Proposal – A Sustainability Framework for SBUSD

Overview

In keeping with the board resolution about sustainability passed on January 15, 2019 and the board vote on April 23, 2019 to investigate a sustainability officer position, we present this analysis and report. This effort will integrate two important issues – climate change and our desire to save money. Every organization in Santa Barbara needs to do their part in reducing their carbon footprint and teach the next generation about important environmental issues. This topic is very much aligned with our mission statement about preparing students for a world that is yet to be created. We are handing them a world that is being increasingly threatened by global warming and other environmental challenges and we need to prepare them to be future citizens and problem-solvers on behalf of society. We also want to run our district as efficiently as possible which aligns with our core values of evaluating our work and improving our practices.

A Comprehensive Framework for Sustainability in SBUSD

Before we think about a position and what we want to accomplish, we propose this framework to guide our sustainability efforts. Our initial thinking about five domains are:

1. Facilities
2. Utilities
3. Food services
4. Transportation
5. Teaching and learning

The largest and fastest impact will involve improving our (1) facilities and monitoring our (2) utilities. Food services (3) uses energy and also produces a large waste stream from our district. Nancy Weiss does a great job with her program and we will include her in this broader sustainability effort. Transportation (4) is a much broader problem to solve and involves about 12,000 families, our 2,000 employees, and how everyone gets to and from our schools. California revolves around cars and with the changes coming to transportation, we should begin thinking about how to lower our carbon footprint at the community level.

The fifth area is the inclusion of sustainability into our teaching and learning efforts. This is a future conversation with our Educational Services leadership team and how it fits into the list of priorities in our instructional program. The district continues to develop and sustain outdoor classrooms, school garden programs, and is currently formulating a plan for the future utilization of the Hidden Valley property, providing opportunities in our teaching and learning practices to explore and integrate place-based and nature-based education.

Sustainability also fits well with the Next Generation Science Standards shifts happening in our science program, but that will take time think through with our science leaders and teachers. We have many crucial efforts underway - literacy, math instruction, ethnic studies graduation requirement, dual language immersion, etc. We need to be appropriate and realistic with how we include sustainability in our teaching and learning.

A Sustainability Officer Position – a Teacher on Special Assignment

We are recommending the addition of a teacher on special assignment (TOSA) to serve as a sustainability officer for our district. Superintendent Matsuoka traveled up to Monterey Peninsula Unified School District on May 9, 2019 to follow up on the information provided by board member, Laura Capps. Superintendent Matsuoka met with David Chandler, Coordinator of Renewable Energy and Conservation and learned about the 7 years history of his work in MPUSD. This position has saved MPUSD a significant about of money over the years and they have reduced their carbon footprint, their energy and water usage. It was noteworthy that Mr. Chandler was a science teacher by background which gave him the right perspective as he entered this position. He has been a driver in their efforts to save money and we believe MPUSD could serve as a model for a program in SBUSD.

We recommend hiring a sustainability TOSA for two years with the goal of saving enough money to pay for the position. We will establish a baseline of data to determine if we are saving enough money to justify the position. We believe two years is the right length of time to see if this position will generate enough savings to continue the position.

Six Sustainability Strategies

We propose six specific strategies to improve our facilities and utility use regarding sustainability:

1. Solar energy and battery storage systems

We have established a standard for our bond program that all new construction will include the addition of solar panels on roofs. In addition to new construction, we will identify existing roofs that can accommodate solar panels. We will set a goal that by 2025, we will generate 1 million Kwh of electricity that will save the district around $200,000 per year assuming an electricity cost of 20 cents/Kwh. We estimate the return on investment to take around 14 years. This goal will depend on finding budget space within each project that involves new construction and finding alternative sources of funding to put panels on existing roofs.

In conjunction with the installation of solar energy, we want to investigate the installation of electricity storage systems. The reason for this strategy is two-fold. First, we want to be

prepared for the interruptions of electricity service due to natural disasters. We want to install power storage systems for our most critical needs such as data centers and food refrigeration systems. Second, we want to take advantage of the shift in electricity pricing models where costs are high during peak hours and cheaper at night. If we can store electricity, we will sell power to the grid during peak hours (earning a credit) and buying electricity at night when costs are lower. You can think of this as an electricity arbitrage system, sell high and buy low. We do not have any financial model for electricity storage systems but the team will begin developing models and consider future investments.

2. Building envelopes

The building envelope includes walls, roofs, windows and doors – basically the perimeter of a building. We have many challenges with our older historic buildings but there are opportunities to improve on the loss or gain of thermal energy through retrofitting windows, adding insulation, etc. Two projects that are included in the bond program include the replacement of windows at SBHS, SBJH, La Cumbre Junior High, and McKinley Elementary School. A second project is the replacement of the very thin walls at DPHS with pre-engineered storefront systems that will greatly improve the retention of heat during the winter months.

3. Lighting – transition to LED lighting, use of natural daylighting

Lighting technology continues to evolve from the older incandescent bulbs to the current standard of fluorescent tubes and now toward light emitting diodes (LED). The energy use of an LED bulb is about 10% of the energy cost of a typical compact fluorescent light bulb but they cost more on the front end. Over time, we will shift our lighting systems towards LED and we have set a standard that all new construction and appropriate modernization is equipped with LED lighting.

We also have some buildings with an abundance of natural daylighting and we should take advantage of this feature. Coupled with dimmable LED lights, we can reduce our energy usage for lighting by using more natural lighting. For all new construction, we are designing in as much natural daylighting as possible.

4. Transportation – transition our vehicle fleet towards EV, solar equipped food trucks

As the world gradually shifts to electric vehicles and eventually autonomous transportation systems, we should begin our own investments in electric vehicles for our employee vehicles. Smaller EV vehicles are available but there are no electric vans or trucks on the market in the United States. We will monitor, research, and consider purchasing EV's as they become available. We will also need to build a charging network in our storage areas.

Nancy Weiss has one food truck equipped with solar panels and we will continue to research the addition of other such vehicles.

A bigger challenge that involves the entire community is how our workforce and students get to and from our schools. We will begin to explore how to lower the carbon footprint of how everyone gets to our schools.

5. Utility monitoring systems – data analytics systems for electricity, natural gas, water

We need to build a data analytics dashboard of our utility usage across all of our sites. We will begin with a Google spreadsheet system that makes data available to all of our schools and locations on a monthly basis. Data is essential to motivate users and change practices when it comes to utilities.

We will investigate the merits of an integrated system to monitor utility use in a more disaggregated model. For example, a vision would be an Internet of Things (IoT) model where we have sensors in every room across the district. We could monitor temperature, energy use, etc. to better inform our utility usage and how to make improvements. These systems are emerging in the field of building management and the cost might not be worth the investment for a school district, but we will investigate.

6. Water conservation

Our annual water bill was $1.1 million dollars in 2017-2018. Water is a limited resource in Santa Barbara and we will research and implement water efficient systems to save water and money. Strategies will include (but not be limited to) landscape irrigation, water efficient fixtures, water monitoring systems, etc. It will be challenging to reduce our water costs as we have already reduced watering of ornamental grass but we will see what can be improved.

Summary

We believe that we can take advantage of our facilities and modernization program and improve the energy efficiency of our future facilities. We also believe that creating a position focused on utility data and identifying savings for our current use will pay for itself. The sustainability TOSA job description would need to be developed and we await direction from the Board about this recommendation.