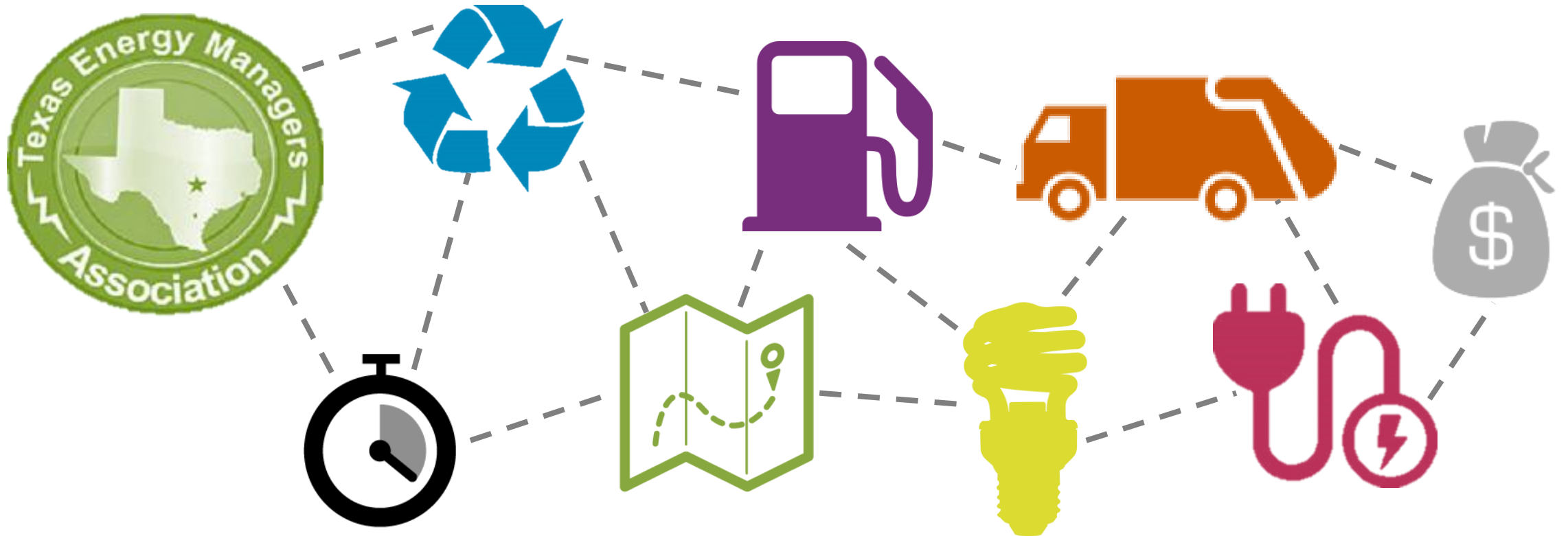


DEFINING SUSTAINABILITY

Developing a Sustainability Management Plan

Texas Energy Manager's Association



Ashley Williams

Paul Raabe

Keith Ordeneaux

Paul Buckner

OVERVIEW

5 How to Measure the Plan?

3 How to Develop the Plan?

4 How to Use the Plan?

2 Why are Communities Key Assets?

1 What is Sustainability?



WHAT IS SUSTAINABILITY?



...development that meets the needs of the present, without **COMPROMISING** the ability of future generations to meet their own needs.



...envisions the enduring **PROSPERITY** of all things.



...is a characteristic of natural and human systems that embodies the possibility of **FLOURISHING** forever.



...means **SATISFYING** our lives, both now and in the future, by not using more natural resources than nature can regenerate.



...a **CHALLENGE** to live our lives and make decisions as individuals, organizations and societies, so that we make sure that future generations have access to the same opportunities and quality of life we do.



...is living within earth's **LIMITS**.



WHAT IS SUSTAINABILITY?



Triple Bottom Line



WHY COMMUNITIES?



...have a greater utilization of community assets.



...can reduce a large environmental footprint.



...can improve quality of life and work environments.



...have a responsibility to appropriately use tax-payers funds.

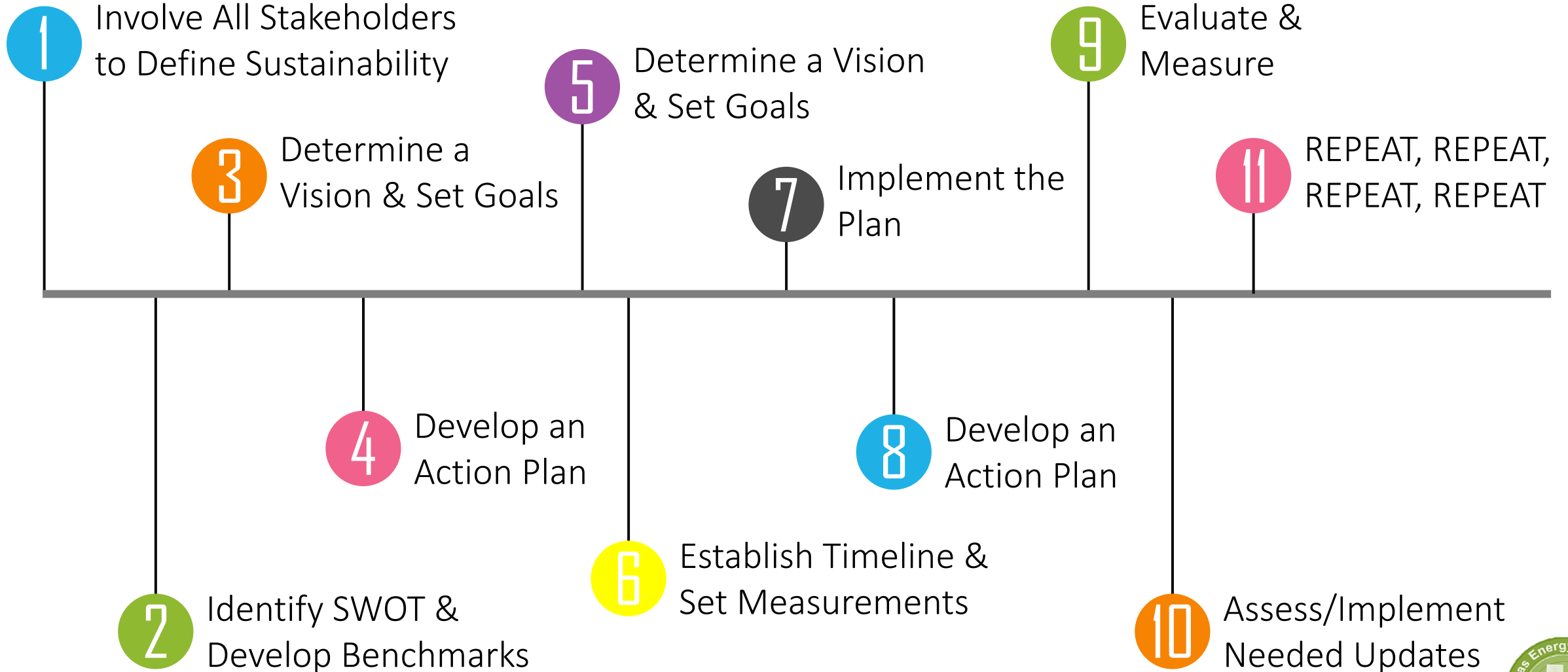


...can increase revenues and divert savings to more projects.



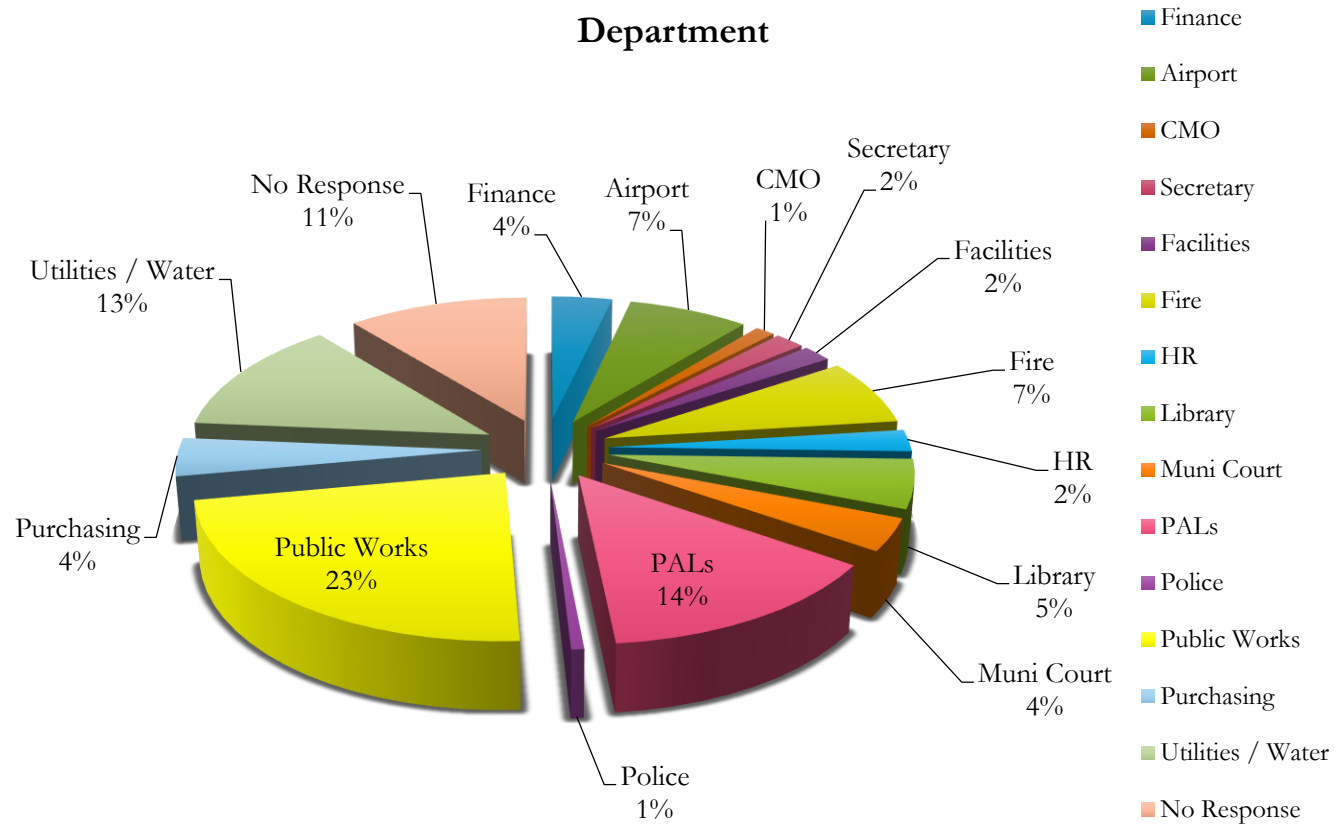
...can improve reputation/perception by leading by example.

HOW TO DEVELOP A PLAN

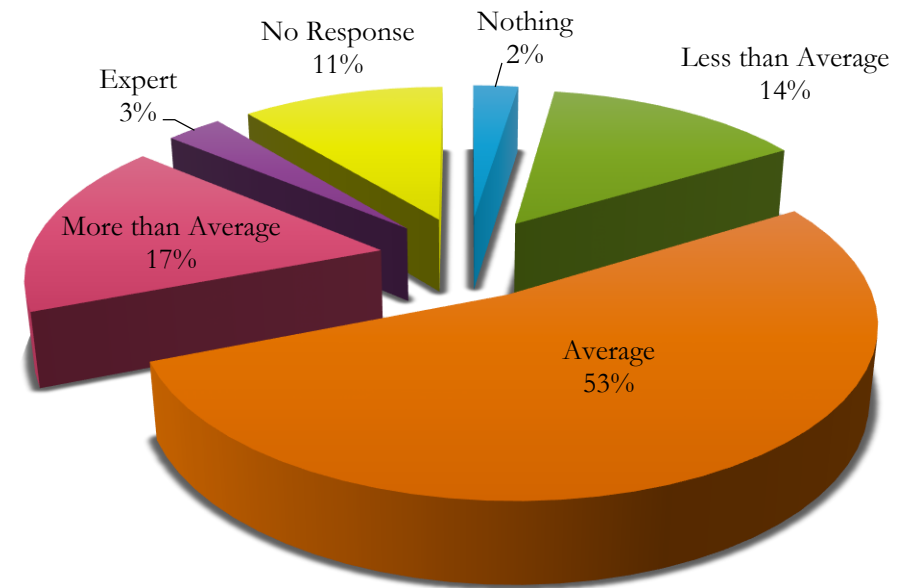


HOW TO DEVELOP A PLAN

Department

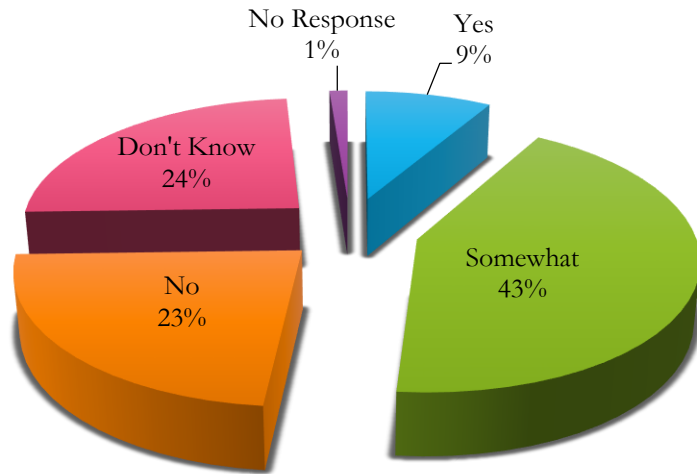


How much would you say you know about living sustainably and general sustainable efforts?

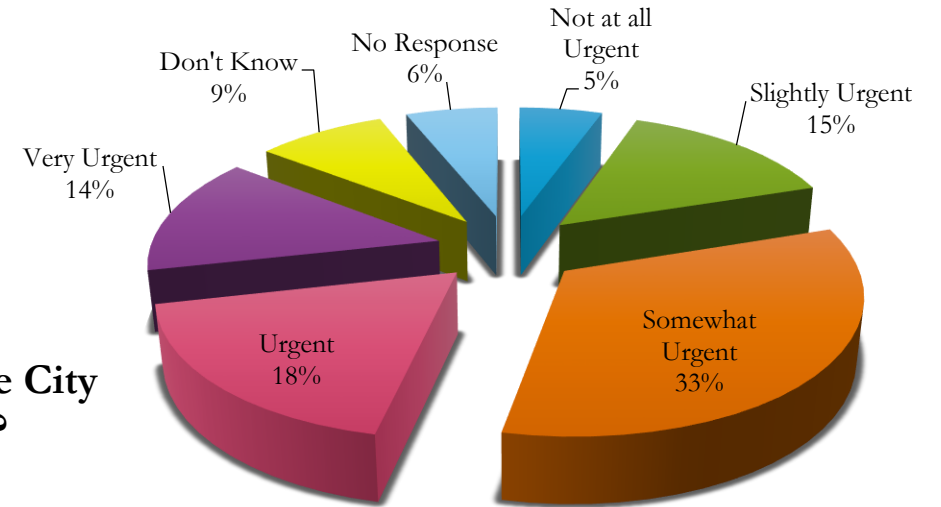


HOW TO DEVELOP A PLAN

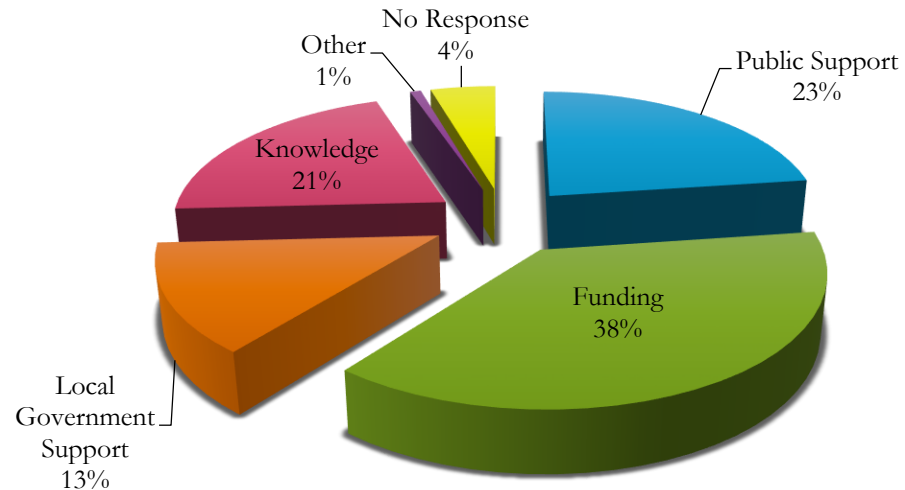
Do you think sustainability is currently practiced within the City of Temple?



How urgent do you feel it is to take steps towards a more sustainable city / work environment?

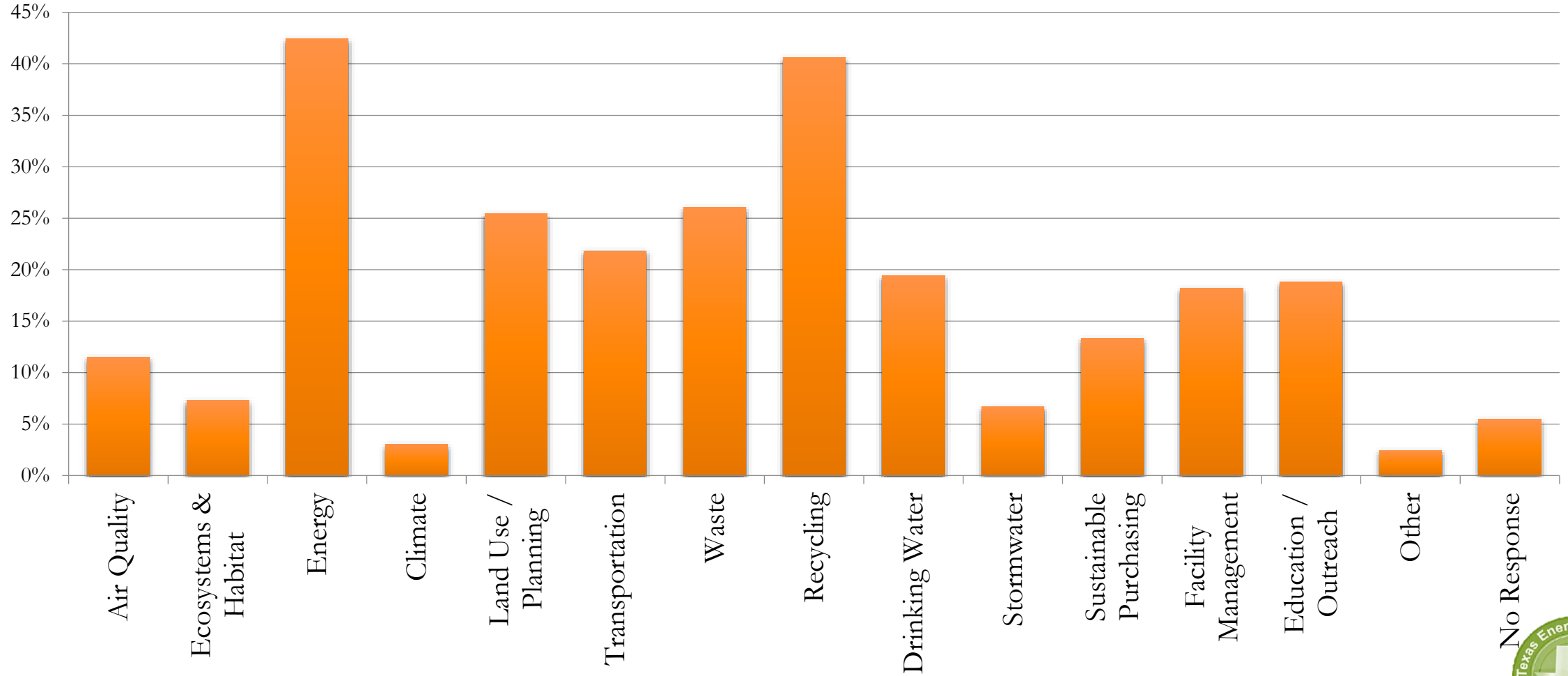


What do you see as barriers to the City becoming more sustainable?



HOW TO DEVELOP A PLAN

Which three issues do you think Temple should focus on the most to become more sustainable?



HOW TO DEVELOP A PLAN



“The City of Temple is committed to creating a more vibrant, harmonious and sustainable city by building on existing strengths, exploring new opportunities, fostering regional partnerships and responding to change, in support of environmental stewardship, community responsibility and economic vitality.”



HOW TO DEVELOP A PLAN

General	Reduce energy costs and consumption	Water Systems	Continue to provide clean drinking water
	Improve environmental monitoring		Reduce water consumption in City facilities
	Prevent pollution		Reduce energy use associated with treatment and distribution of water
City Facilities	Maintain a clean and healthy work environment to secure economic well being	Streets	Improve energy use in street lighting
	Be proactive		Provide and expand on multiple modes of mobilization on City streets
	Increase energy efficiency	Solid Waste	Reduce the amount of solid waste going into the landfill from City facilities
	Reduce reliance on non-renewable resources		Reuse, recycle and purchase recycled content products
Administrative Operations	Promote inter-departmental collaboration	Open Space	Increase recycling opportunities at City facilities
	Incorporate sustainability into the City's decision making process		Naturalize City landscaping
Sustainable Procurement	Increase the City's use of sustainable procurement		Provide equitable access for all residents to City open space
Transportation / Fleet	Reduce vehicle miles traveled	Education and Communication	Engage and educate employees and the community
	Reduce total fuel consumption for fleet vehicles		Measure, monitor and communicate the City's progress toward a defined goal set

HOW TO USE THE PLAN



City of Temple –
Fleet
Diversification



North East ISD –
Single Stream
Recycling



Pearland ISD –
Recommissioning
to Decrease Costs



Bryan ISD –
Upgrading Metal
Halide to LED



FLEET DIVERSIFICATION

Why CNG?

- Once in a decade opportunity
 - 10 refuse trucks came up for replacement in FY 2012
 - 2 more for each of the following 2 years
- Cost Benefits
- Available supplemental funding
- Domestic fuel option; mainly produced in Texas

Core Questions

- Location
- Public Access
- Fast fill or Slow (Time) fill

FLEET DIVERSIFICATION



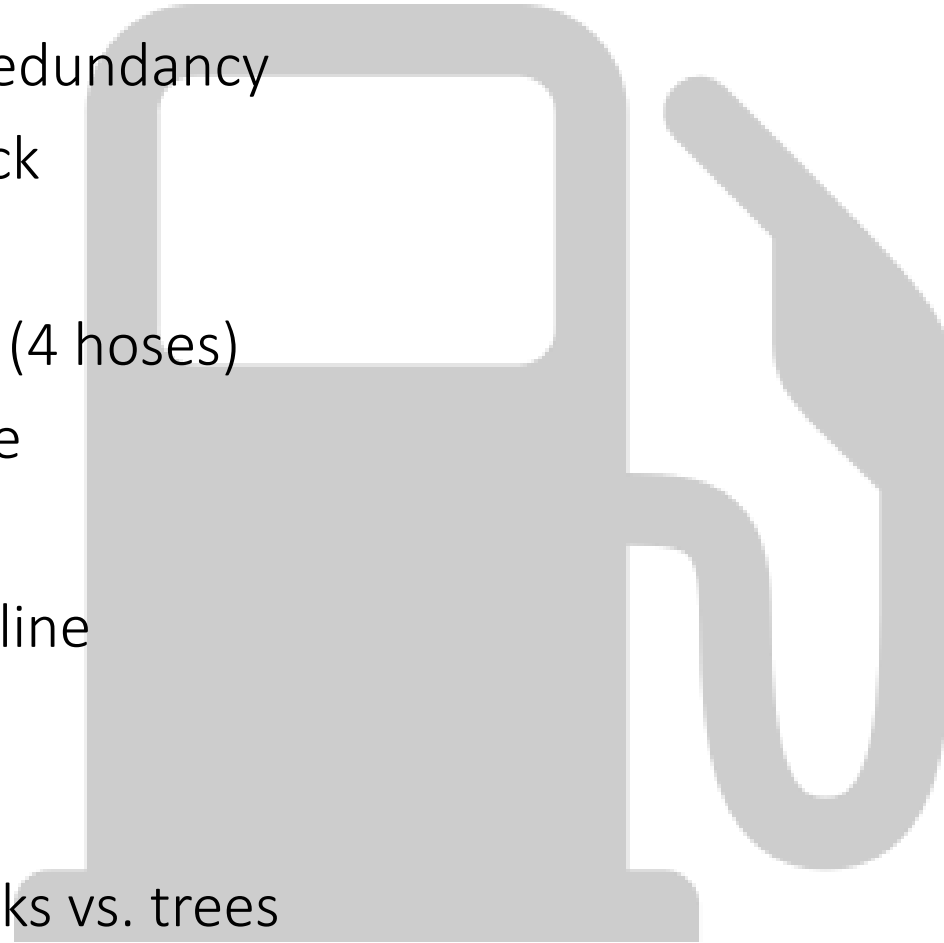
FLEET DIVERSIFICATION

Station

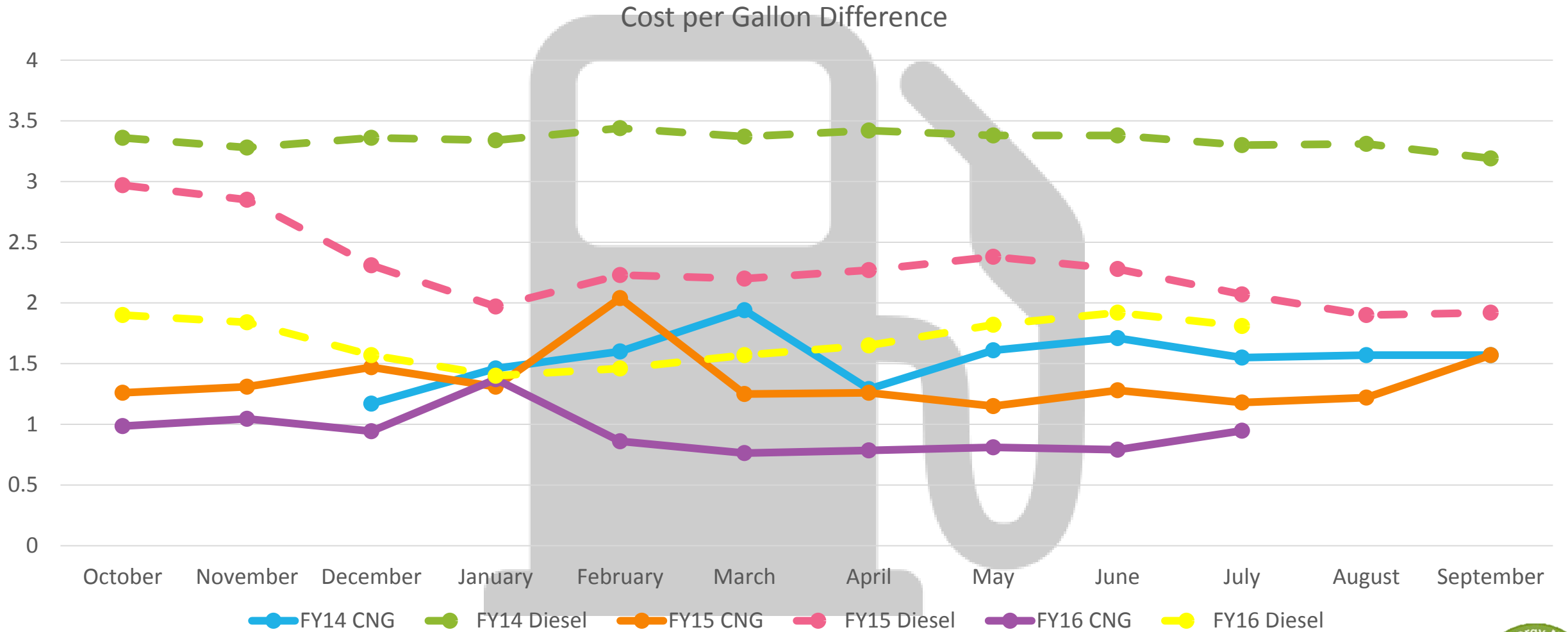
- 2 compressors for redundancy
- Cascade storage pack
- Dryer
- 2 fast fill dispensers (4 hoses)
- FuelMaster software

Issues

- Clean gas from pipeline
- Metering accuracy
- Running out of gas
- Height of some trucks vs. trees



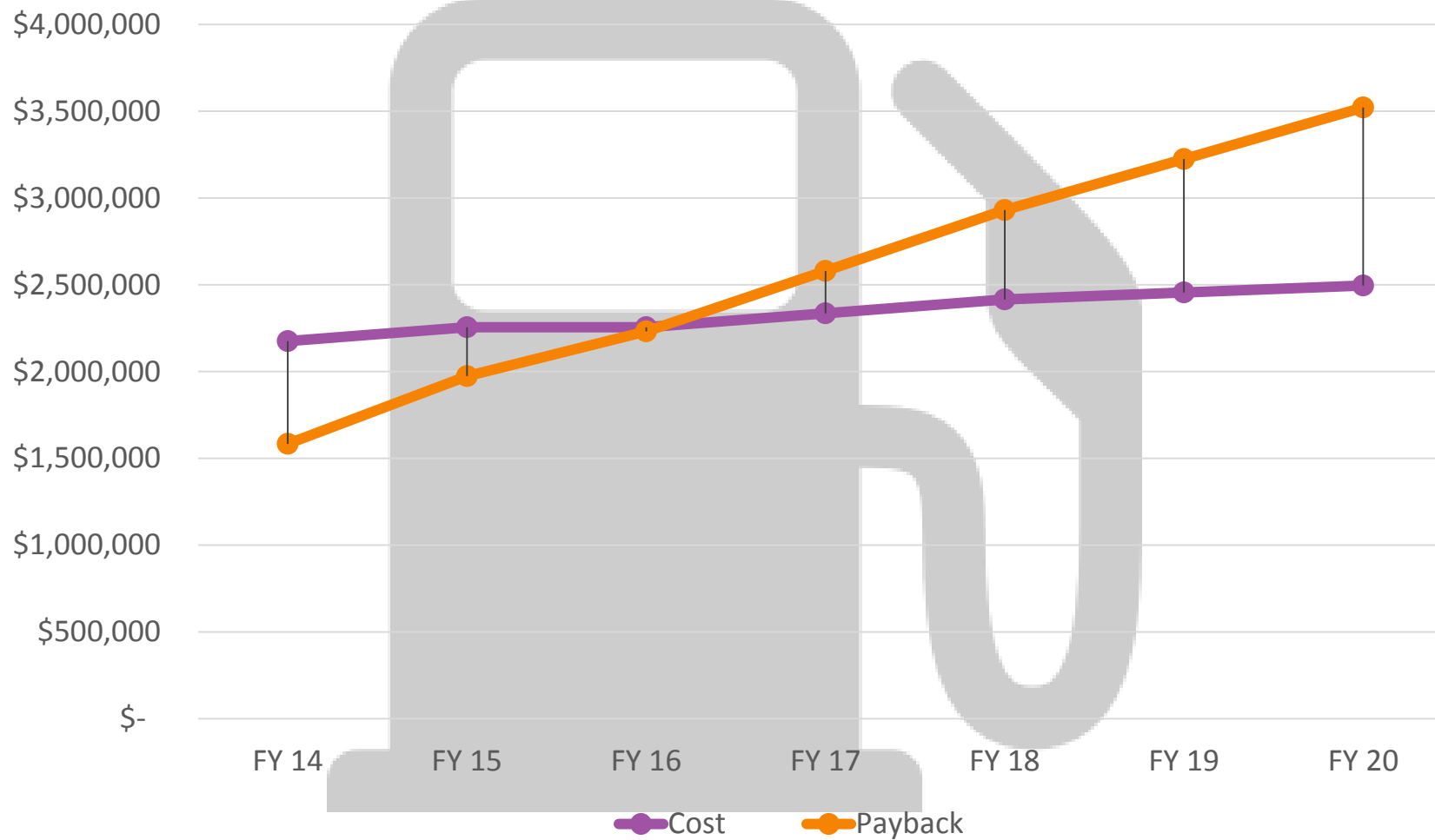
FLEET DIVERSIFICATION



FLEET DIVERSIFICATION

	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Station Build	\$ (1,619,502)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering	\$ (18,890)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Truck Δ	\$ (536,580)	\$ (80,327)	\$ -	\$ (80,000)	\$ (80,000)	\$ (40,000)	\$ (40,000)
Truck Grants	\$ 651,486	\$ 60,000	\$ 30,000	\$ 120,000	\$ 120,000	\$ 60,000	\$ 60,000
Truck Sales	\$ 677,757	TBD	TBD	TBD	TBD	TBD	TBD
Fuel Δ	\$ 114,464	\$ 74,394	\$ 77,058	\$ 78,600	\$ 80,172	\$ 81,775	\$ 83,411
Maintenance Δ	\$ 99,367	\$ 200,948	\$ 82,631	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000
Tax Credits	\$ 40,435	\$ 54,895	\$ 68,061	\$ 69,422	\$ 70,811	\$ 72,227	\$ 73,671
	\$ (591,463)	\$ 309,910	\$ 257,751	\$ 268,022	\$ 270,982	\$ 254,002	\$ 257,082
Cost	\$ 2,174,972	\$ 2,255,299	\$ 2,255,299	\$ 2,335,299	\$ 2,415,299	\$ 2,455,299	\$ 2,495,299
Payback	\$ 1,583,509	\$ 1,973,747	\$ 2,231,497	\$ 2,579,519	\$ 2,930,501	\$ 3,224,503	\$ 3,521,585
	\$ 591,463	\$ 281,552	\$ 23,802	\$ (244,220)	\$ (515,202)	\$ (769,204)	\$ (1,026,286)
CNG \$/gal	\$ 1.5238	\$ 1.3200	\$ 0.9035	\$ 0.9216	\$ 0.9400	\$ 0.9588	\$ 0.9780
CNG Gallons	80,870.51	109,790.67	136,121.69	138,844.12	141,621.01	144,453.43	147,342.49
CNG Costs	\$ 123,230.48	\$ 144,923.68	\$ 122,985.95	\$ 125,445.67	\$ 127,954.58	\$ 130,513.67	\$ 133,123.94
Diesel \$/gal	\$ 3.3400	\$ 2.2700	\$ 1.6700	\$ 1.7034	\$ 1.7375	\$ 1.7722	\$ 1.8077
Diesel Gallons	71,166.05	96,615.79	119,787.09	122,182.83	124,626.49	127,119.02	129,661.40
Diesel Costs	\$ 237,694.60	\$ 219,317.84	\$ 200,044.44	\$ 204,045.32	\$ 208,126.23	\$ 212,288.76	\$ 216,534.53
\$/gal Δ	\$ (1.8162)	\$ (0.9500)	\$ (0.7665)	\$ (0.7818)	\$ (0.7975)	\$ (0.8134)	\$ (0.8297)
Gallons Δ	9,704.46	13,174.88	16,334.60	16,661.29	16,994.52	17,334.41	17,681.10
Cost Δ	\$ (114,464.12)	\$ (74,394.16)	\$ (77,058.49)	\$ (78,599.66)	\$ (80,171.65)	\$ (81,775.08)	\$ (83,410.59)

FLEET DIVERSIFICATION





SINGLE STREAM RECYCLING

PROGRAM IMPLEMENTATION

Paul L. Raabe, P.E. Energy Management Coordinator



North East I.S.D.

Campuses - 67

- **Elementary Schools – 46**
- **Middle Schools – 14**
- **High Schools – 7**

Total Enrollment – 66,700 Students

Total Employees – 9,292

- **Teachers – 4,305**



Program Objectives

- To remove recyclable materials from the campus waste stream.
- To provide an alternate method of collection.
- To minimize sorting of recyclable materials.
- To improve each school's environmental impact on the community.



What is Single Stream Recycling?

- This type of recycling allows for various commodities such as plastics, metal cans and cardboard to be collected in the same bin.
- The bins are picked up and emptied into a loader truck and transported to the material recovery facility.
- Sophisticated sorting machinery at the MRF is then used to separate each commodity for further processing.



Recycling Collection Company

- Provides each school with 1 to 2 recycling bins.
- Each bin is 6 or 8 cubic yards and has the same foot print as a standard trash container.
- Provides a regularly scheduled pickup service, 2 to 3 times per week.



What goes in the Recycling Bin?

- **Plastic Containers**
(#1 through #7) including bottles, buckets, etc.
- **Aluminum Cans**
- **Steel/Tin Cans**
- **Cardboard (Flattened)**
- **Boxboard & Paperboard**



Plastic Bottle Collections



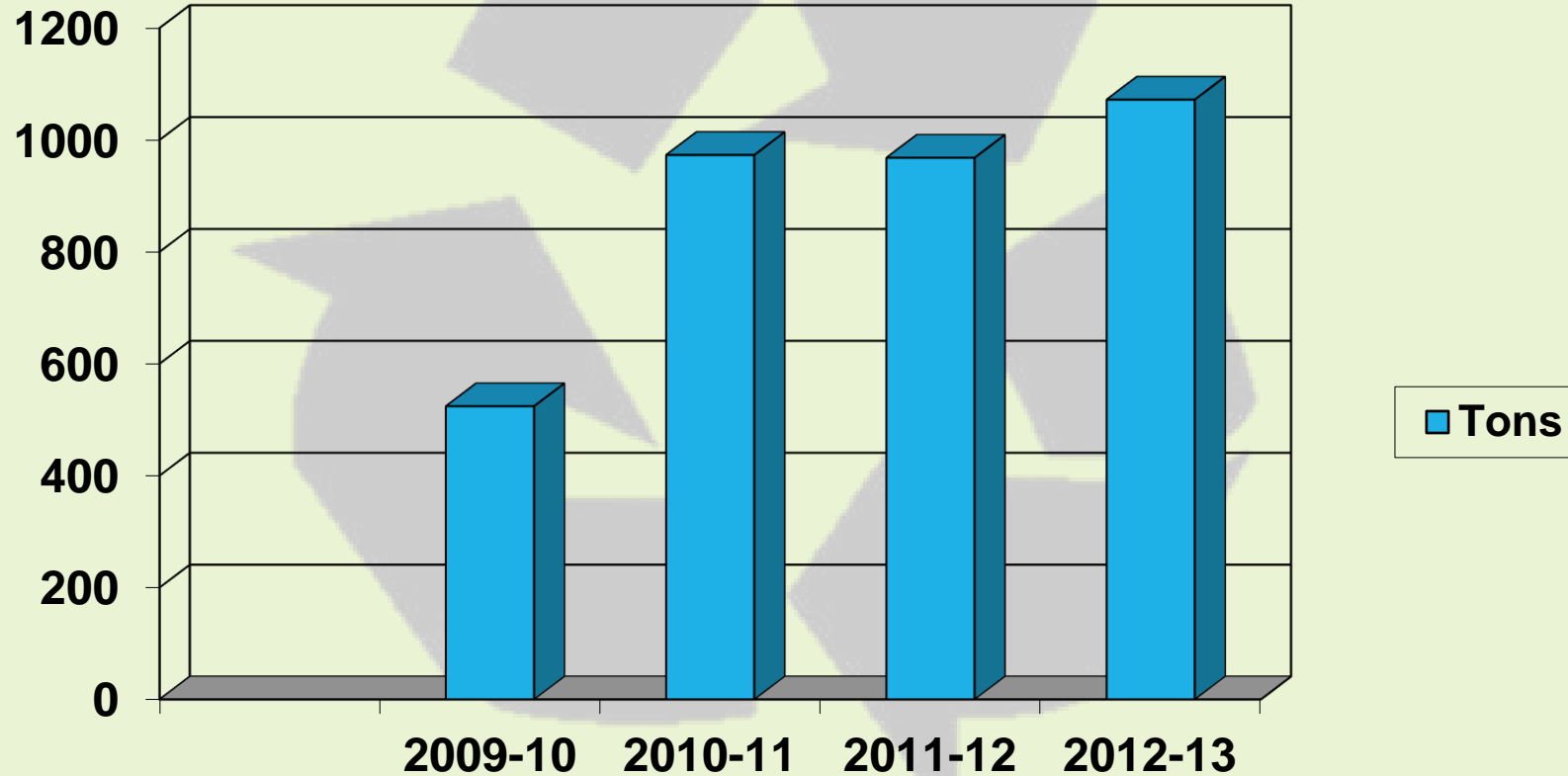
Metal Can Collections



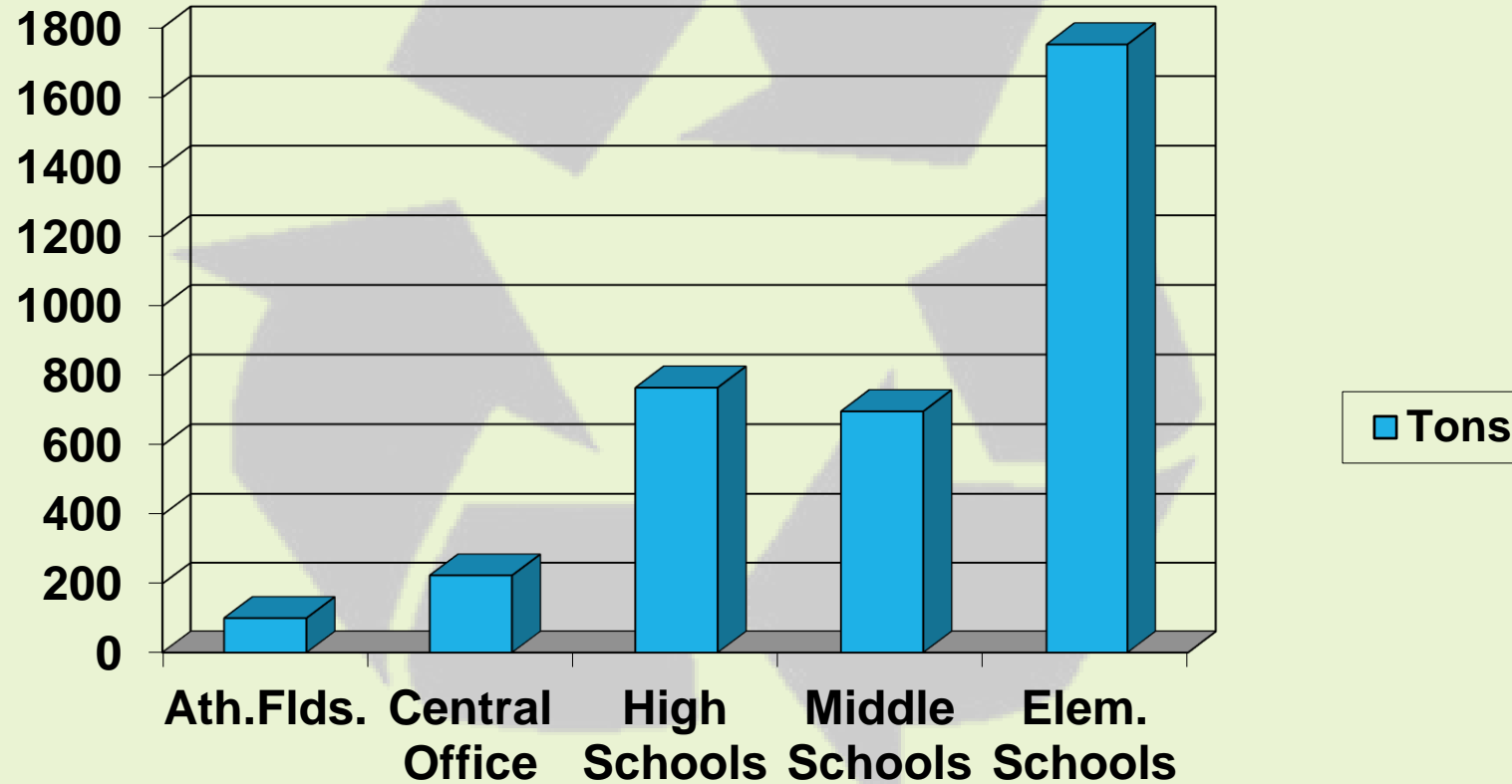
Cardboard Collections



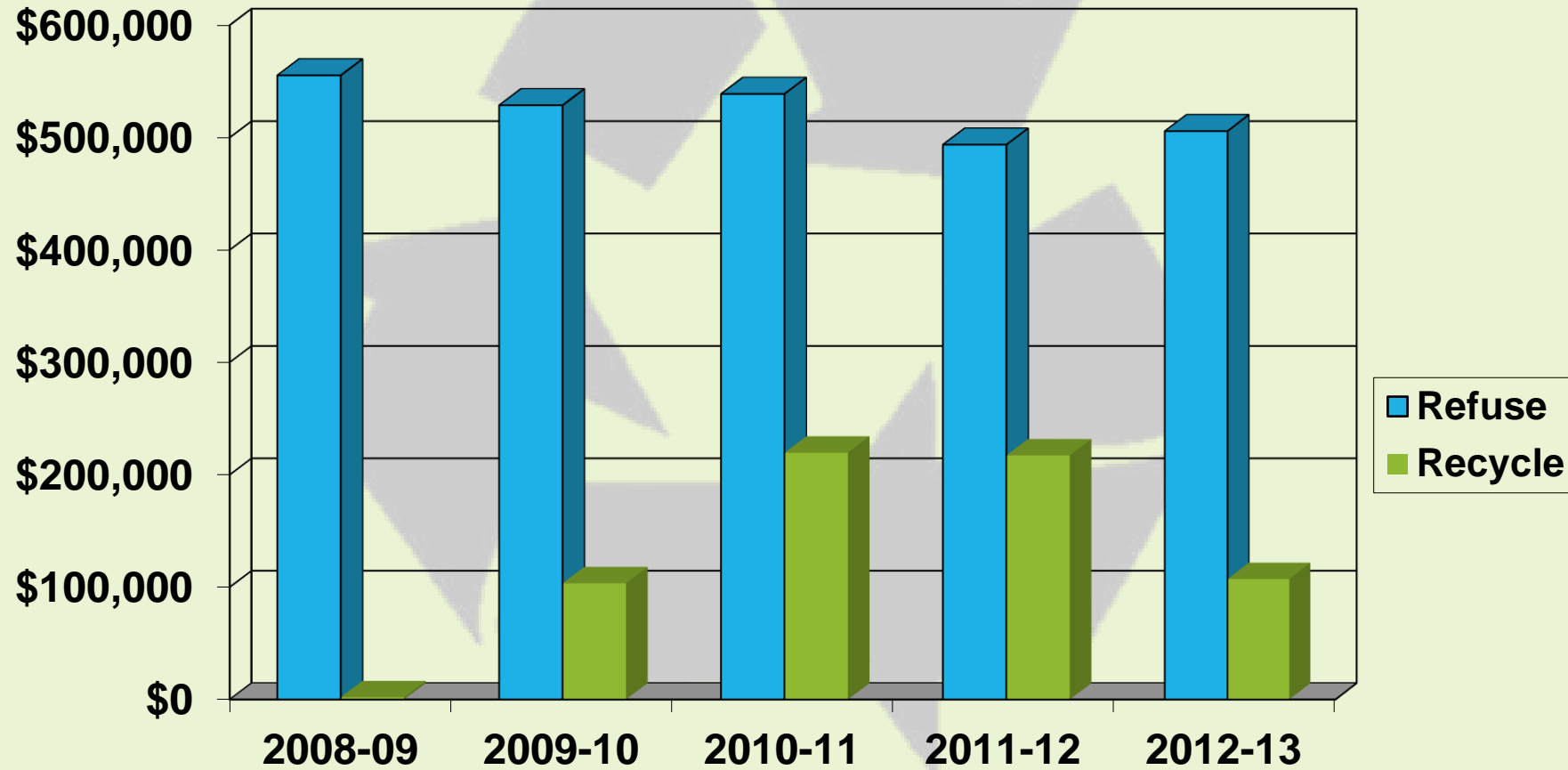
Single Stream Collections 4 Years: 2009-13



Single Stream Collections 4 Years: By Campus



Refuse & Recycling Costs



In Summary

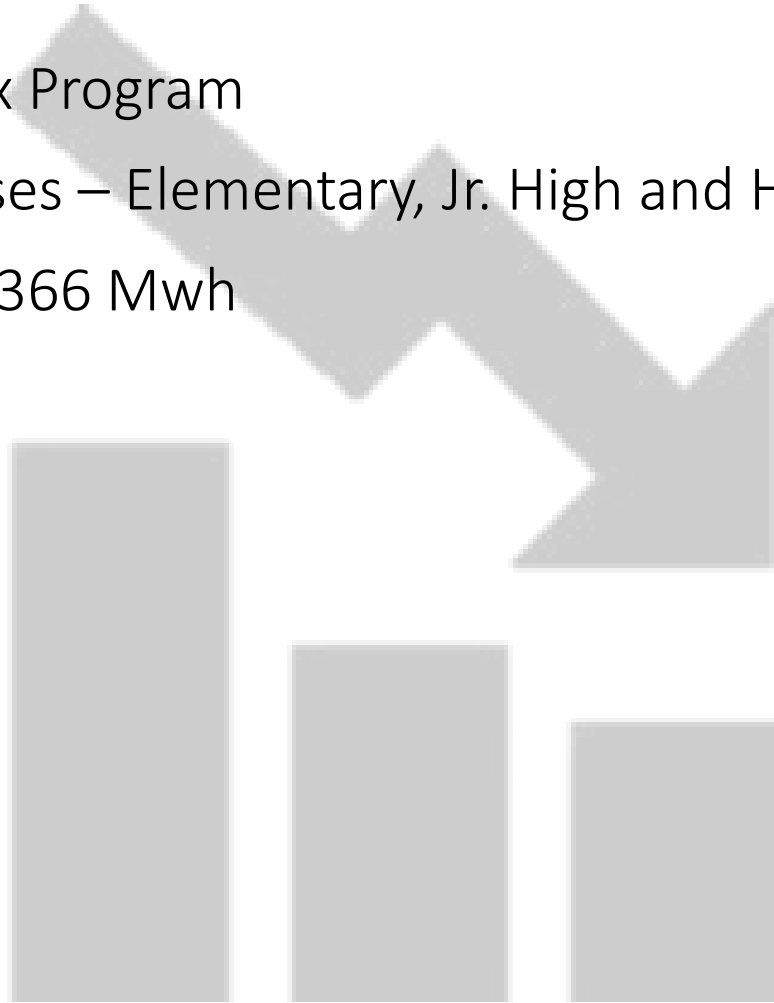
- Diverts material from campus waste stream away from landfill.
- Refuse collection and cost reduced:
 - Volume reduced by 7.5% (15,300 cu.yd./year)
 - Cost reduced by 11.1% (\$61,800 per year)
- Savings has defrayed up to 57% of cost for single stream recycling program.
- Students & parents learn firsthand about recycling & impact on environment.
- Meets Board of Trustees goal for efficient and effective management of resources.



RECOMMISIONING

Project

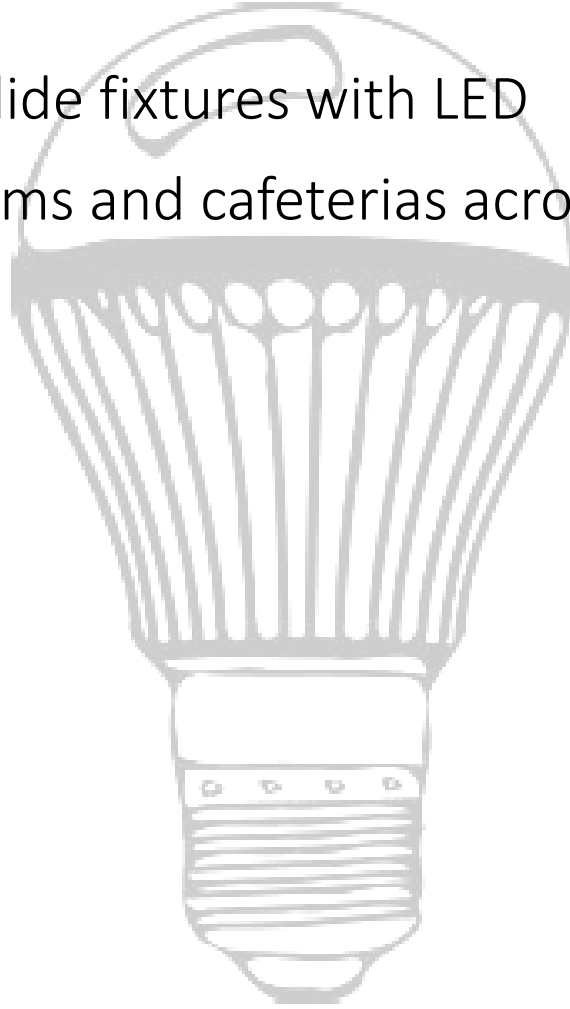
- CenterPoint Energy RCx Program
- Performed at 3 campuses – Elementary, Jr. High and High School
- Savings estimated at 1,366 Mwh



LIGHTING UPGRADE

Project

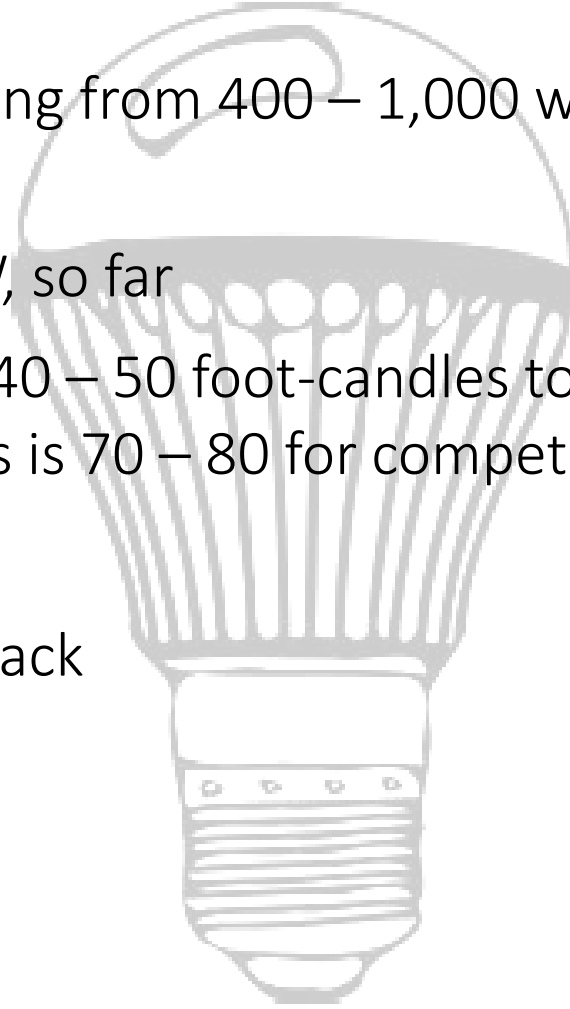
- Replacing interior metal halide fixtures with LED
- Mainly located in gymnasiums and cafeterias across the district



LIGHTING UPGRADE

Details

- Replace metal halides ranging from 400 – 1,000 watts with LED's ranging from 125 – 235 watts
- Reduction in kW by 171 kW, so far
- Increased light levels from 40 – 50 foot-candles to 80 – 100 foot-candles; UIL recommended foot-candles is 70 – 80 for competition gyms
- Decrease in heat load
- Expecting a 3 – 4 year payback



HOW TO MEASURE

Monitoring Plan

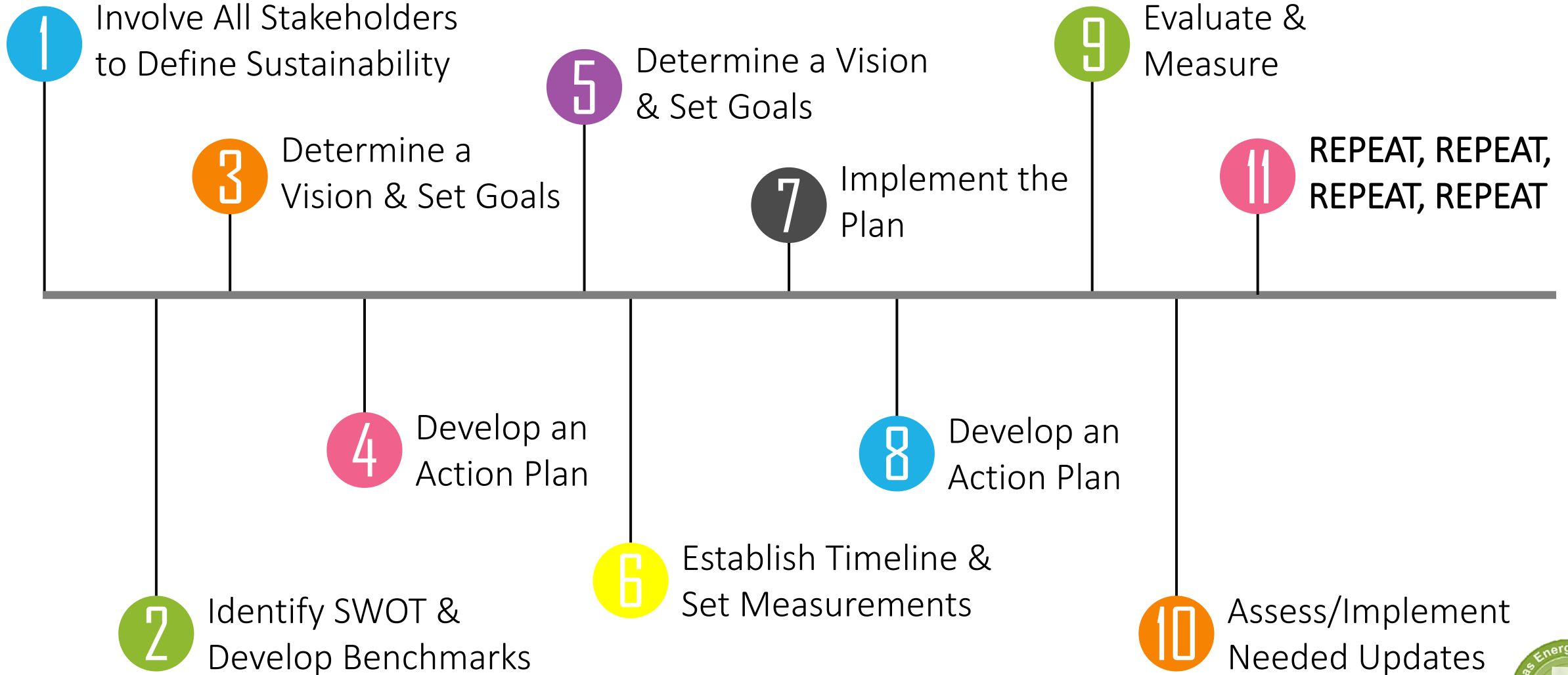
- Evaluate and measure targets
- Increases support and buy-in
- Must be quantitative and qualitative
- PROVIDE FEEDBACK

Launching Pad for Further Planning

- Allow the plan to be organic
- Needs to grow beyond the organization
- Use measurements to educate



HOW TO MEASURE



QUESTIONS?

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