



# **Ann Arbor Public Schools**

## ***Annual Environmental Sustainability Update***

Report to the Board of Education  
April 19<sup>th</sup>, 2023

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# Presentation Summary

## Background

- Board Policy 8000: Environmental Sustainability
- Vision and Mission – Environmental Sustainability at the AAPS
- Review - Environmental Sustainability Framework

## Greenhouse Gas Inventory

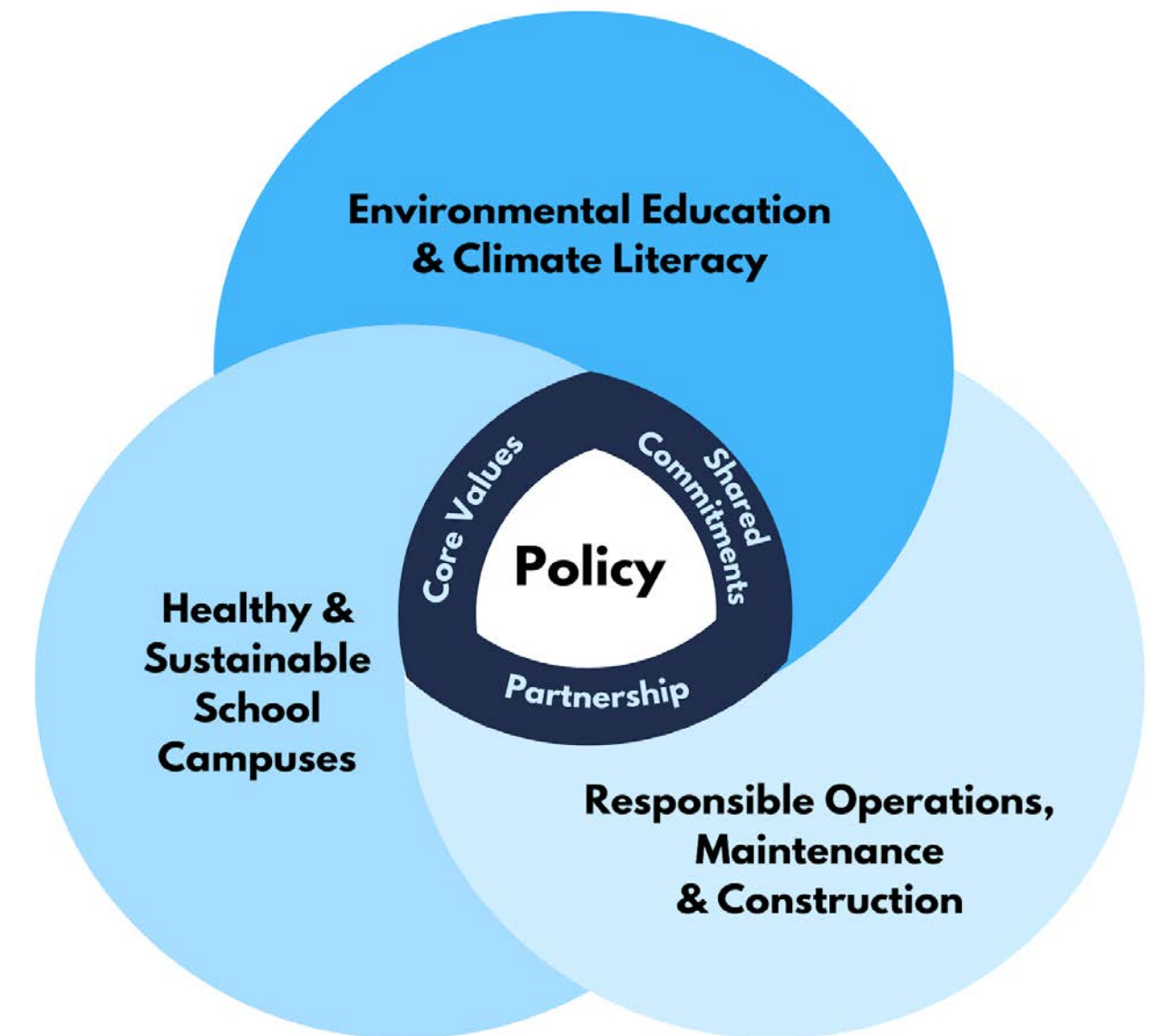
- Scope 1 Emissions - Natural Gas; Bus and Fleet Vehicles; and Site Sequestration
- Scope 2 Emissions - Electricity
- Scope 3 Emissions – Water and Waste

## Environmental Sustainability Updates - Current Initiatives

- AAPS Environmental Sustainability Advisory Group
- Federal Incentives – Inflation Reduction Act (IRA)
- Solar Update
- Electric Bus Update
- Environmental Action School Mini-Grants

## Next Steps

### Environmental Sustainability Framework



# AAPS Board Policy 8000: Environmental Sustainability (Appendix A)

*Adopted 12/12/2018*

The Ann Arbor Public Schools recognizes that:

- **Climate change is real, increasing, and caused by human activity**; and
- the **Ann Arbor community is committed** to practices that support a healthy environment for present and future generations; and
- the **District has a responsibility** to help prepare current and future generations to respond to climate change through the reduction of harmful human activities, the promotion of human activities that restore the environment, and the development of strategies to adapt to climate change.

The District will support the prioritization of:

- **Environmental sustainability education** that prepares present and future generations to become thoughtful stewards of the environment; and
- developing **student leaders** prepared to succeed in an uncertain climate change future; and
- maintaining and operating **district buildings and grounds** that reduce the environmental impact of human activities, promote the restoration of the environment, and adapt to climate change; and
- building and enhancing **partnerships** that support the Ann Arbor community's environmental principles.

The Superintendent and/or designee(s) will report annually to the Board of Education on activities related to this policy.

# Mission and Vision – Environmental Sustainability

## ***Mission:***

The AAPS is committed to care for the environment, to model and achieve an environmentally sustainable existence, with every decision and in every area of the organization.

## ***Vision:***

In all decisions we embody and live the value of care for our earth and the environment. Individual, team and district decisions are consistent with care for the earth.



# Environmental Sustainability Framework – Table of Contents

## 1) Responsible Operations, Maintenance and Construction

- 1.1 Energy
  - 1.11 Energy Efficiency and Conservation
  - 1.12 On-Site Renewable Electricity Generation
  - 1.13 On-Site Natural Gas Combustion
  - 1.14 Purchased Electricity
- 1.2 Water
  - 1.21 Water Quality
  - 1.22 Water Conservation
  - 1.23 Stormwater Management
- 1.3 Waste Reduction, Reuse, Recycling, and Composting
- 1.4 Transportation
- 1.5 Scope 3 Emissions
- 1.6 New Construction and Renovation

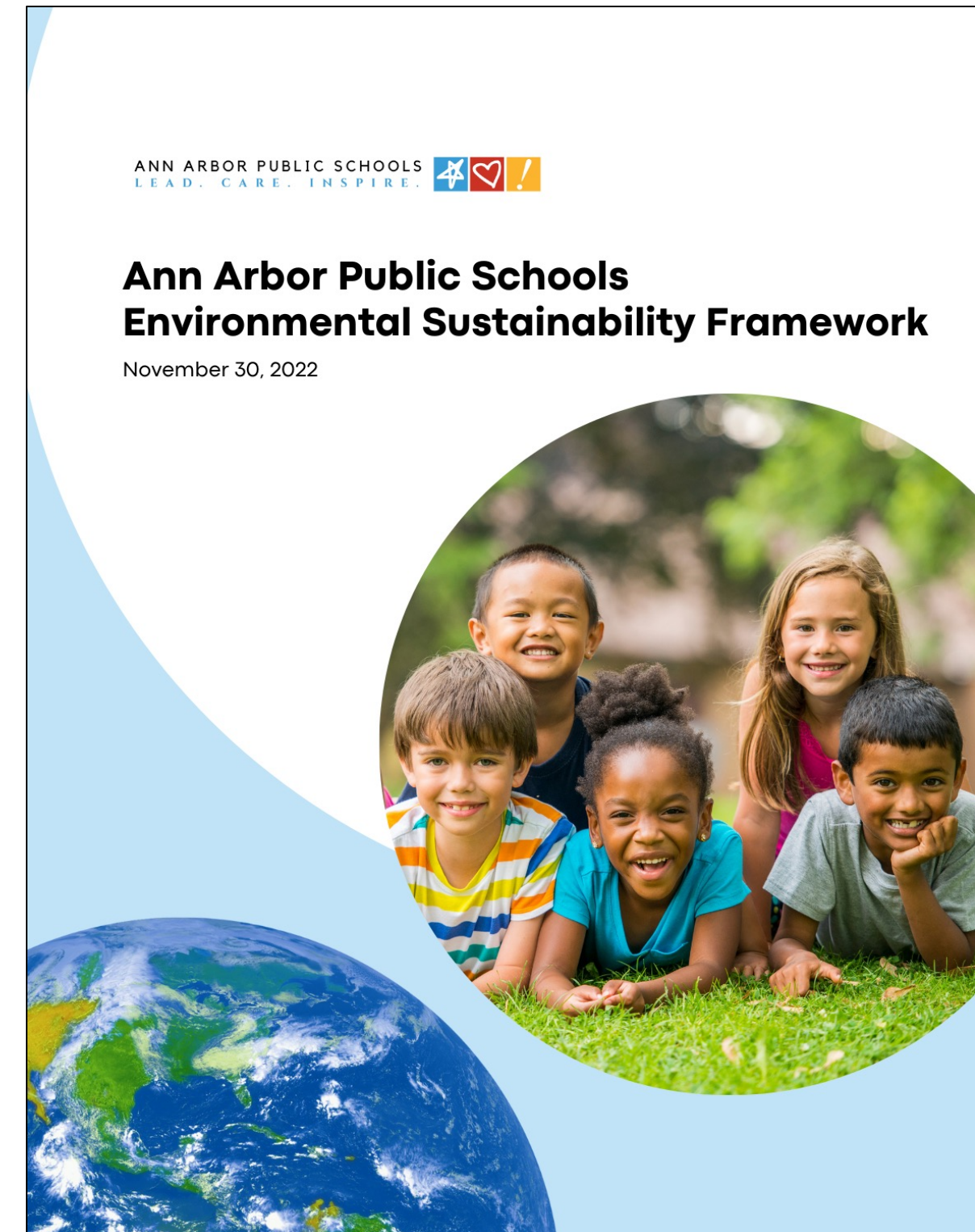
## 2) Environmental Education and Climate Literacy

- 2.1 Core Academics
  - 2.11 Environmental Sustainability Curriculum
  - 2.12 Social and Environmental Justice
  - 2.13 Career Technical Education
- 2.2 Enrichment Learning
  - 2.21 Green Teams
  - 2.22 School Gardens

## 3) Healthy & Sustainable School Campuses

- 3.1 Indoor Environment
- 3.2 Outdoor Environment
- 3.3 Food Systems

[LINK](#)



# Environmental Sustainability Framework

## *Metrics and Reporting*

### Reporting

#### **Develop systems to report the district's carbon footprint in a Greenhouse Gas Inventory, including:**

- **Scope 1 Emissions:**
  - Natural gas consumption, district-wide and by school
  - Bus fuel consumption
  - Fleet vehicle fuel consumption
  - Carbon sequestration from the district's greenspaces
  
- **Scope 2 Emissions:**
  - Purchased electricity, district-wide and by school
  - On-site renewable energy generation, district-wide and by school
  
- **Scope 3 Emissions:**
  - Municipal water usage, district-wide and by school
  - Waste, re-use, recycling and composting
  - Contracted services, including: food service, custodial services, lawn care, snow removal and others
  - Purchasing
  - Employee commuting
  - Business travel
  - Investments
  - Other areas

# Environmental Sustainability Framework

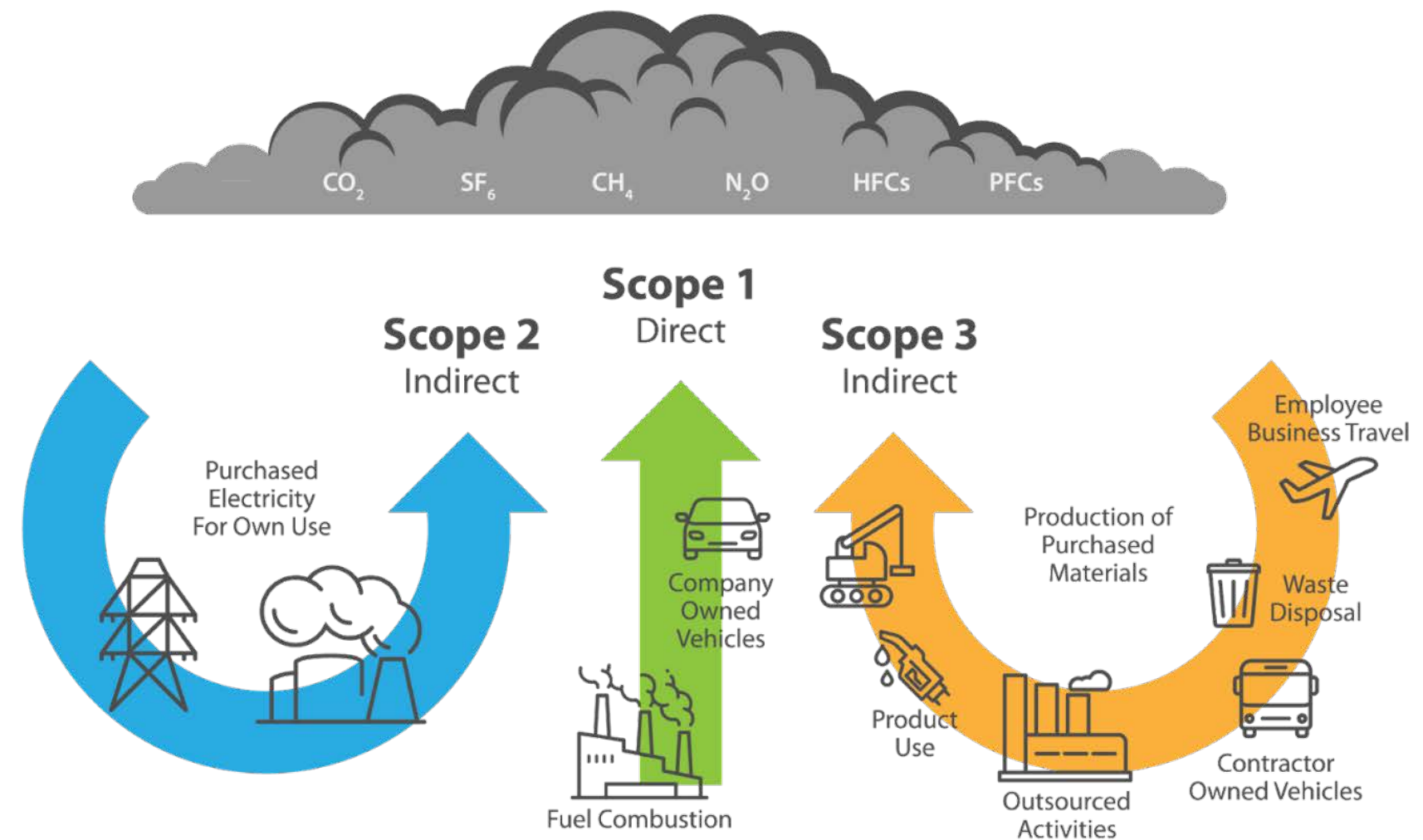
## Greenhouse Gas Emissions (GHG) - Overview

AAPS accounts for less than 1% of our community's greenhouse gas (GHG) emissions. Though this is a small amount of the total emissions in Washtenaw County, the district is committed to doing what it can to be part of a carbon-neutral future.

AAPS Environmental Sustainability Framework includes important steps to reduce the district's GHG footprint. These actions are organized based on the three scopes of emissions utilized by the [Intergovernmental Panel on Climate Change](#) (IPCC) of the United Nations, major corporations, countries, and municipalities worldwide, including in the United States.

[The IPCC defines](#) Scope 1, 2 and 3 emissions as:

'Scope 1' indicates direct greenhouse gas (GHG) emissions that are from sources owned or controlled by the reporting entity. 'Scope 2' indicates indirect GHG emissions associated with the production of electricity, heat, or steam purchased by the reporting entity. 'Scope 3' indicates all other indirect emissions, i.e., emissions associated with the extraction and production of purchased materials, fuels, and services, including transport in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc. (WBCSD and WRI, 2004).





# ***Greenhouse Gas Inventory***

Fiscal Years 2010 – 2022 (7/1/2009 – 6/30/2022)



# Greenhouse Gas Inventory (GHGI)

## Definitions

The [Intergovernmental Panel on Climate Change](#) definitions:

**A Greenhouse Gas Inventory (GHGI)** - a list of emission sources and the associated emissions quantified using standardized methods.

**Greenhouse Gases** - gases in the atmosphere such as water vapor, carbon dioxide, methane and nitrous oxide that can absorb infrared radiation, trapping heat in the atmosphere. This greenhouse effect means that emissions of greenhouse gases due to human activity cause global warming.

**CO2 Equivalent (CO2eq)** - the number of metric tons of CO2 emissions with the same global warming potential as one metric ton of another greenhouse gas.

Examples:

<b>Carbon Dioxide (CO<sub>2</sub>)</b>	<b>Global Warming Potential = 1</b>
<b>Methane (CH<sub>4</sub>)</b>	<b>Global Warming Potential = 25</b>
<b>Nitrous Oxide (N<sub>2</sub>O)</b>	<b>Global Warming Potential = 298</b>

**Baseline Year** - a year in which an organization's past greenhouse gas emissions are measured. The purpose is to provide a benchmark against which to judge the success of future emission-reduction projects.

***AAPS Baseline Year = Fiscal Year 2010***

# Greenhouse Gas Inventory

## Components

### SCOPE 1:

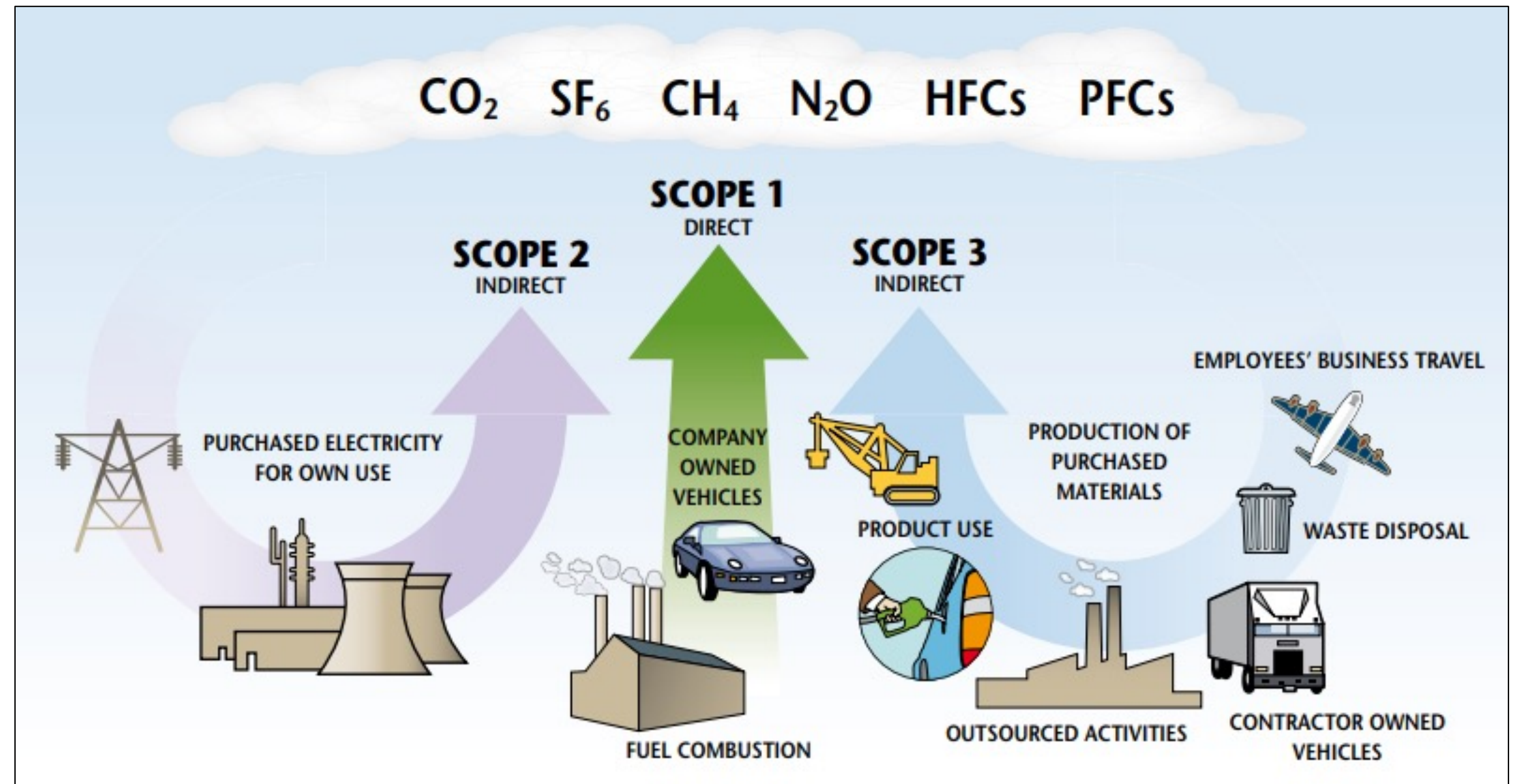
- Natural Gas Combustion
- Transportation Fuels
- Site Sequestration

### SCOPE 2:

- Electricity Consumption

### Scope 3:

- Water Usage



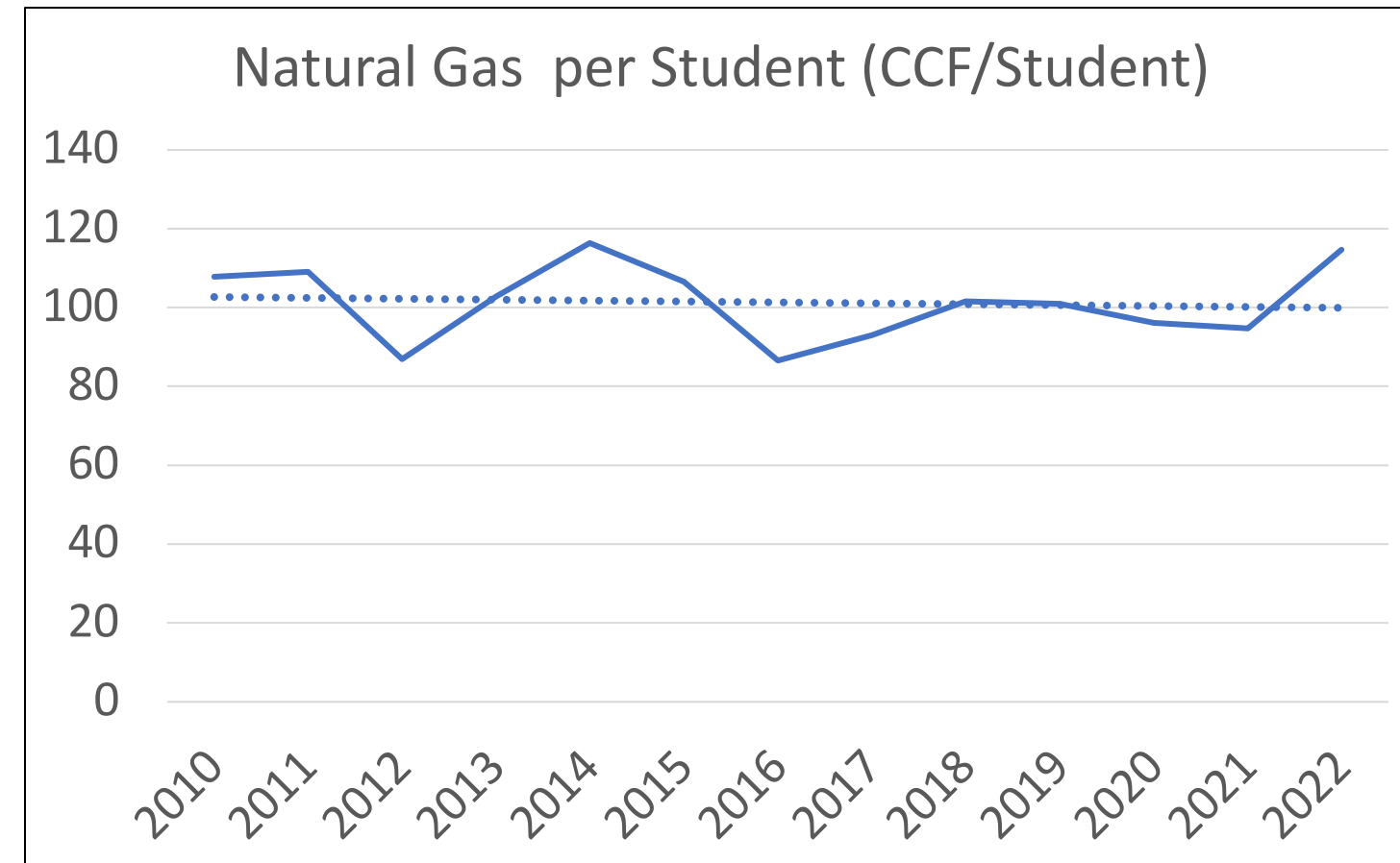
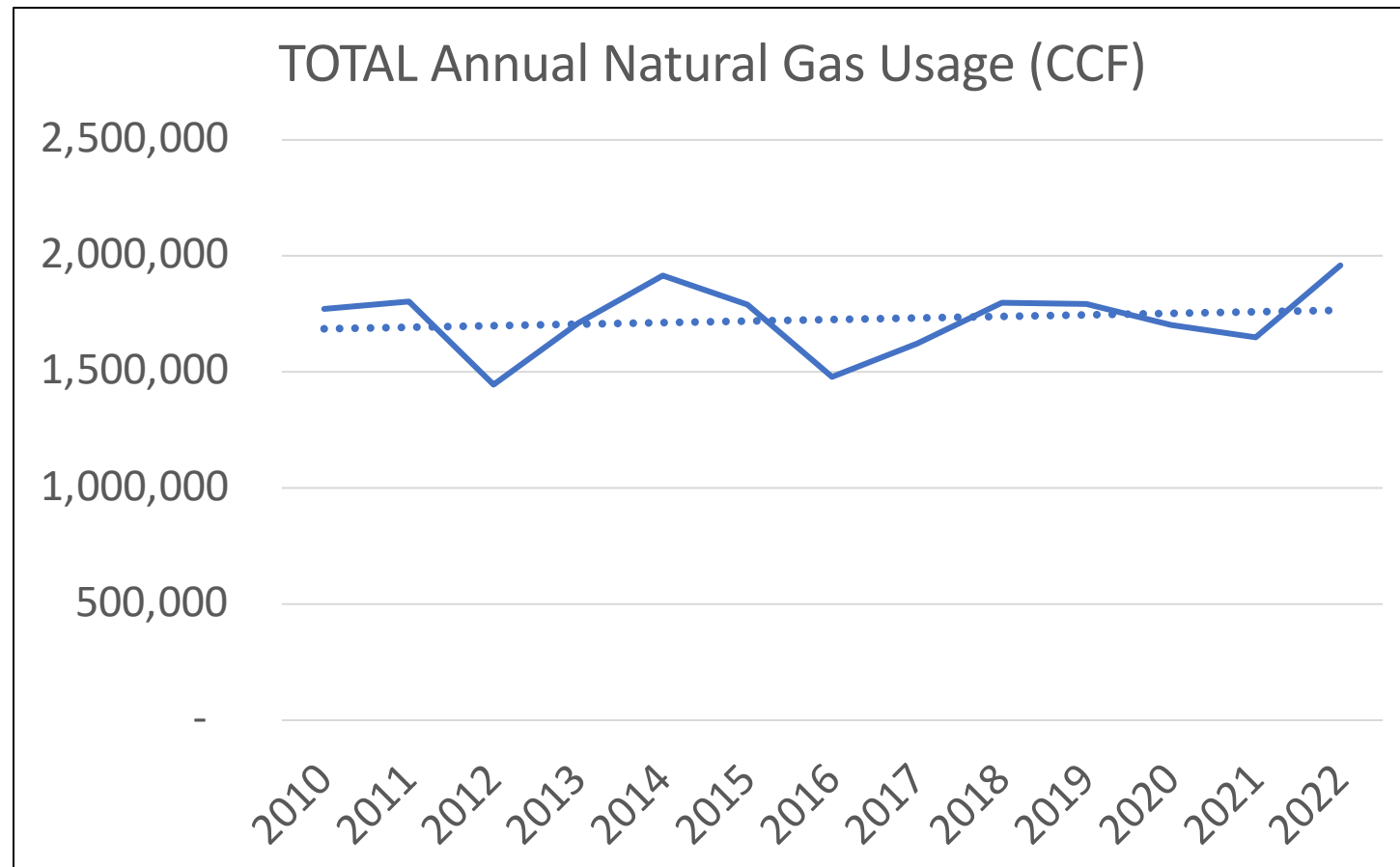
# Greenhouse Gas Inventory – SCOPE 1

## Natural Gas Usage by Building

Natural Gas Usage (CCF) by Fiscal Year												* COVID Remote Learning	* COVID Enhanced Ventilation
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Preschool	22,202	22,202	22,202	22,202	22,202	22,202	16,638	20,088	24,130	22,151	22,580	22,061	25,701
Abbott Elementary	21,846	23,183	15,664	18,409	27,749	23,261	22,281	23,030	23,014	26,348	21,923	21,782	25,786
Allen Elementary	26,840	30,502	23,712	27,959	34,817	28,455	26,975	30,948	38,747	41,104	35,213	32,490	44,210
Angell Elementary	32,014	35,533	29,018	34,205	32,971	34,071	22,608	25,719	26,256	29,942	30,567	25,859	49,337
Bach Elementary	36,584	30,158	22,594	22,603	27,759	30,799	22,600	19,454	24,876	27,535	23,997	25,257	31,730
Bryant Elementary	12,903	12,428	9,358	11,828	15,217	13,170	9,428	16,037	17,001	18,229	17,949	16,207	19,688
Burns Park Elementary	12,903	12,428	9,358	11,828	15,217	34,890	40,579	30,713	36,196	36,242	31,548	33,615	35,274
Carpenter Elementary	30,543	27,850	22,650	27,895	33,787	27,458	24,208	28,313	30,103	32,121	28,978	28,343	30,204
Dicken Elementary	20,541	22,058	14,307	15,955	21,364	18,435	19,019	21,989	23,651	22,541	20,460	19,373	33,699
Freeman Elementary	21,308	21,822	17,751	18,957	19,156	19,547	17,926	17,986	26,884	22,128	21,330	19,751	23,031
Eberwhite Elementary	39,560	42,070	27,074	31,132	40,217	39,128	30,141	34,891	47,479	44,847	37,826	34,377	57,699
Haisley Elementary	28,753	29,548	23,064	25,113	30,095	32,464	27,336	26,321	50,420	40,370	38,563	32,088	35,812
King Elementary	30,728	29,182	27,730	25,524	34,799	30,235	31,017	41,636	39,223	46,563	42,796	39,805	42,731
Lakewood Elementary	21,776	24,103	18,504	17,960	21,202	23,049	20,924	20,921	21,846	18,076	18,748	18,412	17,963
Lawton Elementary	21,736	21,121	17,596	21,028	23,884	39,514	24,327	26,817	29,088	34,512	39,493	30,693	32,051
Logan Elementary	22,143	15,390	18,425	16,185	27,234	16,606	11,311	17,528	22,312	22,533	15,166	15,311	19,268
AA Open Elementary	42,469	50,712	44,989	47,046	54,273	56,173	43,210	40,958	53,777	65,167	48,795	46,441	53,756
Mitchell Elementary	24,489	23,696	16,428	20,071	27,432	23,779	19,268	25,242	29,430	31,152	27,585	27,208	33,044
A2 STEAM	41,068	42,184	34,670	37,434	50,496	29,518	24,582	49,475	53,153	52,562	42,254	51,222	49,884
Pattengill Elementary	23,126	28,203	24,645	25,227	31,623	24,667	20,865	21,791	24,614	26,022	22,666	29,048	35,607
Pittsfield Elementary	30,278	22,140	14,231	15,825	21,927	30,332	16,906	21,452	25,624	23,667	22,274	25,361	33,706
Thurston Elementary	27,545	30,616	18,420	20,034	23,417	16,781	14,456	18,061	27,180	24,975	23,166	25,433	29,466
Wines Elementary		included with Forsythe											
Clague Middle School	124,773	100,631	85,616	106,370	94,744	62,941	78,634	66,748	64,785	82,229	117,295	92,463	109,298
Forsythe Middle School	132,669	137,198	111,939	120,326	128,887	109,648	110,178	125,638	137,477	160,823	121,420	112,491	136,598
Scarlett Middle School	95,380	98,153	74,878	83,556	89,982	84,377	88,595	102,480	91,932	99,064	89,482	83,242	119,279
Slauson Middle School	102,498	118,096	80,996	111,416	130,746	222,252	122,632	116,297	114,910	64,732	91,917	108,368	135,372
Tappan Middle School	90,298	102,148	81,968	79,804	109,594	92,171	75,494	89,870	113,922	95,050	90,220	87,887	96,033
Pathways to Success	30,555	32,689	24,840	26,390	28,733	28,087	24,381	22,560	29,120	31,332	26,330	25,412	28,452
Huron High School	217,970	198,905	195,394	240,434	235,783	225,642	149,631	180,292	170,045	155,911	168,058	159,099	177,298
Pioneer High School	276,824	302,378	239,769	326,356	349,187	258,367	235,005	247,745	280,786	281,330	261,545	258,623	278,683
Community High School	51,631	52,091	29,706	31,037	33,457	24,939	28,791	28,254	35,127	39,369	33,376	31,600	27,770
Skyline High School	27,080	29,161	25,397	36,968	34,050	31,014	30,931	31,983	29,628	34,027	37,039	38,356	57,446
Balas Bldg	16,076	19,571	10,317	17,610	22,442	20,833	17,476	19,486	21,556	24,666	20,722	18,786	20,945
Transportation	15,577	16,498	12,217	15,419	20,037	16,068	11,330	11,308	12,901	14,665	12,243	11,582	12,696
<b>TOTAL Annual Natural Gas Usage (CCF)</b>	<b>1,772,687</b>	<b>1,804,652</b>	<b>1,445,427</b>	<b>1,710,108</b>	<b>1,914,477</b>	<b>1,790,873</b>	<b>1,479,682</b>	<b>1,622,031</b>	<b>1,797,194</b>	<b>1,791,985</b>	<b>1,703,525</b>	<b>1,648,047</b>	<b>1,959,516</b>
<b>Natural Gas per Student (CCF/Student)</b>	<b>108</b>	<b>109</b>	<b>87</b>	<b>103</b>	<b>116</b>	<b>107</b>	<b>87</b>	<b>93</b>	<b>102</b>	<b>101</b>	<b>96</b>	<b>95</b>	<b>115</b>
<b>Natural Gas per Square Foot (CCF/ SF)</b>	<b>0.505</b>	<b>0.514</b>	<b>0.412</b>	<b>0.487</b>	<b>0.543</b>	<b>0.508</b>	<b>0.420</b>	<b>0.460</b>	<b>0.507</b>	<b>0.502</b>	<b>0.477</b>	<b>0.462</b>	<b>0.549</b>
<b>Heating Degree Days</b>	<b>6254</b>	<b>6861</b>	<b>5466</b>	<b>6532</b>	<b>7487</b>	<b>7136</b>	<b>5814</b>	<b>5832</b>	<b>6701</b>	<b>6808</b>	<b>6307</b>	<b>6287</b>	<b>6374</b>

# Greenhouse Gas Inventory – SCOPE 1

## Natural Gas - Usage Trends



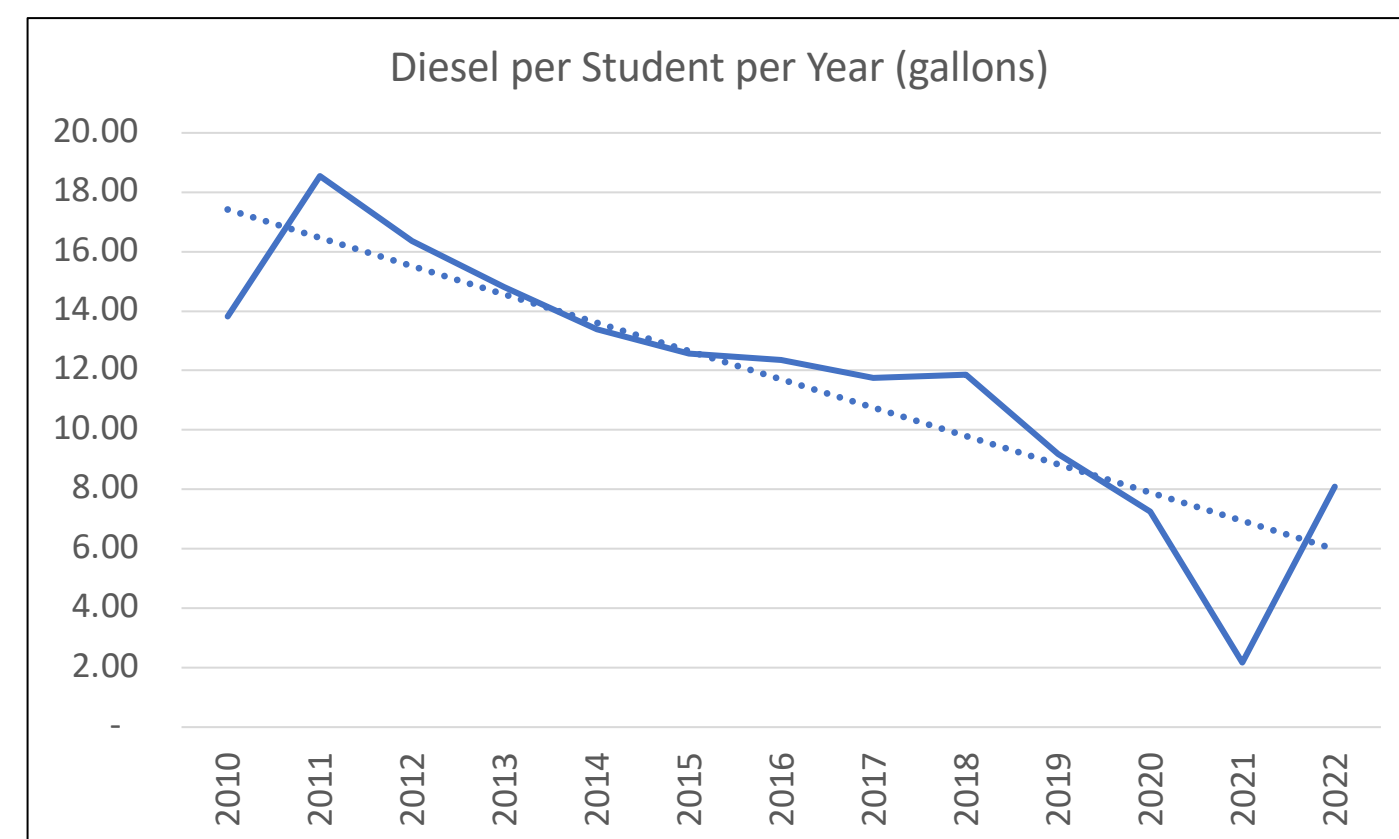
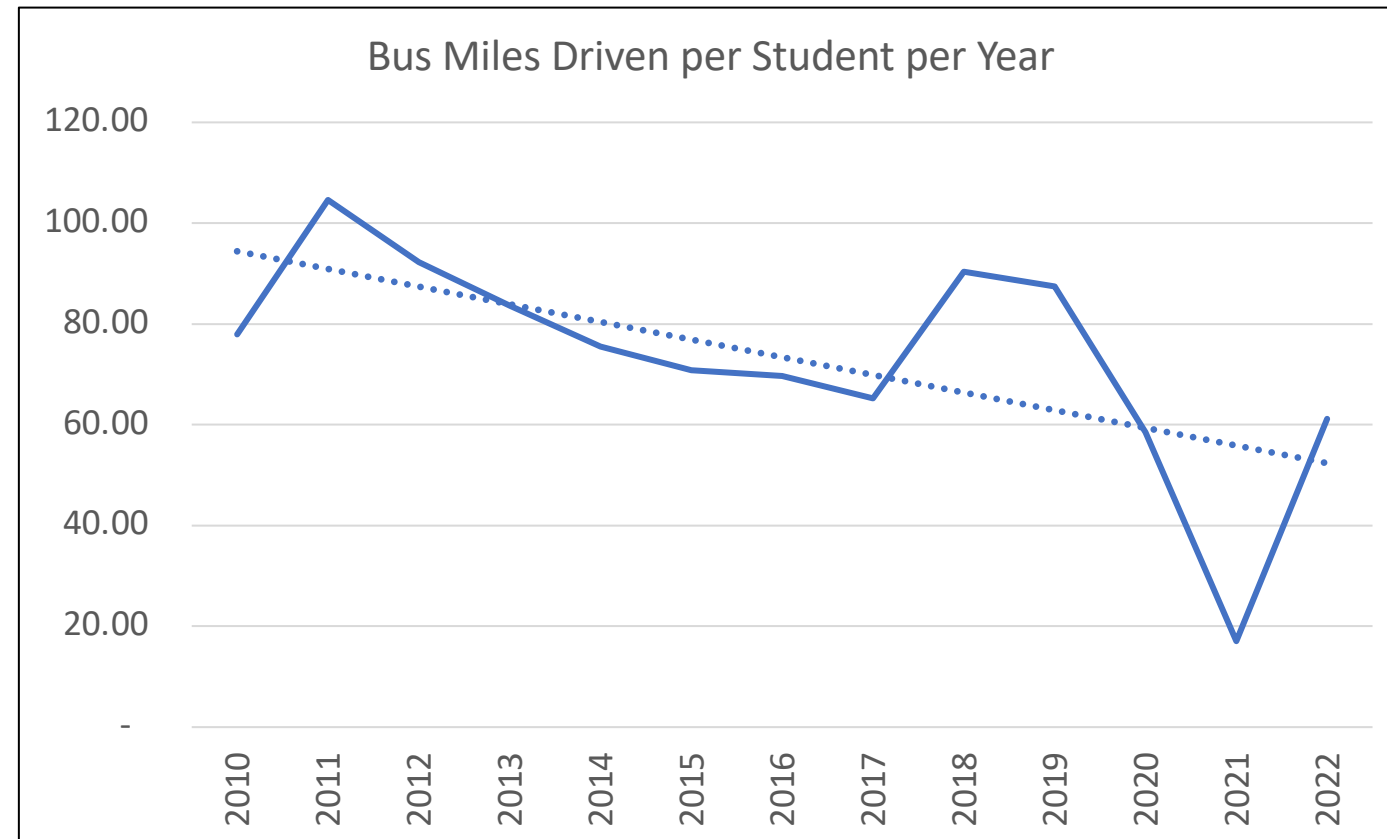
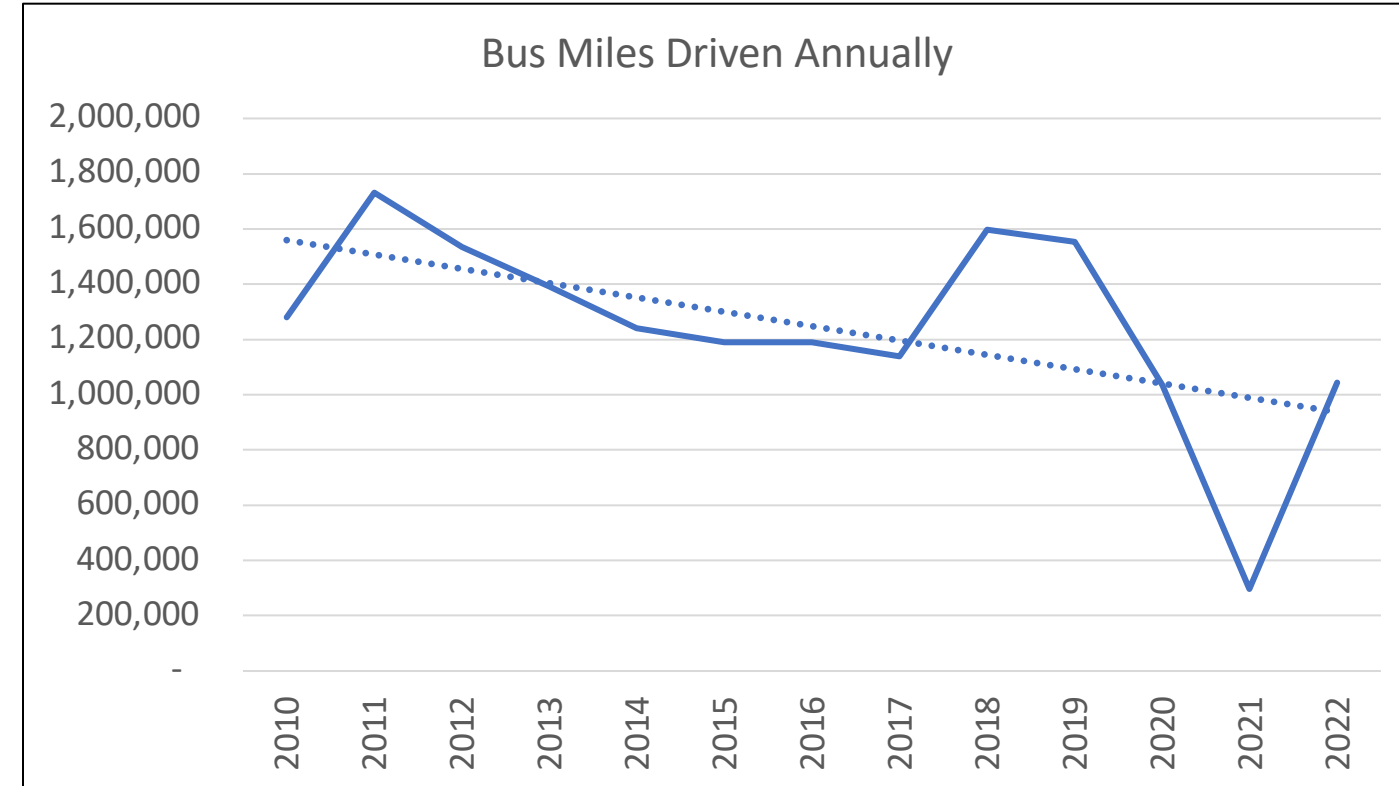
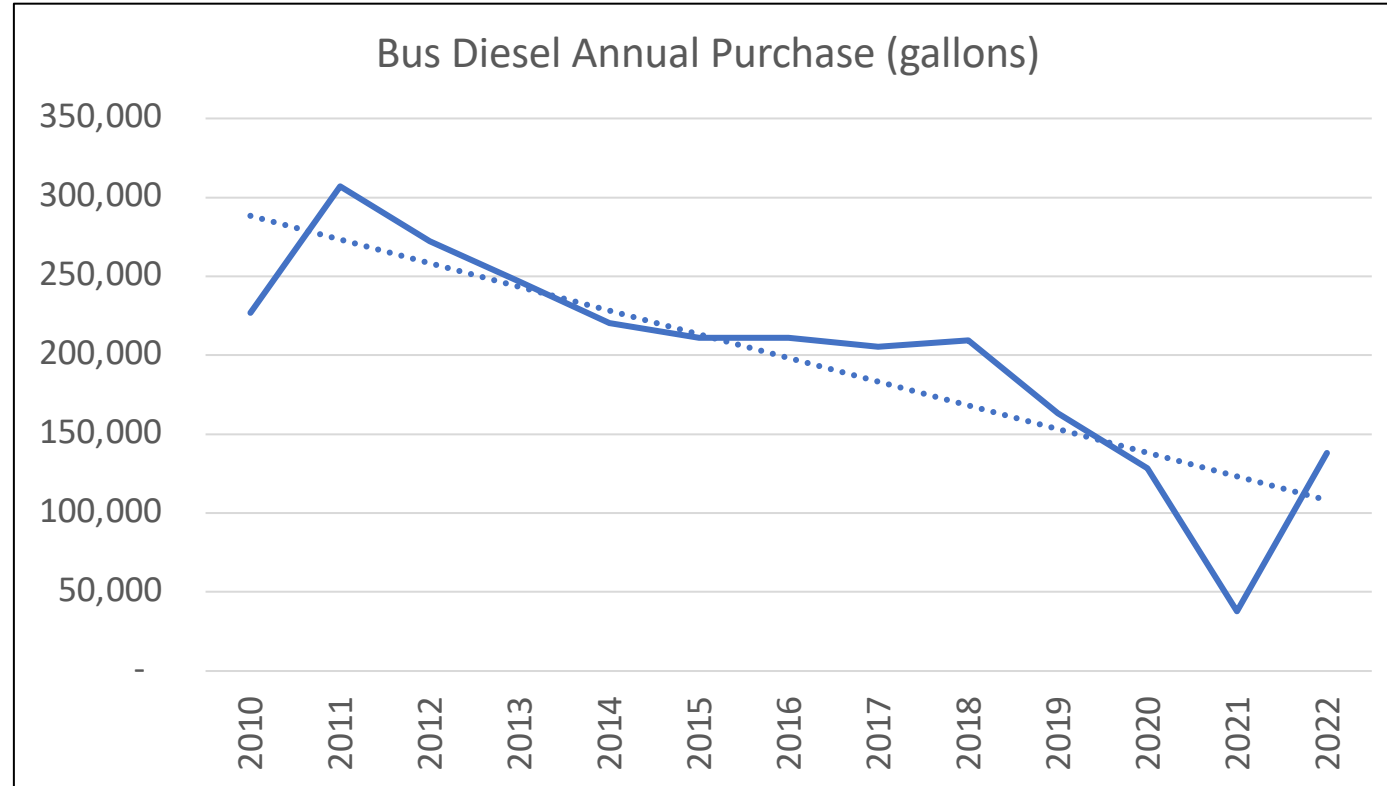
# Greenhouse Gas Inventory – SCOPE 1

## Transportation and other Fuel Usage

Transportation Statistics												* COVID Remote Learning	2-Tier Bussing Begins
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Buses</b>													
Bus Miles Driven	1,280,101	1,731,437	1,535,792	1,390,283	1,241,699	1,190,101	1,190,101	1,138,502	1,598,087	1,553,789	1,035,240	296,115	1,043,348
Bus Diesel Annual Purchase (gallons)	227,006	306,992	272,304	246,504	220,159	211,011	211,011	205,150	209,537	163,147	128,507	37,686	137,993
Fall Enrollment	16,440	16,552	16,637	16,634	16,450	16,801	17,094	17,450	17,681	17,759	17,712	17,406	17,074
Bus MPG	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.55	7.63	9.52	8.06	7.86	7.56
Miles Driven per Student per Year	77.87	104.61	92.31	83.58	75.48	70.84	69.62	65.24	90.38	87.49	58.45	17.01	61.11
Diesel per Student per Year (gallons)	13.81	18.55	16.37	14.82	13.38	12.56	12.34	11.76	11.85	9.19	7.26	2.17	8.08
MT CO2e - Buses	2,317.74	3,134.39	2,780.22	2,516.81	2,247.83	2,154.42	2,154.42	2,094.58	2,139.37	1,665.73	1,312.06	384.77	1,408.91
<b>Fleet Vehicles</b>													
87 Octane Ethanol 10% (Gallons)										11,033	-	5,999	9,050
<b>Generators</b>													
Generators (Diesel Gallons)										560	-	1,493	285

# Greenhouse Gas Inventory (GHGI)

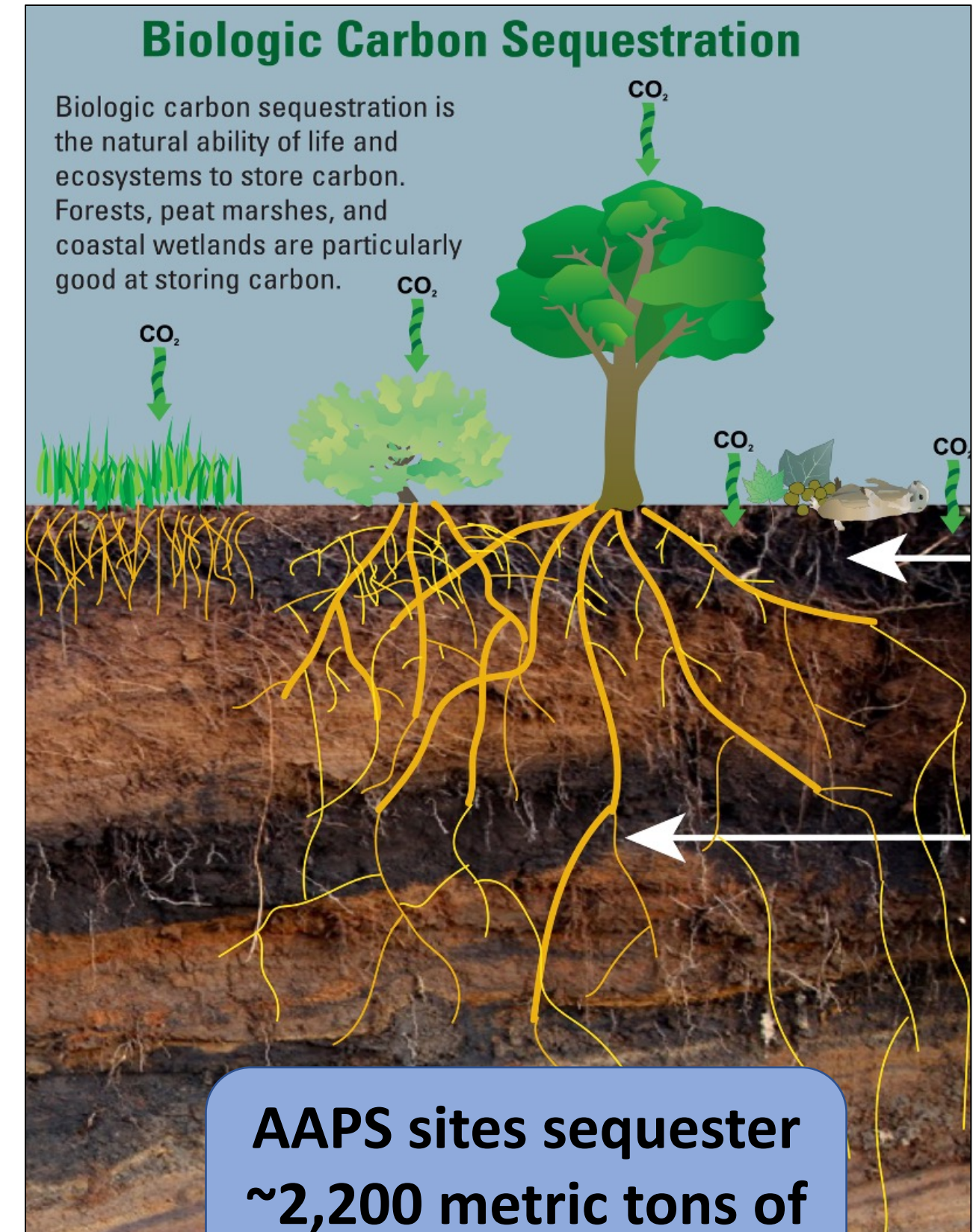
## Transportation and other Fuel Usage - Trends



# Greenhouse Gas Inventory – SCOPE 1

## Site Carbon Sequestration

School	Site Area (acres)	Estimated Hardscape percentage	Estimated Greenspace (acres)	Percentage Grass	Percentage Forest	Percentage Pond	CO2 Sequestration per year (tons)
Abbott Elementary	12	20%	9.60	75%	25%		-11.8
Allen Elementary	10.5	45%	5.78	95%	5%		-5.1
Angell Elementary	3	75%	0.75	75%	25%		-0.9
Bach Elementary	7.8	85%	1.17	50%	50%		-1.9
Bryant Elementary	10.8	25%	8.10	75%	25%		-9.9
Burns Park Elementary	4	65%	1.40	95%	5%		-1.2
Carpenter Elementary	11	45%	6.05	97%	3%		-5.1
Dicken Elementary	10	25%	7.50	75%	25%		-9.2
Freeman Elementary	40	5%	38.00	35%	65%		-72.4
Eberwhite Elementary	42.2	15%	35.87	5%	95%		-86.6
Haisley Elementary	10	35%	6.50	50%	50%		-10.7
King Elementary	9.96	50%	4.98	60%	40%		-7.4
Lakewood Elementary	18	20%	14.40	50%	50%		-23.8
Lawton Elementary	7.7	50%	3.85	90%	10%		-3.7
Logan Elementary	9.75	40%	5.85	50%	45%	5%	-32.3
AA Open Elementary	7	45%	3.85	90%	10%		-3.7
Mitchell Elementary	10	20%	8.00	95%	5%		-7.1
A2 STEAM	17	25%	12.75	90%	10%		-12.4
Pattengill Elementary	11.33	25%	8.50	95%	5%		-7.5
Pittsfield Elementary	4	70%	1.20	97%	3%		-1.0
Thurston Elementary	24.75	20%	19.80	30%	40%	25%	-420.6
Wines Elementary	18.5	25%	13.88	70%	30%		-18.2
<b>AVERAGE ELEMENTARY / K-8</b>	<b>13.60</b>						<b>-34.2</b>
Clague Middle School	26.45	45%	14.55	60%	40%		-21.5
Forsythe Middle School	26	25%	19.50	90%	10%		-18.9
Scarlett Middle School	30.5	15%	25.93	25%	70%	5%	-154.3
Slauson Middle School	12	25%	9.00	75%	25%		-11.0
Tappan Middle School	20	25%	15.00	90%	10%		-14.6
<b>AVERAGE MIDDLE SCHOOL</b>	<b>22.99</b>						<b>-44.1</b>
Pathways to Success	9	30%	6.30	65%	35%		-8.8
Huron High School	55.5	60%	22.20	70%	27%	3%	-80.7
Pioneer High School	177	20%	141.60	35%	62%	3%	-599.0
Community High School	3.2	50%	1.60	90%	10%		-1.6
Skyline High School	108	20%	86.40	25%	70%	5%	-514.1
<b>AVERAGE HIGH SCHOOL</b>	<b>70.54</b>						<b>-240.8</b>
Balas	6.36	75%	1.59	85%	15%		-1.7
Transportation	5.85	75%	7.83	80%	15%	5%	-39.3
Preschool	7.3	50%	3.65	20%	65%	15%	-50.3
							-30.4
<b>TOTAL (tons of CO2 sequestration/yr)</b>							<b>-2268.2</b>



# Greenhouse Gas Inventory – SCOPE 1

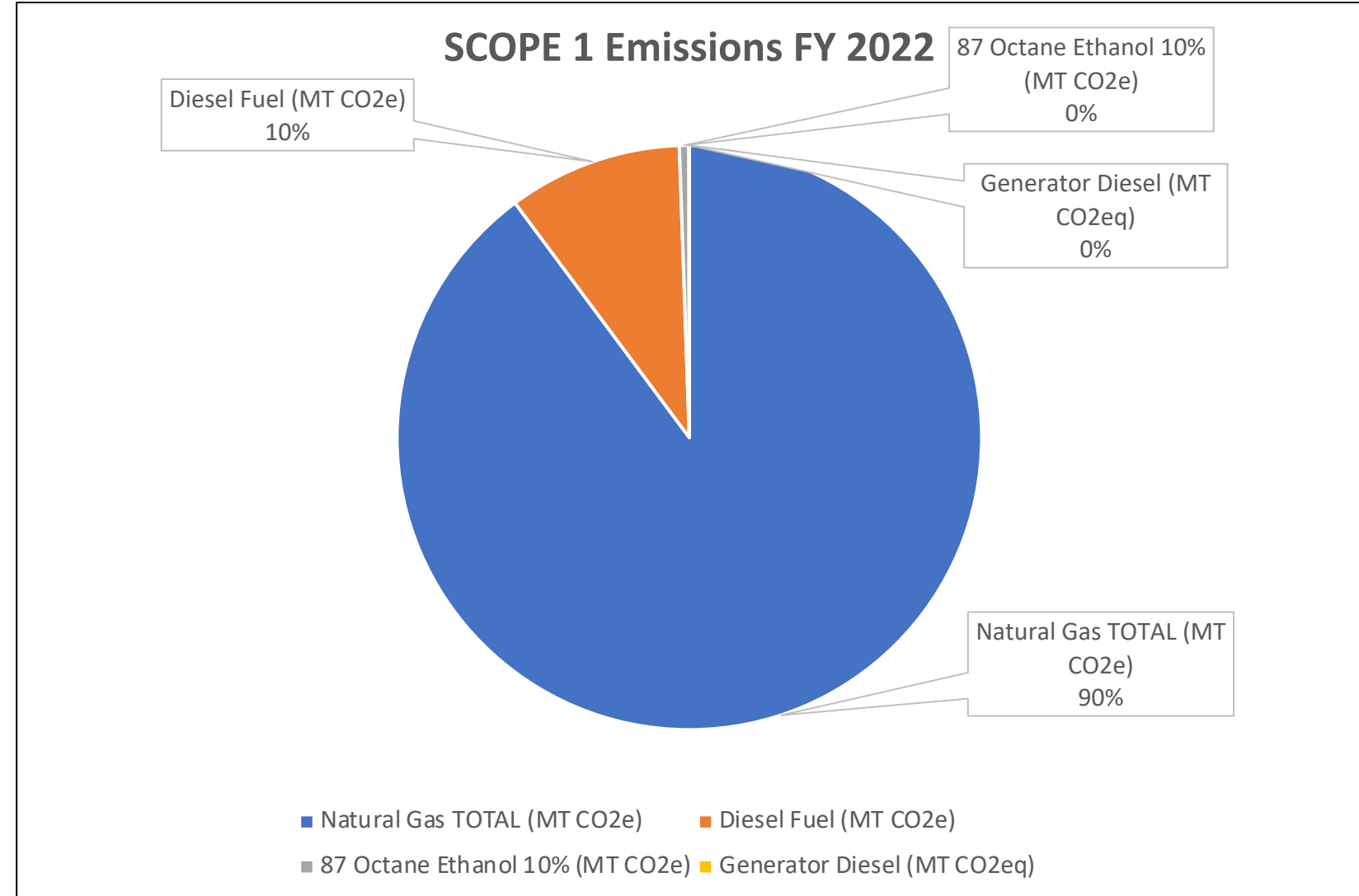
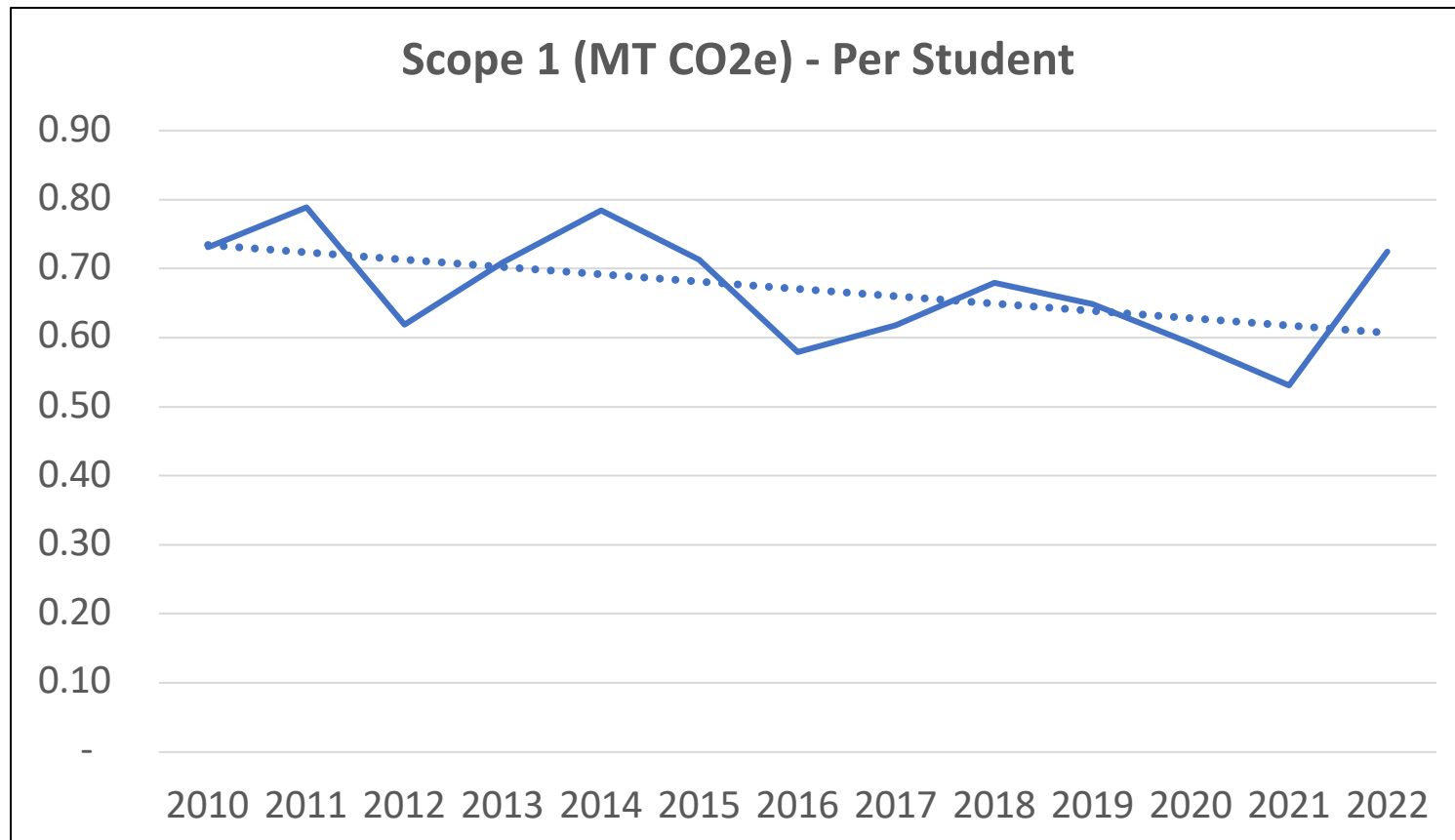
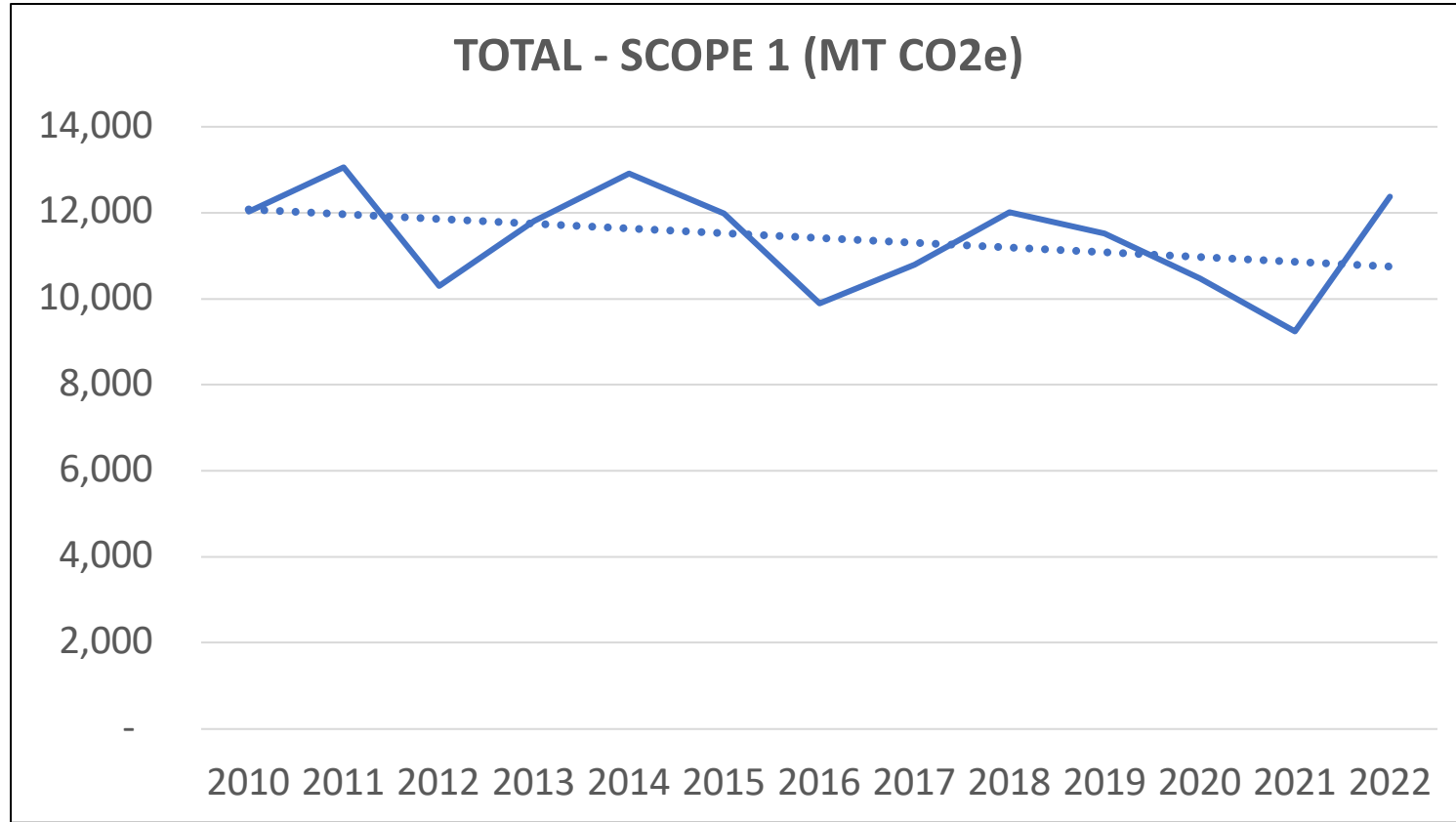
## Summary

SCOPE 1													
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	<i>Baseline</i>												
<b>Natural Gas</b>													
Natural Gas Usage (CCF)	1,772,687	1,804,652	1,445,427	1,710,108	1,914,477	1,790,873	1,479,682	1,622,031	1,797,194	1,791,985	1,703,525	1,648,047	1,959,516
Stationary Combustion Emission (MT CO2e)	9,660	9,835	7,877	9,319	10,433	9,759	8,064	8,839	9,794	9,765	9,283	8,981	10,678
Upstream Stationary Combustion Emission (MT CO2e)	2,235	2,275	1,822	2,156	2,413	2,258	1,865	2,045	2,266	2,259	2,148	2,078	2,470
<b>Natural Gas TOTAL (MT CO2e)</b>	<b>11,895</b>	<b>12,109</b>	<b>9,699</b>	<b>11,475</b>	<b>12,846</b>	<b>12,017</b>	<b>9,929</b>	<b>10,884</b>	<b>12,059</b>	<b>12,025</b>	<b>11,431</b>	<b>11,059</b>	<b>13,149</b>
<b>School Buses</b>													
Diesel Fuel (gallons)	227,006	306,992	272,304	246,504	220,159	211,011	211,011	205,150	209,537	163,147	128,507	37,686	137,993
Miles Driven (miles)	1,680,351	1,329,584	1,337,044	1,355,102	1,280,101	1,731,437	1,535,792	1,390,283	1,241,699	1,190,101	1,190,101	1,138,502	1,598,087
Miles per Gallon (MPG)	7.40	4.33	4.91	5.50	5.81	8.21	7.28	6.78	5.93	7.29	9.26	30.21	11.58
Diesel Fuel (MT CO2e)	2,318	3,134	2,780	2,517	2,248	2,154	2,154	2,095	2,139	1,666	1,312	385	1,409
<b>Fleet Vehicles</b>													
				<i>estimates</i>									
87 Octane Ethanol 10% (gallons)	8694	8694	8694	8694	8694	8694	8694	8694	8694	11033	0	5999	9050
87 Octane Ethanol 10% (MT CO2e)	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	93.5	-	50.9	76.7
<b>Generators</b>													
Generator Diesel (gallons)	779	779	779	779	779	779	779	779	779	559.50	0.00	1,493.10	285.10
Generator Diesel (MT CO2e)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.7	0.0	15.2	2.9
<b>Site Sequestration</b>													
Site Sequestration SUBTOTAL (MT CO2e)	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268	-2268
<b>TOTAL - SCOPE 1 (MT CO2e)</b>	<b>12,026</b>	<b>13,057</b>	<b>10,293</b>	<b>11,805</b>	<b>12,908</b>	<b>11,985</b>	<b>9,897</b>	<b>10,792</b>	<b>12,012</b>	<b>11,521</b>	<b>10,475</b>	<b>9,241</b>	<b>12,369</b>
Scope 1 (MT CO2e) - Per Student (MT CO2e/student)	0.73	0.79	0.62	0.71	0.78	0.71	0.58	0.62	0.68	0.65	0.59	0.53	0.72
Scope 1 - Per 1000 SF	3.43	3.72	2.93	3.36	3.66	3.40	2.81	3.06	3.39	3.23	2.94	2.59	3.47



# Greenhouse Gas Inventory – SCOPE 1

## Summary



# Greenhouse Gas Inventory – SCOPE 2

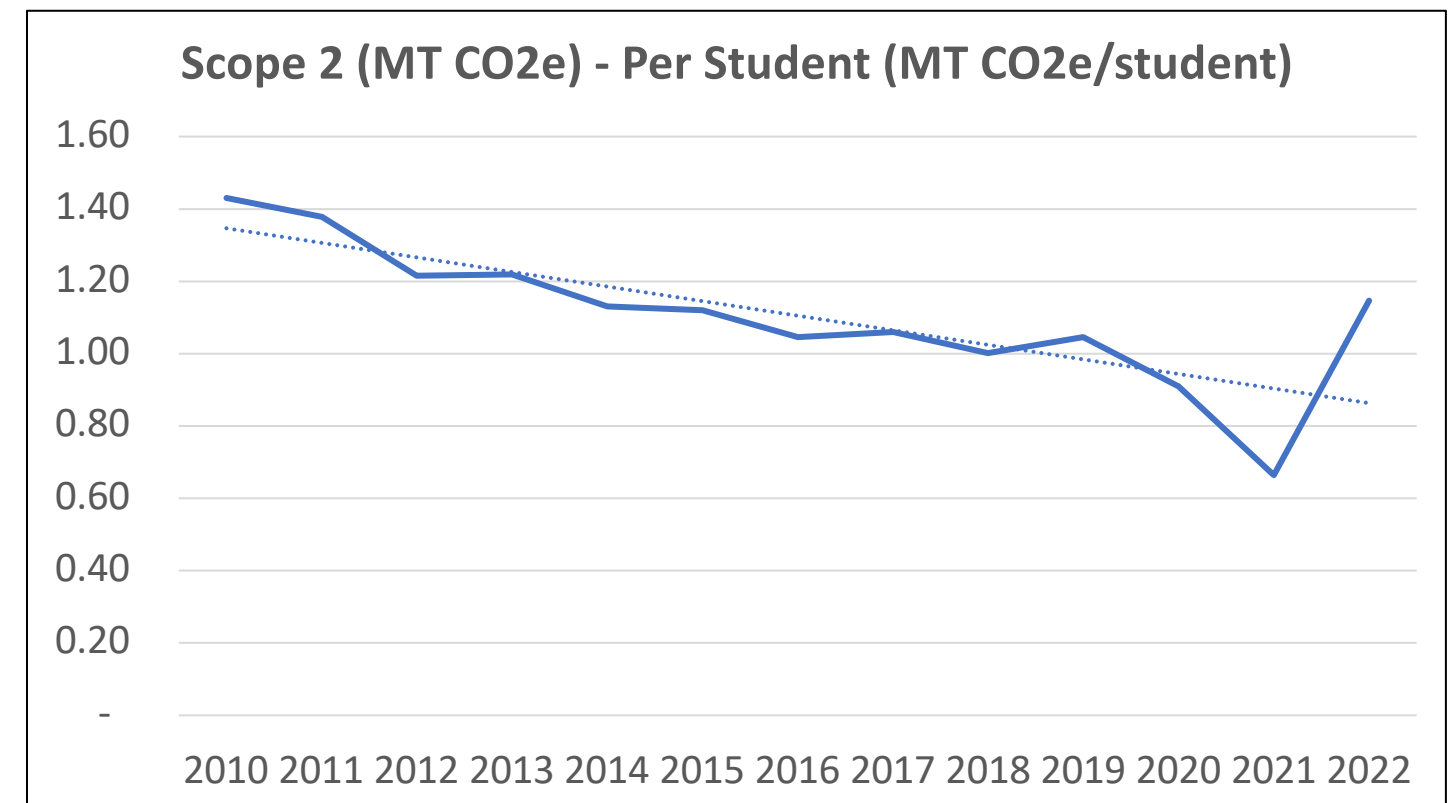
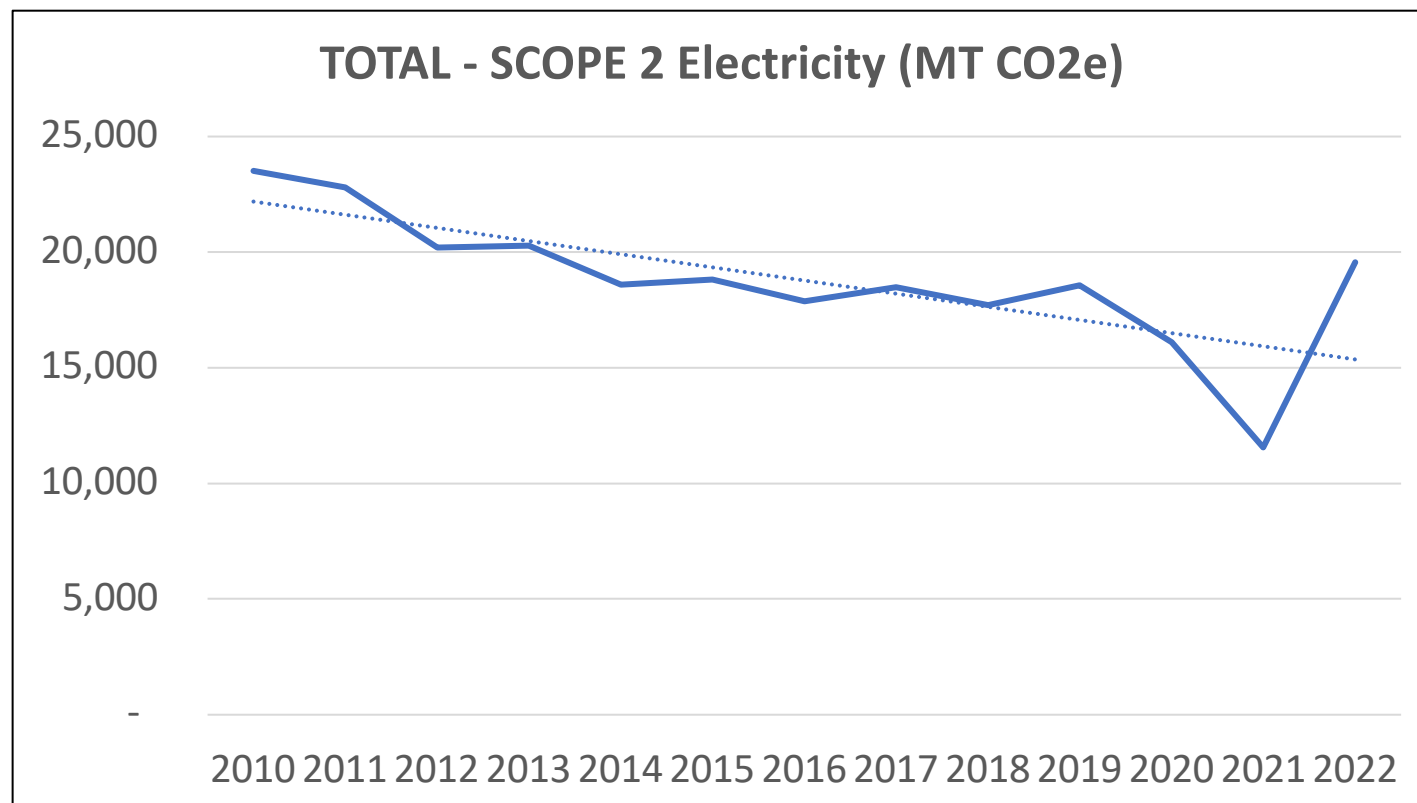
## Electricity Usage by Building

Electricity Usage by Fiscal Year (kWh)												* COVID Remote Learning †	* COVID Enhanced Ventilation and New AC systems
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Preschool	523,620	473,269	461,172	449,662	421,300	419,155	404,791	477,360	466,318	521,730	497,090	370,350	560,707
Abbott Elementary	322,881	329,309	289,735	254,052	233,379	242,620	209,855	255,586	266,481	437,121	511,268	198,641	273,445
Allen Elementary	342,798	318,853	315,202	274,496	252,506	290,438	264,464	291,065	301,472	333,996	340,872	242,644	352,672
Angell Elementary	139,891	128,200	124,730	105,903	95,161	102,060	94,546	137,006	111,642	103,870	121,600	73,415	110,954
Bach Elementary	279,287	280,105	236,086	226,700	211,790	215,108	220,485	256,208	282,517	320,018	252,285	205,989	297,072
Bryant Elementary	484,482	449,468	448,187	399,172	326,585	367,997	361,728	402,172	508,662	483,806	396,916	304,767	351,316
Burns Park Elementary	307,225	301,978	258,091	222,944	218,531	275,632	253,048	261,066	165,457	228,620	355,794	229,167	360,160
Carpenter Elementary	308,360	312,182	269,015	255,133	234,363	241,485	220,261	253,231	248,471	258,119	227,701	169,244	233,675
Dicken Elementary	255,131	277,132	237,192	180,819	176,006	180,199	159,105	184,636	206,345	183,142	170,589	140,736	219,995
Freeman Elementary	312,116	322,192	329,525	310,832	273,039	272,748	267,019	249,619	234,026	185,679	210,424	237,693	197,595
Eberwhite Elementary	336,649	320,902	278,344	234,072	239,166	241,842	214,207	299,559	264,243	255,214	239,013	167,640	313,752
Haisley Elementary	294,884	285,672	253,445	238,809	240,221	257,452	223,112	192,455	221,772	235,199	198,683	137,173	177,456
King Elementary	399,866	408,477	351,046	309,586	302,140	316,191	286,129	351,646	468,700	506,350	448,715	357,506	482,644
Lakewood Elementary	247,204	255,223	257,650	216,474	205,731	197,497	175,703	206,347	211,341	206,065	194,609	147,804	205,251
Lawton Elementary	414,821	419,381	358,240	307,659	295,028	303,670	290,694	243,103	232,969	262,721	272,544	241,824	326,952
Logan Elementary	639,161	621,365	611,939	539,988	566,960	626,768	539,382	625,777	492,206	522,584	444,211	341,239	492,381
AA Open Elementary	611,924	541,931	518,011	493,667	468,189	514,481	539,047	629,552	419,292	223,904	182,768	32,360	189,899
Mitchell Elementary	283,369	288,224	252,024	196,386	200,086	202,236	371,093	263,897	260,141	275,975	262,505	230,681	284,254
A2 STEAM	282,691	282,531	234,461	184,756	197,555	248,547	310,330	373,695	351,014	292,674	270,963	255,344	400,657
Pattengill Elementary	309,437	316,179	301,820	266,571	221,953	245,416	240,160	263,646	238,413	271,168	232,415	173,620	217,232
Pittsfield Elementary	294,400	260,960	224,044	197,739	193,577	197,710	201,983	224,167	231,752	218,308	203,300	159,600	259,840
Thurston Elementary	351,757	338,323	319,041	259,373	260,017	277,786	245,483	292,246	376,770	371,151	318,669	226,860	390,375
Wines Elementary		included with Forsythe											
Clague Middle School	1,039,395	957,226	899,104	785,624	728,571	818,457	826,385	945,873	970,297	977,320	968,713	831,059	1,158,275
Forsythe Middle School	1,448,277	1,507,505	1,193,624	1,048,499	1,013,645	1,061,792	1,049,862	1,172,256	1,254,135	1,310,348	1,112,630	829,318	1,234,353
Scarlett Middle School	1,147,526	1,162,120	1,119,920	977,205	879,970	851,241	951,814	1,097,783	1,089,263	1,070,706	970,819	712,553	1,283,793
Slauson Middle School	1,100,149	839,107	771,261	690,460	624,388	678,385	782,608	865,749	888,438	816,516	711,342	549,881	972,906
Tappan Middle School	977,856	912,312	795,373	747,765	602,751	752,654	731,804	866,725	844,684	862,739	786,867	680,622	1,020,766
Pathways to Success	292,927	263,603	242,938	245,012	227,700	246,966	233,951	276,373	267,360	285,660	256,180	208,464	293,074
Huron High School	4,628,479	4,497,248	3,988,693	3,733,728	3,704,910	3,939,620	3,852,288	4,413,905	4,072,954	4,368,392	4,076,912	3,166,492	4,073,218
Pioneer High School	4,361,037	4,109,455	3,676,982	3,579,709	3,387,017	3,392,779	3,290,610	3,599,904	3,468,410	3,608,318	3,348,082	2,987,083	3,703,845
Community High School	327,049	332,844	317,790	288,703	242,525	287,050	257,525	338,685	286,462	284,392	268,360	223,107	483,421
Skyline High School	6,196,136	6,523,793	5,884,047	6,445,052	6,957,894	6,632,125	6,026,550	5,968,844	5,298,377	5,664,146	5,101,650	6,326,245	10,723,463
Balas Bldg	1,036,491	1,041,915	1,008,280	907,019	752,090	746,491	709,800	747,762	734,776	759,733	683,803	610,400	655,877
Transportation	281,650	361,442	260,690	211,698	298,918	281,377	215,129	244,430	231,270	178,537	162,419	150,718	192,648
<b>TOTAL</b>	<b>30,578,924</b>	<b>30,040,426</b>	<b>27,087,703</b>	<b>25,785,267</b>	<b>25,253,661</b>	<b>25,925,971</b>	<b>25,020,949</b>	<b>27,272,324</b>	<b>25,966,427</b>	<b>26,884,217</b>	<b>24,800,711</b>	<b>21,920,238</b>	<b>32,493,920</b>
<b>kWh/Student</b>	<b>1,860</b>	<b>1,815</b>	<b>1,628</b>	<b>1,550</b>	<b>1,535</b>	<b>1,543</b>	<b>1,464</b>	<b>1,563</b>	<b>1,469</b>	<b>1,514</b>	<b>1,400</b>	<b>1,259</b>	<b>1,903</b>
<b>Kwh/Square Foot</b>	<b>8.72</b>	<b>8.56</b>	<b>7.72</b>	<b>7.35</b>	<b>7.17</b>	<b>7.36</b>	<b>7.10</b>	<b>7.74</b>	<b>7.33</b>	<b>7.53</b>	<b>6.95</b>	<b>6.14</b>	<b>9.11</b>
<b>Solar Production (kWh)</b>												<b>80,750</b>	<b>413,183</b>

# Greenhouse Gas Inventory – SCOPE 2

## Summary

SCOPE 2													
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	<i>Baseline</i>												
Electricity													
Grid Electricity (kWh)	30,578,924	30,040,426	27,087,703	25,785,267	25,253,661	25,925,971	25,020,949	27,272,324	25,966,427	26,884,217	24,800,711	21,920,238	32,493,920
MT CO2e/kWh	0.000769	0.000759	0.000746	0.000786	0.000736	0.000726	0.000714	0.000678	0.000682	0.000691	0.000649	0.000527	0.000602
<b>SUBTOTAL (MT CO2e)</b>	<b>23,515</b>	<b>22,801</b>	<b>20,207</b>	<b>20,267</b>	<b>18,587</b>	<b>18,822</b>	<b>17,865</b>	<b>18,491</b>	<b>17,709</b>	<b>18,577</b>	<b>16,096</b>	<b>11,552</b>	<b>19,561</b>
Green Power Purchase													
Solar Production (On-Site kWh)											12,569	93,319	610,110
Solar Production MT CO2e avoidance											8.16	49.18	367.29
<b>TOTAL - SCOPE 2 (MT CO2e)</b>	<b>23,515</b>	<b>22,801</b>	<b>20,207</b>	<b>20,267</b>	<b>18,587</b>	<b>18,822</b>	<b>17,865</b>	<b>18,491</b>	<b>17,709</b>	<b>18,577</b>	<b>16,096</b>	<b>11,552</b>	<b>19,561</b>
Scope 2 (MT CO2e) - Per Student (MT CO2e/student)	1.43	1.38	1.21	1.22	1.13	1.12	1.05	1.06	1.00	1.05	0.91	0.66	1.15
Scope 2 - Per 1000 SF (MT CO2e/1000 SF)	6.70	6.50	5.76	5.78	5.27	5.34	5.07	5.25	5.00	5.21	4.51	3.24	5.48



# Greenhouse Gas Inventory (GHGI) – SCOPE 3

All 15 Categories

Scope 3 Categories		
Applies to AAPS?		Examples
Yes	<a href="#">Category 1 - Purchased goods and services</a>	<b>Water</b> , lawn service, custodial services, paper, books, technology
Yes	<a href="#">Category 2 - Capital goods</a>	Construction and renovation materials, machines and labor
Yes	<a href="#">Category 3 - Fuel- and energy-related activities</a>	Natural gas extraction, oil refining for diesel fuel
Yes	<a href="#">Category 4 - Upstream transportation and distribution</a>	Transportation of purchased goods, manufacturing of buses
Yes	<a href="#">Category 5 - Waste generated in operations</a>	<b>Landfill waste, recycling</b> and composting
Yes	<a href="#">Category 6 - Business travel</a>	Flights and driving to conferences, meetings, etc.
Yes	<a href="#">Category 7 - Employee commuting</a>	AAPS employee and student commuting (other than on a school bus)
No	<a href="#">Category 8 - Upstream leased assets</a>	N/A
No	<a href="#">Category 9 - Downstream transportation and distribution</a>	N/A
No	<a href="#">Category 10 - Processing of sold products</a>	N/A
No	<a href="#">Category 11 - Use of sold products</a>	N/A
No	<a href="#">Category 12 - End-of-life treatment of sold products</a>	N/A
No	<a href="#">Category 13 - Downstream leased assets</a>	N/A
No	<a href="#">Category 14 - Franchises</a>	N/A
Yes	<a href="#">Category 15 - Investments</a>	General fund, bond and sinking fund financial investments

SOURCE: <https://ghgprotocol.org/scope-3-technical-calculation-guidance>

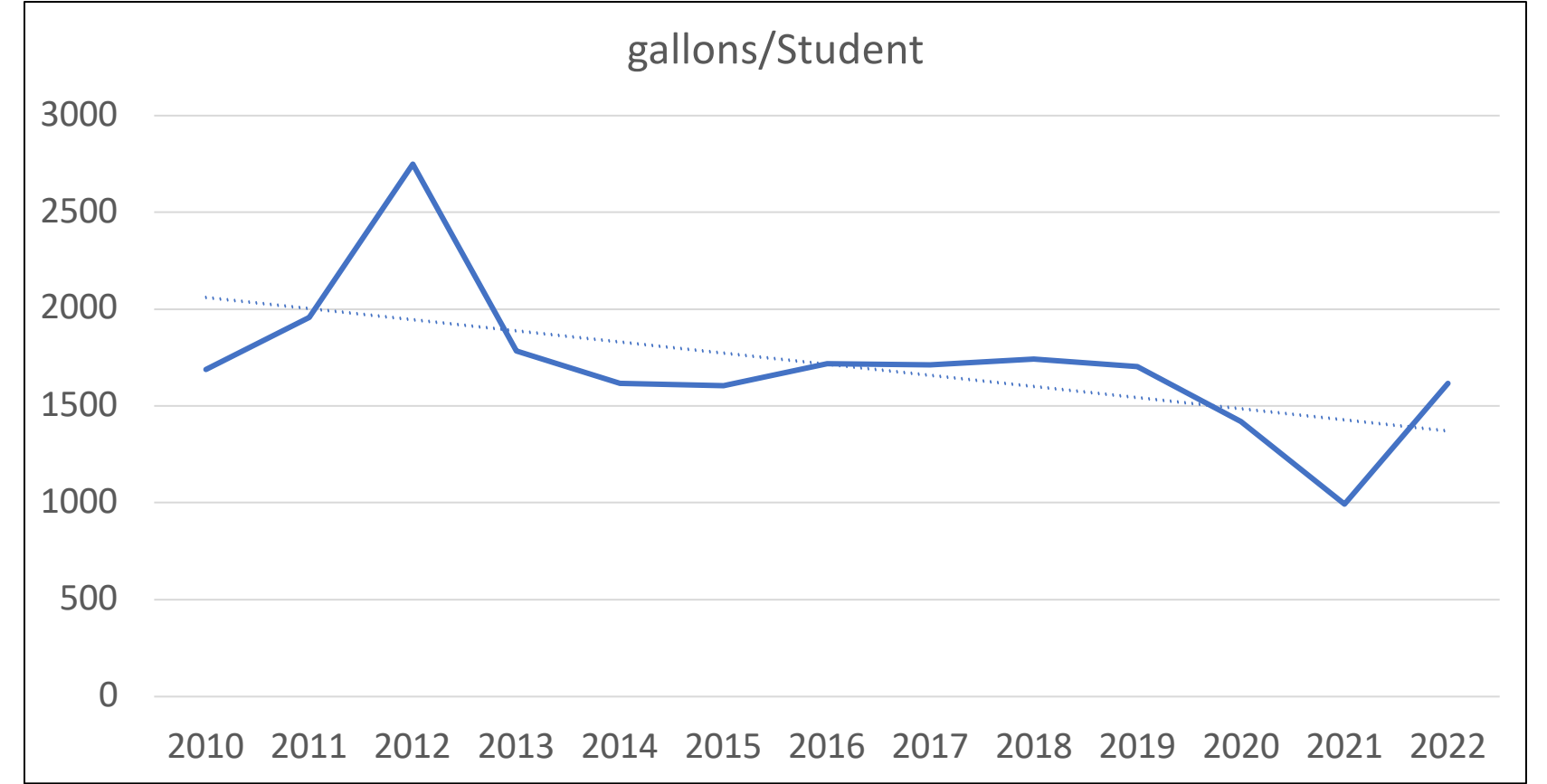
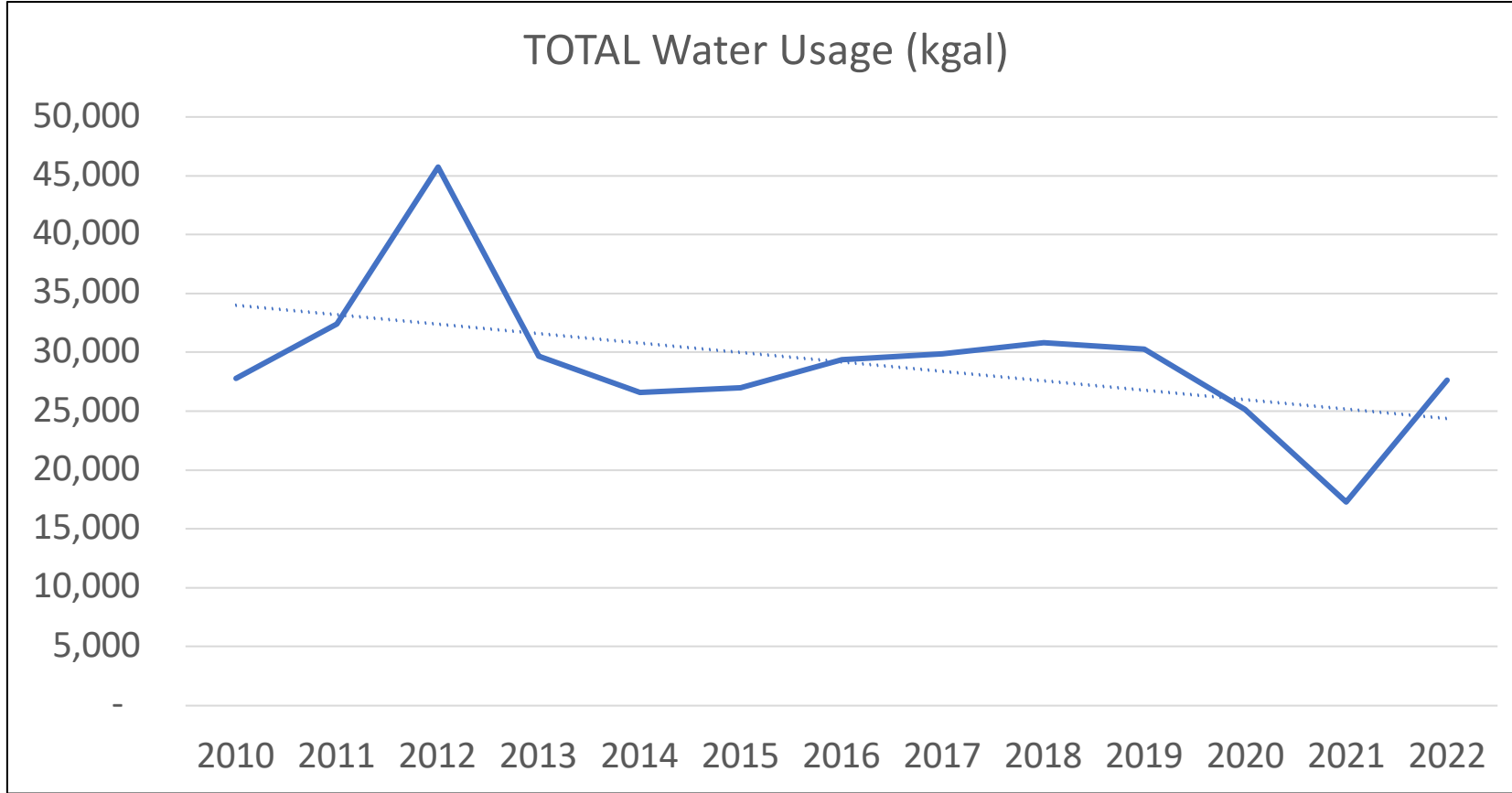
# Greenhouse Gas Inventory – SCOPE 3 – Category 1

## Water

Water Usage by Fiscal Year												* COVID Remote Learning	
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Preschool	200	294	326	434	563	431	415	438	402	381	305	381	257
Abbott Elementary	213	242	215	209	201	200	211	209	228	239	165	42	268
Allen Elementary	373	422	377	386	317	202	383	254	586	611	470	335	451
Angell Elementary	181	344	212	228	169	212	192	210	178	135	9	1	2
Bach Elementary	345	288	310	321	254	265	258	397	320	384	362	255	316
Bryant Elementary	196	154	240	218	275	323	295	292	248	253	290	130	258
Burns Park Elementary	340	367	393	469	335	460	482	426	554	428	317	216	554
Carpenter Elementary	134	247	192	320	236	140	70	80	79	82	45	89	242
Dicken Elementary	377	291	410	519	527	423	415	331	296	302	212	213	527
Freeman Elementary	well water system												
Eberwhite Elementary	304	264	436	418	361	597	375	451	556	384	443	339	528
Haisley Elementary	388	279	414	444	456	489	476	443	390	459	416	244	365
King Elementary	272	256	277	312	316	328	354	370	428	509	392	161	503
Lakewood Elementary	259	183	305	269	228	243	259	263	271	282	236	82	330
Lawton Elementary	642	295	274	269	271	325	335	299	326	327	229	71	320
Logan Elementary	285	473	452	339	353	286	264	305	244	256	206	100	393
AA Open Elementary	1711	1292	2709	2268	1769	1919	2432	2762	2262	2016	1518	99	393
Mitchell Elementary	216	158	317	226	155	226	243	587	308	534	196	119	593
A2 STEAM	347	273	258	285	251	466	505	519	396	443	234	658	882
Pattengill Elementary	428	263	209	185	276	383	300	319	313	217	209	113	305
Pittsfield Elementary	217	164	253	267	255	252	270	267	275	233	119	231	337
Thurston Elementary	396	347	343	374	391	393	412	436	497	606	439	402	460
Wines Elementary	included with Forsythe												
Clague Middle School	855	779	649	847	571	514	722	617	767	1375	1442	658	1143
Forsythe Middle School	2242	1565	3070	2292	2571	1971	2086	2670	2374	2390	1767	1145	2950
Scarlett Middle School	921	441	831	803	408	709	929	987	1119	902	675	23	109
Slauson Middle School	1072	1082	1244	1459	2969	1549	1323	1302	1409	2035	3042	805	1700
Tappan Middle School	1438	1373	1301	891	804	926	1037	974	1039	979	1271	311	977
Pathways to Success	237	223	141	186	185	440	611	421	311	294	207	426	1053
Huron High School	6587	9369	15702	6173	4138	3644	5327	3952	4420	3305	3501	3869	7122
Pioneer High School	3885	7747	10353	5105	4116	4802	3826	4125	5751	4711	3557	1258	1346
Community High School	232	454	380	367	266	642	861	882	634	702	282	488	425
Skyline High School	2042	2028	2792	2377	2241	2895	3367	3876	3414	4053	2320	3783	2140
Balas Bldg	226	214	207	244	189	168	182	231	212	230	192	127	86
Transportation -Main Bldg	218	249	157	160	158	165	160	188	209	191	74	109	279
<b>TOTAL Water Usage (kgal)</b>	<b>27,778</b>	<b>32,418</b>	<b>45,746</b>	<b>29,664</b>	<b>26,572</b>	<b>26,988</b>	<b>29,377</b>	<b>29,880</b>	<b>30,812</b>	<b>30,247</b>	<b>25,142</b>	<b>17,282</b>	<b>27,613</b>
<b>MT CO2eq</b>	<b>88</b>	<b>103</b>	<b>145</b>	<b>94</b>	<b>84</b>	<b>86</b>	<b>93</b>	<b>95</b>	<b>98</b>	<b>96</b>	<b>80</b>	<b>55</b>	<b>88</b>
<b>gallons/Student</b>	<b>1690</b>	<b>1959</b>	<b>2750</b>	<b>1783</b>	<b>1615</b>	<b>1606</b>	<b>1719</b>	<b>1712</b>	<b>1743</b>	<b>1703</b>	<b>1419</b>	<b>993</b>	<b>1617</b>

# Greenhouse Gas Inventory – SCOPE 3 – Category 1

## Water



SCOPE 3													
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	<i>Baseline</i>												
Water (Category 1)													
Water Usage (kgal)	27,778	32,418	45,746	29,664	26,572	26,988	29,377	29,880	30,812	30,247	25,142	17,282	27,613
Water Treatment (MT CO2e/MG)	45.4	52.9	74.7	48.4	43.4	44.1	48.0	48.8	50.3	49.4	41.1	28.2	45.1
Wastewater Treatment (MT CO2e/MG)	42.9	50.1	70.7	45.9	41.1	41.7	45.4	46.2	47.6	46.8	38.9	26.7	42.7
<b>Total SCOPE 3 Water Emissions (MT CO2e)</b>	<b>88.3</b>	<b>103.1</b>	<b>145.4</b>	<b>94.3</b>	<b>84.5</b>	<b>85.8</b>	<b>93.4</b>	<b>95.0</b>	<b>98.0</b>	<b>96.2</b>	<b>79.9</b>	<b>54.9</b>	<b>87.8</b>

# Greenhouse Gas Inventory – SCOPE 3 – Category 5

## Waste

Description & Location	Landfill						Recycling						DIVERSION RATE
	# 6 yard containers	# 8 yard containers	Volume of Compact or / roll off	Days of service/ wk	Annual Volume - CY (42 weeks)	Cubic Foot/SF	# 6 yard containers	# 8 yard containers	Days of service/ wk	Annual Volume - CY (42 weeks)	Cubic Foot/SF		
Preschool	2			1	504	0.233	1		1	252	0.116	33%	
Abbott Elementary	1			1	252	0.129	1		1	252	0.129	50%	
Allen Elementary	2			1	504	0.208	1		1	252	0.104	33%	
Angell Elementary	1			1	252	0.185	1		1	252	0.185	50%	
Bach Elementary	2			1	504	0.256	1		1	252	0.128	33%	
Bryant Elementary	2			3	1,512	0.678	1		1	252	0.113	14%	
Burns Park Elementary	2			1	504	0.207	1		1	252	0.103	33%	
Carpenter Elementary		1		1	336	0.149		1	1	336	0.149	50%	
Dicken Elementary	2			1	504	0.315	1		1	252	0.158	33%	
Freeman Elementary	1			1	252	0.212	1		1	252	0.212	50%	
Eberwhite Elementary	2			1	504	0.219	1		1	252	0.110	33%	
Haisley Elementary	2			1	504	0.234	1		1	252	0.117	33%	
King Elementary	2			1	504	0.239	1		1	252	0.119	33%	
Lakewood Elementary	1			2	504	0.320	1		1	252	0.160	33%	
Lawton Elementary	2			1	504	0.231	1		1	252	0.115	33%	
Logan Elementary	2			1	504	0.227	1		1	252	0.113	33%	
AA Open Elementary	2			2	1,008	0.307	1		1	252	0.077	20%	
Mitchell Elementary	1			2	504	0.194	1		1	252	0.097	33%	
A2 STEAM	2			2	1,008	0.427	1		1	252	0.107	20%	
Pattengill Elementary	1			2	504	0.253	1		1	252	0.126	33%	
Pittsfield Elementary	1			1	252	0.163	1		1	252	0.163	50%	
Thurston Elementary	2			1	504	0.215	1		1	252	0.107	33%	
Wines Elementary	2			1	504	0.235	1		1	252	0.118	33%	
Clague Middle School	3			2	1,512	0.262	1		1	252	0.044	14%	
Forsythe Middle School	4			1	1,008	0.147	2		1	504	0.073	33%	
Scarlett Middle School	3			1	756	0.125	2		2	1,008	0.167	57%	
Slauson Middle School	2			2	1,008	0.143	1		1	252	0.036	20%	
Tappan Middle School	2			2	1,008	0.126	1		1	252	0.032	20%	
Pathways to Success	2			1	504	0.354	1		1	252	0.177	33%	
Huron High School	2		45	1	2,394	0.160	2		1	504	0.034	17%	
Pioneer High School			165	0.8	5,544	0.370	3		2	1,512	0.101	21%	
Community High School	1		10	2	1,344	0.624		1	1	336	0.156	20%	
Skyline High School			35	1	1,470	0.104	2		1	504	0.036	26%	
Balas Bldg	3			1	756	0.438	2		2	1,008	0.584	57%	
Transportation	1			1	252	0.372	0		0	0	0.000	0%	
					<b>29,988</b>	<b>0.227</b>				<b>12,264</b>	<b>0.093</b>	<b>29.0%</b>	

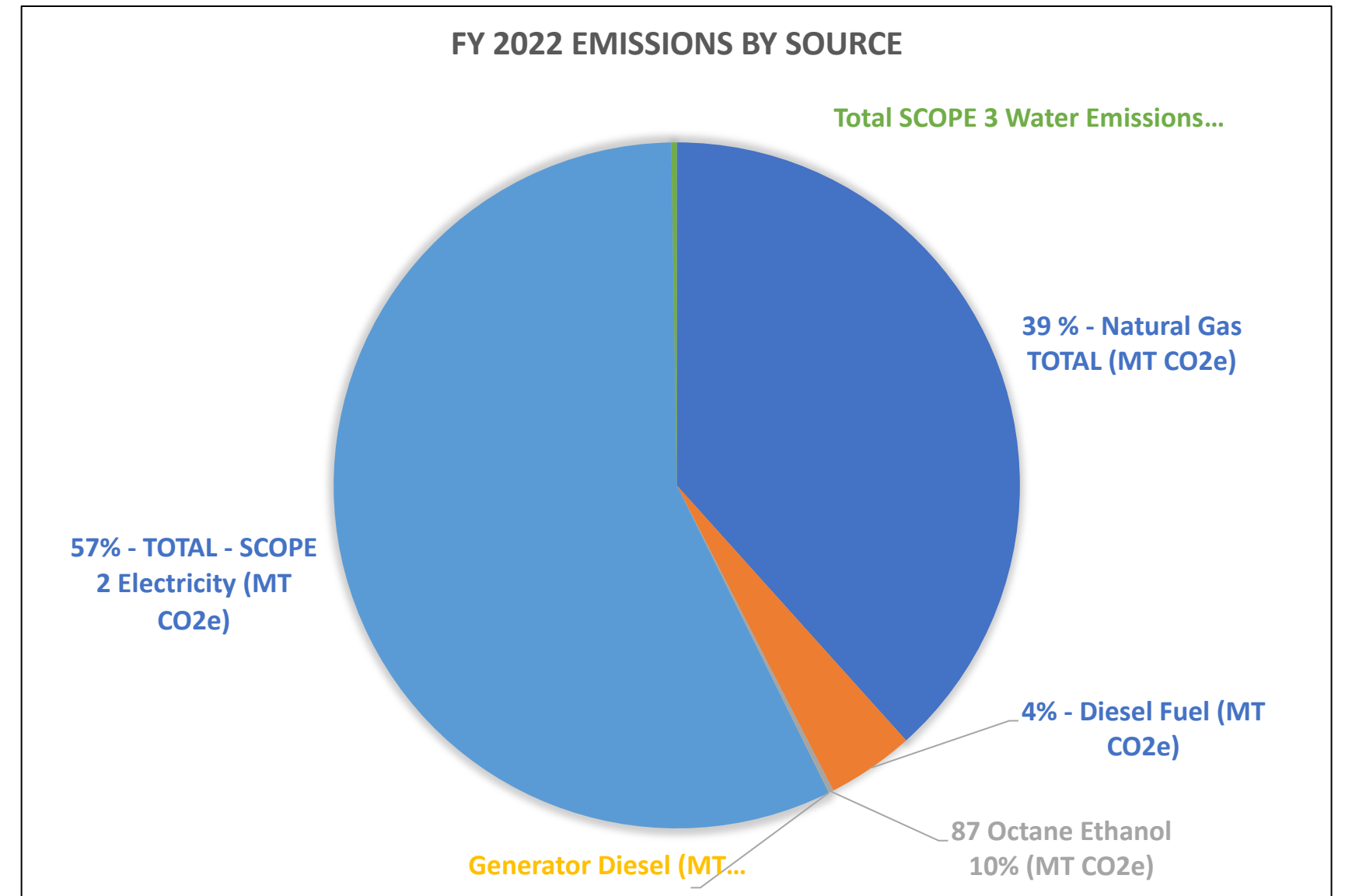
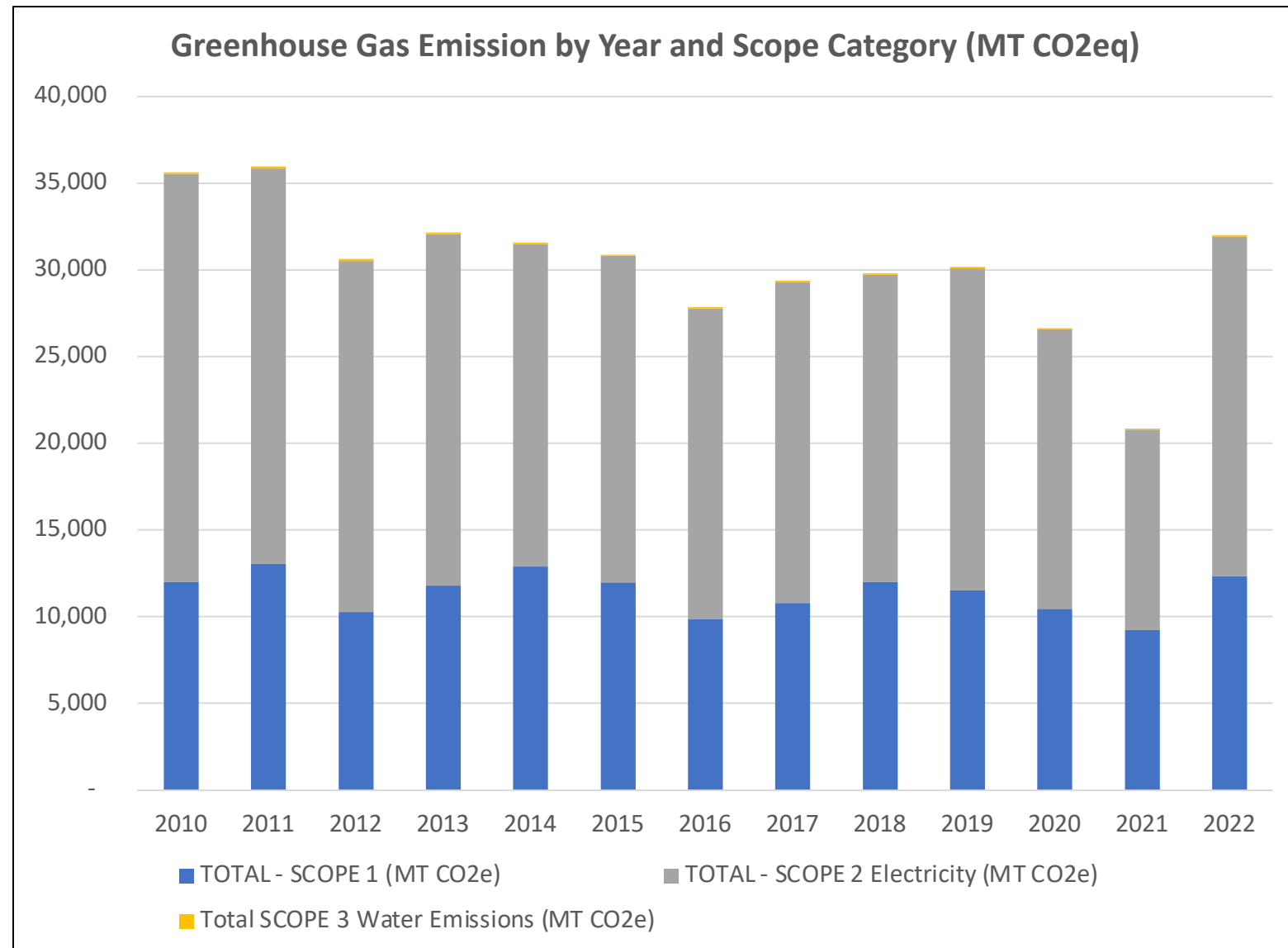
← **Diversion Rate** is the percentage of the total waste stream that is diverted from landfills by recycling or other means

**NOTES:**

- *The calculations are based on the number of times the dumpsters are serviced and does not account for partially full dumpsters*
- *We are not yet able to convert data to carbon emissions*

# Greenhouse Gas Inventory – SCOPE 1+2+3 TOTALS

SCOPE 1+2+3	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2022 vs. 2010
Fiscal Year	Baseline													
TOTAL - SCOPE 1+2+3 (MT CO2e)	35,630	35,961	30,646	32,167	31,579	30,893	27,855	29,378	29,819	30,194	26,650	20,848	32,018	89.86%
Per Student (MT CO2e/student)	2.17	2.17	1.84	1.93	1.92	1.84	1.63	1.68	1.69	1.70	1.50	1.20	1.88	86.53%
Per 1000 SF (MT CO2e/1000 SF)	10.15	10.25	8.73	9.17	8.96	8.77	7.90	8.34	8.42	8.46	7.47	5.84	8.97	88.36%







# ***Environmental Sustainability Updates***

## **Current Initiatives and Next Steps**

# AAPS Environmental Sustainability Advisory Group (ESAG)

The ESAG is composed of representatives from local institutions, AAPS organizations, non-profits, and the business sector in the AAPS community.

Meeting quarterly, the group will advise the AAPS on the implementation of the recently adopted [AAPS Environmental Sustainability Framework](#).

*Meetings will include updates on current initiatives, discussion of items in the planning phase, and exploration of opportunities for improvement and collaboration.*

Organization	First Name	Last Name
<b>Environmental Non Profits</b>		
Ann Arbor 2030 District	Jan	Culbertson
Ecology Center	Katy	Adams
Huron River Watershed Council	Jason	Frenzel
Recycle Ann Arbor	Bryan	Ukena
<b>Institutions and Municipalities</b>		
City of Ann Arbor	Missy	Stults
University of Michigan	Anya	Dale
University of Michigan	Alison	Richardson
Washtenaw County	Andrew	DeLeeuw
<b>AAPS Organizations</b>		
Ann Arbor Administrators Association	Brittany	Sayles
Office Professionals Union	Darryl	Hayes
Ann Arbor Education Association	Fred	Klein
AAPS Parent Teacher Organization Council	Lisa	Querijero
AAPS Freeman Youth Council	Coert	Ambrosino
AAPS Freeman Youth Council (HS Rep - Pioneer)	Maisey	Weyhing
AAPS Freeman Youth Council (HS Rep - CHS)	Serena	O'Brien
<b>Other Community Partners</b>		
Community Action Network	Derrick	Miller
Neutral Zone (2x HS Reps TBD)	Lori	Roddy
Peace Neighborhood Center	Bonnie	Billups
Zingerman's Delicatessen	Rodger	Bowser

# Inflation Reduction Act (IRA)

## *Incentives for Environmental Sustainability*

### Business Energy Investment Tax Credit (ITC)

Base Credit: 6% - 30% (depending on labor factors)

Domestic Content Bonus: 10% additional

Energy Community Bonus: 10% additional

Low-Income Community Bonus: 10% additional

- **AAPS Incentive Value 40% of System Cost**
- Method of Incentive: Direct Payment
- Relevant Technologies:
  - Solar (Photovoltaic and Thermal)
  - Geothermal (Ground Source Heat Pumps)

### Energy-Efficient Commercial Buildings Tax Deduction (179D)

**Incentive of \$0.30-\$1.80 per square foot**

- Incentive level based on energy efficiency above and beyond code minimum construction
- Applicable to renovation and new construction projects that meet energy efficiency targets

# Solar Update – *Financial Projections w/ Inflation Reduction Act*

Financial Projection for a Typical AAPS School Solar System w/ Inflation Reduction Act Direct Payments																							
System Size (kW DC)	180																						
Installed Cost per kW DC	\$2,250	<table border="1"> <tr> <th colspan="2">Inflation Reduction Act</th> </tr> <tr> <th colspan="2">Direct Payment Levels</th> </tr> </table>																		Inflation Reduction Act		Direct Payment Levels	
Inflation Reduction Act																							
Direct Payment Levels																							
System Cost (no IRA)	\$405,000																						
IRA 30% Discount	\$283,500	30%	Prevailing Wage																				
<b>IRA 40% Discount</b>	<b>\$243,000</b>	<b>10%</b>	<b>BONUS - Domestic Content Bonus</b>																				
<i>*40% Direct Payment = most likley incentive level for AAPS</i>																							
IRA 50% Discount	\$202,500	10%	BONUS - Low-Income Community																				
IRA 60% Discount	\$162,000	10%	BONUS - Energy Communities																				
*Highlighted cells = break even year																							
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
Electricity Cost (\$/kWh)	\$0.13	\$0.13	\$0.14	\$0.14	\$0.15	\$0.16	\$0.16	\$0.17	\$0.17	\$0.18	\$0.19	\$0.20	\$0.20	\$0.21	\$0.22	\$0.23	\$0.24	\$0.25	\$0.26	\$0.27			
Solar production	226,133	225,455	224,778	224,104	223,432	222,761	222,093	221,427	220,762	220,100	219,440	218,782	218,125	217,471	216,818	216,168	215,519	214,873	214,228	213,586			
Solar value	\$28,719	\$29,778	\$30,876	\$32,015	\$33,196	\$34,420	\$35,689	\$37,006	\$38,370	\$39,785	\$41,253	\$42,774	\$44,352	\$45,987	\$47,683	\$49,442	\$51,265	\$53,156	\$55,116	\$57,149			
Cumulative Solar Value		\$58,497	\$89,373	\$121,388	\$154,584	\$189,004	\$224,693	\$261,699	\$300,069	\$339,855	\$381,107	\$423,881	\$468,233	\$514,220	\$561,904	\$611,346	\$662,611	\$715,767	\$770,883	\$828,032			
Inflation Adjusted Solar Value	\$28,719	\$28,771	\$28,856	\$28,973	\$29,119	\$29,294	\$29,495	\$29,723	\$29,977	\$30,255	\$30,558	\$30,884	\$31,234	\$31,606	\$32,002	\$32,421	\$32,862	\$33,327	\$33,814	\$34,324			
Cumulative NPV of Solar Generation		\$57,490	\$86,346	\$115,319	\$144,438	\$173,732	\$203,227	\$232,950	\$262,927	\$293,182	\$323,740	\$354,624	\$385,857	\$417,464	\$449,466	\$481,887	\$514,749	\$548,076	\$581,890	\$616,213			



- Pioneer High School Solar Club

# Solar Update – *Financial Projections w/ Inflation Reduction Act*

Typical 20-Year Solar Investment @ 1 School w/ IRA				
BOND COSTS			GENERAL FUND SAVINGS	
System Size (kW DC)	180		\$154,584	General Fund Savings Year 1-5
System Cost	\$405,000		\$185,271	General Fund Savings Year 6-10
IRA Direct Payment	\$162,000		\$222,049	General Fund Savings Year 11-15
Net First Cost - Bond Funds	\$243,000		\$266,129	General Fund Savings Year 16-20
Year 15 Inverter Replacement Cost	\$31,500		\$828,032	Total 20-Year General Fund Savings
<b>Net 20 Year Cost - Bond Funds</b>	<b>\$274,500</b>		<b>\$616,213</b>	<b>Net Present Value - 20-Year GF Savings</b>



- Huron High School Solar

Assumptions	
Electricity Cost Escalator	4%
Solar Degredation	0.30%
Discount Rate (inflation)	3.50%
Inverter Replacement Cost (\$/kW DC)	\$175

# Electric Bus Update

## Electric Bus Pilot Program:

Four electric buses through EGLE Grant (VW emissions settlement funds)

- Costs heavily subsidized by grant funds and DTE Energy
  - Electric buses ~5x more expensive than regular buses
- Electrical Infrastructure upgrade 4x more expensive than originally estimated
- Tracking performance through software tool; reporting results to EGLE thru 12/31/2022
- Significant downtime and performance issues
- Attempt at Vehicle to Grid (VtG) interconnection failed – technology not ready at this time
- DTE is assisting AAPS in identifying, developing and implementing Market Ready solutions

As incentive programs continue to become available, AAPS is committed to continuing with the pilot program and to purchase additional electric buses as the technology matures



*Proterra Charging Equipment*



*New Electric School Bus – fossil fuel free*

# Environmental Action – School Mini Grants

AAPS, in partnership with the City of Ann Arbor, is pleased to announce initial recipients of the Environmental Action School Mini-Grant Program in support of environmental action and sustainability at our schools. The grants will provide AAPS school staff with up to \$500 to complete projects that have an environmental focus by the end of the 2023/2024 school year.

## Round 1 Awardees:

Awardee	Staff Role and Location	Project Description
Coert Ambrosino	Freeman Environmental Youth Council	Environmentally-themed board game - purchasing classroom sets of "Solutions" to engage classes
Coert Ambrosino	Freeman Environmental Youth Council	School Cafeteria Waste Audits - purchasing school cafeteria waste audit kits
Leslie Baugh	Teacher at Scarlett Middle School	Composting - purchasing composting bins for school use
Jessica Bell	Teacher at A2 Steam	Kayaking Huron River - to study local watershed
Melissa Bender	Teacher at Pioneer High School	Recycling Binders and Notebooks - purchasing Zero Waste boxes from TerraCycle
Samantha Cucu	Assistant Principal at Martin Luther King Elementary	Outdoor StoryWalk - purchasing supplies for nature trail signs of pages from a children's book
Cameron Dominick	Teacher at Bach Elementary	School Garden - purchasing garden supplies
Sherry Grant, sponsored by Koren Clinkscale	Garden Coordinator at Martin Luther King Elementary	School Garden and Composting - purchasing garden supplies and worm factory composting bin
Janet Heaton	Teacher at Wines Elementary	Recycling Supplies - using TerraCycle to collect hard to recycle classroom and office supplies
Angela Hood	Teacher at Pioneer High School	Controlled Prairie Burn - partnering with Greenview Nature preserve to have controlled burn of Pioneer Prairie
Tori Jovanovski and Tom Gibb-Randall	Teachers at Ann Arbor Open School	Public Transportation Education - purchasing public buses for school field trips and educating about AATA buses
Catherine Moutard	Speech Language Pathologist at Bryant Elementary	School Garden - purchasing supplies to re establish foundations of school garden
Michael Mychaliska, sponsored by Casey Warner	Student at Skyline High School	Native Plants Garden - installing native species planting and revitalizing school garden
Laura Padalino	Teacher at Scarlett Middle School	Native Plant School Garden - purchasing native plants for garden
Polly Salvato	Teacher at Westerman Preschool and Family Center	Recycled Art Projects - using materials from Scrap Box
Heather Schimmel	Counselor at Skyline High School	Nature Trail - developing a labyrinth on the mindfulness path walkway
Neha Shah	Teacher at Burns Park Elementary	Garden Sensory Beds - to purchasing garden sensory beds supplies
Daniel Verdugo	Teacher at Huron High School	Environmental Education Magazine - printing and distributing N! magazine, an educational project
Casey Warner	Teacher at Skyline High School	Helping and Protecting Trees - researching and planting mulch around damaged trees on school property
Jenni Wilkening	Teacher at Pioneer High School	School Composting - creating a school composting system
Jenni Wilkening	Teacher at Pioneer High School	School Garden - purchasing supplies for the plant club to restart the school garden
Jean Wilson	Teacher at A2 Steam	Classroom Gardens - purchasing small cold frame for growing kale, mint, basil, and lavender
Erin Wright	Teacher at Eberwhite Elementary	Increasing Recycling and Composting - researching and incentivizing to reduce waste

# Environmental Action – School Mini Grants

## Round 2 Awardees:

Awardee	Staff Role and Location	Project Description
Kristin Berger	Teacher at King Elementary	Nature Trails - purchasing mulch to cover school pathways accessible to students
Rachael Bergren	Teacher at Westerman Preschool	Outdoor Learning - purchasing rain suits for students to use during data collection and on the nature playground
Heidi Busch-Binetti	Paraeducator at Slauson Middle School	Reusing - purchasing stainless steel bottles for students
Laura Dills	Family Resource Specialist at Westerman Preschool	Outdoor Learning - installing a "Little Free Library" with garden boxes
Cala Millis	Teacher at Carpenter Elementary	Water Conservation Learning - Leslie Science Center, virtual water plant tour and reusable water bottles
Neha Shah	Teacher at Burns Park Elementary	School Garden - purchasing sensory garden beds for school use
Eva Simon	Teacher at Lakewood Elementary	Native Species - purchasing materials for the life cycle of monarch butterflies and native plants for garden
Nathan Smead	Teacher at A2 Steam	School Garden - purchasing native pollinator plants, blueberry, raspberry, and blackberry bushes
Josh Tumolo	Teacher at A2 Steam	School Garden and Composting - purchasing soil for existing garden beds and adding a new compost station
Carolyn Wood	Teacher at Logan Elementary	Classroom Garden - purchasing cold frames for 3rd-grade classes to use during their science unit

***A limited number of additional grants are still available!!***

<https://forms.gle/JomLXSs1gVijXNH78>.



# Next Steps

- **Composting - Implement Composting beginning with a Composting Pilot**

AAPS will pilot full cafeteria composting at three elementary schools during the 2023-2024 school year. The pilot will allow for the gathering of information regarding the educational, staff, and financial resources needed to expand the program across the district.

- **School Gardens - Expand to ensure active neighborhood school gardens at all elementary/P8 campuses**

AAPS will conduct an evaluation of existing school gardens at AAPS elementary/P8 campuses to better understand existing conditions including garden locations, access to water, appropriate tool storage locations, teacher and volunteer support, curriculum connection, and other features.

- **Outdoor Learning- Outdoor Learning Evaluation and Plan for Continued Enhancements**

In the spring of 2023 and fall of 2024, the AAPS will conduct an inventory and evaluation of all outdoor learning environments at AAPS campuses to inform enhancements to formal and informal outdoor learning opportunities and sustainable land management practices.

- **Environmental Sustainability Teacher Champions**

AAPS will invite Teacher Champions to serve as leaders in their schools to ensure the building of organizational capacity for environmental sustainability work across the district at every school campus. Teacher Champions will lead and mobilize support for school-based sustainability efforts and enable the work of student Green Teams at each AAPS campus

- **Aligned Curriculum - Ensure an Aligned Learning Experience and Environmental Sustainability Curricula P-12**

Beginning with the 2023-2024 school year, a comprehensive curriculum mapping process will be initiated, including an analysis of existing environmental sustainability lessons and curricula across all disciplines. The information gathered will inform a strategic planning process to map current environmental sustainability curricula and to clarify, align and strengthen environmental education and climate literacy in the AAPS.

# Thank You!



## **Ann Arbor Public Schools** ***Annual Environmental Sustainability Update***

Report to the Board of Education  
April 19<sup>th</sup>, 2023

Emile Lauzzana  
Executive Director, Environmental Sustainability