Clean Power Prescription at Boston Medical Center

Anna Goldman, MD, MPA, MPH
Energy Insecurity among BMC patients

We ask patients about energy insecurity as part of our “Social Determinants of Health” screening

6500+ patients screened positive in 2022

1340+ letters written by providers to prevent disconnection

The average low-income household in Massachusetts spends 10% of income on energy costs.¹

¹ https://www.mapc.org/planning101/reducing-energy-burden-resources-for-low-income-residents/
Origin Story: Community Solar at BMC?
Clean Power Prescription

357 kW array on a BMC administrative building at 960 Mass Ave

Produces virtual net metering credits which we will distribute to patients

Approximately $50 per month appears directly on patient bills x 12 months

Goal of 80-100 households in pilot phase
The Role of the Inflation Reduction Act

- IRA subsidies can cover up to 70% of a community solar project installation cost

- Low income communities bonus credit --> if project is located in or serving low income communities

- Elective pay mechanism allows non-profits and local government to participate
Community Partnerships

ABCD Energy Division
Low Income Heating Energy Assistance Program (LIHEAP)
Discount electric rate
Arrearage management
Home energy efficiency upgrades
Weatherization
Air Source Heat Pumps

Energy Allies
“Energy bill check-up”
Clean Power Prescription: Looking Forward

Opening enrollment now

IRA Tax Credit Application pending

External partnerships to increase solar capacity
Challenges: Energy donation to patients

Legal concern that these might appear as inducements

We have addressed this by routing the program through our Complex Care Management Program
Challenges: IRA Low Income Community Bonus Credits

Delays in BMC solar array operation

Uncertainty around caps and allocation process for EJ Bonus

Tax credits/elective pay mechanism does not subsidize costs of siting, permitting, and interconnection
Challenges: Interconnection in Massachusetts

Aging grid infrastructure creates problems for distributed generation

Long “studies” of grid capacity creates years-long delays, economic uncertainty

Need for a state or regional plan and shared cost of improvements to grid infrastructure
Challenges: Community Solar for Low-Income Massachusetts Residents

Community solar offers a long-term solar option for low-income households and renters.

In Massachusetts, billing complexity and automatic billing creates barriers for low-income residents.

Consolidated billing exists in only NY, VA, OR, IL.
Organizing Clinicians for Planet Earth

Noe Woods, MD, FACOG
Assistant Dean of Healthcare Sustainability
Assistant Professor of Obstetrics and Gynecology
University of Pittsburgh School of Medicine, UPMC
Hysterectomy LCA

Lots and Lots of Trash
Life Cycle Analysis of HealthCare

• Life Cycle Perspectives on Delivering an Infant in the US. Sci Total Environ 2012
• Environmental Impacts of Surgical Procedures: Life Cycle Assessment of Hysterectomy in the US. Environmental Science and Technology Dec 2014
• Sustainable Healthcare and Environmental Life-Cycle Impacts of Disposable Supplies: A Focus on Disposable Custom Packs. Journal of Cleaner Production 2015
• Strategies to Reduce Greenhouse Gas Emissions from Laparoscopic Surgery. American J of Public Health, 2018 Apr
• Going green in gynecology: a call to action. Am J Obstet Gynecol, 2023 Apr 26
• The Utilization of Disposable Supplies in a Urogynecology Operating Room: Measuring Suburethral Sling Surgical Waste by Cost and Weight” Urogyn 2023
Office for Sustainability in the Health Sciences
University of Pittsburgh School of Medicine Faculty working in Healthcare Sustainability

Faculty

- Gabriel Cisneros, MD
  - Assistant Professor

- Amanda Arsen
  - Professor

- Melissa Bilec
  - Chief Medical Sustainability Officer

- Michael Boninger
  - Professor

- Thuy Bui
  - Assistant Professor

- Stephanie Maximous
  - Co-Chair, Clinicians for Climate Action

- Isabela Angelelli
  - Clinical Assist Professor

- Keith Somers, MD
  - Assistant Professor

- Maya Ragavan
  - Chair, Clinicians for Climate Action

- Noe Woods
  - Program Director, Hand Fellowship Program
  - Clinical Professor of Orthopaedic Surgery

- Mark E. Baratz, MD
  - Professor

- Pam Moalli
  - Clinical Assist Prof

- Marc Cordero
  - Clinical Assist Professor

- Christiane M Hadi
Clinicians for Climate Action
Healthcare professionals committed to reducing greenhouse gas emissions from healthcare systems

550+ members
including MD, OD, PT, RN, PA, NP, cRNA and dental

6 working groups involving education, equity, sustainable practices, research, communication/advocacy and outpatient medicine.

Presentations at National and Regional Scientific Meetings, Publications, Workshops and Educational Sessions

Interdisciplinary Projects, Research collaborations

www.c4ca.pitt.edu
Spring 2022– Gathering at Tree Pittsburgh
Asks

1. **Demonstrate Intent**

2. **Develop a Climate Plan** by 2023 that charts a course to achieve carbon neutral status

3. **100% renewable electricity** (wind, solar, hydroelectric) for UPMC operations by 2030

4. **Divest** UPMC’s reserve portfolio from fossil fuel companies

5. Create a **UPMC Climate and Health Center** that brings together transdisciplinary teams to support carbon mitigation and environmental justice efforts

6. Integrate **environmental quality metrics** into UPMC’s educational, research and operational goals
FACT SHEET: Health Sector Leaders Join Biden Administration’s Pledge to Reduce Greenhouse Gas Emissions 50% by 2030
UPMC Sustainability Strategic Plan

Facilities
- Operations
- Energy (Solar, Wind, Hydrogen)
- Water
- Design

Supply Chain
- Closed loop solutions

Environmental Services
- Recycling
- Chemicals

Surgical Services
- Desflurane
- HVAC Setback in OR

Transportation
- EV Charging Stations
- Ride Share Programs
- Fleet Transport

Sustainable Models of Care
- Single use of plastics

Food
- Composting
- Donation
- Production/Selection

UPMC CENTER FOR SUSTAINABILITY

Slide Courtesy of Holly Vogt
Health care has a massive carbon footprint. These doctors are trying to change that

OCTOBER 2, 2023 • 6:00 AM ET
HEARD ON MORNING EDITION
By Reid Frazier

Local & National Presence

RSV IMMUNIZATION can protect pregnant patients' babies

Medscape Medical News > Features

Gynecologic Procedures Can Be Less Wasteful. Why Aren't They?

Kaitlin Sullivan
December 13, 2023

Pittsburgh-area hospitals tackling climate emissions, pollution and waste
And more to come…

Clinicians for Climate Action was formed in 2022 when several physicians in Pittsburgh
OSUWMC Case Study: Leveraging the IRA Funding

Lauren Koch, MA, MENR
Sustainability Program Manager
2.12.24
We are central Ohio’s only academic medical center

7 hospitals
1,506 beds
9 multispecialty centers
NCI designated comprehensive cancer center
100+ facilities
Wexner Medical Center (WMC) Strategic Plan Pillars

- Talent and Culture
- Research
- Education
- World Class Care
- Operational Excellence
- Health Equity
SUSTAINABILITY

Resource Stewardship Goals

University Fleet’s Carbon Footprint
Reduce carbon footprint of university fleet per thousand miles traveled by 25% by 2025

Carbon Neutrality
Achieve carbon neutrality by 2050 per Presidents’ Climate Leadership Commitment

Locally Sourced Food
Increase production and purchase of locally and sustainably sourced food to 40% by 2025

Ecosystem Services
Increase Ecosystem Services Index score to 85% by 2025

Potable Water Consumption
Reduce potable water consumption by 10% per capita every 5 years – reset every 5 years

Zero Waste
Achieve Zero Waste by 2025 by diverting 90% of waste away from landfills

Building Energy Consumption
Increase the energy efficiency of the university by 25% per building sq. ft. by 2025

Preferred Products
Develop and implement standards by 2025
FY23 Sustainability Results

- 4.5% less energy use than FY22
- 65% decrease in anesthetic gas emissions from 2018 baseline
- 38% diversion of waste
- 32.4% carbon neutral electricity
- 900 Green Team members, an increase of 15%
- Telehealth avoided emissions of 1100 cars for a year
- 9,200 pounds of medical devices reprocessed and $1 million in savings
- 1100 cars for a year
- 9,200 pounds of medical devices reprocessed and $1 million in savings
# Building Design Standards: Division 18

**Ohio State’s custom sustainability standards**

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<td>▶ Contract Administration (Division 1)</td>
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<td>▼ Sustainability (Division 18)</td>
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**Division 18 - Sustainability**

- Sustainability Applicability Matrix Spreadsheet -
  - Construction Budget [Over $75k](#) or [Under $75k](#)
  - Owner's Project Requirements -
    - Construction Budget [Over $75k](#) or [Under $75k](#)

| ▶ Plumbing, HVAC, Fire, Electric (Divisions 21 - 28) |
Outpatient Care Powell

200,000 sq ft of medical office and ambulatory health services
Goal Setting through Sustainability Charrette

How do we improve on sustainability from previous ambulatory locations?

<table>
<thead>
<tr>
<th>ENERGY</th>
<th>MATERIALS</th>
<th>ECO SYSTEM SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUI Target: 95</td>
<td>No Materials Tracking</td>
<td>Evaluated at -1</td>
</tr>
<tr>
<td>Meets OH Energy Code</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| MINIMUM PERFORMANCE PER BDS |
|------------------------------|-----------------------------------|
| EUI Target: 89              | Tracking Product data including manufacturer, material and sustainability criteria per BDS Tracker |
| Target Confirmed with OSU   | Tracking Positive in most categories. Credit for integration with regional storm water system. |

<table>
<thead>
<tr>
<th>CARBON NEUTRAL BY 2050: DEFINING A PATH TOWARDS ZERO CARBON</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUI Target: 50% Better Than Code</td>
</tr>
<tr>
<td>How do we optimize embodied carbon in materials?</td>
</tr>
<tr>
<td>Innovation Strategies for Vegetation, Eliminate Irrigation</td>
</tr>
</tbody>
</table>
Sustainable design – how do you pay for it?

Enter America Is All In case study on IRA cost savings.

IRA Cost Savings Analysis for New OSU Wexner Medical Center
Outpatient Center

Authors: Juning Ge and Tansy Massey-Green
June 1, 2023

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Relevant IRA Programs and Provisions ................................................................. 1
Investment Tax Credit (ITC) .................................................................................. 1
Production Tax Credit (PTC) ................................................................................. 4
Commercial Energy Efficient Buildings Deduction (179D) ................................. 5

Source: An All In Case Study (The Ohio State University Wexner Medical Center - A Case Study of IRA Funding for Sustainable Design).pdf (americaisallin.com)
Outcomes

Added heat recovery chiller to design

TOWARDS ZERO CARBON

OPTION 1: Heat Recovery
Air Cooled Chiller in AHC with added Dedicated Heat Recovery Chiller
30% Reduction in Heating Energy
40% Reduction in Gas

OPTION 1A: Hybrid Source of Energy
Provide Air Cooled Chillers with Reverse Cycle Capability, MOB RTU Heat Pump with Nat. Gas Aux Heat <32F

OPTION 2: Eliminate Fossil Fuel
Integrate Geothermal as source/sink for MOB and AHC, HR Chiller
54% Reduction in Heating Energy
100% Reduction in Gas
Outcomes

Solar-ready roof approved for design

<table>
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<tr>
<th>Area</th>
<th>19,000 SF</th>
<th>47,000 SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Annual Solar Energy Production</td>
<td>361,800 kWh (1,235,000 kBtu)</td>
<td>895,000 kWh (3,054,000 kBtu)</td>
</tr>
</tbody>
</table>
## Outcomes

*Exploring 179D pass through with construction company*

<table>
<thead>
<tr>
<th>Potential Amount of Commercial Building Energy Efficiency Tax Deduction for Powell Medical Center</th>
<th>Ambulatory Health Center (56,000 sf)</th>
<th>Medical Office Building (151,530 sf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed percentage reduction in building energy usage compared to standard</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Total tax deductions per square foot</td>
<td>$2.50</td>
<td>$5.00</td>
</tr>
<tr>
<td>Amount of tax deduction (based on assumed energy use reduction)</td>
<td>$140,000</td>
<td>$280,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$378,825</td>
<td>$757,650</td>
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</tbody>
</table>

*Note: These estimates assume the project meets the prevailing wage and apprenticeship requirements. Reduction in building energy usage will be evaluated based on final building design.*
Other Next Steps

What other projects qualify?

- Exploring another recent project (opened in August 2023)
- Exploring another project in construction (opening in 2026)
- Exploring opportunity to bundle deferred maintenance with an LED retrofit (existing community hospital)
Lessons Learned

And there were many.

1. Start early and include a buffer in the project budget before design even starts.
2. Identify a champion for sustainability (at the senior leader level) since this still is not always a cost savings.
3. Looking to not just new building projects, but energy reduction strategies, master planning, and deferred maintenance for IRA opportunities.
Thank You

Lauren.Koch@osumc.edu

Sustainability | Ohio State Wexner Medical Center (osu.edu)