

# How Sustainable Hospitals Can Help Bend the Cost Curve Research Study

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April 6, 2011

# Why This Study Now?

Health Care Has a Large Environmental Footprint:

- Hospitals are the second-most energy intensive buildings in the U.S.
- Health facilities create 6,600 tons of waste per day.
- The health care sector is the single largest user of chemicals.
- Pollution is a key contributor to chronic disease.



# Why This Study Now?

At the same time, despite all of the debate about health care reform, everyone agrees that the current health care system is not economically sustainable.



# Why This Study Now?

- There is considerable data that greening health care can protect health and the environment, while also saving money.
- But what about the other 5,000 hospitals? How much could we save nationally if hospitals nationwide were to adopt several well-established sustainability practices?



Photo: Herbs grown on one of Metro Health Hospital's rooftop gardens

# The Study

- Timeline
- Research Team
- Funded by The Commonwealth Fund, Becton, Dickinson & Co., and the Robert Wood Johnson Foundation, through grants to Health Care Without Harm

# Context for the Study: The Healthier Hospitals Initiative

- Developed by a group of health systems that are leading the way on sustainability
- Goals include leadership and corporate culture change to support sustainability, reducing energy health impacts, greening the OR, reducing harmful chemicals, reducing waste, and greening the supply chain.

Advocate Health Care

Hospital Corporation of America, Inc.



Catholic Healthcare West

Med Star Health



# Our Study Hypothesis:

Greening health care through broad implementation of at least three sustainability interventions would “bend the cost curve” for health care nationally – with collateral benefits for patient and worker safety.

- Waste Reduction
- Energy use reduction
- Environmentally Preferable Purchasing

Anytown Health Facility - John Smith - 555-123-8067

1. ECAR Search from Map

East Central Area Reliability Coordination Agreement

KWh per Year: 20,000,000 Calculate

Clean Energy Fraction: 0 %

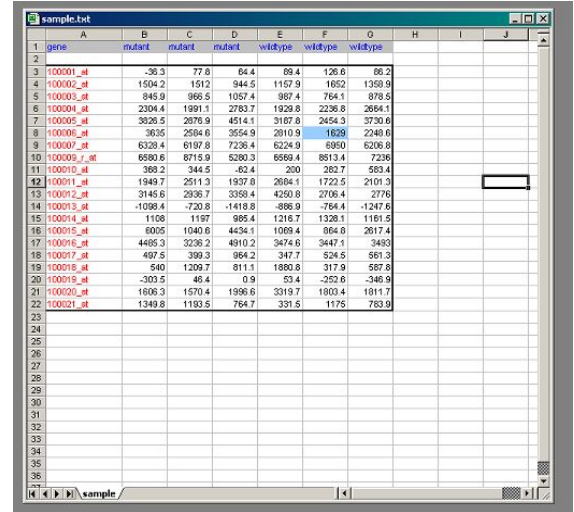
**Calculate how your energy use impacts health**

Pollutant	Current Year	Next Year	Direct Medical Costs
SO2 (Tons):	104.55	55.125	\$116,563
NOx (Tons):	104.4	55.125	\$29,964
CO2 (Tons):	21,277.54	10,638.77	\$3,534
Mercury (Tons):	0.15	0.075	\$458

Incidents	Current Year	Next Year	Direct Medical Costs
Premature Death:	0.79	0.407	\$116,563
Chronic Bronchitis:	385	192.5	\$29,964
Hospital Visit Incidents:	6.66	3.33	\$3,534
Asthma Attacks:	7.92	4.0	\$458
Respiratory Symptoms:	377.20	192.5	\$116,563
Work Loss Days:	69.67	35.25	\$116,563
Mercury Related:	N/A	0.075	\$120,052
Totals:	N/A	\$2,884,564	\$306,465
Unintended Impacts/kWh:		0.1442	0.0153

# The Study Has Three Phases

- Phase 1: Document hospitals' cost savings
- Phase 2: Conduct macro-analysis: "If 1,000 (and 5,000) American hospitals were to implement these innovations, how much could we save as a nation?"
- Phase 3: Carry out case studies of culture change



gene	mdat	mdat	mdat	wldtype	wldtype	wldtype
100001_at	-36.3	77.8	64.4	89.4	126.6	86.2
100002_at	1504.2	1512	844.5	1157.9	1652	1358.9
100003_at	945.9	968.5	1057.4	987.4	756.1	870.5
100004_at	2304.4	1991.1	2783.7	1929.8	2236.8	2654.1
100005_at	3826.5	2076.9	4514.1	3187.8	2454.3	3730.6
100006_at	3635	2504.6	3554.9	2010.9	1628	2240.6
100007_at	6329.4	6197.8	7226.4	6224.9	6990	6206.8
100008_at	6580.6	6715.9	5280.3	6569.4	6813.4	7236
100009_at	369.2	344.5	-62.4	200	282.7	563.4
100010_at	1949.7	2511.3	1937.6	2694.1	1722.5	2101.3
100011_at	3145.6	2936.7	3350.4	4250.8	2706.4	2776
100012_at	-1098.4	-720.8	-1418.8	-886.9	-754.4	-1247.6
100013_at	1108	1197	985.4	1218.7	1328.1	1181.5
100014_at	8005	1040.6	4434.1	1069.4	864.8	2617.4
100015_at	4495.3	3236.2	4910.2	3474.6	3447.1	3463
100016_at	497.5	399.3	864.2	347.7	524.5	581.3
100017_at	540	1209.7	811.1	1880.8	317.9	567.8
100018_at	-303.5	46.4	0.9	53.4	-252.6	-346.9
100019_at	1808.3	1570.4	1996.6	3319.7	1803.4	1911.7
100020_at	1348.8	1183.5	784.7	331.5	1175	763.9
100021_at						

# Study Framework

- Calculate the return on investment (ROI), or net cost savings, realized as a result of implementation of the sustainability intervention.
- ROI: Subtract total costs of implementation from total cost savings as a result of implementation.
- Extrapolate to cost savings nationally.



# Study Framework

Example of ROI calculation: Healthy Hospital used to throw all used devices in the trash. Then they implemented a third-party reprocessing program.

Baseline costs (waste disposal costs for devices prior to reprocessing program implementation):	\$500,000
Total cost savings as a result of implementation:	\$120,000
Total costs of implementing program:	\$ 20,000
ROI, or net savings, due to program:	\$ 100,000

# Study Framework

<b>WASTE REDUCTION: Key Activities</b>	<b>Baseline Costs</b> <i>(Costs of processes and procedures PRIOR to implementation of this waste reduction activity) (total costs of disposal under old program - waste pickup, equipment, hauling, fees, staff time)*</i>	<b>Return on Investment Calculation – 5-year timeframe:</b> Total Cost Savings As Result of Implementation (avoided waste disposal costs, avoided purchasing costs, other)	<b>[Minus] Total Costs of Implementation</b> (costs of disposal plus associated capital costs, operational costs, staff training costs, staff use costs, additional energy/water costs, other)	<b>[Equals] Cost Savings</b>
Implement a Third-Party Reprocessing Program	\$500,000	\$ 90,000	\$ 8,000	\$ 82,000
Reduce RMW to less than 15% of total waste generated	\$300,000	\$ 150,000	\$ 20,000	\$130,000
Achieve a 20% recycling rate	\$400,000	\$ 250,000	\$100,000	\$150,000
Use reusable sharps containers	\$200,000	\$ 100,000	\$ 50,000	\$ 50,000
<b>Totals for Waste Reduction Key Activities</b>	<b>\$1,400,000</b>	<b>\$ 590,000</b>	<b>\$178,000</b>	<b>\$412,000</b>

# Environmentally Preferable Purchasing


## Kaiser Permanente's EPP Program:

- Started as grassroots effort (remove DEHP, PVC)
- In 2007, EPP became a strategic focus
- Sustainability Scorecard
- Saved \$2.037 million system-wide in 2009, \$27 million in 2010



# Kaiser's EPP Program: Case Studies

## From P6 to P7 IBM Servers

- Selected smaller, more energy-efficient servers
  - Reduce energy consumption by 69 percent per machine
- 
- Year one equipment savings in excess of \$5.8 million; \$415,000 annual savings in electricity costs by year end 2011

# Kaiser's EPP Program: Case Studies

## The Sustainable Fabric Alliance – Sourcing Upholstery to Drapery

- The concern: Petrochemical-based materials and finishes linked to cancer, thyroid disease, and developmental defects
- Develop tiered sustainability criteria
- Approximate annual cost savings: \$1 million or 30 percent



# Kaiser's EPP Program: Case Studies

## Purchasing Longer-Lasting, Higher Quality Bulbs

- Standardized type of lightbulb purchased (based on life-cycle analysis)
- Reduce mercury, GHG, universal hazardous waste
- Cost Savings: Program-wide, 23 percent or \$2 million in operating costs per year.



# Energy Use Reduction

## Gundersen Lutheran

- Established strategic energy master plan
- Extensive renewables
- Energy conservation program:
  - Improved energy efficiency 25% in the first two years
  - Cost savings: \$1.25 million/year



# Energy Use Reduction

## Advocate Health Care:

- Retrocommissioning
- Created 200-item operational checklist
- Extensive staff education – “culture change”

## Big savings:

- \$705,600/year from staff turning off computers at end of day
- \$1.2M/year from turning off lights when not needed

# Waste Reduction

## Reprocessing Single-Use Medical Devices

- A process to make a used, reusable, single-use device, or an unused but opened product, patient-ready.
- Cost savings:
  - 50% reduction of medical device costs compared with purchasing new equipment.
  - \$1.5M to \$5-6M/year A source: Kwakye, Provonost & Makary article in Academic Medicine



# Waste Reduction

- Providence Portland: Achieved 50% recycling rate, saving \$185,000 across 4 hospitals.
- At Cleveland Clinic, paper recycling costs 70% less per pound system-wide than trash service.
- The Cleveland Clinic system saved several hundred thousand dollars a year with reusable sharps containers.



# Greening the OR

- Choosing reusable, not disposable, gowns, surgical drapes and basins
- OR Kit Formulation
- Waste Anesthetic Gas Scavenging Systems
- Fluid Waste Management Systems
- Energy Use/Lighting & Thermal Comfort
- Regulated Medical Waste Minimization/Segregation
- Green Cleaning
- Medical equipment donation

# Greening the OR



- ORs generate 20-30% of a facility's waste.
- At the two-campus Boulder (Colo.) Community Hospital, recycling in the ORs reduced waste by 40 percent annually and saved \$650,000 per year.

# Inquiries, comments, questions?

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