Making the Case for Energy and Climate Actions

Thursday, May 19th, 2022
10:30 AM – 12:00 PM ET
Jaime Van Mourik
Department of Energy: ORISE Science, Policy & Technology Fellow
Today’s Presenters

• **Ryan Yetzer, Senior Manager of Construction and Sustainability**
  • Physicians Realty Trust

• **Alan Eber, Director of Facility Operations**
  • Gundersen Health System

• **Sandrine Schultz, Director of Energy and Sustainability**
  • Chicago Public Schools
Ryan Yetzer
Physicians Realty Trust
Agenda

1. Overview of ESG at DOC
2. Behavioral Improvements – Low/No Cost
3. Value-Add Projects
4. What Kind of Projects Can Be Recovered
5. Bundling Projects
6. Green Leasing
Who is Physicians Realty Trust (NYSE:DOC)

Over $5.1 Billion in Gross Real Estate Investments

<table>
<thead>
<tr>
<th>Properties</th>
<th>RSF</th>
<th>Avg. Building Size</th>
<th>Portfolio Occupancy</th>
<th>Weighted Avg. Lease Term Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>275</td>
<td>14.5M</td>
<td>52,872</td>
<td>95.3%</td>
<td>6.3 YRS</td>
</tr>
</tbody>
</table>

Overview

- DOC is an internally-managed health care REIT focused on the selective acquisition and management of high-quality medical office facilities leased to leading health systems.
- Management’s significant relationships with physicians, hospitals, and health systems offers a distinct strategic advantage relative to peers.

National Portfolio Presence

Portfolio by GLA

- 89% On-Campus Affiliated
- 11% Off-Campus

- 136 Multi-Tenant MOBs – 56.1%
- 122 Single-Tenant MOBs – 37.3%
- 5 Hospitals – 2.2%
- 12 Unconsolidated JVs – 4.4%
Why is ESG important to DOC?

- Real estate makes up 41% of all global energy use & 30% of GHG emissions

**Share of Global CO₂ Emissions by Sector**

- Buildings 28%
- Industry (non-construction) 30%
- Construction 11%
- Transportation 22%
- Other 9%

**Other Demand Drivers Among REITs:**

- Investor questions
- 3rd party ESG rankings
- Market demand
- Lower cost of capital
- OpEx reductions
- Employee engagement
- Recognition
ESG Encompasses Nearly Every Aspect of DOC’s Operations

**Environmental:** Capitalize on opportunities, lower occupancy costs, reduce our carbon footprint, improve the patient experience through property upgrades, and generate long-term shareholder value.

At DOC, we strive to be sustainability leaders in the Medical Office Building (MOB) sector of the real estate industry. All DOC ESG projects stem from our adherence to a G2 Sustainability™ philosophy—a practical approach in which being “green” through our capital initiatives equates to a ‘green’ cash return via cost savings over time.
Behavioral Improvements Speak for Themselves

- Each of our properties plays an important role in helping us meet our ESG goals, but in 2020, the first year of our Low- or No-Cost Challenge, participants saw significantly more reduction in Energy Usage, Greenhouse Gas Emissions and Water Usage compared with non-participating properties.
Low or No-Cost Resources

ENERGY STAR
- Provides a handy checklist to evaluate low- or no-cost opportunities

BOMA
- Provides a step-by-step guide on best practices for approaching low- or no-cost opportunities

DSIRE
- Helps identify rebate and incentive programs for your properties – simply type in your area code!
Value Add Projects

We define a “Value-Add” project as a CapEx project in which we can generate an ROI that is less than the useful life of the equipment.

Examples include:

• LED retrofits
• Building Automation installs/upgrades
• Electrification of building equipment
• Envelope upgrades
• Water efficiency upgrades
Overall potential reduction through these efforts can be up to 40-70%.

<table>
<thead>
<tr>
<th>Lighting Retrofits</th>
<th>Building Automation Systems (BAS)</th>
<th>Behavioral Improvements</th>
<th>Updated Building Equipment</th>
<th>Upgrade Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace outdated lighting fixtures with high-efficiency LED bulbs</td>
<td>Use automation to control heating/cooling schedules and reduce energy in buildings off hours</td>
<td>Instill positive habits to our tenants to reduce overall energy usage</td>
<td>Electrification retrofits</td>
<td>Upgrade windows to energy efficient models and install window film</td>
</tr>
</tbody>
</table>

- Reduces GHG emissions as much as 20-30%
- Reduces GHG emissions as much as 10-20%
- Reduces GHG emissions as much as 5%
- Reduces GHG emissions as much as 10-15%
- Reduces GHG emissions as much as 10%
### Simple Financial Structure of Value Add

<table>
<thead>
<tr>
<th>Project Details</th>
<th>LED Retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected Cost</td>
<td>$350,000</td>
</tr>
<tr>
<td>Rebate Amount</td>
<td>$43,000</td>
</tr>
<tr>
<td>Net Project Cost (Cost – Rebate)</td>
<td>$307,000</td>
</tr>
<tr>
<td>Estimated Annual Savings</td>
<td>$92,000</td>
</tr>
<tr>
<td>Payback/ROI (Net Project Cost/Est. Annual Savings)</td>
<td>3.37 Years</td>
</tr>
<tr>
<td>Estimated Useful Life of Asset</td>
<td>15 Years</td>
</tr>
</tbody>
</table>
What does a “Billback Model” Look Like

Financial Impact – 5 Year Payback

- 2021 Electric: $119,400
- During Payback: $30,064 (Utility Payment Now: $27,775, Amortized Project Cost: $61,561)
- After Payback: $91,625 (Utility Payment After: $27,775, Tenant Savings: $27,775)
Project Cost = $200k
Projected Annual Savings = $30k
ROI = 6.67 years
EUL = 15 years

LED Retrofit
Project Cost = $100k
Projected Annual Savings = $25k
ROI = 4.0 years
EUL = 15 years

BAS Optimization
Project Cost = $200k
Projected Annual Savings = $30k
ROI = 6.67 years
EUL = 15 years

Chiller Replacement
Project Cost = $300k
Projected Annual Savings = $10k
ROI = 30.0 years
EUL = 20 years
<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021 Electric Cost</td>
<td>$208,400</td>
</tr>
<tr>
<td></td>
<td>$3.45 psf</td>
</tr>
<tr>
<td>2021 Electrical Maintenance</td>
<td>$4,398</td>
</tr>
<tr>
<td>Cost to Convert to LEDs</td>
<td>$203,565</td>
</tr>
<tr>
<td>1st Year Energy &amp; Operational Cost Savings</td>
<td>$58,843</td>
</tr>
<tr>
<td>BAS Optimization</td>
<td>$45,200</td>
</tr>
<tr>
<td>BAS Annual Savings</td>
<td>$77,485</td>
</tr>
</tbody>
</table>

$780,900
Energy/Operational/Maintenance Savings

1.82 years
Simple Payback

345,677
Annual kWh Savings
Green Leasing Overview

“Green Leases” are an important instrument because it engages the tenants in our energy savings initiatives. Tenant space can comprise upwards of 90% of Commercial Real Estate properties. Without engaging the tenants, we will never achieve our goals.

The key green lease clauses for us are:

• **Tenant Energy Disclosure**
• **Cost Recovery for Value-Add projects**
• **Energy Star Score disclosure**
Tenant Energy Disclosure

- This is especially important where the tenant pays their own utilities
- You can’t measure what you don’t track!

Cost Recovery for Value-Add projects

- This allows the landlord to recover CapEx costs outlined in the previous examples

Energy Star Score disclosure

- Our leases mandate the landlord discloses Energy Star scores
- This ensures this is a transparent and reciprocal agreement
Alan Eber
Gundersen Health System
Gundersen Health System

- Non-For-Profit
- Physician-led organization
- Headquartered in La Crosse, Wisconsin
- Integrated delivery system
- 8,000+ employees
- 800 providers
- 325-bed tertiary medical center
- 6 critical access hospitals
- Over 50 clinics

First Day of Energy Independence October 2014
Pollutants from the burning of fossil fuels cause:
- Cancer, liver disease, kidney disease, asthma, reproductive issues
- Cardiovascular deaths and stroke

Hospitals are some of the worst energy offenders
- This is inconsistent with our mission... we are responsible for contributing to disease through our wasteful consumption.

Energy costs continue to escalate, making it more difficult to provide affordable care
Energy Management Pillars

- Energy Conservation
- Sustainable Design of New Construction
- Energy Generation
Measure and Benchmark

Regional Facility 12 Month EUI

Total Annual Energy Spend (ex Affiliate)

Projected Spend
Actual Spend

Cumulative Benefit Since 2008 = $33M
Wind Generation (8MW)

Landfill Gas Tri-Generation

Solar Generation (2.5MW)

Dairy Digesters

Biomass Steam & Electricity
Challenges

GHS Blended Retail Electricity Purchase Rate
Electricity Wholesale Rate (Avg. Cost to Produce Grid Power)

MISO System Daily Average Real-Time Prices, 2008 - 2016 (Source: MISO Data)
Modified Goals

Utility Energy Usage

Develop/Modify Goals to Drive Desired Actions
Modified Goals Cont...

**All New Construction**  
**Net Zero Energy**

**Elroy Clinic**  
25 EUI design target. Planned to be first Site-Based Zero-Energy new construction using geothermal + rooftop solar.

**Tri-County Hospital**  
100 EUI design target with solar offset.
Sustainable Design

Process
- Set Targets
- Identify Incentives
- Create Energy Model
- Commission
- Track Usage
How Can We Achieve Targets

- Aggressive Scheduling
- Occupancy Sensors
- Distributed System
- Variable Frequency Drives

- Variable Frequency Drives
- High Efficiency Motors

- Geothermal Heat Pump
- Minimize Outdoor Air
- Heat Recovery
- Additional Insulation
- Efficient Windows

- Minimize Outdoor Air
- Heat Recovery
- Additional Insulation
- Efficient Windows

- Night Watchman

- LED Lights
- Occupancy Sensors
- Daylight Harvesting
- Scheduling
- Minimize Light Levels

- Reheat 42.3%
- Process Steam 6.2%
- Kitchen, Labs, etc. 1.2%
- Kitchen, Labs, etc. 1.2%
- Electric

- HVAC Fans 10.6%
- Pumps 5.7%
- Heat Rejection 0.2%
- Cooling 4.2%
- Elevators 0.7%
- Plant Med. Equip. 0.8%
- Imaging 0.8%
- Kitchen 0.9%
- Misc. Equipment 13.0%
- Interior Lighting 8.2%
Results (Two Sided Green)

Financial

Harmful Emissions

<table>
<thead>
<tr>
<th>Emmission</th>
<th>2008</th>
<th>2021</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate (lbs)</td>
<td>434,928</td>
<td>259,221</td>
<td>40%</td>
</tr>
<tr>
<td>SO2 (lbs)</td>
<td>241,011</td>
<td>82,080</td>
<td>66%</td>
</tr>
<tr>
<td>Nox (lbs)</td>
<td>161,729</td>
<td>65,294</td>
<td>60%</td>
</tr>
<tr>
<td>CO2 (lbs)</td>
<td>80,846,997</td>
<td>38,599,867</td>
<td>52%</td>
</tr>
<tr>
<td>Mercury (lbs)</td>
<td>2.39</td>
<td>1.48</td>
<td>38%</td>
</tr>
<tr>
<td>Facility (Sqft)</td>
<td>2,056,824</td>
<td>2,735,508</td>
<td>33%</td>
</tr>
</tbody>
</table>
Thank You

www.gundersenenvision.org
Sandrine Schultz
Chicago Public Schools
ACHIEVING DECARBONIZATION: PLANNING & IMPLEMENTATION

MAKING THE CASE FOR ENERGY AND CLIMATE ACTIONS

Sandrine Schultz
CPS Energy and Sustainability Director
Agenda

1. Meet the Energy and Sustainability Office
2. What We Do - Why - How
   a. Strategy
   b. Guiding Goals
   c. Approach
3. CPS Goes Solar!
4. CPS Zero Waste!
5. Other Initiatives and How to get involved
The Team
Team Mentality

Our mission is to develop and implement strategies to Conserve, Protect and Sustain resources to provide healthy and high-performing facilities that meet or exceed energy efficiency standards, bring real-world energy and sustainability challenges and solutions into the classroom, and encourage community engagement to address the climate crisis.

Our internal team is complemented by community partners, advisors, CPS staff, and students and teachers.
Our Strategy
Centering Our Community

Establishing a communication and engagement strategy across the district and shared with the community. The 2022 CPS Climate Action Plan and Energy and Sustainability team centers the health and wellbeing of our communities by:

- **Developing a framework for planning and implementing strategies** to reducing greenhouse gas (GHG) emissions and related climatic impacts.

- Identify energy and sustainability goals, in addition to cost saving opportunities.

- Provide baseline for identifying target areas for improvement, estimating impacts, and implementing climate protection initiatives especially in underserved communities.

- Bring real-world energy and sustainability solutions into the classroom and encourage community engagement to address the climate crisis.

**Actionable Data** - Engagement - Funding - Collaborative Partnerships - New Technology - Communication Via Social Media and other Platforms
Guiding Goals
Pillars

Conserve

Reducing the amount of waste energy we consume can help to make our district more efficient and environmentally responsible.

Protect

Maintaining, implementing and recovering healthy natural environments and delivering long-term equitable solutions will benefit current and future generations.

Sustain

Investing in sustainable energy sources to power our district means a cleaner, better future for our students, staff and community.
Pillars in Action
2022 Climate Action Plan

Chapters
- Energy and Resource Efficiency
- Information and Technology
- Waste Management
- Transportation
- Health and Wellness
- Curriculum networks

Audience
- Teachers, Principals
- District Staff
- Community Partners
- Energy and Sustainability Staff

Outcomes
- Cohesive district strategy
- Public commitment to doing our part to mitigate emissions

Climate Action Plan Goals

Energy
- Reduce electricity consumption by 30% by 2025
- Reduce natural gas consumption by 20% by 2025

Emissions
- Reduce GHG emissions by 45% by 2030, 100% by 2050

Greening
- Achieve 100% renewable electricity by 2025
- Achieve 80% waste diversion rate by 2030

Foreword
Dear CPS Stakeholders,

In the wake of the United Nation’s Intergovernmental Panel on Climate Change Sixth Assessment, we are pleased to present the CPS Climate Action Plan for 2021-2023. This is CPS’s first climate action plan and lays out the foundation for how we will do our part to mitigate climate change. The program aligns with the City of Chicago Climate Action Plan and demonstrates our commitment to collaboration.

Our mission is to conserve, protect and sustain resources to provide healthy and high-performing facilities that teach and ensure energy efficiency strategies (long-term) energy sustainability challenges and solutions into the classroom, and encourage community engagement to address climate change.

Our approach is to infuse solutions to encourage a culture of sustainability and increased awareness of savings through green, interactive, efficient buildings to optimize energy savings and avoid renewable goals while also reducing carbon emissions.

Our children are our future, and we owe it to them and to you to ensure they have access to the highest quality education and a district that does its part to mitigate climate change.

Our responsibility is to lead and educate our students on the science, technology, and strategies to meet our environmental goals.

We thank you for your continued support and partnership.

Sincerely,

[Signature]
Chief Executive Officer
Chicago Public Schools

[Image of Chicago Public Schools logo]
Our Approach

Developing Grid Interactive Buildings
Grid Interactive Efficient Buildings

1. Energy Efficiency
2. Load Flexibility Technologies
3. Distributed Energy Generation and Energy Storage
## Energy Efficiency - Step 1

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>Climate Action Plan Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>Reduce electricity consumption by 30% by 2025</td>
</tr>
<tr>
<td>Boiler Tune Ups</td>
<td>Reduce natural gas consumption by 20% by 2025</td>
</tr>
<tr>
<td>Mechanical Systems Repair or Replacement</td>
<td></td>
</tr>
<tr>
<td>Piping Insulation</td>
<td></td>
</tr>
<tr>
<td>Steam Traps Repair or Replacement</td>
<td></td>
</tr>
</tbody>
</table>

### Load Flexibility Technologies

### Distributed Energy Generation and Energy Storage

CPS Sustainability
Energy Efficiency

Asset Planner

CPS saved over $1.5 million (since 2019) by using Asset Planner and savings continue to increase.

Asset Planner identifies issues that result in savings:

- Data assessment
- Billing error
- Monthly consumption validation

Asset Planner - Utility Data and Billing Tracking tool:

- Access to each school utility bill (ComEd, Peoples Gas and Constellation) - 2400 bills/month
- Usage data since 2013
- Cost data
- Facility KSF

CPS saved over $1.5 million (since 2019) by using Asset Planner and savings continue to increase.
Energy Efficiency
Geographic Information Systems (GIS)

GIS Overview
- Geographic Information Systems (GIS) is a mapping and spatial data platform.
- GIS can allow for multi-layered analysis of buildings, campuses, and the CPS district in its entirety.
- GIS also makes data digestible to a larger audience.

CPS Energy and Sustainability Geospatial Module
- Track energy performance over time
- Benchmark against industry targets
- Identify savings opportunities
- Develop accurate reporting
- Create consumption and cost avoidance reports using weather normalization
- Assess greenhouse gas emissions
- Calculate carbon footprint

The project will increase cross-functional collaboration, eliminate redundancies and increase efficiencies.
Energy Efficiency
ComEd Public Buildings in Distressed Communities

LED Lighting Retrofit

In 2021 ComEd Energy Efficiency Program offered free LED lighting kits to public sector organizations located in distressed communities.

Through the PBDC offering, ComEd works with Energy Efficiency Service Providers to provide incentives that can cover up to 100% of project costs.

At the time the program, more than 400 of our schools were eligible for free energy-efficient lighting kits and incentives.

215 CPS Schools took advantage of this opportunity saving the district $10.2M in energy costs and $4.7M in equipment fees.

Eligible public sector organizations include municipalities, townships, counties, school districts, park districts, police and fire departments, library districts, and state and federal agencies.
CPS has saved over $1.5 million by implementing energy efficiency programs with ComEd since 2018.

Sample projects:
- Lighting retrofits
- Virtual Commissioning
- HVAC and Refrigeration Upgrades
- Demand Response

<table>
<thead>
<tr>
<th>Year</th>
<th>KWH Saved</th>
<th>Utility Savings</th>
<th>Incentives Paid to CPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>244,307</td>
<td>$21,987</td>
<td>$31,455</td>
</tr>
<tr>
<td>2019</td>
<td>2,029,522</td>
<td>$182,657</td>
<td>$252,704</td>
</tr>
<tr>
<td>2020</td>
<td>2,729,194</td>
<td>$245,627</td>
<td>$439,454</td>
</tr>
<tr>
<td>2021*</td>
<td>1,236,947</td>
<td>$111,325</td>
<td>$236,798</td>
</tr>
</tbody>
</table>

*2021 savings calculations are not yet complete

CPS and ComEd have prevented the equivalent emissions 43 million passenger vehicle miles.
Energy Efficiency
Peoples Gas* Efficiency programs

CPS saved over $8.6 million by implementing energy efficiency programs with Peoples Gas.

Sample projects:
- Boiler Tune-ups
- Steam Trap and Condensate Pump Replacements
- HVAC System Control Upgrades
- ASHRAE Audits

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<table>
<thead>
<tr>
<th>Year</th>
<th>Therms Saved</th>
<th>Utility Savings</th>
<th>Incentives Paid to CPS</th>
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</thead>
<tbody>
<tr>
<td>2018</td>
<td>271,485</td>
<td>$81,525</td>
<td>$149,910</td>
</tr>
<tr>
<td>2019</td>
<td>79,610</td>
<td>$23,907</td>
<td>$54,212</td>
</tr>
<tr>
<td>2020</td>
<td>633,641</td>
<td>$152,903</td>
<td>$430,566</td>
</tr>
<tr>
<td>2021</td>
<td>7,343,759</td>
<td>$4,983,474</td>
<td>$2,796,390</td>
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</table>

CPS and Peoples Gas have prevented the equivalent equivalent emissions 111 million passenger vehicle miles.

CPS saved over $8.6 million by implementing energy efficiency programs with Peoples Gas.

*Peoples Gas recently won an award at the Inspiring Efficiency awards in Chicago, due to their partnership with CPS.
## Load Flexibility Technologies - Step 2

### Energy Efficiency

<table>
<thead>
<tr>
<th>Lighting</th>
<th>Boiler Tune Ups</th>
<th>Mechanical Systems Repair or Replacement</th>
<th>Piping Insulation</th>
<th>Steam Traps Repair or Replacement</th>
</tr>
</thead>
</table>

### Load Flexibility Technologies

- Building Automation Systems
- Plug Load
- Real Time Monitoring

### Distributed Energy Generation and Energy Storage

- Install BAS to the buildings
- Real Time Monitoring devices
- Provide Actionable Information
Load Flexible Technologies

Virtual Commissioning™

CPS has avoided generating an additional 5,000 tons of CO2

CPS saved over $1.3 million in utility costs over a four year period

Virtual Commissioning™

One on One with Building Engineers, meetings are held to discuss unusual energy usage abnormalities as leading indicators of efficiency savings potential and adjustments per the team’s recommendations.
Grid Interactive Efficient Buildings

**Energy Efficiency**

<table>
<thead>
<tr>
<th>Lighting</th>
<th>Boiler Tune Ups</th>
<th>Mechanical Systems Projects</th>
<th>Piping Insulation</th>
<th>Steam Traps Projects</th>
</tr>
</thead>
</table>

**Load Flexibility Technologies**

<table>
<thead>
<tr>
<th>Building Automation Systems</th>
<th>Plug Load</th>
<th>Real Time Monitoring</th>
</tr>
</thead>
</table>

From 2018 through 2021, the Energy and Sustainability team has saved CPS over $28 million.

**Climate Action Plan Goal**

- Reduce electricity consumption by 30% by 2025
- Reduce natural gas consumption by 20% by 2025

**Electricity Consumption Over Time**

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>529M KWh</td>
</tr>
<tr>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td></td>
</tr>
</tbody>
</table>

**Natural Gas Consumption Over Time**

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>34.1M therms</td>
</tr>
<tr>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>27.2M therms</td>
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</table>

CPS Sustainability
Distributed Energy Generation and Energy Storage - Step 3

Energy Efficiency

Load Flexibility Technologies

Distributed Energy Generation and Energy Storage

CPS Goes Solar! | RECs | Carbon Offsets

Climate Action Plan Goal
Achieve 100% renewable electricity by 2025

CPS Sustainability
CPS Goes Solar!
CPS Goes Solar!

Program Background

Our current energy mix produces the equivalent emissions from driving nearly 470M miles in a passenger car.

Current Energy Mix

- Nuclear, 34%
- Natural Gas, 38%
- Coal, 22%
- Renewable, 5%

Our Projected Future Energy Mix

- Off-site Renewable, 90%
- On-site Renewable, 10%

CPS Goes Solar takes us from our current energy mix, to a clean, renewable energy future.

Data sources: ComEd consumption, EPA GHG Equivalent Calculator, ComEd Environmental Disclosure
CPS Goes Solar!
Program Background

Stakeholders
- Schools
- CPS Energy and Sustainability
- CPS Capital Team
- ComEd/Ameresco
- RFP Respondent

Goals
- Reach 100% renewable electricity by 2025
- Reduce GHG emissions by 45% by 2030
- Educate students through classroom and real-world learning opportunities

Actions
- Develop Pilot to evaluate feasibility, duration, cost, challenges and delineate Standard Operating Procedures for future solar projects (on and off site)
CPS Goes Solar!
Pilot Program Mission

Climate Action Plan Goal

Achieve 100% renewable electricity by 2025

Develop a **systematic, replicable, and integrated approach** to identify and prioritize solar projects designed to support CPS in achieving our mission.

- Developing an **organization-wide framework** validated with pilot sites
- Developing **Business Case to qualitatively and quantitatively prioritize projects**
- Documenting **verified affordable, replicable best practices** and lessons learned
Schools Under Next Step Review

Pilot schools will generate close to 1,000 KWh daily on average. The equivalent carbon savings provided by 4,300 mature trees.
CPS Zero Waste!
CPS Zero Waste!

- This is a project designed to support CPS to become zero waste by 2040, which means diverting 90% more of all waste from the landfill.

- CPS interim milestone is achieving 80% waste diversion by 2030, or more of all cafeteria/kitchen waste from landfills through commercial composting, recycling, liquid diversion, and food recovery.

- Educate students/staff about the how and why of going for zero waste, empowering them to make a difference each and every day.

- Apply the best practices learned at the pilot schools to develop a plan for expanding the program to all schools across the district.

CPS generates over 40,000 tons of waste each year, approximately 35% of which is food scraps. Composting and recycling keep valuable resources out of landfills and have significant environmental impacts.

2015-2021

District Diversion Rate: Tons

- Recycling: 24%
- Landfill: 76%
Funding
For 10 schools, the projected cost is ~$7.5M, but the projects could generate more than $9M in credits, rebates, and utility savings. (ownership model)

### Funding Mechanisms

<table>
<thead>
<tr>
<th>No Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Capital $</td>
</tr>
<tr>
<td>● Bond Funds</td>
</tr>
<tr>
<td>● Incentives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>● No upfront cost</td>
</tr>
<tr>
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<td>● If we move, PPA transfers to the new owner</td>
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### Power Purchase Agreement - PPA

- Long term electricity agreement between power producer (solar developer) and consumer (CPS). The solar developer will install solar panels and operate the system, while CPS receives negotiated, low energy rates.
- Ability to install solar without upfront costs and have maintenance taken care of.
- Decades of predictable energy prices.

Has CPS analyzed alternative financing?

Yes.

- No upfront cost
- Price is locked for years
- 24/7 monitoring
- Operation and Maintenance
- If we move, PPA transfers to the new owner
Responsibilities

**Vendor Responsibilities:**
- Engineering and construction
- Equipment purchase
- System installation services
- Performance guarantee and operations

**CPS Responsibilities:**
- Reviews RFP
- Manages contract development and execution (design and construction)
- Monitor system performance per contract agreement
- Monitor system operation and maintenance

**Plan of Action and Milestones:**

- **Preliminary Assessment:** 2 to 4 weeks
- **Application:** 3 to 6 months
- **Design, Engineering, Permitting, Procurement:** 3 to 6 months
- **Installation, Approvals, Interconnection:** To 25 Years
- **Operation and Maintenance:** To 25 Years
- **Construction Starts:**
- **System Online:**
- **Financing Incentive Application:**
Other Initiatives and How to Get Involved
On Going Initiatives

Goethe STEAM Design Challenge
Join Goethe ES as they embark on another Design Challenge. Contact Heath Davis to learn more.

Green Workforce and Technical Education
Contact Sustainability Program staff to learn more about ways to develop the workforce.

Dialogue with students on the importance of sustainability
To join in on the fun contact Sustainability Program staff.

Podcast
Listen to Director Sandrine Schulz speak in depth about our programs on the TC Podcast.

Stay tuned for our...

Website reboot
Climate Action Plan release
Newsletter sign-ups
Better Buildings Partners with DOE
Jump on board!
Q & A
Thank You!

Provide feedback on this session in the Summit App!

Download the Whova app to your mobile device or use the QR code to access the web version.