscopic shavers
- Blood pressure cuffs
- Soft tissue ablaters
- External fixation devices
- Electrophysiology catheters
- Scissors and staplers
- Biopsy forceps
- Laparoscopic scissors and forceps
- Clamps and dissectors
- Compression sleeves (DVT)
- Phaco tips
- Pneumatic tourniquet cuffs
- Pulse oximeter sensors
- Orthopedic drill bits and burrs
- Tracers
- Trocars
- and many opened-but-unused items

Advantage Reprocessing Program

Place all “Single Use” devices in the new blue reprocessing bin.



Exceptions: sutures, glass vials, prep razors, needle counters, needles and syringes. These items should be placed in the attached sharps container.

Facts about the Advantage Program

- **SAFE** - Meets original manufacturer specifications and carries warranty from Ascent
- **HOSPITAL APPROVED** - Reviewed and approved by Health Alliance Infection Control and Surgical Advisory committees
- **OVERSIGHT** - Cleared by the FDA
- **WIDELY ACCEPTED** - Used by nationally respected medical centers nationwide
- **CONVENIENT** - Requires no sorting
- **GOOD FOR THE ENVIRONMENT** - Metals & plastics recycled

Questions about reprocessing should be directed to Kathleen Blair, R.N., 513-584-8312 or Michael Nussbaum, M.D., 513-584-2320.

University Hospital
Health Alliance

Savings from Reprocessing SUD's

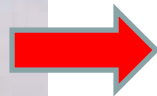
Estimated Savings for a 500 Staffed Bed Acute Hospital	Annual Est. Savings Potential Based on Best Demonstrated Practices	Annual Est. Waste Diversion (lbs) Potential Based on Best Demonstrated Practices
Laparoscopic Trocars	\$93,799	4,288
Ultrasonic Scalpels	\$124,345	1,985
Compression Devices	\$202,193	1,072
Diagnostic Ultrasound Catheters	\$209,217	13,540
EP Catheters & Cables	\$289,430	282
Pulse Oximeter Probes	\$433,585	994
Total Annual Savings Potential:	\$1,544,144	25,045

- Numbers based on best demonstrated practice from actual Ascent customers

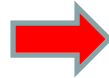
Reusable sharps containers



Move from disposable suction canisters toward fluid management systems that drain dispose



Sterilization Wrap Reduction





Recycling pilot in the OR

YES

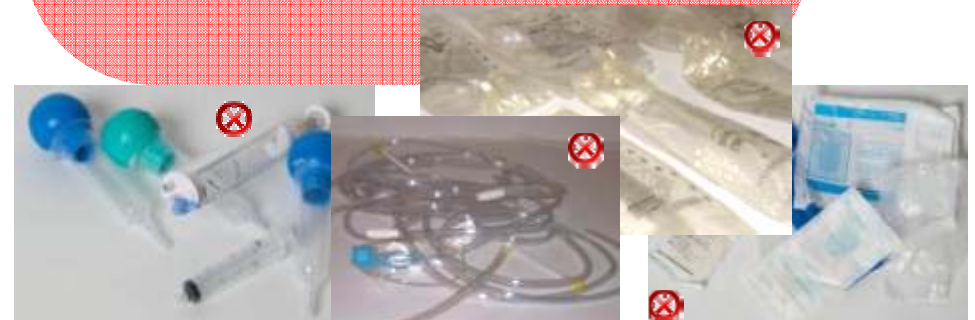


- Blue Wrap, including clean drapes & gowns
- Rigid, empty plastic containers of any shape, color, or number
- Boxboard

NO



- Foam
- Syringes – even if unused
- IV bags
- Tubing of any type
- Soft plastics, films
- Peel pouches, overwraps



Any item from
the surgical field
once a case has
started—NO!!!





“Systems” to encourage
the desired outcomes



In high volume infectious waste areas



In lower volume treatment areas



We autoclave our infectious waste







**CANS
AND
BOTTLES**

 **PAPER**

TRASH

Departmental Recycling Bins



Personal, Deskside Recycling Bins



Waste Separation Signage



3. Unwrap case cart(s).
4. Place recyclable items in hanging bag. Place non-recyclables in the bag lining the trash can.



1. Line the trash can with a red bag, then a clear bag.
2. Hang the bag from the case cart next to the trash can.



Pre-case trash



5. Before case begins, place recycling bag in gray toter and remove bagged clear trash from can.
6. Now the case can begin. Place all trash in the red bag once the case begins.



Other waste minimization programs

- Donations of surplus supplies
- Office supply reuse center
- Online waste exchange
- Waste prevention education

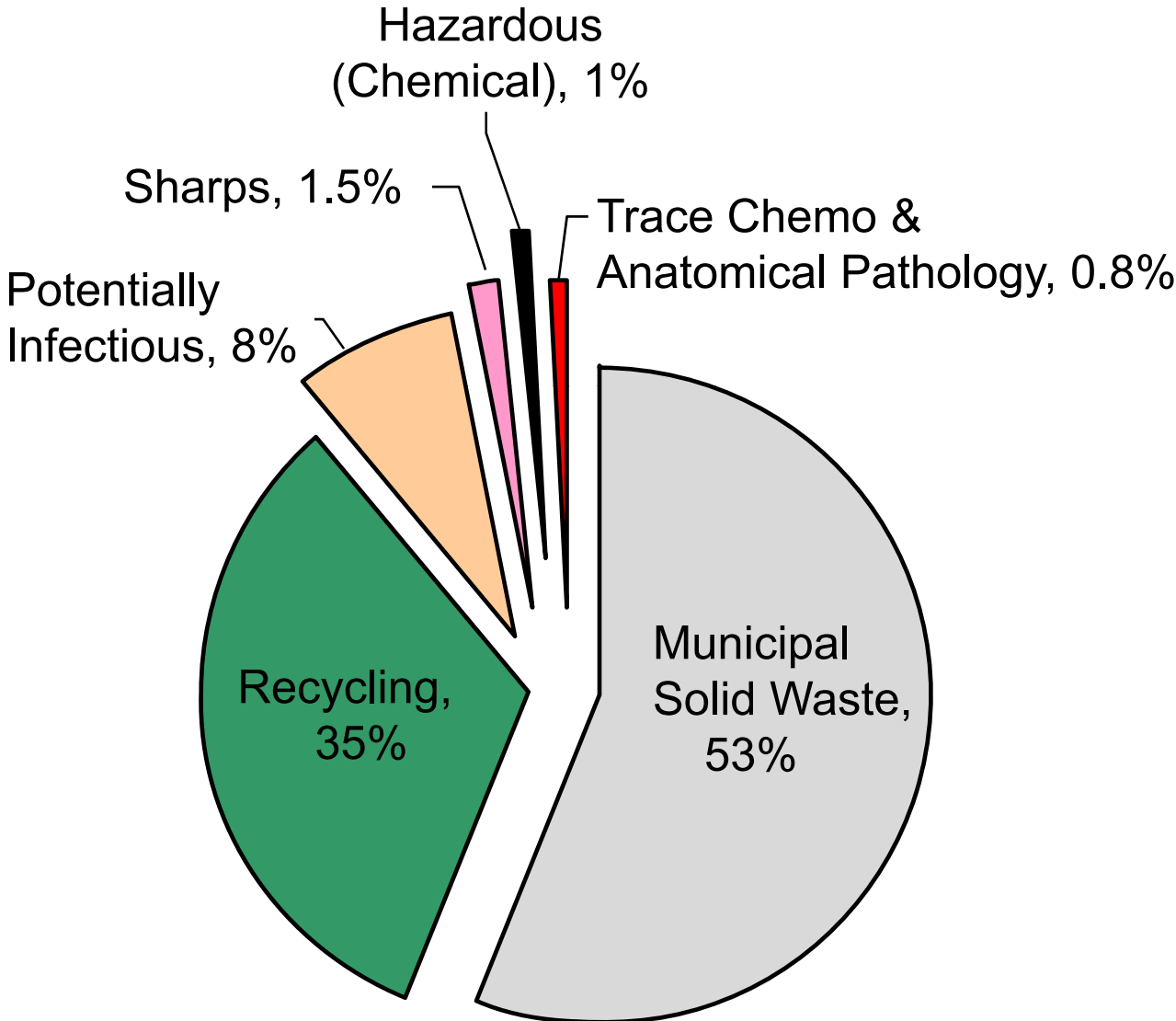
Impacts to Make, Deliver, and Dispose the Stuff We Use



Waste Management Program Elements

- Engineering Controls
 - Container placement
 - Color coding & labeling
- Training & Ongoing Staff Engagement
 - New employee orientation
 - Departmental staff meetings
 - Weekly facility tours
- Compliance Monitoring
 - Well trained housekeepers
 - Waste mgmt. technicians
- Support
- Policies
- Measurement

Now Let's Focus In On Measurement...



DHMC Waste Streams, Percent by Weight

What You Can Do With Data

- Track changes (generation, costs, composition)
- Generate ideas, prioritize actions
- Measure progress, see what needs attention
- Win environmental leadership awards
- Better manage your:
 - Haulers
 - Processors
 - Equipment
 - Budget

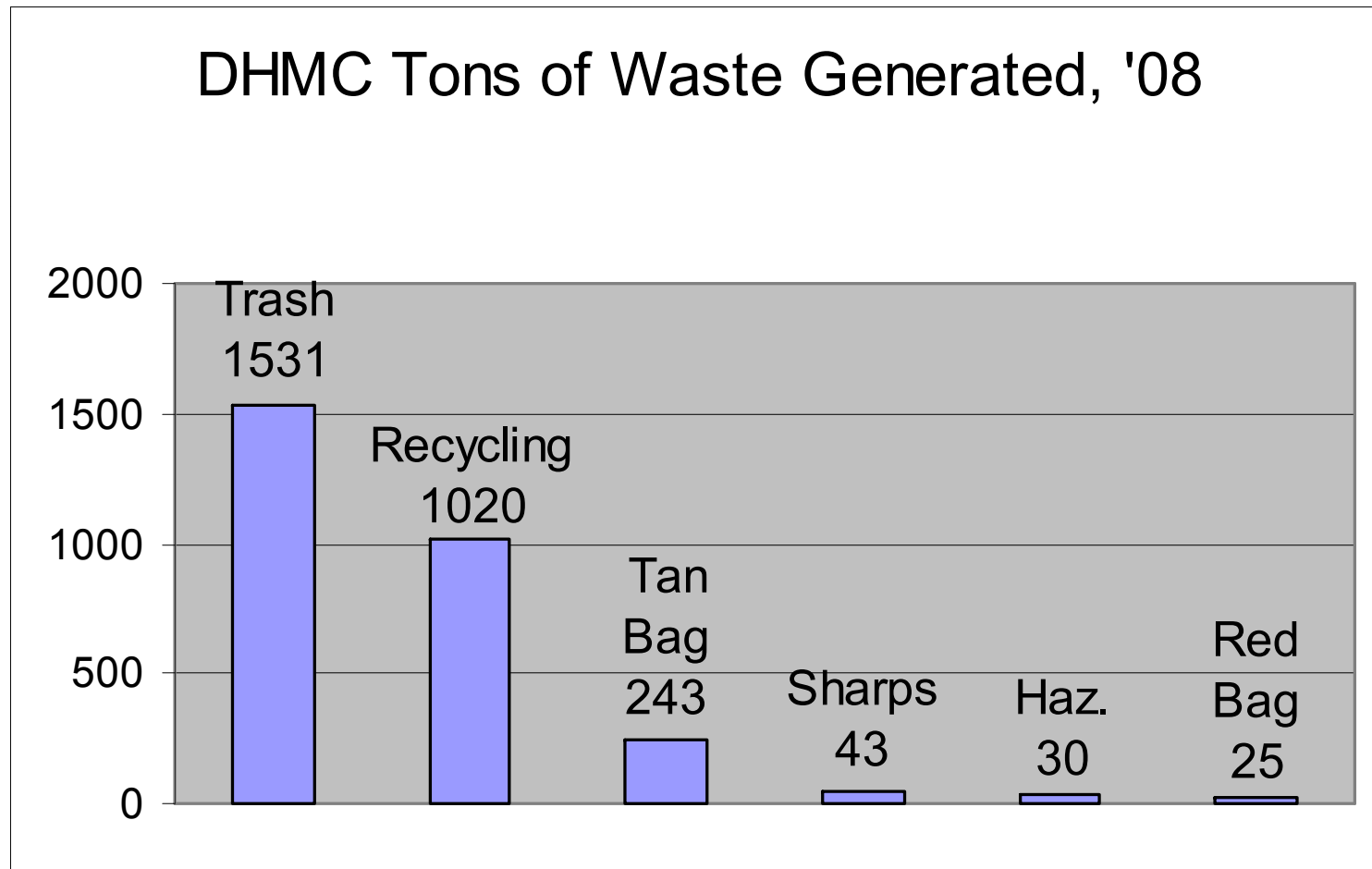
Whom I Gather Waste Data From

- Vendors (a dozen or so)
- Other departments (Pathology, Engineering, Med School, Safety, Radiology, Inventory & Logistics)
- My staff (Excel spreadsheets)





Strive to Measure All of Your Institution's Waste Streams Annually, By Weight

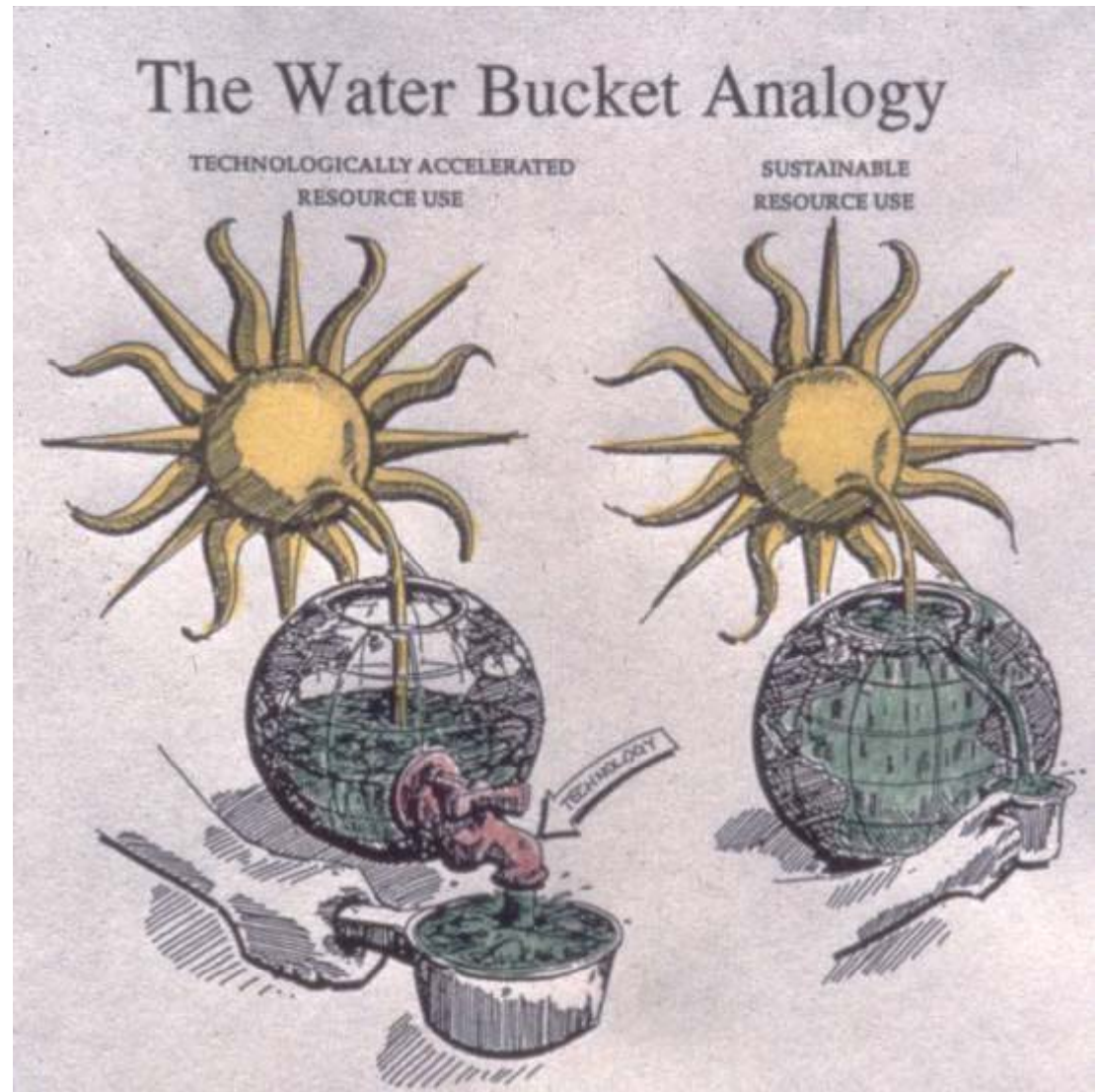


What is a sustainable rate of resource use?

When our consumption does not exceed the rate of production, thereby compromising the ability of future generations to meet their own needs

**Biospheric
Production
compared to
Humanity's
Consumption**

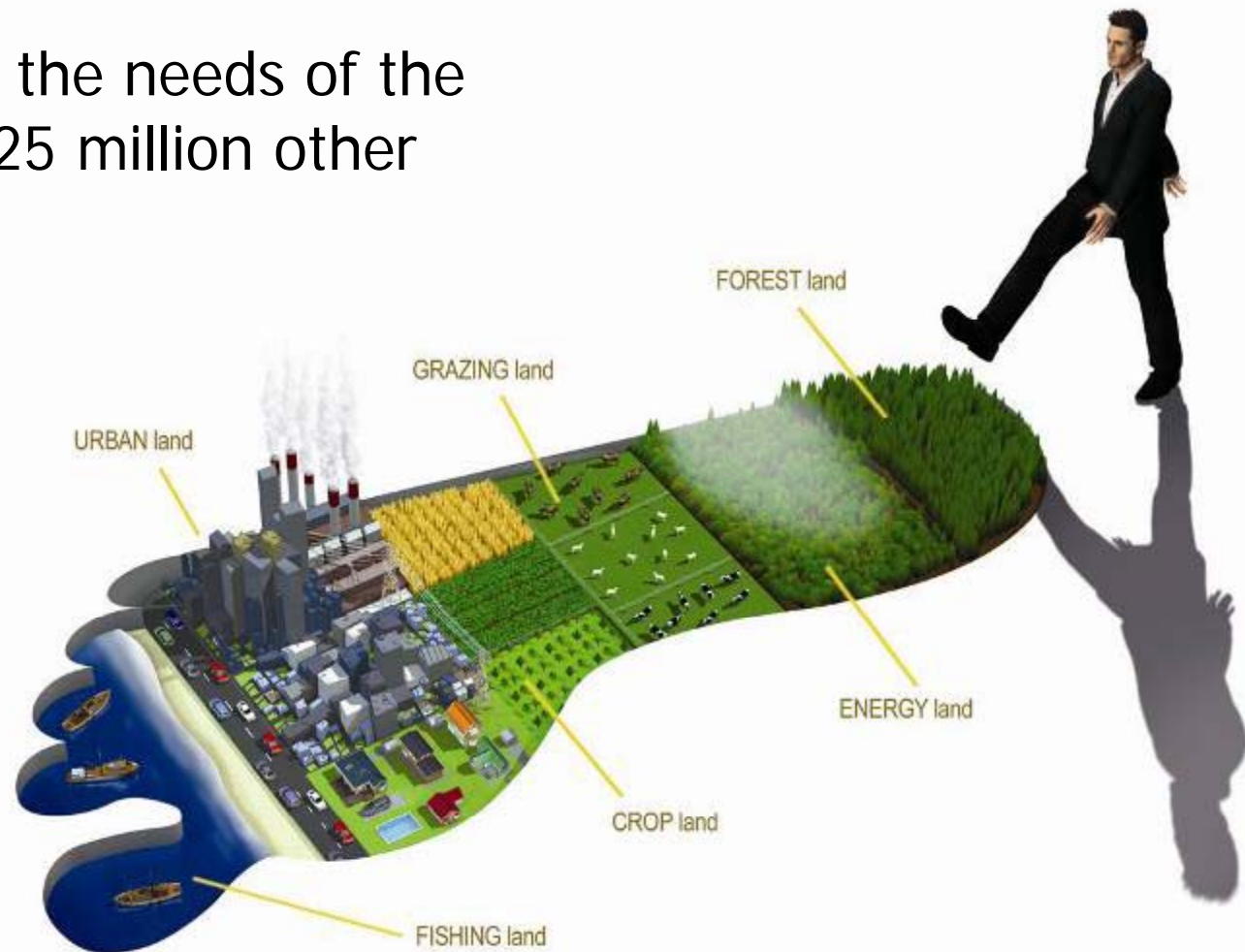
Can these rates be measured? Yes! ...



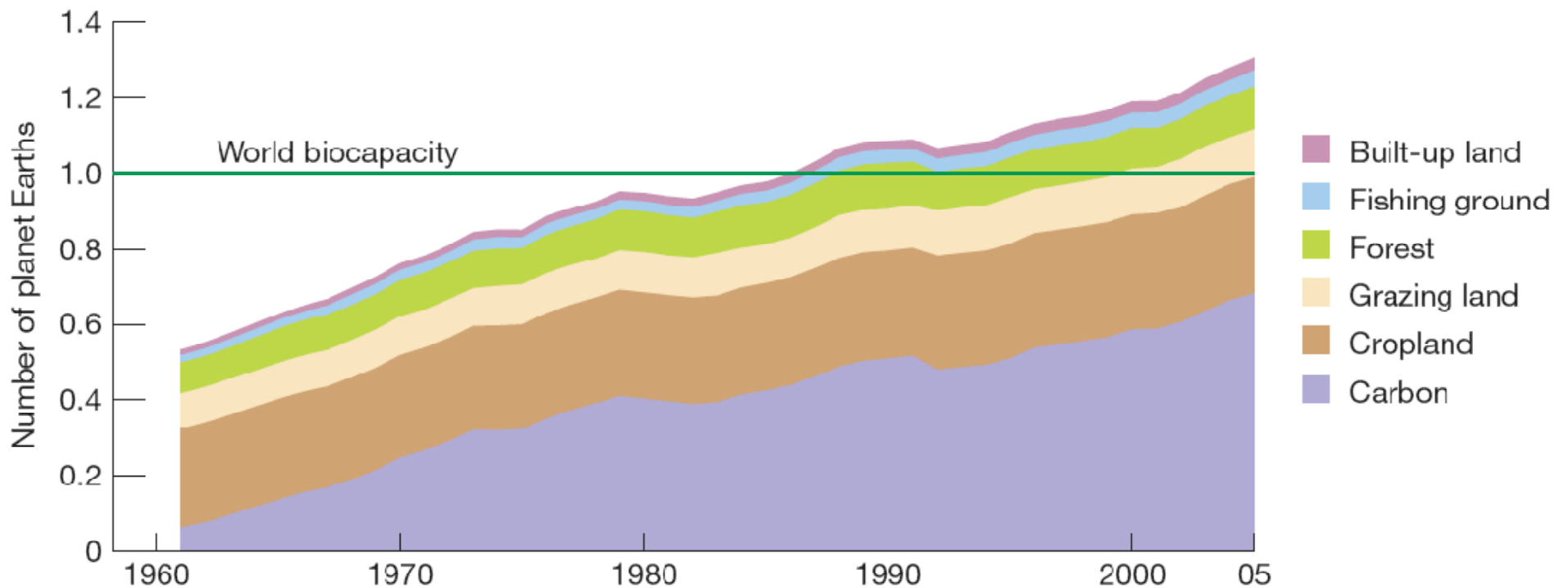
What's Our Fair Share?

33B bioprod. acres / 6.5B people = 5.1 acres/person*

*Excluding the needs of the estimated 25 million other species!



Global Ecological Overshoot: We're drawing down natural capital



Source: *The Ecological Footprint Atlas 2008*. Oakland: Global Footprint Network.

National Ecological Footprints¹

the human demand on natural resources

vs.

the earth's capacity to regenerate its resources
measured in global acres



Typical US acute care hospital approx. 15-20 x sustainable level^{Ref.2}

United States
24 global acres per person
4.7 x sustainability level

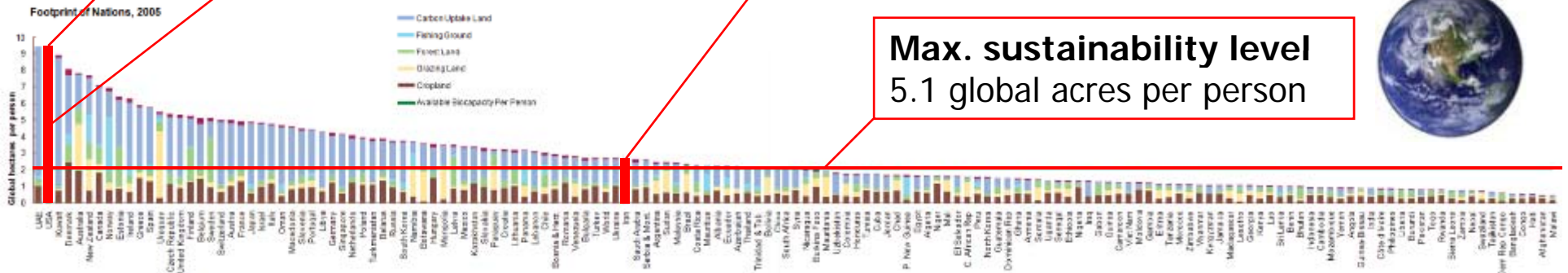


60% of US footprint is CO₂ from fossil fuels

Current world average
6.6 global acres per person
1.3 x sustainability level



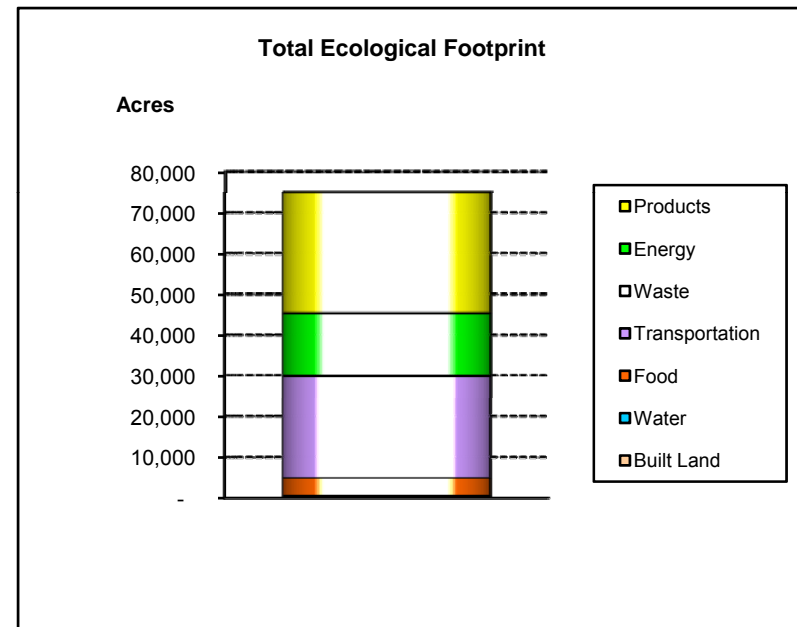
Max. sustainability level
5.1 global acres per person



Ref 1: The Ecological Footprint Atlas 2008. Oakland: Global Footprint Network. Ref 2: Guenther and Vittori Sustainable Healthcare Architecture pp.368-370
This slide compliments of Hubert Murray, Partners HealthCare

DHMC's Ecological Footprint

	MTCO2e	Global Acres	%
TOTAL	190,288	75,096	100%
Products	85,346	29,949	40%
Energy	44,085	15,470	21%
Waste	498	175	0.2%
Transportation	46,885	24,679	33%
Food	12,095	4,329	6%
Water	332	119	0.2%
Built Land	1,047	375	0.5%



More than **1,000 times** our physical footprint of 70 acres

Benefits of footprinting at the institutional level

- Draw staff attention to sustainability issues through a new lens
- Help prioritize areas of action (energy, water, purchases, etc.)
- (As tools get better) Measure progress

A Good Place to Start and Return To: Assess Your Status

- Inventory past & current activities
- Create baseline for future efforts
- Assist with strategic prioritization
- Take credit for what is already happening



Hospital A

	Performance / Maturity			
	Poor	Fair	Good	Excellent
Environmental Stewardship Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Education and Communication	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmentally Preferable Purchasing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Waste Management and Reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mercury Elimination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Energy, Water and Climate	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Environmental Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Food Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainable Sites Management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Transportation Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chemical Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Hospital B

	Performance / Maturity			
	Poor	Fair	Good	Excellent
Environmental Stewardship Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Education and Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Environmentally Preferable Purchasing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waste Management and Reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mercury Elimination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy, Water and Climate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Environmental Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Transportation Operations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- 
- Waste Reduction
 - Landfill diversion rate, volume
 - Energy Conservation
 - Energy Utilization Index
 - Local Food
 - % Sourced < 200 miles
 - Toxicity Reduction
 - PVC/DEHP product migration
 - Green Purchasing
 - % recycled content, many others
 - Green Building
 - LEED or GGHC scoring systems
 - Climate Change
 - Greenhouse gas inventory
 - Transportation
 - Fleet MPG, Commuter incentives

Means of Self Assessment

This slide material compliments of Christina Ayers, Cleveland Clinic

Be Ready for Barriers & Challenges

- Focus on incremental change; pick your battles
- Don't make *the perfect* the enemy of *the better*
- Myth: Hiring a Sustainability Coordinator = extravagant luxury we can't afford

Important Ingredients for a Successful Recipe

- Dedicated FTE
- Coordination across departments
- Commitment from the top-down *and* bottom-up
- Accountability structure
- Ability to engage and remind staff regularly

Here's a Popular Place to Start

But excelling in waste management involves a lot more than beverage container recycling





What Can We Recycle?



A	Aluminum cans & foil	G	Glass bottles	R	Refrigerants
B	Batteries		Grease from kitchen	S	Scrap metals
	Books (hard cover)	H	HDPE #2 plastics (e.g., milk jugs)		Silver from X-rays
	Bottles & Cans	I	Ink jet cartridges	T	Tin/steel cans
	Boxboard	J	Junk mail		Toner cartridges
C	Corrugated cardboard	K	Kraft paper		Transparencies
	Computers	L	Light bulbs (all)	U	Used motor oil
	Compact disks (CDs)	M	Mixed paper	V	Video tapes
D	Diskettes (floppies)		Medical supplies & equipment	W	White office paper
E	Electronics	N	Newspapers	X	Xylene
	Ethyl alcohol	O	Office supplies & equipment		X-ray film
F	Food waste	P	PETE #1 plastics (e.g., soda bottles)	Y	Yellow stickies (<i>Post-it</i> notes)
	Furniture	Q	"Quicksilver" (Mercury) Devices	Z	<i>Zero waste is our ultimate goal!</i>



What Materials Should We Target?

- Tier 1: Universal wastes, motor oil, solvents, hazardous pharmaceuticals, computers
- Tier 2: Scrap metals, cardboard, paper, C&D
- Tier 3: Pallets, bottles/cans, grease, toner cartridges, reuse of furniture & office supplies
- Tier 4: Mixed electronics, food waste, 3-7 plastics, non-haz. pharmaceuticals
- Tier 5:
CDs, diskettes, videos, transparencies, packing peanuts, freezer packs

“We need
to protect the
environment not
because we love trees,
but because we love
people”.

- R.F. Kennedy Jr.

