



# Chicago Public Schools: Energy and Sustainability Program Executive Summary

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# Our Vision and Mission



**CPS Vision & Mission: Success starts here.** Provide a high-quality public education for every child, in every neighborhood, that prepares each for success in college, career and civic life. Provide a Safe-Healthy-Comfortable-Welcoming environment for students and staff.

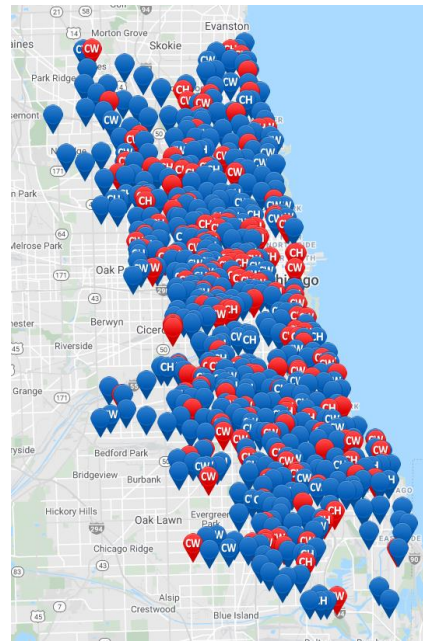
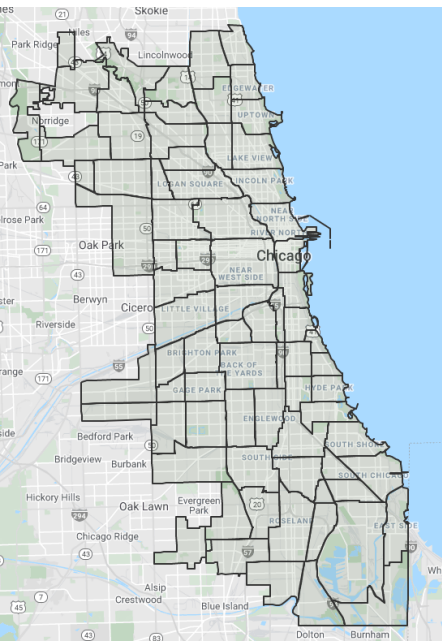
**Department of Facilities Mission:** Dedicated to providing CPS students with a building that is safe, warm and dry. Our mission is to make a student proud of their school so that each student can concentrate on their studies.

The department assists schools in the day-to-day physical operation of the building, striving to reduce the energy use of each while providing a more comfortable classroom.

## Mission

**C**onserve, **P**rotect and **S**ustain resources to provide healthy and high performing facilities that meet or exceed energy efficiency standards and bring real-world energy and sustainability challenges and solutions into the classroom and encourage community engagement.

# CPS Portfolio

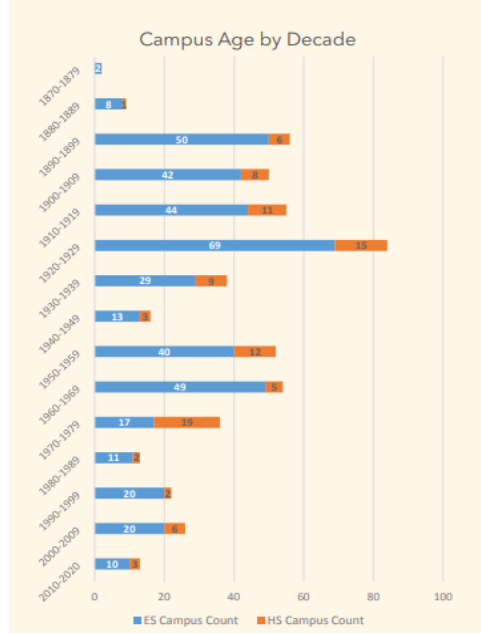
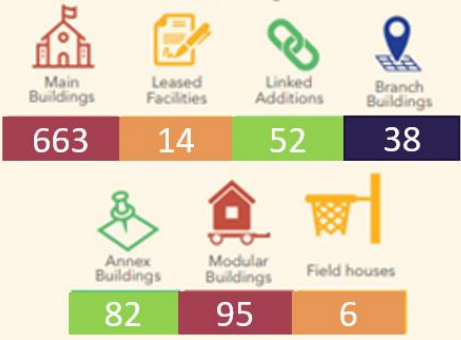


**654 Schools**  
**178 HS**  
**476 ES**

**950** Buildings  
**650** Campuses  
**64 M** Square Feet

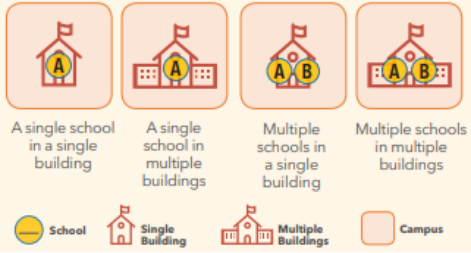
### Building Portfolio

Administrative and stadium buildings excluded



### CPS Campuses

A CPS campus can look several ways:



# Top 10 Elements of CPS Energy Efficient and Sustainable Schools

## Healthy and High Performing Schools



# Energy and Sustainability Integration Across CPS Core Functions: A Systems Based Approach



## Energy and Water

- Utility Management
- Energy Efficiency
- Demand Response
- Distributed Energy Resources
- Energy Use Intensity (EUI)
- Benchmark



## Facilities

- Planning and Design
- Operation and Maintenance
- Deferred Maintenance
- Retrofit
- Commissioning
- Lifecycle Cost Analysis



## Information and Communication Technology

- Building Automation Systems
- Smart Meters
- Geographic Information Systems
- Energy Dashboard



## Waste Management & Recycling

- Recycling Programs
- Reuse Textbooks
- Reuse Furniture
- Food Waste Prevention



## Health and Wellness

- Healthy Buildings
- Acoustic Comfort
- Environmentally Material and Products
- Indoor Air Quality Management Plan
- Green Cleaning

**Safe – Healthy – Comfortable - Welcoming**

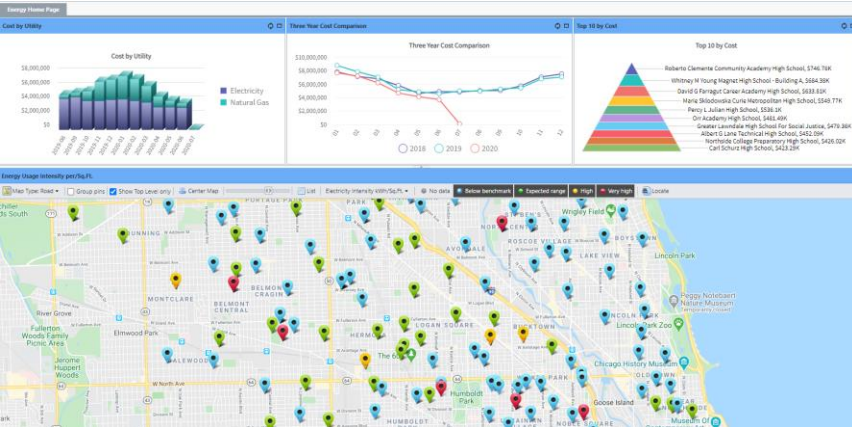
# Goals



## **CPS aims to hit the below sustainability goals as part of their integrated district plan:**

- › Reduce the District's annual energy consumption by 25% from the 2019 Fiscal Year baseline by 2025, saving the District a potential \$11M
- › Reduce operating costs by 25%
- › Achieve an average district-wide Energy Star rating of greater than 75
- › Increase energy security via reliability, resilience, energy efficiency, and renewable energy goals (City of Chicago Goal transition to 100 percent clean, renewable energy in buildings community-wide by 2035)
- › Reduce the District's water use and improve stormwater management
- › Reduce District waste and increase recycling
- › Heighten energy awareness and environmental stewardship

# Asset Planner™ - Actionable Information



## Facility and Engineering Assessments

- (Select All)
- Classroom
- Electrical
- Exterior
- Fire Protection
- Interior
- Mechanical
- Plumbing
- Room
- Site

### PRIORITY REPLACEMENT

0 - 1 Years	Full replacement recommended within 1 year (0 - 12 Months)
1 - 2 Years	Full replacement recommended within 1 -2 years (13 - 24 Months)
3 - 5 Years	Full replacement recommended within 3 - 5 years (25 - 60 Months)
6 - 10 Years	Full replacement recommended within 6 - 10 years (61 - 120 Months)
10 + Years	Full replacement recommended beyond 10 years (> 120 Months)

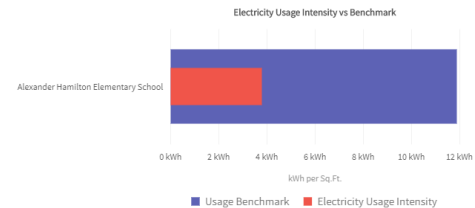
Utility Meters (Add a new Utility Meter, Back to Find or New Search)

Select all | 
  Unselect | 
  Select between | 
  Export | 
  Modify

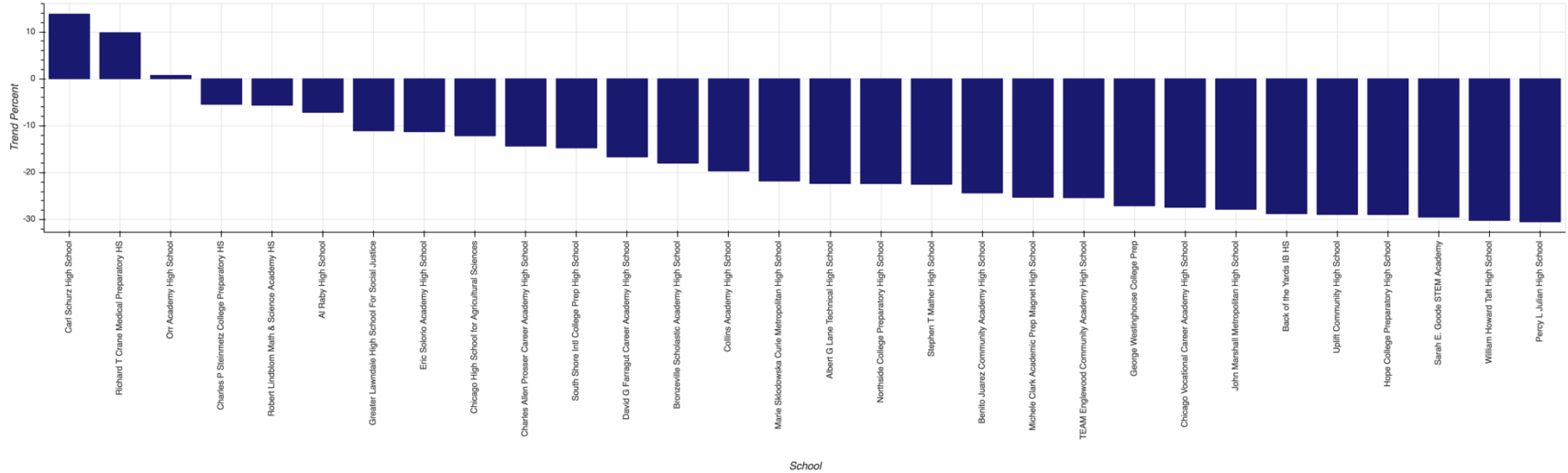
ID	Utility Type	Name /	Meter Status	Asset	Utility Provider
2319	Natural Gas	2501 W Addison St	Active	Albert G Lane Technical High School	Constellation
2320	Natural Gas	2501 W Addison St	Active	Albert G Lane Technical High School	Peoples Gas
712	Electricity	2501 W Addison St	Active	Albert G Lane Technical High School	ComEd
713	Electricity	2501 W Addison St	Active	Albert G Lane Technical High School	Constellation



## Energy Assessment



# AGENTIS



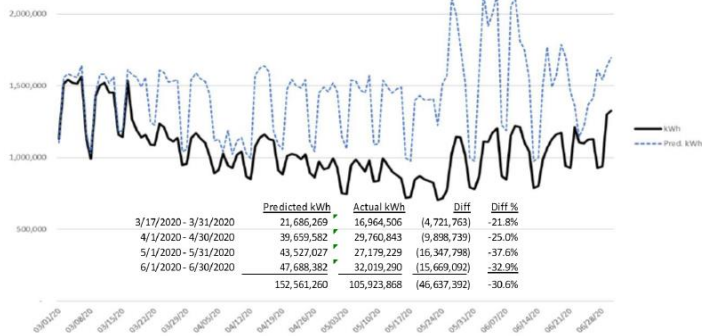
## Best Opportunities for Operational Improvements

School	Energy Trend
Carl Schurz High School	+ 13.8%
Richard T Crane Medical Preparatory HS	+ 9.8%
Orr Academy High School	+ 0.7%
Charles P Steinmetz College Preparatory HS	- 5.5%
Robert Lindblom Math & Science Academy HS	- 5.6%





# COVID-19 Impacts



**TOP 10 Schools (in use)**

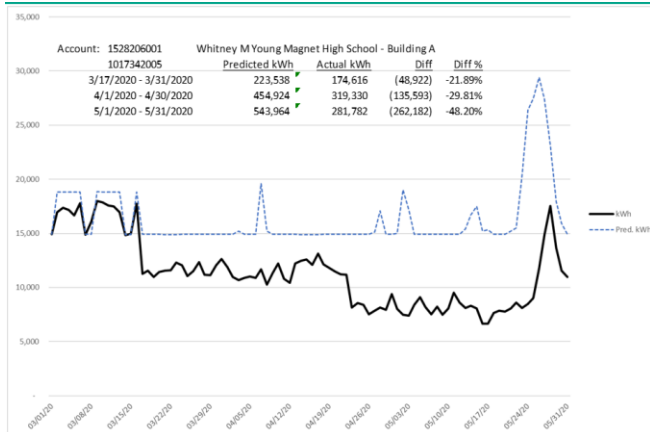
Rank	School Name	ComEd Account	FYTD kWh	% Portfolio
1	Roberto Clemente Community Academy High School	1026626005	6,861,322	1.5%
2	David G Farragut CareerAcademy High School	1430443003	8,051,757	1.8%
3	Whitney M Young Magnet High School - Building A	1528206001	4,831,168	1.1%
4	Marie Sklodowska Curie Metropolitan High School	1017342005	842,263	0.2%
5	Percy L Julian High School	1110075003	5,591,141	1.2%
6	Greater Lawndale High School For Social Justice	1353588003	4,957,126	1.1%
7	George H Corliss High School	1155035056	5,217,517	1.1%
8	Walt Disney Magnet Elementary School	1310223003	4,495,595	1.0%
9	Northside College Preparatory High School	1299607007	4,211,576	0.9%
10	George Westinghouse College Prep	1153117002	3,422,670	0.7%

ComEd Account	FYTD kWh	% Portfolio	Mar 17-31	Apr '20	May '20
1026626005	6,861,322	1.5%	-19.6%	-28.1%	-57.96%
1430443003	8,051,757	1.8%	0.9%	10.1%	11.21%
1528206001	4,831,168	1.1%	-21.9%	-29.8%	-48.20%
1017342005	842,263	0.2%			
1110075003	5,591,141	1.2%	8.2%	-6.5%	0.88%
1353588003	4,957,126	1.1%	-0.1%	-7.2%	-18.85%
1155035056	5,217,517	1.1%	8.1%	6.4%	-1.06%
1310223003	4,495,595	1.0%	-13.3%	-39.7%	-47.84%
1299607007	4,211,576	0.9%	11.8%	2.4%	9.52%
1153117002	3,422,670	0.7%	-28.1%	-33.9%	-40.90%
8243128125	3,336,984	0.7%	1.4%	-13.1%	-20.19%
51,819,309		11.3%			

**ADDITIONAL Schools**

Rank	School Name	ComEd Account	FYTD kWh	% Portfolio
1	Morgan Park High School	1353590003	1,633,508	0.4%
2	Wendell PhillipsAcademy High School	1101028000	1,173,721	0.3%
3	Cyrus H McCormick Elementary School	1017737004	736,069	0.2%
4	Mildred I Lavizo Elementary School	724287003	928,532	0.2%
5	Skinner North	1017599004	276,522	0.1%

ComEd Account	FYTD kWh	% Portfolio	Mar 17-31	Apr '20	May '20
1353590003	1,633,508	0.4%	19.45%	1.73%	-40.39%
1101028000	1,173,721	0.3%	5.04%	-6.79%	-13.48%
1017737004	736,069	0.2%	-5.79%	-17.59%	-46.21%
724287003	928,532	0.2%	20.37%	16.08%	-19.01%
1017599004	276,522	0.1%	3.65%	-18.27%	-43.14%
4,748,359		1.0%			



## Ventilation and Indoor Air Quality Assessment

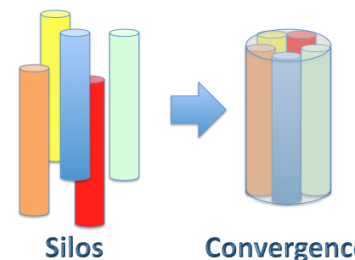
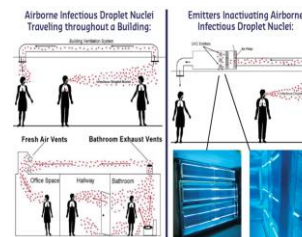
As we have committed to you and your family throughout our response to COVID-19, the health and wellness of our school communities is paramount.

To ensure school buildings are prepared for a return to in-person instruction, we worked to ensure every classroom has a working window or a mechanical ventilation system to dilute air particles that may have viruses or bacteria and allow old air to move out of the classroom.

We also hired independent state-certified environmental specialists to conduct indoor air quality assessments.

How does this ensure classroom air is safe and healthy for students?

clean air and reduces the risk of indoor transmission of viruses and bacteria.



# Energy Efficiency Programs



## Facility Assessments

**ComEd Energy Efficiency Program**

**Facility Assessment**

Prepared for  
**Chicago Public Schools Warehouse**

By: Anna Sorenson - Energy Program - (847) 329-6564 - anna.sorenson@comed.com  
Assessment Number: 1617 - 2020-04-07-01 - Chicago, IL 60612 - 04-2020

**EXECUTIVE SUMMARY**

**Financial Benefit**

We estimate your Facility will be rewarded for:

Annual Savings	\$8,900
ComEd Energy Efficiency Program Incentive	\$7,540

**Annual Energy Benefit**

Before	770,000 kWh/yr	Up to 12% Energy Savings
After	677,000 kWh/yr	Up to 12% Energy Savings

**Annual Environmental Benefit**

Can Reduce Your Carbon Footprint by up to:

30 Metric Tons of CO <sub>2</sub> Equivalent
or 2.5 Metric Tons of Petroleum

**Standard Measure Details**

**Lighting Solutions**

**Replace T8 Lighting**

Replace T8 Fluorescent Fixtures with Tubular LED (TLED) lamps, which are more efficient than Standard Fluorescent T8 Lamps and provide comparable light levels

Location	City	Existing	Proposed	Estimated Energy Savings (kWh/yr)	Estimated Savings (\$/yr)	Cost (\$)	Incentive (\$)	Payback (Years)
Entire Facility	150	4 Lamps x 8 T8 with Standard SP Electronic Ballast (T8)	4 Lamps x 8 Tubular LED (TLED) Lamps (20W)	27,100	\$2,400	\$13,700	\$2,400	4.7
Entire Facility	350	2 Lamps x 4 T8 with Standard SP Electronic Ballast (20W)	2 Lamps x 4 Tubular LED (TLED) Lamps (20W)	33,900	\$3,050	\$21,650	\$2,800	5.1
<b>Subtotal</b>				<b>61,000</b>	<b>\$5,450</b>	<b>\$34,750</b>	<b>\$5,200</b>	<b>5.8</b>

**Install Lighting Controls**

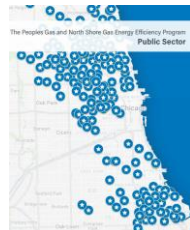
Install Occupancy Sensors which turn lights on/off based on space occupancy and/or ambient light levels

Location	City	Existing	Proposed	Estimated Energy Savings (kWh/yr)	Estimated Savings (\$/yr)	Estimated Cost (\$)	Estimated Incentive (\$)	Payback (Years)
Entire Facility	100	4 Lamps x 8 Tubular LED (TLED) Lamps (20W)	Install Occupancy Sensors	6,400	\$575	\$2,400	\$460	2.7
Entire Facility	350	2 Lamps x 4 Tubular LED (TLED) Lamps (20W)	Install Occupancy Sensors	7,500	\$670	\$2,700	\$500	2.8
<b>Subtotal</b>				<b>13,900</b>	<b>\$1,245</b>	<b>\$5,100</b>	<b>\$1,020</b>	<b>2.8</b>

**2018-2020**  
kWh Savings: 8,031,880  
Cost Savings (Incentives, Utility and Project) : \$2,497,452  
Potential Incentive Amount: \$843,460

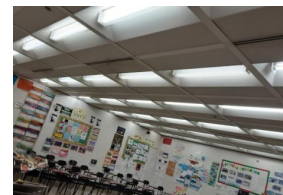
## Boiler Tune-Up and Steam Trap

Projects	Incentives Earned	Therms Saved
Boiler Tune-ups	\$464,113	884,258
Steam Trap Replacements	\$33,590	32,009
Condensate Pump Replacements	\$51,470	20,588
Leaking Steam Valve Replacements	\$29,925	25,210
Steam Leak Repairs	\$13,238	5,834
HVAC System Control Upgrades	\$42,352	16,836
<b>Total</b>	<b>\$634,688</b>	<b>984,735</b>



**2018-2020**  
Total Therms Saved: 1,254,456  
Annual Cost Savings: \$840,485.52  
Rebate Amount: \$850,771

## Lighting Retrofit



**Total Lifetime Projected Savings**  
**215 Schools**  
\$15,023,722.15  
Energy Savings: \$10,236,243.40  
Material and Labor Savings: \$4,787,478.75

## Building Technology



**2020**  
**19 Schools**  
kWh Savings: 5,000,899  
Cost Savings: \$485,087

# Renewable Initiatives

## CPS Goes Solar !



### › **Need:**

- Climate Change is real
- Globally we must reduce GHG by 7.6% between now and 2030
- Future generation deserve it
- CPS Goes Solar! will address "operations" and "education" need to equip schools and young people to mitigate climate change and lead the 21<sup>st</sup>-century renewable economy.

### › **Project Summary:**

- Develop a team of non-profit and for-profit advisors, sister agencies, and CPS staff and students
- Develop a Community Solar models that enable schools to purchase energy from solar arrays on other schools.
- Support renewable energy procurement options and decision-making to round out the District's renewable energy goal targets.
- Develop and implement a resource guide and webinar training for CPS teachers that incorporate professional climate crisis curriculum videos

### › **Goals:**

- To achieve CPS renewable energy portfolio goal target of 100% by 2025.
- To reduce greenhouse gas emissions generated by CPS by 45% by 2030 and 100% by 2050 per Intergovernmental Panel on Climate Change recommendations.
- Align with the Illinois Renewable Portfolio Standard, the target of 25% renewable electricity by 2025, and future possible goal targets, including the Clean Energy Jobs Act (100% by 2050) or the Path To 100's 40% goal by 2030.
- To equip teachers to implement inquiry-based learning modules and professional climate change video curricula (presented by students), resulting in design products related to the climate crisis and equity.
- To educate students about all aspects of solar energy, panels, installations, and careers, and developing a sense of possibility for future jobs in solar energy.
- To reduce CPS's energy spend.

# Waste Management and Recycling

## CPS Classroom Recycling Guide

- |  |   |  |
|--|---|--|
| <p><b>Teacher/Supervisor Role</b></p> <ul style="list-style-type: none"> <li>Place the recycling bin and landfill bin next to each other. Place signs above or on the bins.</li> <li>Lead by example and learn what can and can't be recycled.</li> <li>If you see items not sorted properly, reach proper sorting.</li> <li>Encourage students to recycle.</li> </ul> | <p><b>Student Role</b></p> <ul style="list-style-type: none"> <li>Learn what can and can't be recycled.</li> <li>Recycle at meal times and throughout the day.</li> <li>Remind your teacher/supervisor to recycle.</li> <li>Encourage your classmates to recycle, reach proper sorting.</li> <li>Bring the message of recycling home to your family.</li> </ul> | <p><b>Custodian Role</b></p> <ul style="list-style-type: none"> <li>Empty all trash and recycling from the classroom into hallway containers. If the recycling bin has a lot of contamination from food, liquids, or non-recyclables, discard the load in the trash.</li> <li>Inform the teacher and the building engineer if contamination happens regularly, or if you see a lot of recyclables in the trash.</li> <li>Place trash and recycling in proper outdoor dumpsters.</li> </ul> |
|--|---|--|

**Why recycle? Recycling...**

- Reduces what gets sent to landfills
- Conserves valuable natural resources
- Aligns with CPS recycling goals
- Aligns with the City of Chicago's recycling goals
- Saves money - it costs CPS about twice as much when recyclables get hauled as trash



Give milk and juice cartons a second life! All cartons recycled in CPS go to a paper mill in Wisconsin where they get turned into new products like toilet paper, tissues, and paper towels.

## Classroom Set-Up for Mealtime Recycling

- Place the 10-gallon blue recycling bin next to the classroom trash bin.
- Line the recycling bin with a clear liner bag.
- Line the trash bin with a black liner bag (trash bin size may vary).



The 10-gallon blue bin is only for collecting recycling from breakfast & lunch. A separate recycling bin should be used for collecting all other classroom recycling.



The landfill trash from meals should go into a bin lined with black bag (bin size & shape will vary).

Always place bins next to each other and post signage on the wall above or on each bin.

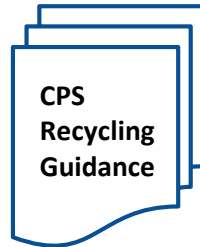


### BREAKFAST & LUNCH RECYCLING

ALL CONTAINERS MUST BE EMPTY

MILK & JUICE CARTONS	GLASS & METAL	PLASTICS #1-6	CLEAN PAPER & CARDBOARD

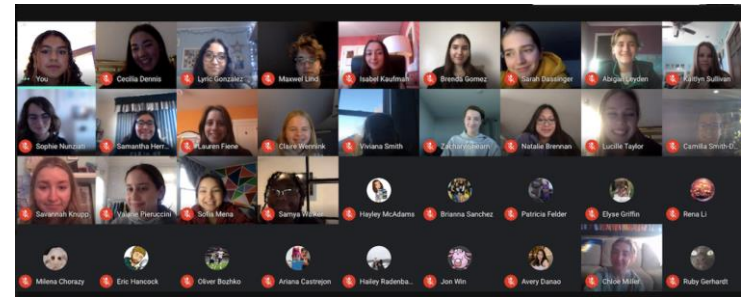
NO FOODS OR LIQUIDS	NO PLASTIC UTENSILS OR STRAWS	NO WRAPPERS	NO JUICE POUCHES	NO PLASTIC BAGS	NO PLASTIC #4 STYROFOAM



## How to Sort in the Classroom at Mealtimes

Drink containers must be **emptied** before getting recycled. If your classroom has a sink, instruct students to pour their unconsumed liquids into the sink.

If your room does not have a sink, instruct students to pour their unconsumed liquids into the landfill trash bag/bin.



# 2020 - Partnerships

## > The Peoples Gas and North Shore Gas Energy Efficiency Programs

and

## > Illinois Tech Chapter of Citizens' Climate Lobby; Political Advocacy organization focused on cutting down Carbon Dioxide Emissions

- College Students – mechanical, architectural, civil and chemical engineering



### Gas Group: Summary

- **\$17,600** Annual Financial Savings
- **390,000** pounds of CO2 Saved Annually
- 436,000 miles driven by passenger vehicles
- 10,600 trees planted

### Electric Group: Summary

- **\$6307** Annual Financial Savings
- **1,500** pounds of CO2 Saved Annually
- 8,000,000 cell phones charged
- 83.2 acres of forest

# Other Success Stories



Projects	Incentives Earned	Therms Saved
Steam Trap Replacements	\$22,160	18,344
Condensate Pump Replacements	\$51,470	20,588
Leaking Steam Valve Replacements	\$29,925	25,210
Steam Leak Repairs	\$13,238	5,834
<b>Total</b>	<b>\$116,793</b>	<b>69,976</b>

## CASE STUDY

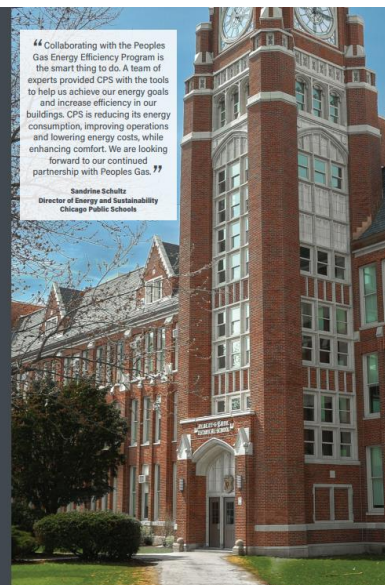
**CUSTOMER**  
Chicago Public Schools:  
Lane Tech College Prep High School

- PROJECTS**
- Steam Trap Replacements
  - Condensate Pump Replacements
  - Leaking Steam Valve Replacements
  - Steam Leak Repairs

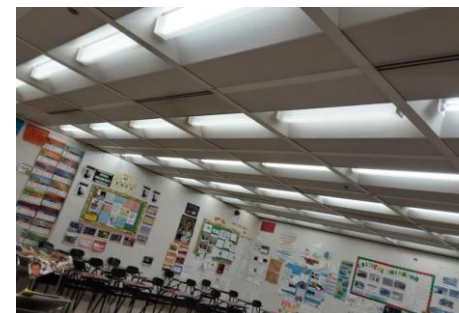
**TOTAL REBATE AMOUNT**  
\$116,793 (2019-2020)

**ENERGY SAVINGS**  
69,976 therms

**CUSTOMER BACKGROUND**  
Lane Tech College Prep High School is a large, coeducational seventh through twelfth-grade public high school. This Chicago Public School offers students a college preparatory curriculum with an emphasis on the technical aspects of modern education. Chicago Public Schools Energy and Sustainability Program is committed to significantly reducing energy consumption across the district, while maintaining a healthy and productive learning environment for faculty, students and staff.



	Design/Build	Energy Services Performance Contract	Contingent Payment Agreement (CPA)	Savings as a Service (SaaS)	Public Private Partnership (P3)
Counterparty with Customer	NORESCO	NORESCO	NORESCO	Financier	Developer
Counterparty with Financier	Customer or Not Applicable	Customer or NORESCO	NORESCO	Not Applicable	Developer
NORESCO Role	Prime Contractor	Prime Contractor	Prime Contractor	EPC Contractor and Guarantor	EPC and O&M Contractor
Payment Type	Fixed	Fixed	Performance Based	Performance Based	Fixed/Performance Based
Asset Ownership Transfer	At Acceptance	At Acceptance	At End of Term	Fair Market Value at End of Term	At End of Term
Accounting Treatment	Financing Dependent, if any	Lease/Debt	Lease/Debt	Service Agreement	Service Agreement
Credit Impact	Financing Dependent, if any	Negative to Neutral	Neutral	Neutral	Neutral to Positive



# Questions