BEST PRACTICES for SUSTAINABILITY

2022

CULVER CITY UNIFIED SCHOOL DISTRICT

Culver City
Unified School District
GREEN

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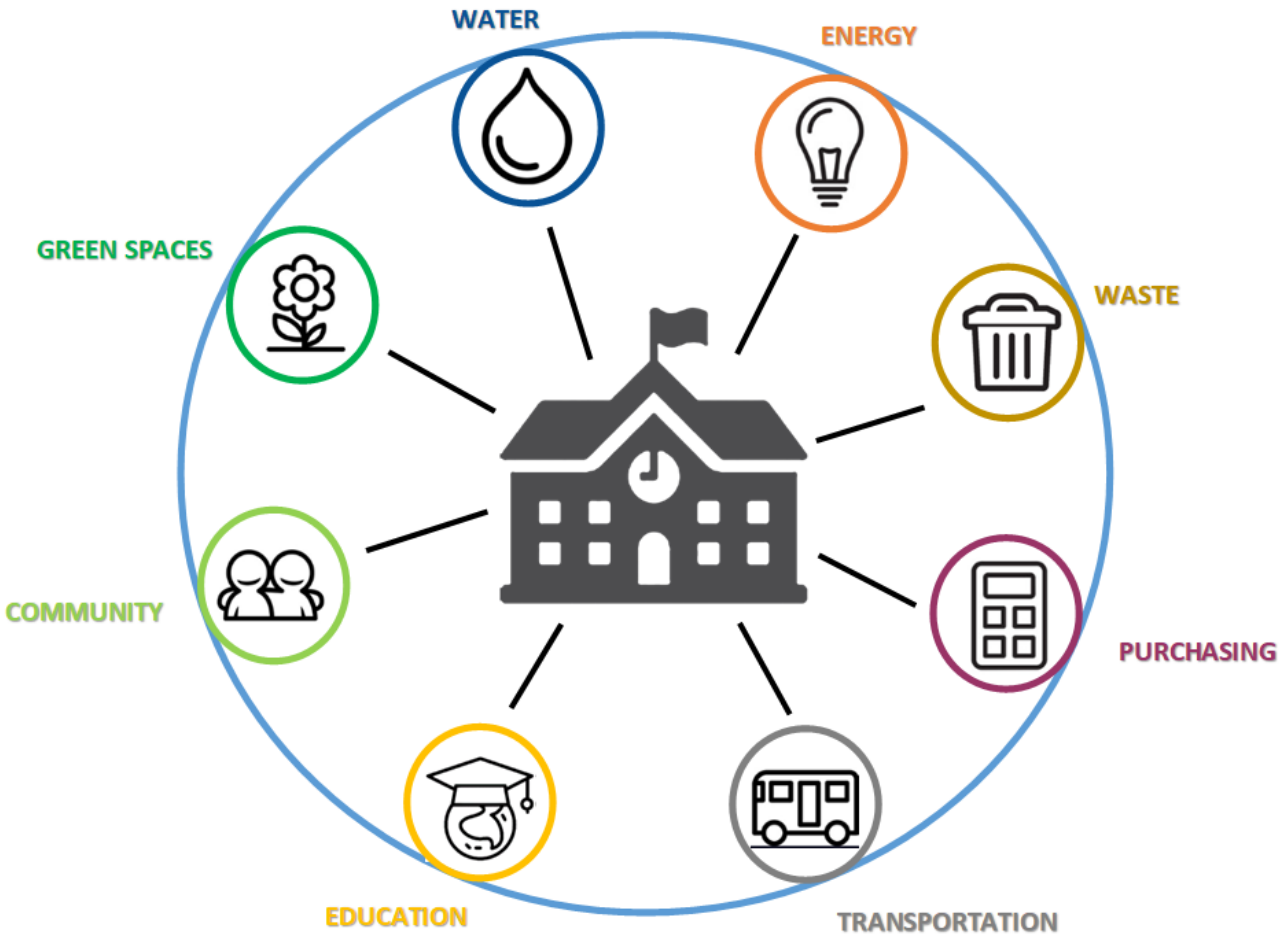
Introduction

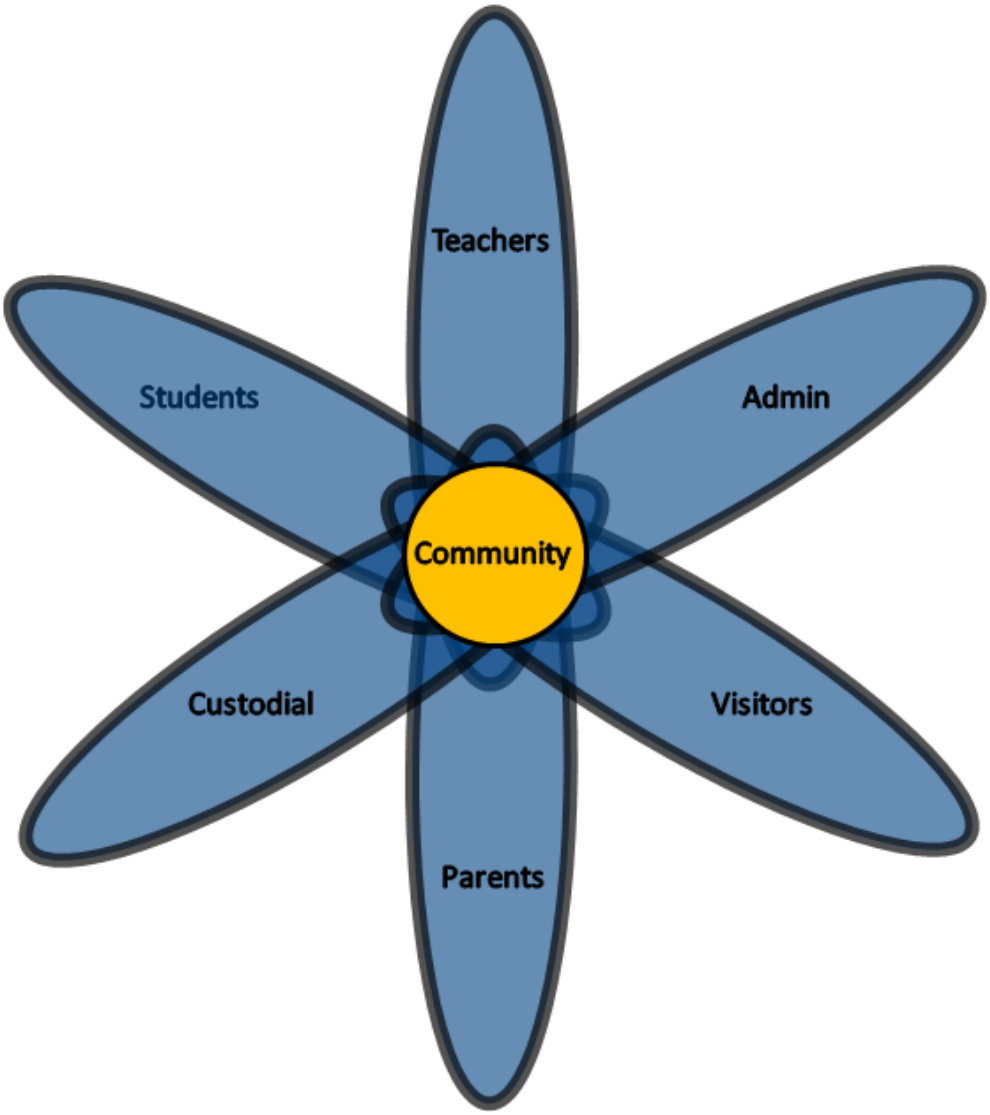
Integrating Sustainability into the Fabric of the Culver City Unified School District

Through the collective work of our Environmental Sustainability Committee (ESC) led by the Sustainability Coordinator, and following our Board Policies 3510 and 3511, we are proud to present our Best Practices to improve Sustainability in the entire School District.

We have identified 8 main areas of focus around Sustainability:



Through this handbook, we will explore ways to improve our green actions through best practices per area and for each of our stakeholders: Students, Teachers, Custodians, Administrative Staff, Parents and Visitors, working individually and together to improve the system.



At Culver City Unified School District, we foster a sustainable environment for teaching, learning and building a healthy community

Waste

Working Towards Zero Waste

'How Bad for The Environment Can Throwing Away One Plastic Bottle Be?' 30 Million People Wonder – Headline from *The Onion*

At CCUSD, we strive to build a better, cleaner, more efficient environment for generations to come. And as a community, we all have a role to play. Administrators, teaching and support staff, parents, students as well as visitors contribute to the health of not only the school system, but also the greater Los Angeles area. **CCUSD aims to build a robust waste management system** where everyone can help to reduce the waste we send to landfill. We may not be a city of 30 million, but we are over 40,000 strong, and we can make a difference!

CCUSD Goals working towards Zero Waste are:

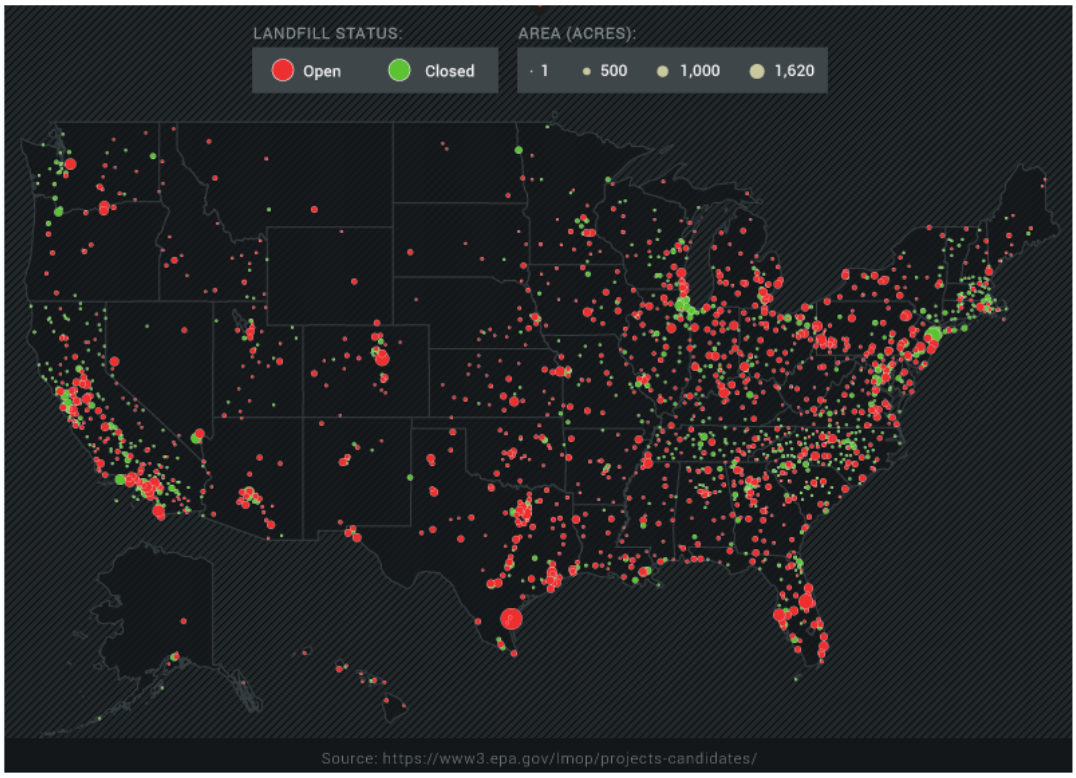
- Reduce overall waste by encouraging the use of reusable items
- Educate and involve everyone in the system on waste sorting
- Increase our Recycling and Organics diversion
- Work to eliminate single-use plastic items

1. Background of the Problem - Why Zero Waste?

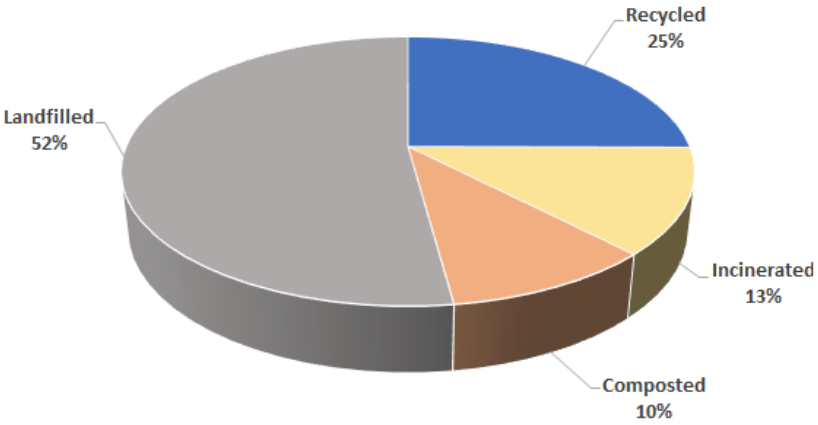
So, what happens when we don't practice waste diversion? What happens if we don't recycle and compost?

a. Landfills

First, Landfills start to grow in size into mountains and we need more land to accommodate the waste.



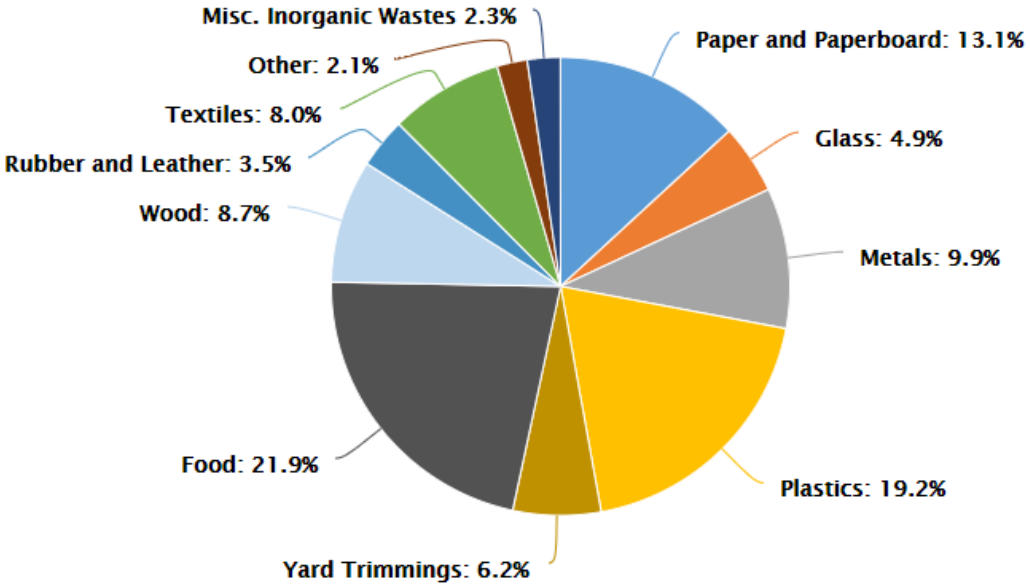
Landfills in the United States by size and status (open/closed) Source



2017 Municipal Solid Waste (EPA) Source

The latest report from the EPA (2017) revealed that the total generation of municipal solid waste (MSW) was 267.8 million U.S. tons per year or 4.51 pounds per person per day, and over 50% of it is still going to landfills. We can do better!

What is in our Landfills? Mainly food (21.9%) and plastics (19.2%).



US Landfill waste composition (EPA 2017)

Let's talk weight!...

Annually in the US, 1 person produces the equivalent in trash of a cow (1,646lbs)

A family produces the equivalent of an elephant (6,585lbs).

The whole country produces the equivalent of over **1 million blue whales (220,000,000,000 pounds)**!

In Culver City, our 2019/2020 Municipal Solid Waste total is projected to be 42,000 tons. Our existing disposal site is Simi Valley Landfill & Recycling Center which is owned and operated by Waste Management Industries.

Simi Valley Landfill and Recycling Center

b. Greenhouse gases

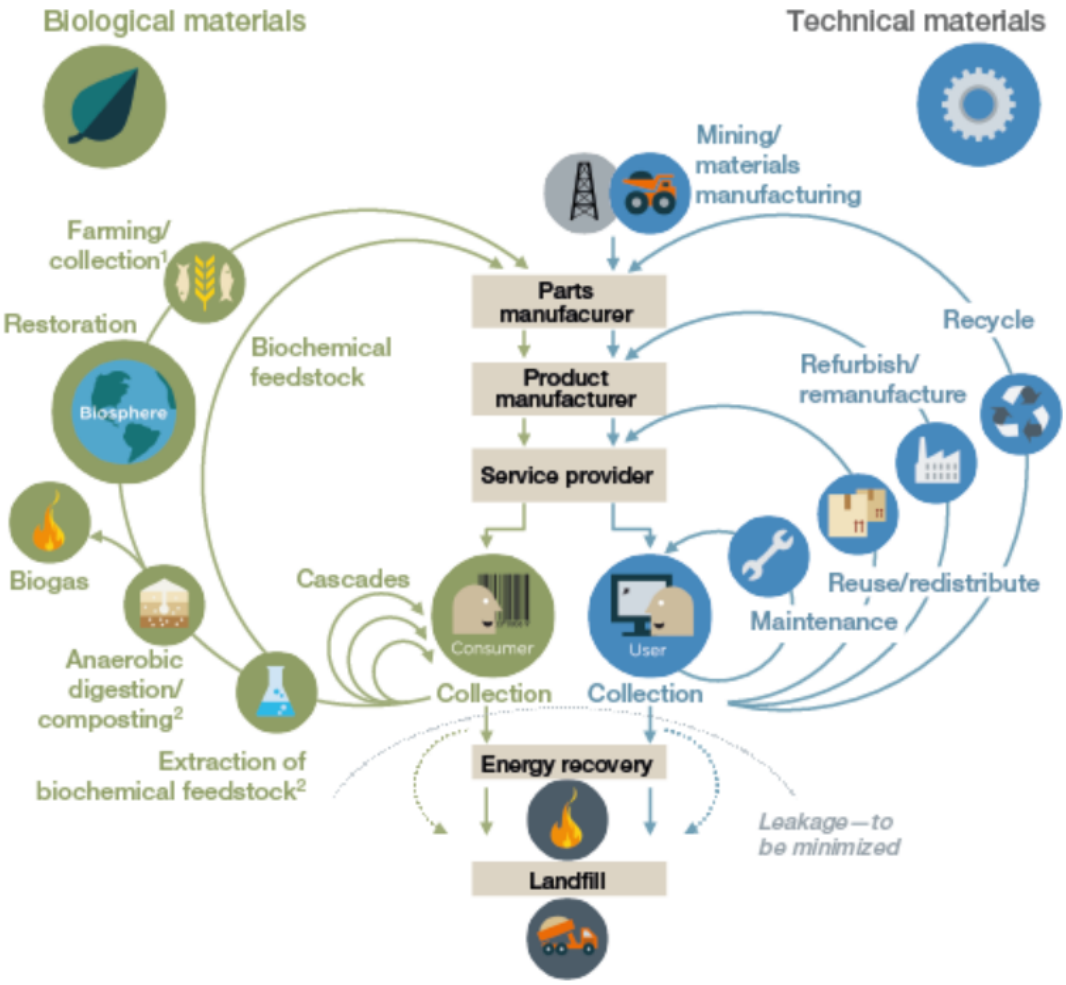
Greenhouse gases increase. Organic waste that ends up in landfill doesn't get the oxygen it needs to decompose, so it releases greenhouse gases. One of these is methane, a very powerful greenhouse gas which contributes to global warming and climate change. In addition, waste incineration releases CO2 and other contaminant particles which if not properly managed and filtered are harmful both to our health and to the climate.

For many years, Culver City would only accept yard waste in the residential green cans, but in April 2019 this policy changed. They are now accepting organic waste from food, which sends food waste to composting instead of being taken to landfill. We should all do our part and use the green recycling bins. Or create a compost pile in our backyard! When we rely on the City for composting, we are relying on their fleet of vehicles that need to transport this waste to different places. Composting in our backyard takes these trucks off the road and, as a bonus, it provides us with healthy soil for our plants. Source
Culver City takes its Organics to Athens, American Organics in Victorville.

Organics Recycling System source

c. Fossil fuels

Fossil fuels are disappearing. The supply of fossil fuels is finite. We can no longer base our models of survival around it. Waste systems, along with all our supply chain systems, rely heavily on fossil fuels (from transportation to plastic packaging). As explained above, transporting waste is senseless. In fact, the notion of waste does not exist in nature: everything gets transformed and reused in some way. This is the very idea behind a circular economy (see next page), mimicking nature to both replenish the soils with biodegradable nutrients (compost) and recycling the technical nutrients to produce new products.



1 Hunting and fishing
2 Can take both postharvest and postconsumer waste as an input
Source: Ellen MacArthur Foundation circular economy team drawing from Braungart & McDonough and Cradle to Cradle (C2C)

The circular economy - an industrial system that is restorative by design

d. Ecosystems

Ecosystems are endangered. Trash that isn't properly managed often ends up in our drainage systems, our rivers, and eventually the coastal waters and lakes that we use for recreation and for our food sources. Some of it ends up in surrounding land areas, wrapped up in trees and creating an unsightly and hazardous landscape for humans and animals that inhabit the area. A lot of this trash is plastic, which never disappears, and over time, breaks down into tiny bits that are small enough to the human eye, that it no longer appears to be a problem. The reality is, plastic at that micro level (called microplastics) is harder to manage and is ingested by animals, killing wildlife and entering our food system which is an additional health concern. Reducing our reliance on plastics is key to species survival and everyone's health.

Did you know?
Of the 8.3 billion metric tons of plastic that has ever been produced in the world, 6.3 billion metric tons has become plastic waste. Of that, only nine percent has been recycled. The vast majority—79 percent—is accumulating in landfills or sloughing off in the natural environment as litter. - *National Geographic December 20, 2018*

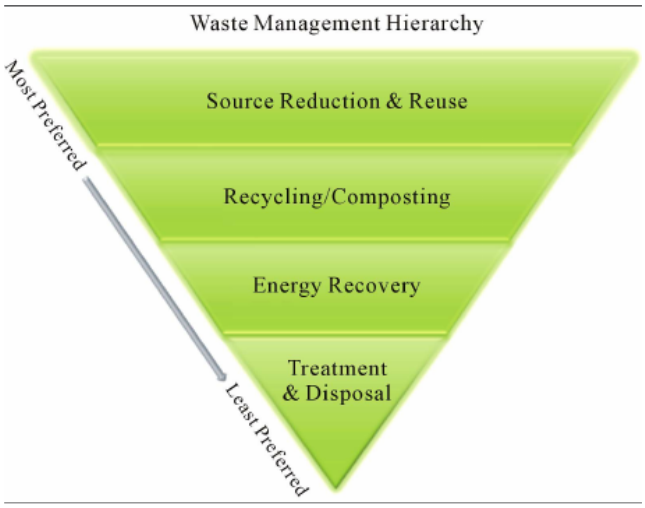
"The ocean is turning into a plastic soup" - The Surfrider Foundation

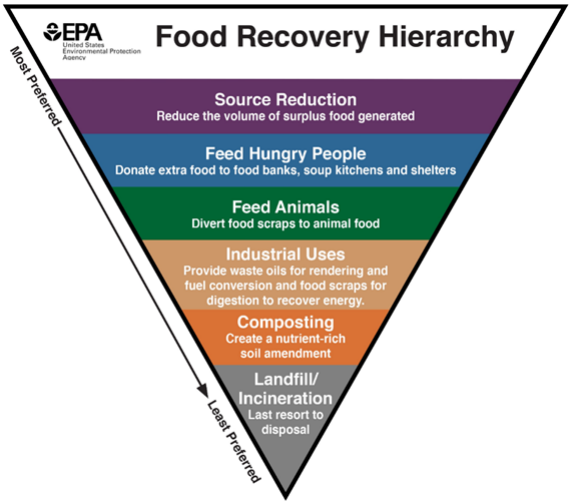
Three of our schools, Farragut, Culver City Middle School and Culver City High School share Ballona Creek in their backyard, bringing awareness and responsibility to keep the creek clean and clear of pollution debris. In fact, CCHS Ballona Creek Renaissance Club, and its parent organization Ballona Creek Renaissance, are active in keeping the campus and creek clean with regular cleanups.

Culver City also has implemented a polystyrene ban in 2017, prompting many local food establishments to offer fiber take-out containers and compostable utensils, thus reducing the City's dependence on fossil fuels, as well as limiting plastic contamination. Culver City is currently looking at strengthening this ban to include additional single-use plastic items.

2. Regulatory Framework on Recycling and Organics Recycling

a. From the Federal Environmental Protection Agency (EPA)





b. From the State of California

The State of California in an effort to mitigate climate change has enacted various policies in regard to waste:

AB341 requires Mandatory Commercial Recycling in California beginning July 1, 2012. This law requires commercial businesses and public entities that generate four or more cubic yards per week of waste and multi-family housing complexes with five or more units, to adopt ***recycling practices***. This is designed to reduce greenhouse gas emissions by diverting waste from landfills and to reach California's recycling goal of 75% by the year 2020.

AB1826 requires that on and after January 1, 2016, local jurisdictions across the state implement an ***organic waste recycling program*** to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste (also referred to as organics) means food waste, green waste, landscape and pruning waste, non-hazardous wood waste, and food-soiled paper waste that is mixed in with food waste. After January 1st 2019, businesses that generate 4 or more cubic yards of solid waste per week must arrange for organics recycling.

SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The law grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that not less than 20 percent of currently disposed ***edible food is recovered*** for human consumption by 2025.

c. From the City of Culver City

The City of Culver City has put in place many environmental efforts and Zero Waste Culver City**. Download** Recycle Coach to find out what is recyclable in Culver City.

What goes in the Blue Recycling can?

What goes in the Green Organic Recycling can?

What goes in the black can?
Everything that cannot go in the blue or the green, meaning mostly plastic packaging. Our goal is to have the least amount of waste in that black can, and hopefully one day Zero Waste!

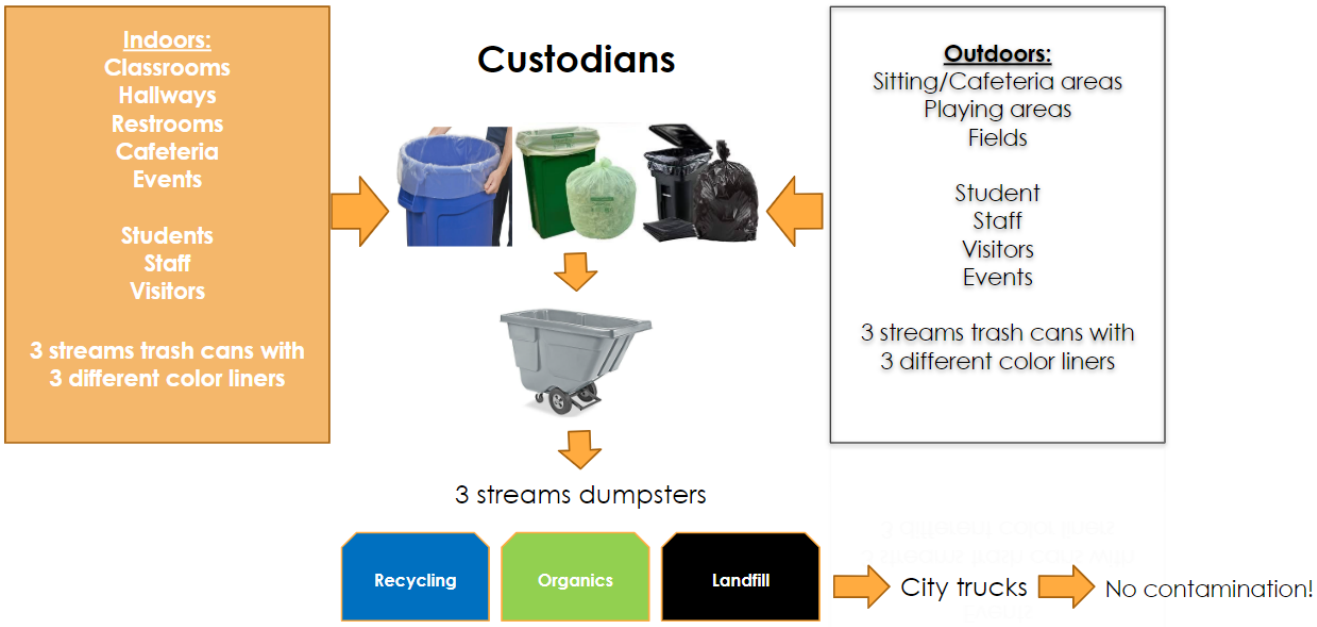
It is very important that everyone participates actively in the waste sorting. If our waste cans are not what they say they are (recyclables only, compostable organics only and trash only), they are tagged as contaminated by the City and the whole container will go to the landfill. The school can also get fined if their containers are not compliant.

3. CCUSD 3-way stream

At CCUSD, we encourage and are actively promoting how to sort waste. We need to have 2-way bins in classrooms and offices (blue for recycling and black for trash), and 3-way bins (blue/green/black) everywhere else, especially in kitchens and near food areas. Custodians will recognize the 3 bins with 3 distinctive color liners, to make sure everything that has been sorted goes into the corresponding City dumpster.

3 Way Stream System Examples:

Trash container colors: **BLACK** for trash, **BLUE** for recycling, **GREEN** for composting
Liner colors: **BLACK** for trash, **BLUE** for recycling, **CLEAR** for composting



4. Hazardous Material and Universal Waste Management

Some products are too toxic to be put in your common black trash can. They are qualified as Universal Waste or Hazardous Waste.

These include items such as:

- Paint, Cleaners and solvents
- Used oil
- Batteries
- Pesticides
- Aerosol cans
- Mercury containing products like CFL light bulbs
- Unwanted electronic equipment (e-waste)

Where to take these materials? There are permanent collection sites known as S.A.F.E. Centers, or City occasional collection events. The City of Culver City has its own information about this in their HHW guide. Some stores collect lightbulbs or batteries, or you can take back your electronics too: Wherever they sell these items, they should take it back!

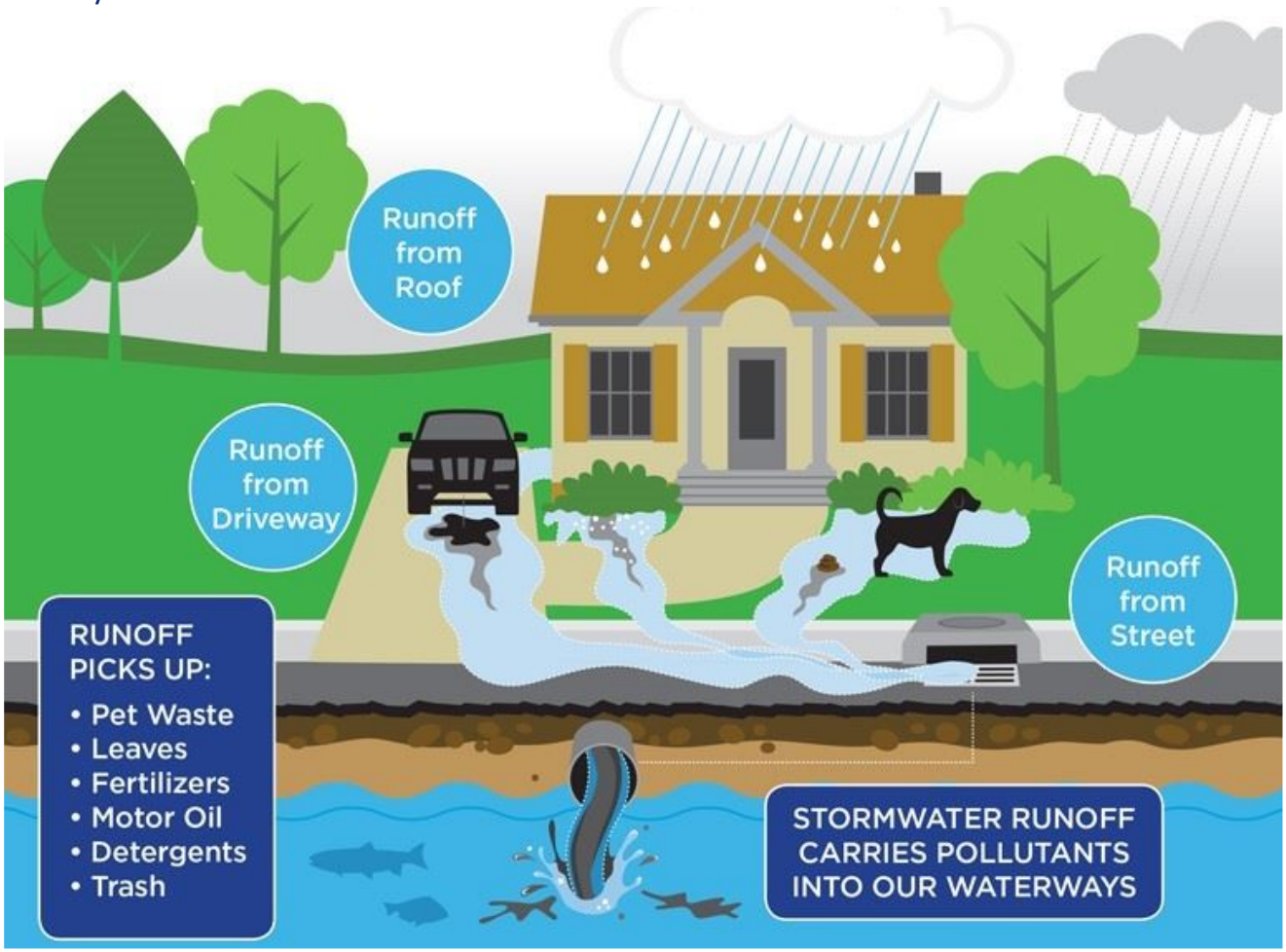
For electronics, Homeboy Recycling in Los Angeles accepts your e-waste. You can also look for your own recycler here.

5. Outsized items and Recurring hard-to-recycle items

What to do with furniture or equipment that we no longer use? If they are still in good or fair condition, they can be reused, so you could donate them. Look for local companies like Habitat for Humanity , Goodwill, or the Salvation Army who would accept donations.
For recurring items that are hard to recycle and not accepted in the blue recycling bin, like pens or vinyl gloves, Terracycle may offer a recycling option. Worth exploring if we want to go Zero Waste!

6. Waste water

It doesn't rain very often in Los Angeles, but when it does the dirt from the streets flows directly into the ocean with the storm water runoff…

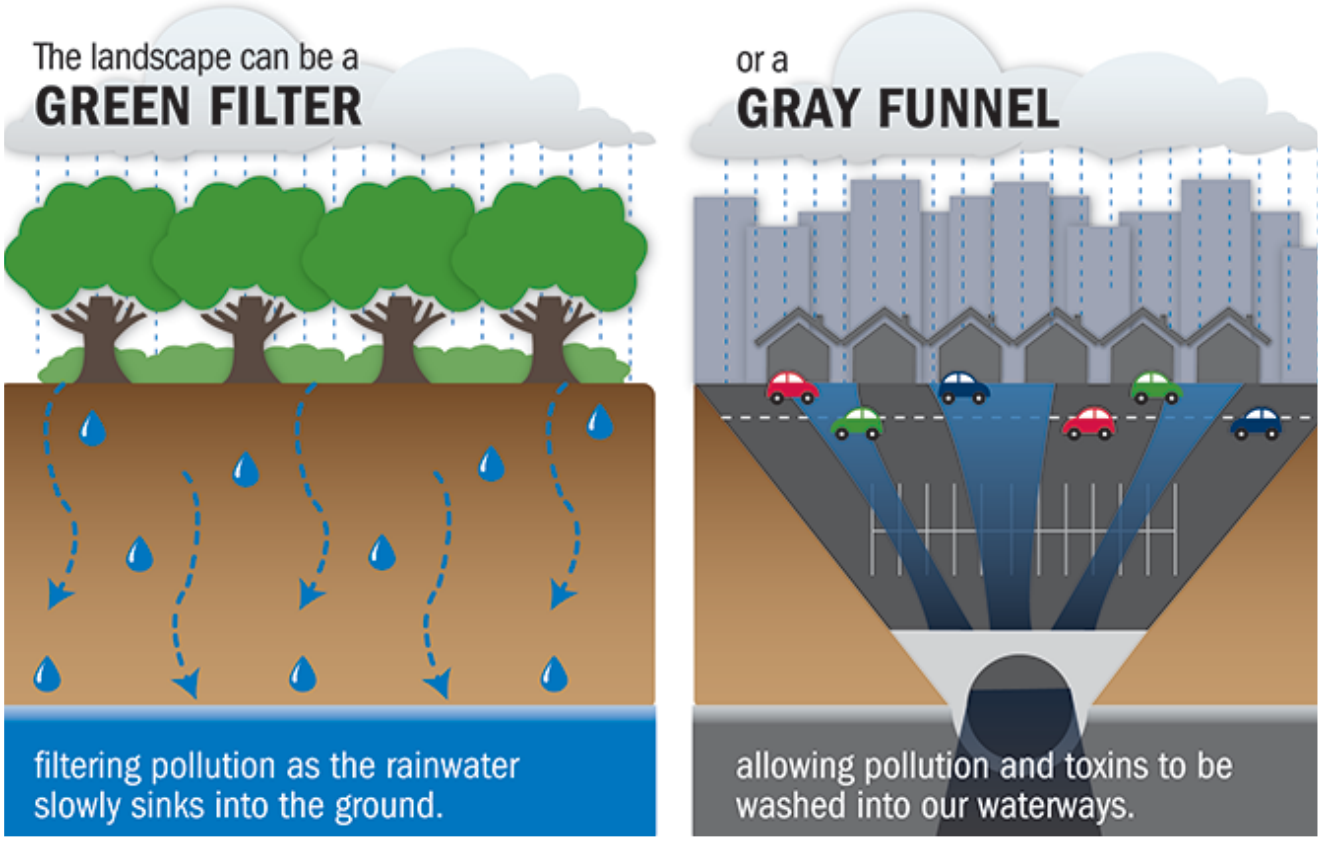


So, what can YOU do to prevent this runoff?

- **Keep drains clear** from debris and make sure they are labelled with "No dumping, Drains Ocean"
- **Keep pollutants covered** and impermeable to rainwater
- Ensure our outdoor trash **dumpsters have lids and are closed** when not in use.
- **Avoid washing cars or contaminating objects on impervious surfaces** so that the runoff water does not enter storm drains.
- **Protect and secure pollutants** and other materials **in construction zones** to avoid runoff.
- **Limit or suspend chemical fertilizers and pesticides** to preserve the balance of microorganisms in streams and oceans.

Additional ideas to reduce stormwater runoff: Reduce the area of impervious surfaces and increase the vegetated land cover of your property, create a stormwater pond in your landscaping, or install rain barrels under your gutters.

The following diagram highlights the differences between natural and man-made surfaces and how they affect filtration and flow of rainwater. This goes to show that the greener we keep our land, the bluer we can keep our waters!



Water

Taking care of our most precious resource

Culver City is part of the urban sprawl that comprises the Greater Los Angeles area, an area that has its foundations in what was and still is a desert. What is true in all deserts is true for Southern California: Rain doesn't come around very often, and millions of residents in this region rely on a steady source of water for growing food, irrigating landscaping, drinking, cleaning, manufacturing, and more. **CCUSD is committed to reducing water use at each of the school campuses**, thereby helping to reduce water stress on our regional water supply and our wild habitats, and helping conserving water for generations to come.

CCUSD Goals working towards greater water efficiency are:

- Reduce water waste with more efficient water fixtures on school campuses
- Educate school community about water-saving behaviors
- Plan and implement sustainable landscaping on district school grounds

1. Water supply on Earth

Water covers about 71% of the earth's surface and the amount of water on the planet is around 326 million cubic miles! Of all available water on earth, 97% of it is found in the oceans, which is too salty for drinking, for growing crops, and for most industrial uses except

If the Earth were a Globe 28 inches in Diameter:
- All of the water on the planet would fill less than a cup
- Only 0.03% of one cup is in rivers and fresh water lakes.
- Slightly more than one drop of water would fill all the rivers and lakes – *Source: usbr.gov*

cooling. The remaining 3% is found elsewhere, with 2.5% either locked up in glaciers, polar ice caps, the atmosphere, and soil, or too highly polluted or sitting too far below the earth's surface to be extracted at an affordable cost. **That leaves only 0.5% of the earth's water available for drinking or consumer use.**

2. Water supply in Greater Los Angeles County

Water flows into Los Angeles (L.A.) from several sources (see map thereafter) and legal water wars have continued to bubble over how much water belongs to thirsty Angelenos. Per the River Project, "We currently spend $1 billion a year to **import 85% of our water supply** from other regions whose ecosystems are seriously threatened by that loss." Percentages vary every year depending on climate conditions.

Currently, these are the three major water sources for L.A.:

- 3 sources of imported water:
  + the **Los Angeles Aqueduct** which is sourced from the Eastern Sierras
  + the **California Aqueduct** which is sourced from the San Joaquin Valley route called the State Water Project*
  + The **Colorado River Aqueduct**
- Local Surface Water (L.A. River, San Gabriel River, and recycled wastewater)
- Local Groundwater

* The State Water Project (SWP) is a system of reservoirs, pump stations, storage facilities, power plants, and 660 miles of pipes and canals that span two-thirds the length of California.

Bringing water from far requires energy, and while some of the water flows to Los Angeles by way of gravity, most of it needs to be pumped in.

Source : LA Sierra Club

Every drop counts!
Did you know the average Californian uses 196 gallons of water per day? More significantly, we use up to 70% of that water outdoors by watering plants or filling our swimming pools. By making sure every drop counts, Los Angeles County residents can make a huge difference in protecting this resource for future generations – *Source: LACWD*

*Percentages fluctuate based on climate conditions Source: Greater Los Angeles County Integrated Regional Water Management Plan, 2014

Greater Los Angeles County Water Supply (2014)

Source: Water Talks

California Aqueduct

Colorado River Aqueduct

Parker Dam on Lake Havasu where Colorado River waters are initially drawn into the system

Los Angeles River

3. Water at CCUSD

a. Understanding the water agencies' network

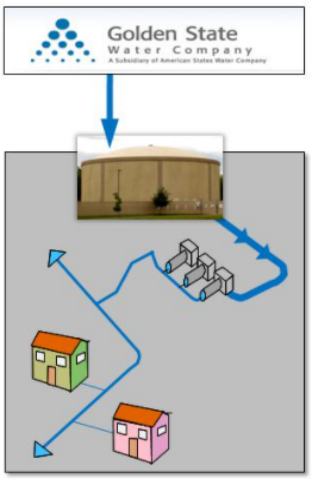
Golden State Water is the Water Utility Company that serves the community of Culver City which represents approximately 9,500 customers including CCUSD. The Culver City System serves imported water from the Colorado River Aqueduct and the State Water Project, imported and distributed by Metropolitan Water District of Southern California.

The Metropolitan Water District of Southern California is a cooperative of 26 cities and water agencies (including West Basin Municipal Water District) serving 19 million people in six counties. The district imports water from the Colorado River and Northern California to supplement local supplies and helps its members to develop increased water conservation, recycling, storage, and other resource-management programs.

West Basin Municipal Water District is a wholesale water agency that provides imported drinking water to 17 cities and unincorporated areas of Los Angeles County throughout its 185 square mile service area. An innovative public agency, West Basin is a leader in the production of recycled water, conservation and educational programs.

b. How does the water get to my school or my home?

Water must be analyzed to ensure that it is safe to drink. Public water utilities such as Golden State Water filter and treat water with certain chemicals to remove impurities in order to provide this clean water for you. Filtered and treated water that is safe to drink is called



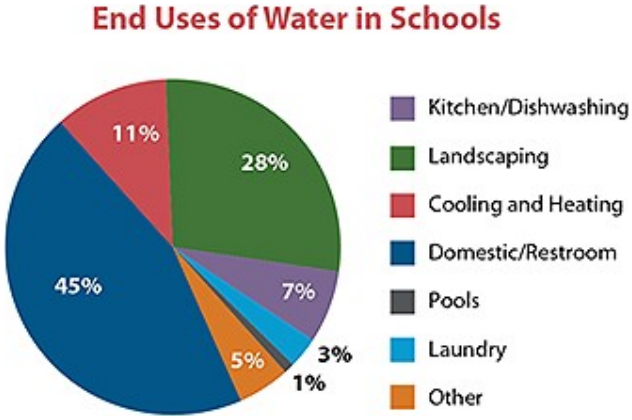
potable water. Once treated, this water is then stored in a reservoir from which it gets pumped through underground pipes (called water mains) to your school and home. A water pipe (known as a "service lateral line") connects that water main to the plumbing in your home and brings the water right to your faucet and toilets when you turn it on.

Since our water comes from a public water supply, we pay fees to our public water utility company (Golden State Water) based upon how much water we use. Our water use is measured by a water meter located on the property. Culver City School District has a total of 14 water meters (and bills).

c. Water use

About 80% of California's water is devoted to agriculture. There is considerable discussion about farming, especially water-thirsty permanent crops like almond orchards.

The remaining 20% of California's water goes to public and private consumption. In any given school, according to the EPA, 45% of all water used is for restrooms and 26% for landscape. Those two areas combined make up nearly 75% of all water use at the schools. By focusing on efficient plumbing and smart landscaping, CCUSD can really make a dent in Southern California's water saving efforts.



Source: *EPA.gov*

4. Why Conserve?

a. We live in a desert...kind of.

Many Angelenos are quick to point out that "Los Angeles is a desert". Truthfully, the jury is still out on whether that can be factually supported by scientific evidence. Some argue that Los Angeles isn't technically a desert since, for one, the annual temperature fluctuates in a similar pattern to the Mediterranean. In addition, enough rain falls each year for trees and plants to continue to grow in this climate. Still, others believe, and argue quite emotionally, that Southern California is desert-like and does not receive enough rainfall to shrug off the idea that we could be in a drought in any given year. Water is always in short supply in SoCal, with some years worse than others.

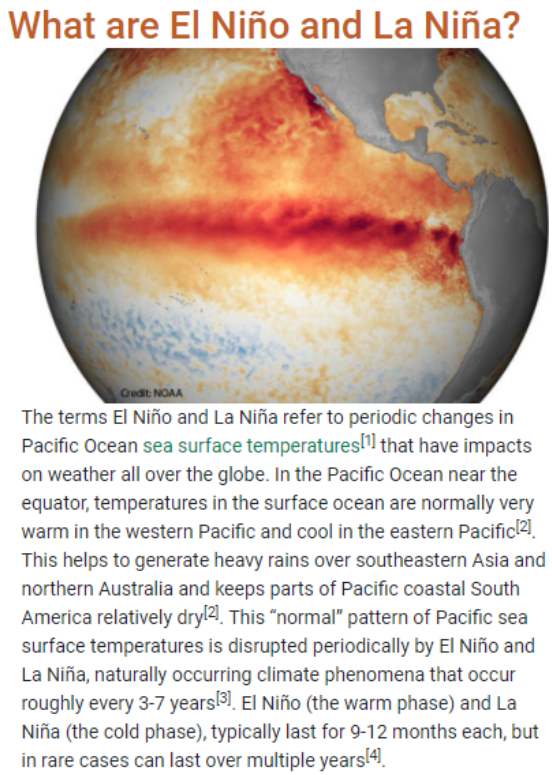
But, consider how much Los Angeles has changed over the last 100 years or so. This is what it looked like in 1905 compared to today:

Hollywood/Highland then and now (1905 on left; 2000s on right)

The area continues to grow to this day. This population growth vastly exceeded water supply and it is crucial that CCUSD plays a role in reducing our need.

b. Weather patterns are shifting with Climate Change

To make matters worse, the world is now facing the current climate change crisis head-on. While human beings have long been contributing to the increase in CO2 emissions over centuries, the severity of this issue has finally made headlines within the last decade, and the world now looks at all the different ways we can reduce our global carbon footprint.



Source: americangeosciences.org

Los Angeles confronts two looming crises as a result of climate change: Rising sea levels that could wipe out coastal cities, and an increase in the length and intensity of our drought seasons over time. Studies are revealing that climate change is certainly affecting our water resources and will continue to do so for years to come:

"Precipitation [in California] is the primary driver of drought variability but anthropogenic warming is estimated to have accounted for 8–27% of the observed drought anomaly in 2012–2014 and 5–18% in 2014. Although natural variability dominates, anthropogenic warming has substantially increased the overall likelihood of extreme California droughts." *Source*

It is thus crucial that we not only do what we can in California and across the globe to combat climate change, we will also need to be prepared for more droughts in the future and plan for more reserves. The truth is, we cannot afford to be wasteful because while the future is unpredictable, science can help us understand what we might expect.

5. Can We Do It?

Yes, we can.

Around the mid-2010s, researchers conducted a study of water conservation practices demonstrated by CA natives. The outcome provided very positive results. They found that Californians conserved almost 1.19 million acre-feet of water, "enough to supply 5.9 million Californians for an entire year" and "the equivalent to the combined population of San Diego, Riverside and Tulare counties, or 15 percent of the state's population." (Source)

Then-State Water Resources Control Board chair, Felicia Marcus, said of Californians: "[They] rose to the occasion, reducing irrigation, fixing leaks, taking shorter showers, and saving our precious water resources in all sorts of ways," and she added "Conservation should be the California way of life."

We have shown amazing resilience and creativity when it comes to saving water. What was once feasible many times before is certainly feasible down the road.

6. How Do We Do It?

To help meet the needs of the School District, we can look for examples of what is being done in our own backyard. Culver City has two major projects

a. City of LA/ City of Culver City Projects

- LA Hyperion Water Reclamation Project: The City of LA is aggressively pursuing its commitment to recycle 100% of treated water at the Hyperion Water Reclamation Plant by 2035. Currently workers are testing the bioreactors at the plant, and completion is scheduled for September 2021. Treated wastewater will double the amount delivered to the West Basin Municipal Water District Plant in El Segundo.
  Source: waterworld.com

- The Culver Boulevard Realignment Project/Urban Runoff Project: The Urban Runoff Filtration project will "incorporate into the Realignment Project structural stormwater

best management practices that will filter, retain and reuse captured urban run-off." The project is now in Phase 3, repaving the road and putting up street lights after completing all of the underground reconstruction. Everything should be completed prior to the rainy season at the end of 2021. *Source : Culver City*

b. CCUSD water conservation initiatives

In 2020, CCUSD benefitted from a water retrofit from a Golden State Water Program. Faucet's aerators and dual-flush toilet valves were installed in our schools for water conservation. The next area to reduce CCUSD's water use is landscaping: reducing areas of turf which are water intensive and creating native or drought-tolerant plants landscape. This will also encourage biodiversity and the local fauna and flora to thrive.

While many of the projects rely on involvement of members of the school community, i.e., students, teachers, and staff, still others focus on improving structural aspects of the schools which can be built-in. Both, however, are essential in helping the district participate in the efforts across Southern California to save water.

The EPA suggests that educational institutes use many, if not all of these water-saving measures:

- Develop a water management plan.
- Assess your water use to identify opportunities for savings and track results.
- Check regularly for leaks and, when found, repair them promptly.
- Replace bathroom fixtures with more efficient models.
- Use water-smart landscaping and irrigation practices.
- Optimize your cooling systems and determine if they can provide or use alternative onsite sources of water.
- Evaluate equipment in cafeterias, laboratories, and other on-campus facilities for potential water savings.
- Review WaterSense at Work (308 pp, 6 MB, About PDF) for information on these practices and more.

Source : epa.gov

c. What can YOU do?

Did you know that there are many free programs available to businesses and residents in our region to help you conserve water? Check out Metropolitan Water District's portal for water-

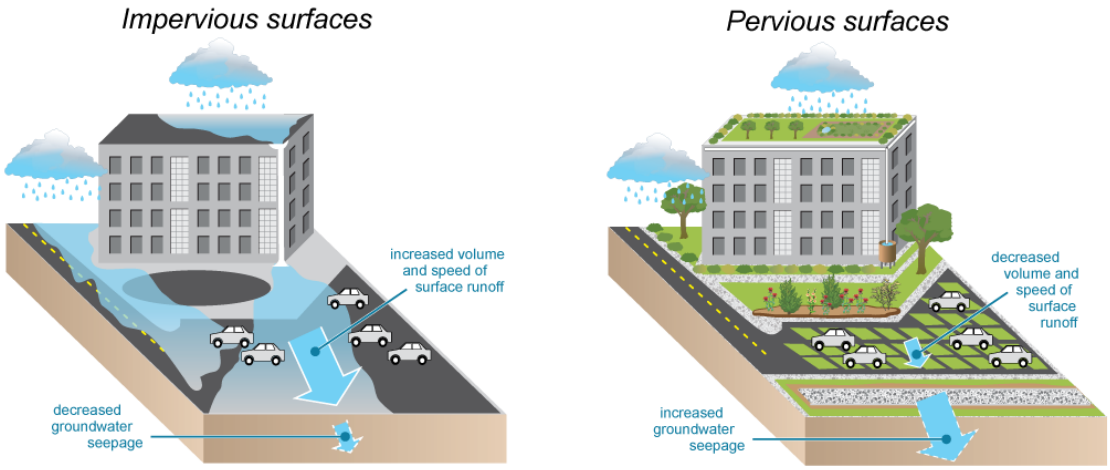
saving rebates and grants, landscape classes, water-wise garden inspiration and tons of helpful tips (and tell your parents!): bewaterwise.com

There is plenty we can also do as individuals at school, at home, and just in our daily lives. We have provided a list of some of these things in our one-pager "Water Best Practices for all" located at the end of this document. Some of the suggestions include taking showers instead of baths, turning off the faucet while brushing your teeth or lathering your hands, and running your dishwasher when completely full instead of half-full. If we all contribute in our small ways, we can make differences in big ways

7. Beyond Conservation

a. Building Water Resilience: replenishing our ground water

Another important action to lower our amount of imported water (and its pumping carbon footprint and cost on ecosystems) is to rely more on local groundwater. We therefore need to replenish our local groundwater. How? Letting rain water infiltrate in the soil instead of washing our street and contaminate the ocean. This is why it is best to use pervious surfaces when building the city or re-doing our yard.



Impervious 'hard' surfaces (roofs, roads, large areas of pavement, and asphalt parking lots) increase the volume and speed of stormwater runoff. This swift surge of water erodes streambeds, reduces groundwater infiltration, and delivers many pollutants and sediment to downstream waters.

Pervious 'soft' surfaces (green roofs, rain gardens, grass paver parking lots, and infiltration trenches) decrease volume and speed of stormwater runoff. The slowed water seeps into the ground, recharges the water table, and filters out many pollutants and sediment before they arrive in downstream waters.

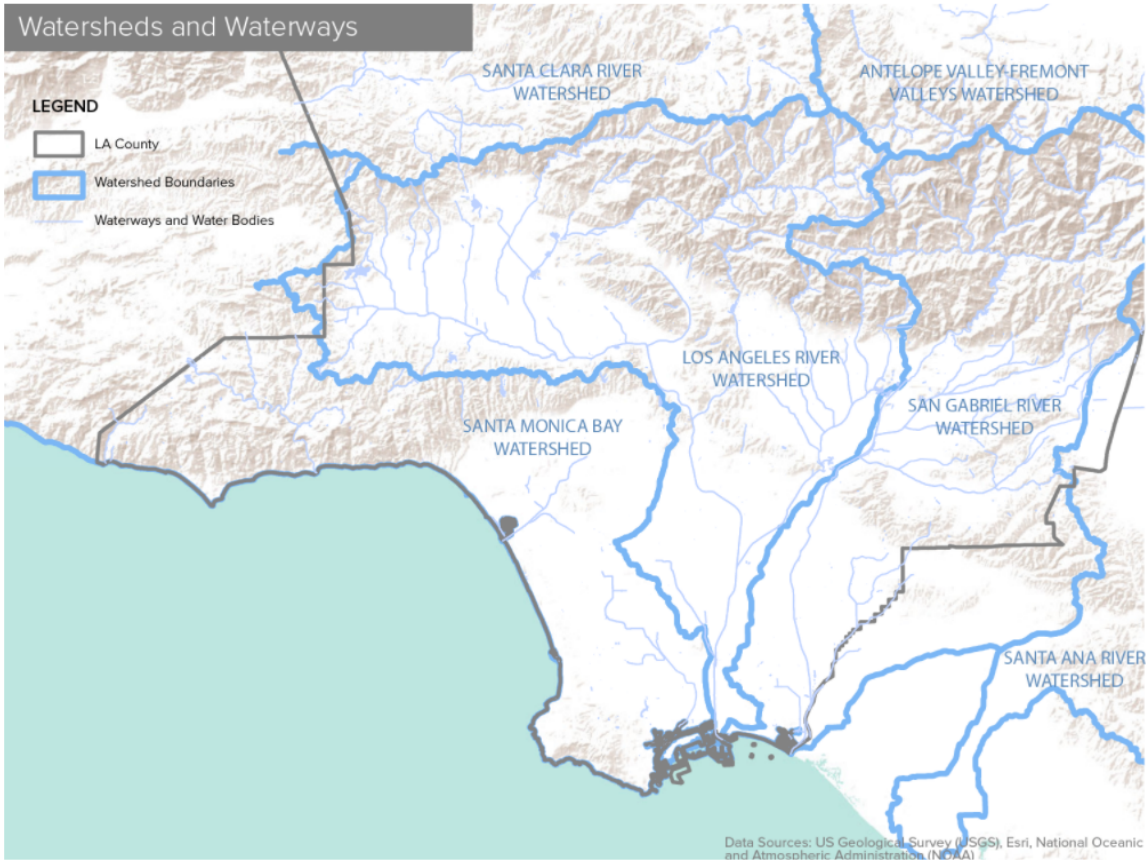
Source: umces.edu

While allowing water to infiltrate into the ground, not only do we replenish our groundwater, but we also limit the polluted water to contaminate our watersheds and ocean. The soil and plants act as natural filters.

b. Taking care of our watersheds and protecting our ocean

While it is important to use less water in order to conserve for the future, it is equally important to hold on to the water that comes to us during the rainy season. Watersheds help us to capture rainfall and it is incumbent on all of us to help protect these areas.

The Los Angeles Basin covers 1,000+ square miles of the second-most densely populated metropolitan area in the United States and is made up of several watersheds. These include the Santa Clara watershed in the north, the Ballona Creek/Santa Monica Bay watershed in the west, the San Gabriel in the east, and the Los Angeles River watershed right in the middle of it all. These are further broken down into sub-watersheds, organized by smaller tributaries and local organizational groups. These include Tujunga/Pacoima Wash, Arroyo Seco, Sun Valley, Compton Creek, Dominguez Channel, Upper San Gabriel River, Rio Hondo and Ballona Creek.



Source: theriverproject.org

The Los Angeles (LA) River Watershed is one of the largest in the Region at 824 square miles; the LA river is 55 miles long. It is also one of the most diverse in terms of land use patterns. Approximately 324 square miles of the watershed are covered by forest or open space land

including the area near the headwaters which originate in the Santa Monica, Santa Susana, and San Gabriel Mountains. The rest of the watershed is highly developed.

Pollutants from dense clusters of residential, industrial and other urban activities have impaired water quality in the middle and lower watershed. Added to this complex mixture of pollutant sources (in particular, pollutants associated with urban and stormwater runoff), is the high number of point source permits. Excessive nutrients (and their effects) and coliform are widespread problems in the watershed as well as excessive metals. A number of Regional Board programs and actions are in place to address the water quality impairments noted earlier. Below are just a few in the Southern CA region:

- Integrated Regional Water Management (IRWM) Plan for Greater Los Angeles County (GLAC)
- The Los Angeles Basin Stormwater Conservation Study (conducted by the Los Angeles County Department of Public Works and the U.S. Department of the Interior, Bureau of Reclamation.)
- Los Angeles River Ecosystem Restoration Integrated Feasibility Report (conducted by The US Army Corps of Engineers)
- The Los Angeles River Revitalization Master Plan (developed by The City of Los Angeles, US Army Corps of Engineers and others)
- The Los Angeles River Watershed Monitoring Program (LARWMP) (developed by the Cities of Burbank and Los Angeles)
- The Friends of the Los Angeles River
- The River Project

Source: waterboards.ca.gov

In Culver City, a non-profit called Ballona Creek Renaissance (BCR) is working to protect and clean up the Creek, preventing some plastic debris to enter the ocean, and working with the City to ban certain single use plastics. CCUSD also has a BCR Club: get involve, or join a clean-up sometimes!

c. Water in my food and clothes?!

Water is certainly a local issue, but it also is a global issue. We only have one ocean. Think of water when you buy things: how much water did it use? Whether it is in our clothes, our food or in manufactured products, each of them has a water impact. Below is a list of foods that we commonly eat along and the amount of water required to produce this these items.

How Much Water Does it Take to Produce Your Food?

Food	Portion	Gallons of Water
Orange Juice	1 cup	49
Orange	1 medium	14
Cantaloupe	1 melon	160
Broccoli	2 cups	11
Catsup	1 ounce	3
Corn	1 ear	80
Lettuce	1 cup	3
Tomato	1 small	8
Tomato Sauce	4 ounces	13
Butter	1 pat	46
Cheese	1 ounce	56
Milk	1 cup	48
Yogurt	1 cup	88
Beef Steak	8 ounces	1,232
Chicken	8 ounces	330
Egg	1 each	50
Hamburger	4 ounces	616
Tofu	2 cups	61
Almonds	1 ounce	80
Sugar	1 Tablespoon	7
White Rice	2 cups	25
Brown Rice	2 cups	16
Wheat Bread	1 slice	7
White Bread	1 slice	11
Pasta	2 ounces	36

Source : usbr.gov

Water is crucial for the survival of our local and global community. The forces of nature have been emboldened by human influence and we are seeing the devastating effects of climate change on our surrounding environment. With summers getting longer and drier, we are seeing the beginning of an uncertain future for our water supply.

But as much as we have seen the negative impact of human activity on Earth's precious resources, we have also seen humans bring about sweeping changes to reinvigorate these resources and bring water flowing in places that had once been a desert. These small water-

saving tips may seem like a drop in the bucket, but together we can build storms. For we rely on each other today, and the future relies on us right now.

John Thorson, a public policy advocate for water rights, said it best: “Water links us to our neighbor in a way more profound and complex than any other.”

Energy

Working towards Net Zero Energy in our Schools

Everything is Energy.

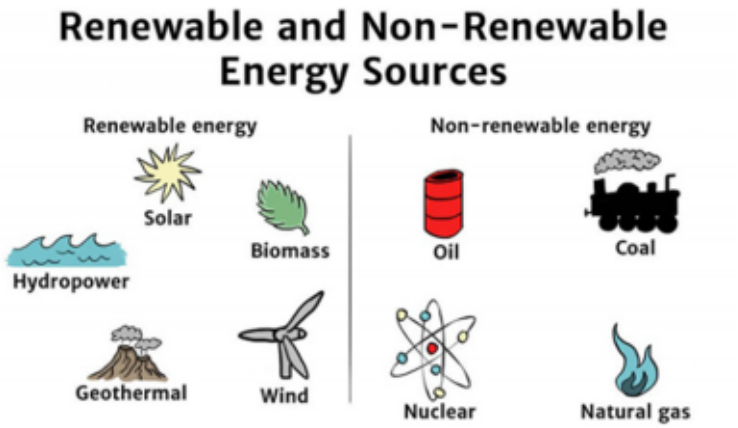
In physics, energy is the quantitative property that must be transferred to a body or physical system to perform work on the body, or to heat it (Wikipedia). Humans have first used the energy of woodfire and animals to help them with cooking, transportation and agriculture. They may also have used the energy of water and wind (mills), and potentially the sun. But with the discovery of coal and oil, a lot of cheap energy revolutionized our societies. Now we have highly technological and industrialized societies requiring quite a lot of power to function. But we are realizing that the coal, the oil and the gas (=the fossil fuels) we are burning to produce our energy have been releasing greenhouse gasses in our atmosphere which is leading to global warming. This is why we say we need to decarbonize our economies, meaning, transitioning from these fossil fuels to renewable energy sources.

CCUSD Goals working towards Net Zero Energy are:

- Monitor to reduce electricity and gas consumption in all schools
- Educate and involve all stakeholders starting with Maintenance and Facilities Personal, and Purchasing
- Have all District sites run on 100% renewable energy
- Study more school sites to install solar to produce as much as we use

1. What are today's sources of energy?

To better understand renewable energy, let's start with the finite resources and why they are 'finite' sources. Finite energy resources include coal, oil, natural gas and uranium. Finite energy resources are found within the earth and have to be harvested and refined for use.



a. Non-renewable Resources

- Types

Oil

Oil is one of the most relied upon sources of non-renewable energy sources, yet most of it is used for transportation and products like plastics. Actually, very little, less than 1%, is used for producing electricity. Oil comes from the earth, a result of millions of years of compression on living creatures and plant life. Oil is called a fossil fuel because it is derived from the remains of plants and animals, now existing as fossils deep below the surface of Earth.

Oil is extracted by drilling either on land or at sea, and it is then processed in refineries. The entire process of extraction, shipping and processing is already extremely energy intensive. It is considered non-renewable because, like coal and gas, once extracted and processed, it no longer exists in a form that can return to Earth.

Natural Gas & HGLs

Like oil, natural gas is a fossil energy source that is formed by compression and time. Natural gas is made from a variety of gasses, but the largest and most familiar to everyone, is methane. But this type of gas is not easily found and geologists use different techniques to search for sources. They will conduct seismic surveys to look for rock formations, sometimes through creating large vibrations using "thumper trucks" and/or explosives, then responses to these massive tremors are read and interpreted to determine where sources of natural gas might be available.

In some places, natural gas is extracted in a process called fracking, where water, chemicals, and sand are forced down into shale crevices with high pressure. Once natural gas is released at the surface, it is captured and delivered by pipeline to processing plants. As with oil, most of the drilling occurs on land, but some gas is produced from drilling offshore, and the majority of offshore drilling for US produced gas occurs in the Gulf of Mexico.

A similar type of gas is HGLs, or Hydrocarbon gas liquids. This is the third most utilized source of petroleum in the United States. Gasses like propane, ethane, butane, and other HGLs are produced at natural gas processing plants and oil refineries. Hydrocarbon gas liquids (HGLs) are produced when raw natural gas is processed at natural gas processing plants and when crude oil is refined into petroleum products. Right in our backyard, the Baldwin Hills Oil Fields covers 1,000 acres, making it one of the largest contiguous urban oil fields in the U.S.

Coal

Coal is another source of energy, though significantly less of it is used in producing energy for California than that of natural gas. Coal is sedimentary rock composed of carbon and hydrocarbons, and like other fossil fuels, it is the result of living material, particularly plants, that have been buried under the ground for millions of years.

Coal can be found in Wyoming (which accounts for 22% of US production) and in the Appalachian coal region, (26% of US production), the Interior coal region (17% of US production) and the Western coal region, which is the largest (about 57% of US production). This area includes Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming. (Source)

Coal is mined and then delivered to coal-fired power plants, which burn coal to make steam that turns turbines for electricity. While coal is abundant, both mining and delivery of coal are hazardous and costly processes.

In 2020, the US produced 4.58 billion metric tons of carbon dioxide (CO2) emissions. While coal burning decreased in the past few years, that was related to COVID-19 which reduced overall need for energy for travel and for businesses. Unfortunately, as COVID restrictions are lessened, travel and business will likely go back to previous levels. (Source)

Uranium and Nuclear Power

Nuclear energy is derived from the process of nuclear fission of uranium atoms: Where a neutron collides with an atom, breaking it apart. This creates intense energy, heat and radiation. Energy can also be generated through nuclear fusion, where atoms are combined to form a larger atom. Research on expanding this type of energy production continues today, but its sustainability and safety remain questionable.

The largest earth element used in nuclear energy is uranium which is extracted and processed before going to nuclear plants. There it is used to create heat in reactor cores, and that heat boils water to steam which then powers steam turbines. Those turbines are where the electricity is generated. That steam then is returned to cooling towers where it can be returned to normal temperatures.

- Environmental Impact

Unfortunately, every stage of extraction and processing greatly impacts the environment in a number of ways. Drilling into the seabed causes a lot of displacement of natural oceanic ecosystems, but one of the gravest consequences of drilling, by far, remains accidental oil spills. Major historical oil spills like the Exxon Valdez spill in Alaska in 1989 and the Deep Horizon in 2010 have revealed the dangers in drilling and the catastrophic damages that result from these spills. Wildlife is impacted immediately. Repeated images of birds covered in oil typically follow in the news after these disasters take place. Fracking is also extremely dangerous to surrounding ecosystems and causes irreparable damage to the earth. The process of fracking requires large amounts of water and possible use of chemicals. There have been numerous stories of well-water catching fire out of the tap in some nearby towns to locations of fracking. In addition, fracking generates a great deal of highly polluted wastewater that finds itself getting into nearby rivers and streams. Fracking has also been

suspected to trigger earthquakes. The 2010 documentary *Gasland* explores the terrible effects of fracking on our landscape and dangers to residents nearby. For more information, go to the IMDb page.

Natural gas has many qualities that make it an efficient, relatively clean burning, and economical energy source. However, the production and use of natural gas have some environmental and safety issues to consider. While natural gas burns relatively clean, some of it can leak into the air as methane. In 2019, it was reported that natural gas accounted for 29% of total methane emissions. In an article published in 2022, researchers summarized just how much methane contributes to emissions in the U.S.: "Using a 20-year timeframe for methane, annual methane emissions from all gas stoves in U.S. homes have a climate impact comparable to the annual carbon dioxide emissions of 500,000 cars." (Source: Lebel, Eric D., Finnegan, Colin J., Ouyang, Zutao, & Jackson, Robert B. (2022). *Methane and NOx Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes*. Environ. Sci. Technol. 56(4), 2529–2539)

Excavation to acquire natural gas also causes irreparable destruction to ecosystems. From drilling to laying pipeline, surrounding areas are impacted by contaminated water and overdeveloped drilling locations. While there have been some advances in drilling practices aimed at limiting damage to land and water, there is still great risk of continuing to drill and alter land in an effort to obtain these forms of energy.

About 63% of the coal mined in the US in 2020 was from surface mines (Source). In this process, layers of rock and soil are removed from the surface of the earth leaving areas barren. Mountaintop excavation is another form of coal extraction, where explosives are used to blast sections of earth from mountains causing massive damage to ecosystems and habitats for both animals and humans. While the US has enacted policy to control runoff from these mining areas, there is still significant damage that cannot be reversed.

Additional hazards come with burning the coal which releases gasses like sulfur dioxide (SO2), nitrogen oxides (Nox), and carbon dioxide (CO2), among others. These pollute the sky and contribute to the greenhouse effect. In addition, pollutants that fill the air become a danger to the health of local communities and beyond. While advances in technology like "carbon capturing" may help limit some of these problems, reducing our need for coal would greatly contribute to creating a safer environment for humans, animals and other life.

While nuclear energy possesses little health risk as compared to other nonrenewable sources, nuclear energy production is one of the most dangerous processes. An accident at a nuclear power plant could be disastrous not only for the nearby areas, but the impact could be far-reaching and timeless. While the risk remains low for major accidents, they have happened in our recent history.

In addition, radioactive waste, which is what remains after nuclear energy is created in the reactors, is highly toxic and can last for thousands of years. While storage of this waste is regulated and monitored, it is still an extremely unsafe byproduct of this type of energy production. And though most of the radioactive waste generated at plants has a very low level of radioactivity, we would be better off not taking these risks and relying on safer, renewable sources that already exist in nature.

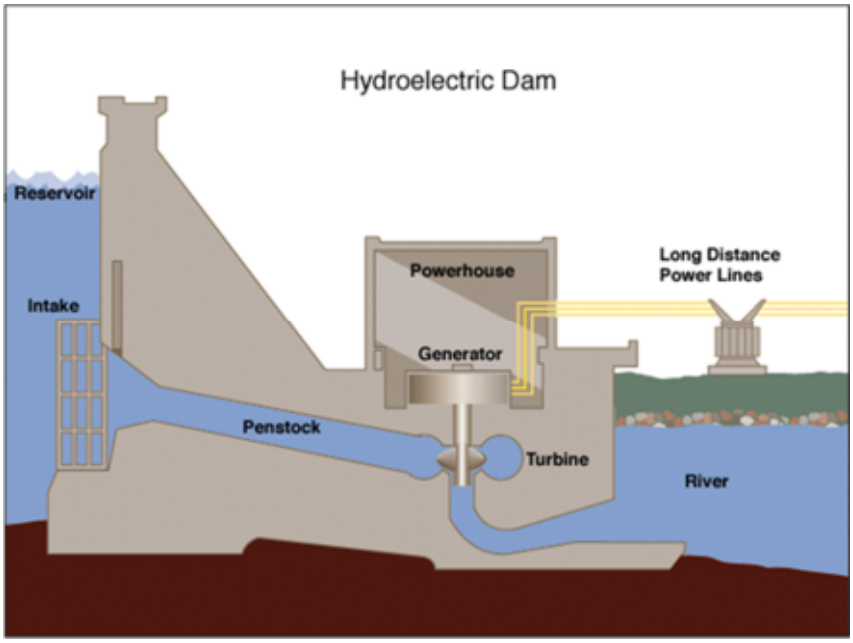
b. Renewable Resources

- Types

Hydropower

Water provides for a great variety of energy sources. Hydroelectric power, tidal barrages and wave power are three forms of water power prevalently used in the US.

Hydroelectric power is produced with moving water. Water flows from a higher to a lower elevation, often referred to as “head”. The greater the water flow and the higher the head, the power can be generated. Water then pushes through pipes and turns blades in a turbine to generate electricity. These hydropower plants typically need to be close to water sources. Below is an image of what a typical hydroelectric dam looks like.



(Source)

Tidal barrages are similar to dams, but these are installed around ocean bays or lagoons. Water levels are controlled at gates coming in and out of this bay, where the incoming/outgoing water flows through an electricity turbine similar to that of a hydropower dam. Unfortunately, plants and animals sometimes suffer from the construction and use of these barrages.

Energy from the ocean can be harnessed in the waves as well. As waves are formed and move across the ocean, they can be captured by devices that are placed on or just below the surface of the water or anchored to the ocean floor. Waves can also be channeled into a narrow area which increases their power, and those waves push turbines, similar to the process used in hydroelectric plants.

Wind Power

Wind is formed by uneven heating across land, and due to the differences in how land and water comprise our landscape, we experience daily wind cycles. Because we have these wind cycles, we can partly depend on wind to help us generate more electricity in a somewhat consistent way.

Wind energy is created as wind pushes the blades on windmills. Those blades are connected to a drive shaft that turns a generator.

Wind is becoming much more abundant and the costs of producing wind energy are going down. In addition, government incentives are making wind energy much more of a lucrative business.

Solar

The sun is one of the most dependable sources of nonrenewable energy we have, producing light and heat across the globe for millions of years. One of the earliest uses of solar energy was in 1830s where a British astronomer used a solar oven to cook food in an expedition across Africa.

Solar energy is captured in different ways. A photovoltaic (PV) cell, commonly called a solar cell, is a non-mechanical device that converts sunlight directly into electricity. Some PV cells can convert artificial light into electricity. When photons, or particles of solar energy, strike a PV cell, they may reflect off the cell, pass through the cell, or be absorbed by the semiconductor material. Only the absorbed photons provide energy to generate electricity.

PV systems can supply electricity in locations where electricity distribution systems (power lines) do not exist, and they can also supply electricity to an electric power grid. Solar photovoltaic cells are grouped in panels (modules), and panels can be grouped into arrays of different sizes to produce small to large amounts of electricity, such as for powering utility-scale electricity generation.

The type of solar collector can determine the type of solar radiation and level of exposure to the sun that a solar collector receives. Concentrating solar collector systems, such as those used in solar thermal-electric power plants, require direct solar radiation, which is generally greater in arid regions with few cloudy days.

Solar electricity generation accounted for about 95% of all total solar energy use in 2020 and direct use of solar energy for heating accounted for about 5%. One projection says that solar generation for electricity will account for 20% of all energy sources for electricity by 2050. (Source) Total U.S. solar electricity generation increased from about 5 million kWh in 1984 (nearly all from solar thermal-electric power plants), to about 133 billion kWh in 2020, of which 66% was from utility-scale PV power plants, 31% was from distributed/small-scale PV systems, and 2% was from solar thermal-electric power plants. (Source)

Solar thermal power/electric generation systems collect and concentrate sunlight to produce the high temperature heat needed to generate electricity. All solar thermal power systems have solar energy collectors with two main components: reflectors (mirrors) that capture and focus sunlight onto a receiver. In most types of systems, a heat-transfer fluid is heated and circulated in the receiver and used to produce steam. The steam is converted into mechanical energy in a turbine, which powers a generator to produce electricity.

Geothermal

Geothermal energy is heat within the earth. The word geothermal comes from the Greek words geo (earth) and therme (heat). Geothermal energy is a renewable energy source because heat is continuously produced inside the earth. People use geothermal heat for bathing, to heat buildings, and to generate electricity.

The slow decay of radioactive particles in the earth's core, a process that happens in all rocks, produces geothermal energy. Scientists have discovered that the temperature of the earth's inner core is about 10,800 degrees Fahrenheit (°F), which is as hot as the surface of the sun. Heat is found deep below in the rocks, where water absorbs heat from magma and holds these extreme temperatures.

Geothermal power plants use hydrothermal resources that have both water (hydro) and heat (thermal). These plants require high-temperature water or heat that come from either dry steam wells or from hot water wells. Wells are drilled to reach steam or hot water, and pipes are installed to bring these sources above ground. From there, the hot water or steam powers a turbine that generates electricity. Some geothermal wells are as much as 2 miles deep.

Biomass

Biomass is renewable organic material that comes from plants and animals. Biomass contains stored chemical energy from the sun. Plants produce biomass through photosynthesis and this byproduct can be burned directly for heat or converted to renewable liquid and gaseous fuels through various processes.

Biomass sources for energy include wood, some crops like corn and soybeans, some municipal solid waste materials, animal manure and even human sewage.

Biomass is converted to energy through various processes, including direct combustion (burning) to produce heat, thermochemical, chemical or biological conversion to produce

either solid, gaseous, and liquid fuels, but direct combustion is the most common method for converting biomass to useful energy. All biomass can be burned directly for heating buildings and water, for industrial process heat, and for generating electricity in steam turbines.

While biomass can be used to produce electricity, it only represents 9% of all end use in the United States, where industrial and transportation needs take up the bulk of biomass energy. The electric power sector uses wood and biomass-derived wastes to generate electricity for sale to the other sectors.

- Environmental Impact

The amazing thing about renewable forms of energy is that they are infinite in volume. Fossil fuels and coal, once used up, cannot be returned to Earth. But there will always be sun, wind and heat from the earth. Relying on these forms of energy for electricity production is sustainable, more cost-efficient in the long run, and just better for our environment.

Hydro

Most dams in the United States were built mainly for flood control, municipal water supply, and irrigation water. Although many of these dams have hydroelectric generators, only a small number of dams were built specifically for hydropower generation. Hydropower generators do not directly emit air pollutants.

However, dams, reservoirs, and the operation of hydroelectric generators can affect the environment. Some of the negative effects of dams include effects on wildlife where dams create reservoirs which may cause damage to underwater and natural areas used for fish and above ground animals, changes in water temperature and flow, and barriers to fish jumping upstream as spawning seasons begin.

In addition to these above, resourcing of materials and manufacturing of plants may need fossil fuels for this process, though given the long operating lifetime of a hydropower plant (50 years to 100 years) these emissions are offset by the emissions-free hydroelectricity.

As was mentioned, though, hydroelectric dams themselves do not create pollution and do not use up or burn any resources as they generate power.

Wind

Overall, using wind to produce energy has fewer effects on the environment than many other energy sources. Wind turbines generally do not release emissions that can pollute the air or water, and they do not require water for cooling. Wind turbines may also reduce the amount of electricity generation from fossil fuels, which results in lower total air pollution and carbon dioxide emissions.

Wind turbines have some negative effects on the environment. For example, production of supplies needed to make windmills requires resources and energy from possibly non-renewable resources. In addition, there have been cases of animals dying from the large turbine blades and some wind turbines have caught fire, though this is rare. And unfortunately, most of the materials that comprise these windmills cannot be recycled. However, researchers at the National Renewable Energy Laboratory (NREL) established an approach to manufacturing wind turbine blades, employing a thermoplastic resin system. These thermoplastic resins enable a manufacturing process that allows wind turbine blades to be recycled at their end of life and also reduces the energy required to manufacture blades.

Solar

Solar energy systems do not produce air pollutants or carbon dioxide, and solar energy systems on buildings have minimal effects on the environment. While there are some construction costs and materials associated with the production of solar energy production, the benefits far outweigh the costs. For example, there was a study conducted by a number of organizations and researchers in which they found that PV systems produce the equivalent amount of energy used to manufacture those same PV systems within 1 to 4 years, and most PV systems have operating lives of up to 30 years or more.

In addition, there are some chemicals used in the making of PV cells and in the production of energy as it transfers from the sun to the grid. The US government, however, regulates how these chemicals are disposed of and some states have even encouraged recycling of PV panels through their own laws.

As with any large power plant, this requires space, and because solar panels are spread out across a broad stretch of land, the impact on the surrounding area may be felt in nearby communities and ecosystems. But again, the impact on the environment is fairly small compared to the benefits of this non-polluting source of energy.

Solar thermal plant at Crescent Dunes near Tonopah, Nevada

Biomass

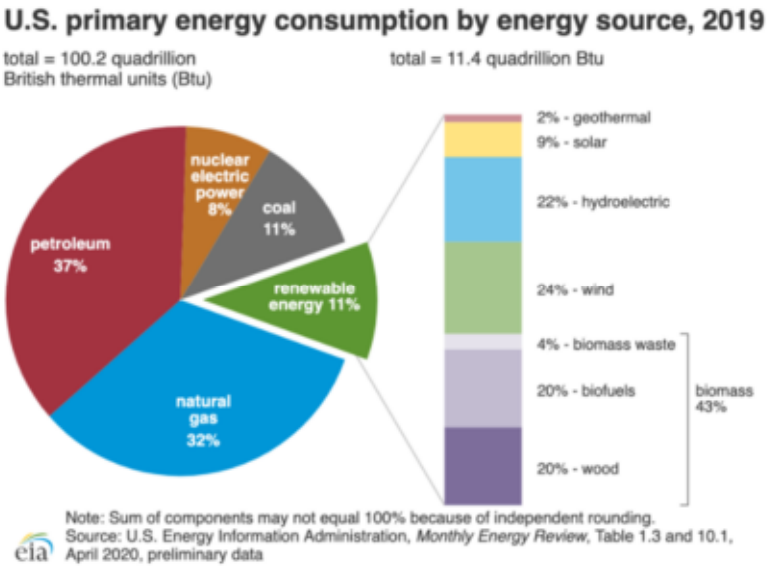
The use of biomass energy has the potential to greatly reduce greenhouse gas emissions. Burning biomass releases about the same amount of carbon dioxide as burning fossil fuels. However, fossil fuels release carbon dioxide captured by photosynthesis millions of years ago—an essentially "new" greenhouse gas. Biomass, on the other hand, releases carbon dioxide that is largely balanced by the carbon dioxide captured in its own growth (depending how much energy was used to grow, harvest, and process the fuel).

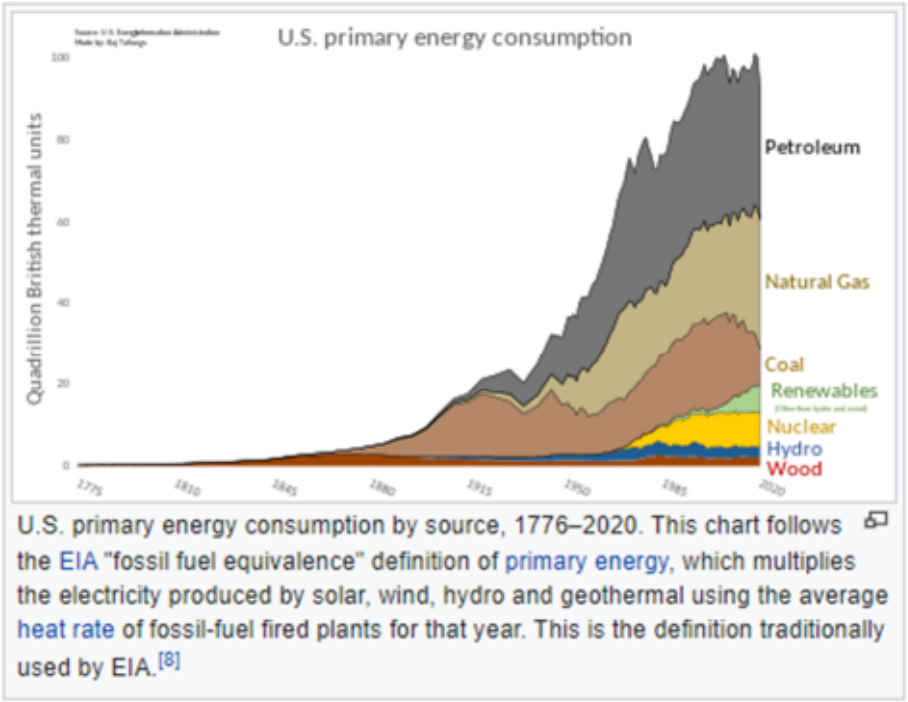
There are some groundbreaking technologies on the horizon. Agricultural residues such as corn stover (the stalks, leaves, and husks of the plant) and wheat straw can be used in place of other crops that may not easily withstand certain land areas. Long-term plans include growing and using dedicated energy crops, such as fast-growing trees and grasses, and algae. These feedstocks can grow sustainably on land that will not support intensive food crops. (Source)

2. Where does our energy come from?

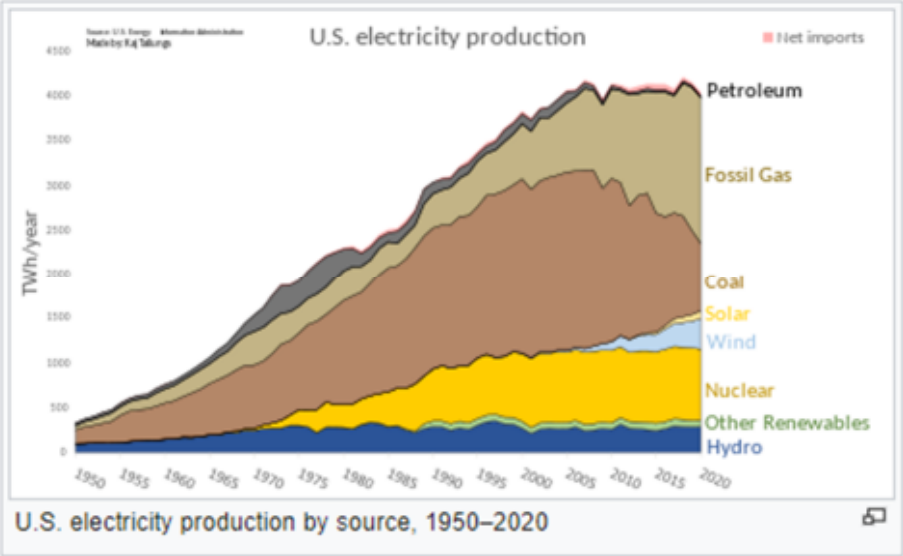
a. In the US

In the US, 80% of the energy consumption is sourced from fossil fuels (petroleum, natural gas and coal). 8% is from nuclear power and 11% from renewables.





U.S. primary energy consumption by source, 1776–2020. This chart follows the EIA "fossil fuel equivalence" definition of primary energy, which multiplies the electricity produced by solar, wind, hydro and geothermal using the average heat rate of fossil-fuel fired plants for that year. This is the definition traditionally used by EIA.[8]



b. In California

Electricity

Natural gas-fired power plants typically account for almost one-half of in-state electricity generation. California is one of the largest hydroelectric power producers in the United States, and with adequate rainfall, hydroelectric power typically accounts for close to one-fifth of the state's electricity generation. Due to strict emission laws only one coal-fired power plant remains operating in California: The 63-megawatt Argus Cogeneration Plant in Trona (San Bernardino County).

Renewable Energy accounts for 33% of California power generation (and power use as well).

California leads the nation in electricity generation from non-hydroelectric renewable energy sources, including geothermal power, wind power, and solar power. California has some of the most aggressive renewable energy goals in the United States. The state was required to obtain at least 33% of its electricity from renewable resources by 2020, and 50% by 2030, excluding large hydro. Intermittent solar power has led to a peak demand and production imbalance creating a "duck curve", where traditional power plants produce little generation at noon, ramping fast to high generation at dusk.

Assembly Bill 2514 directed the California Public Utilities Commission (CPUC) to adopt an energy storage program and procurement target. As a result, the CPUC established an energy storage target of 1,325 MW by 2020. In 2014, Southern California Edison commissioned the

8MW/32MWh Tehachapi Energy Storage Project, which was the largest lithium-ion battery system operating in North America and one of the largest in the world at the time of commissioning. The 1-hour 230 MW Gateway Energy Storage project near San Diego became the biggest Lithium-ion grid storage in 2020, and several more are under construction, such as the two at Moss Landing.

Fuel Type	In-State Generated*	Imported*	Total California Power Mix*
Coal	0.17%	8.76%	2.74%
Natural Gas	48.35%	10.68%	37.06%
Oil	0.02%	0.00%	0.01%
Other (Waste Heat / Petroleum Coke)	0.20%	0.16%	0.19%
Nuclear	8.53%	11.21%	9.33%
Large Hydro	9.40%	18.78%	12.21%
Unspecified	0.00%	17.90%	5.36%
Total Non-Renewables and Unspecified Energy	*66.65%*	*67.50%*	*66.91%*
Biomass	2.97%	1.22%	2.45%
Geothermal	5.94%	2.44%	4.89%
Small Hydro	1.82%	0.39%	1.39%
Solar	15.43%	8.08%	13.23%
Wind	7.18%	20.37%	11.13%
Total Renewables	*33.35%*	*32.50%*	*33.09%*
Total System Energy	100.00%	100.00%	100.00%

*The % for each source is the amount that source represents as a fraction of the total for that column. For example, Coal represents 0.17% of all energy In-State Generated sources used to produce electricity in California.

Source: California Energy Commission, 2020 Total System Electric Generation

Petroleum

As of 2012, California's crude oil output accounted for about 8.3% of total U.S. production. Drilling operations are concentrated primarily in Kern County and the Los Angeles basin. With twenty-seven platforms along the coast as of 2020, there is substantial offshore oil and gas production. There is a permanent moratorium on new offshore oil and gas leasing in California waters and a deferral of leasing in Federal waters.

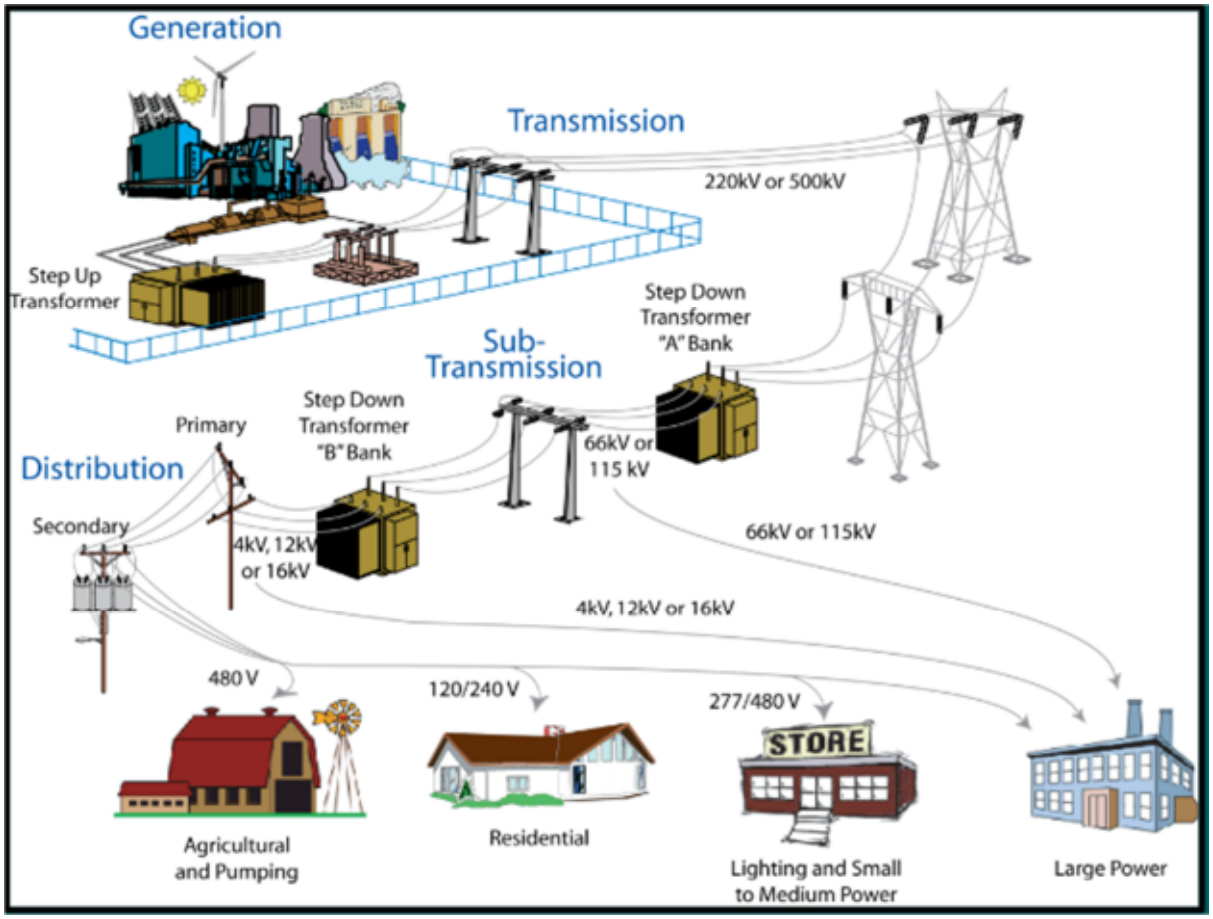
California ranks third in the United States in petroleum refining capacity, behind Texas and Louisiana, and accounts for about 11% of total U.S. capacity, as of 2012. In addition to oil from California, California's refineries process crude oil from Alaska and foreign suppliers. The refineries are configured to produce cleaner fuels, including reformulated motor gasoline and low-sulfur diesel, to meet strict Federal and State environmental regulations. As of 2017, California has 18 refineries with a capacity to process nearly 2,000,000 US barrels per day.

Natural Gas

California natural gas production is typically less than 2 percent of total annual U.S. production and satisfies less than one-sixth of state demand. California receives most of its natural gas by pipeline from production regions in the Rocky Mountains, the Southwest, and western Canada.

c. In Culver City: The Clean Power Alliance and Southern California Edison

Southern California Edison (SCE) was traditionally the provider of electricity in Culver City, along with most parts of Southern California (50,000 square miles). Here is how SCE's grid works:



Clean Power Alliance is a new electricity supply provider, offering clean, renewable energy to our community. Clean Power Alliance purchases clean power (from the generation portion) and Southern California Edison (SCE) delivers it (distribution portion). Clean Power Alliance of Southern California (CPA) is a nonprofit entity and a Community Choice Aggregation (CCA) program, formed through a Joint Powers Authority. CPA is made up of 32 public agencies across Los Angeles and Ventura counties, including Culver City, working together to bring affordable, clean energy to our communities.

Early in 2019, the City of Culver City enrolled all of its residents and businesses under the Clean Power Alliance (CPA) at 100% renewable energy for their electricity. They could then opt out (to stay with Southern California Edison), or choose cheaper rates with either 36% or 50% renewable energy content.

LEAN POWER	CLEAN POWER	100% GREEN POWER
Provides 36% renewable content at the lowest possible cost—with the added benefit of local management and control.	Provides 50% renewable content and the opportunity to support building a cleaner future, all at cost competitive rates.	Provides 100% renewable content and gives you the opportunity to be an environmental champion—leading the way to a greener future.Our community has selected Green Power as our default option.

2020 POWER CONTENT LABEL
Clean Power Alliance of Southern California
https://cleanpoweralliance.org/power-sources/

Lean Power	Clean Power	100% Clean Power	2020 CA Power Mix
40.7%	**50.1%**	**100.0%**	**33.1%**
0.0%	2.5%	0.0%	2.5%
2.2%	17.9%	0.0%	4.9%
0.0%	1.8%	0.0%	1.4%
0.6%	16.5%	70.4%	13.2%
37.9%	11.4%	29.6%	11.1%
0.0%	**0.0%**	**0.0%**	**2.7%**
4.5%	**9.1%**	**0.0%**	**12.2%**
0.1%	**0.1%**	**0.0%**	**37.1%**
0.0%	**0.0%**	**0.0%**	**9.3%**
0.2%	**0.2%**	**0.0%**	**0.2%**
54.5%	**40.5%**	**0.0%**	**5.4%**
100.0%	**100.0%**	**100.0%**	**100.0%**

d. What about CCSUD?

At the same time as the city-wide change, CCUSD converted to 100% renewables with CPA but opted out for its biggest (and most expensive) campus: the Elenda campus, which remained under the former SCE rate. All the other sites are with CPA under 100% renewable energy. As of January 2022, the Elenda campus is back in the CPA at 36% clean energy. The goal is to reach 100% renewable Energy districtwide.

3. What is Net Zero Energy?

a. Net Zero Energy buildings

A Zero Energy Building (ZEB), also known as a Net Zero Energy (NZE) building, or a Zero Net Energy (ZNE) building, is a building with net zero energy consumption, meaning the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site or in other definitions by renewable energy sources offsite, using technology such as heat pumps, high efficiency windows and insulation, and solar panels. The goal is for these buildings to contribute less overall greenhouse gas to the atmosphere during operations than similar non-ZNE buildings.

b. California net-zero greenhouse gas emissions plan

To limit global temperature rise below 3.6 degrees Fahrenheit (2 degrees Celsius) by 2100, the United Nations Intergovernmental Panel on Climate Change says human-caused greenhouse gas emissions need to be reduced to nearly zero, and any remaining emissions need to be captured and stored. This is known as net-zero greenhouse gas emissions.

Researchers at the U.S. Department of Energy's Pacific Northwest National Laboratory, along with colleagues at the University of California, Los Angeles and the Chinese Academy of Sciences, developed a detailed roadmap for California to achieve net-zero emissions sustainably by 2050. Here is the 2020 draft report to achieve carbon neutrality in California by 2045.

4. Energy at CCUSD

a. Electricity

Consumption:

CCUSD's annual net electricity consumption is over 3.2 million kwh and costs over half a million dollars each year, and rates are increasing. Adding our own solar generation, the actual total electricity consumption of the District is 4.3 million kwh (2021 data).

Solar Generation:

In 2014, the District installed a 750 KW Solar System on some of its parking lots. In 2021, the energy produced by our solar systems was 1,053,172 kwh, representing about 25% of the total electricity consumption in the District.

Performance	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Trailing Year
Measured Energy	69,929	86,150	111,772	109,083	112,861	119,933	114,195	91,971	75,783	68,135	54,576	38,783	1,053,172

According to the EPA Greenhouse Gas equivalency calculator, this is equivalent to the emissions of 162 passenger cars driven for a year, or 90 houses powered for a year, or even, the carbon sequestered by 914 acres of forests.

b. Gas

SoCalGas is our Gas provider at CCUSD. Natural Gas is usually used for water heating and cooking. Our 2021 gas consumption was 50,000 therms, representing 68k$.

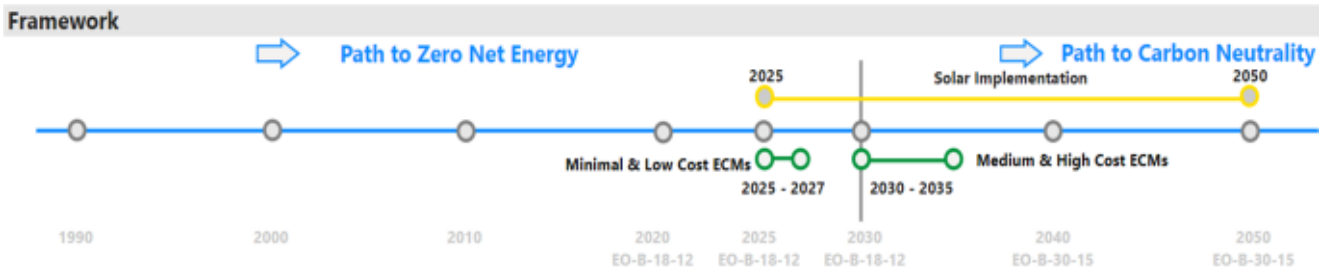
c. Transportation

The more cars we have on the road, the more we burn gasoline and create both local air pollution and carbon emissions. For CCUSD, if you live nearby your school, the best option for you is to walk, bike, skate or scooter to school!

In 2021 CCUSD started a pilot program with the City of Culver City Department of Transportation for a Free Fare Program. All CCUSD Students are granted a free pass to take the bus everywhere in Culver City and beyond, since it also includes the LA Metro lines. They just need to ask for and register their tap card. The goal is to have less cars on the road and a healthier environment.

d. The CCUSD Integrated Energy Masterplan

A consulting company has been working on an Integrated Energy Masterplan for CCUSD, with the first part focused on indoor air quality, and a second focused on ZNE (Zero Net Energy). The Masterplan sets a goal of Net Zero Energy (for electricity) by 2030, then carbon neutrality (offsetting all carbon footprint) by 2050. This means starting to install more solar as soon as 2025, as well as reducing our energy consumption.



e. The Students Green New Deal

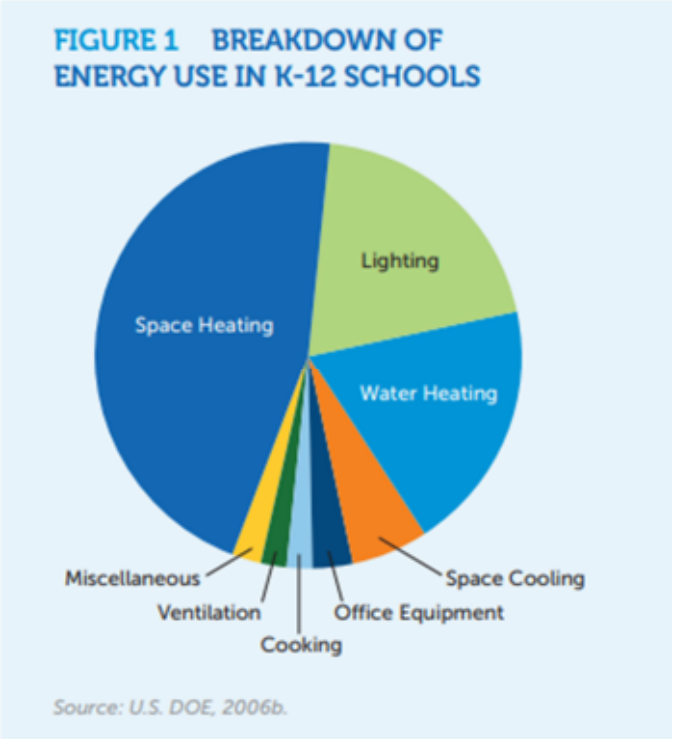
In spring of 2022, a group of High School Students presented to the Board of Education their Green New Deal for CCUSD. This GND has an energy portion which demands the following:

1. Maintaining CCUSD on 100% renewable energy
    i. All schools should be enrolled in 100% green energy, through the Clean Power Alliance (note: Elenda campus still on 36%, all others on 100%) by 2030
2. Committing to use and purchase Energy Star-rated electric equipment (computers, copiers, refrigerators,..)
3. Adding solar panels, where possible
4. Making sure we are taking advantage of utility rebates
5. Regularly maintaining all HVAC (including refrigerators) systems (at least twice a year)
6. Setting energy efficient seasonal temperature thermostats: Recommended 76 cooling, 68 for heating
7. Turning off lights in classrooms, hallways, and offices outside of school hours
8. Monitoring monthly energy use by school/site and analyzing discrepancies (using Energy Star Portfolio Manager)
9. Displaying conservation signage in appropriate locations
10. Making sure windows and doors are sealed properly and closed when HVAC is on
11. Recommending that the District websites use green hosts

5. Greening our energy at CCUSD and beyond

a. Energy conservation and reduction

i. Energy efficiency devices and practices



In any given school, most energy is used for space heating and cooling (HVAC). For that reason, we want to make sure we check on filters regularly and keep them clean (at least every 6 months), and also ensure we do not overuse these systems with excessive temperatures. For lower energy consumption it is recommended to set the thermostat at 78° for cooling and 68° for heating. In addition, a good practice for people who work in buildings is to make sure doors and windows are closed and that the building envelope does not leak.

Lighting can also be an important source of energy consumption. It is recommended to only use LED lights as they live longer and use about 75% less energy than traditional incandescent light bulbs. They are also more efficient and less toxic than the CFL bulbs which contain mercury (need special recycling).

source Pinterest

ii. Energy Star and EPEAT certified equipment

For all equipment running with energy (refrigerators, stoves, dishwashers, water heaters, computers, monitors/TV…), it is best when replacing old equipment to purchase Energy Star rated equipment, or make sure to get a certified low energy rated equipment, even if it costs a bit more. This will ensure the overall cost of running the equipment over its lifetime will be lower, as it will use less energy. Electronics (computers, etc…) now have another energy rating system called EPEAT.

iii. Water heating

Whether water is heated by gas or electricity, one of the best ways to reduce energy consumption is to make sure the pipes carrying hot water out of the heater are insulated. In this way the water stays warm in the pipes longer. Using low flow faucets (adding faucets aerators) will also reduce hot water consumption and the energy needed to heat it.

b. SoCal Ren

In April 2022, CCUSD enrolled with the Southern California Regional Energy Network (SoCalRen). SoCalRen offers free assistance to public agencies like cities, counties and school districts to complete energy efficiency projects. SoCalRen will help us monitor our monthly energy consumption (electricity, gas) and access grants or other efficiency retrofit projects the School District could qualify for.

c. Adding Solar

One way we can help CCUSD reach its Net Zero Energy goals faster is to install solar panels. Unfortunately, due to the age of most buildings, the last feasibility study was not encouraging to add more weight to our building roofs. One location mentioned in the feasibility study that could be further explored is the District warehouse building. In addition, as more buildings get retrofitted, more solar panels could be installed.

d. Community Choice Aggregation (CCA)

A Community Choice Aggregation (CCA), also known as “Community Choice Energy”, “municipal aggregation”, “governmental aggregation”, “electricity aggregation”, and “community aggregation”, is an alternative to the investor owned utility energy supply system in which local entities in the United States aggregate the buying power of individual customers

within a defined jurisdiction in order to secure alternative energy supply contracts. The CCA chooses the power generation source on behalf of the consumers. Currently our electricity provider, the Clean Power Alliance is an example of Community Choice Aggregation (CCA).

e. Buying Renewable Energy Credits (RECs)?

A Renewable Energy Credit (REC) is a certificate corresponding to the environmental attributes of energy produced from renewable sources such as wind or solar. RECs were created as a means to track progress towards and compliance with states' Renewable Portfolio Standards (RPS), meant to support a cleaner generation mix. In business practices, buying Renewable Energy Credits allows you to offset your energy consumption and appear greener.

f. Measuring our carbon footprint: Towards Carbon neutrality

One interesting project for the District would be to measure its carbon footprint. This could be done every year to track our progress at all the schools. The University of California, Berkeley offers a free carbon calculator online. Once we reach our goal of Net Zero Electricity, it is time to tackle our whole carbon footprint including water, waste, transportation, food and all other areas of consumption.

Appendices: One-pagers Best Practices

WASTE - BEST PRACTICES FOR STUDENTS

"Be a Part of the Solution, Not Part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

1. Your everyday actions matter-----Dare to care! Celebrate Earth Day (April 22) and America Recycles Day (November) every year.

2. Make it cool to protect the environment, be part of the Global Youth Movement
3. Volunteer: Get involved in your school's green committee, club and local environmental organizations
4. Never litter. With wind or rain, it goes down storm drains to Ballona Creek to the ocean and kills wildlife

5. Separate your trash from recycling and composting properly: download the City Recycle Coach App and share it with family members
6. Pay attention to signage and bin color to make sure your trash goes into the right bin
7. Don't contaminate the recycling bin with non-recyclable or dirty recyclables
8. Say "No" to plastic bottles: take the plastic-free pledge
9. Bring your own reusable water bottle to refill at existing water filling stations

10. Bring Zero Waste lunches and snacks
11. Use reusable utensils to avoid plastic
12. Replace single-use Ziploc's with reusable baggies
13. Choose to wrap food in cloth or paper rather than plastic or aluminum foil
14. Purchasing power: Go for the item that has the least amount of packaging (or none!), buy in bulk and use your purchasing power
15. Don't buy it, DIY!
16. Recycle your electronics properly: HHW guide
17. Speak up and share your concern when you see too much plastic: whether at your cafeteria, favorite coffee shop or restaurant. Your voice matters! Ask for change or boycott the place that uses too many disposable items. Sign petitions.
18. Don't forget to thank all staff at your school

WASTE - BEST PRACTICES FOR TEACHERS

"Be a part of the Solution, Not part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

Thank you for your leadership in helping our students learn about important environmental issues. Continue to lead by example!

1. Think about the environmental impact in everything you do

2. Make sure you know what is compostable / recyclable in Culver City, and encourage students to use the appropriate bins. Information here. Consult and share the City Recycle Coach App

3. Make sure your classroom has a blue recycling bin

4. Bring your own reusable mug, bottle, containers for zero waste lunches and snacks

5. Choose earth-friendly non-toxic products and materials for your projects, and encourage students to do the same

6. Organize in-class activities relating to Sustainability: Celebrate Earth Day (April 22) and America Recycles Day (November) every year

7. Integrate sustainability in your curriculum like composting and the cycle of nature biodegradation; Where does our recycling go (how do recycling facilities work); Organize field trips to landfills and/or recycling facilities

8. Reduce paper printing; Go digital when possible; If you print, print double-sided and in black and white

9. Know about hazardous waste like e-waste and batteries and dispose of them safely; Create a clearly marked used battery box for your classroom

WASTE - BEST PRACTICES FOR CUSTODIANS

"Be a part of the Solution, Not part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

Your role is central. After training everyone to use the appropriate bin (compost / recyclables / trash) to reduce contamination, you are responsible for placing the right bags in the right City containers.

1. Make sure all classrooms and offices have a **black trash can** and a **blue recycling bin**

2. Make sure that every other area has 3 stream cans (**black for trash / blue for recyclables / green for compost**). Never place only 1 can, it will lead to contamination

3. Each waste stream needs to have a dedicated liner color (black for trash / blue for recyclables / clear for compost). You will save time and avoid errors when taking the trash bags out

4. Train your team, or if you see people that are not sorting or wrongly sorting. Information from the City of Culver City here; You can also use the City Recycle Coach App

5. Organize regular team training; reward green champions with incentives or awards

6. Display corresponding signage to enhance waste sorting education

7. Never allow litter. With wind or rain, it goes down storm drains to Ballona Creek to the ocean and kills wildlife

8. Choose Green Cleaning Products: key words "eco-friendly", "non-toxic", "EPA Safer Choice", "Ecologo" or "Green Seal"

9. Know about Hazardous Waste and how to dispose of it safely

WASTE - BEST PRACTICES FOR ADMIN STAFF

"Be a part of the Solution, Not part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

In offices, the main source of waste is paper… and electronics!

1. Make sure to print only if necessary. Print double-sided as much as possible, and re-use draft paper to print drafts. Print black and white instead of color when possible

2. Buy paper made with at least 30% recycled paper. Also look for FSC (Forest Stewardship Council) certified paper

3. For supplies, look for a green alternative (less plastic or made from recycled content): key words "eco-friendly", "non-toxic", "EPA Safer Choice", "Ecologo" or "Green Seal"

4. Encourage everyone to bring their own bottle, mug, utensils to reduce single use disposable items

5. Each desk needs to have a 2-way bin (recyclable and trash); office kitchens need to have 3-way bins (compostable, recyclable and trash) with proper signage

6. Use the City app to find out what is recyclable here

7. Know about hazardous waste like e-waste (computers, printers etc…) and batteries and dispose of them safely here

WASTE - BEST PRACTICES FOR PARENTS

"Be a part of the Solution, Not part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

You are our hope to support our Students in this effort of reducing waste!

1. Pack snacks or lunches in reusable boxes or cloth bags, and with reusable utensils. Check out an example of 0-waste lunch for school here

2. Provide a reusable bottle: they can refill it at school

3. Keep the spirit at home and be conscious when you go shopping: choose items with less packaging, less plastics and use reusable bags

4. Know what is recyclable at home here. You can also use the City Recycle Coach App

5. For any supply, look for a green alternative (less plastic or made from recycled content): key words "eco-friendly", "non-toxic", "EPA Safer Choice", "Ecologo" or "Green Seal"

6. Know about hazardous waste like e-waste and batteries and dispose of them safely here

WASTE - BEST PRACTICES FOR VISITORS

"Be a part of the Solution, Not part of the Pollution"

AVOID waste and use reusables ONLY. Sort your waste into trash, recycling and composting bins.

Visitors, welcome to our school campus! At Culver City Unified School District, we thrive to be Zero Waste schools and we need your help.

1. Please use our 3 stream cans to sort your waste (recyclables, organics / compostable, or landfill).

Ideally, we encourage:

"Pack it in, pack it out!" *(what you bring to school you bring back home)*

2. Make sure to keep the campus clean: any trash left behind might end up in Ballona Creek which goes directly to the ocean

3. Please bring your own water bottles and refillable 5-gallons water jugs to avoid using plastic water bottles

4. Make sure to buy snacks in bulk and to provide package-free snacks such as fruits and finger foods

5. If you print material for your event, consider printing double-sided and in black and white

6. Consider setting-up a Recycling Program for your team uniform (if applicable)

WATER - BEST PRACTICES FOR ALL

"Every drop counts!"

Conserving water preserves ecosystems, slows down global warming, cares for your future and the future of generations to come, and saves you money. Why wait? Conserve now!

1. Fix any water leaks in your home and yard
2. Take showers instead of baths, and try to limit shower time to 5 minutes
3. Turn off the faucet while brushing your teeth or lathering your hands
4. Install low flow toilets (and urinals); check for local rebates!
5. Change your laundry washing machine to an efficient front loader. Washing machines are the #2 source of water use after toilets in a home. Check for local rebates! Also, make sure you do your laundry when you have a full load

6. Run your dishwasher when completely full instead of half full
7. Don't thaw your food by running it under hot water; Plan ahead and let it thaw on your counter or in the fridge
8. Re-use water (if you washed vegetables or didn't finish your glass) to water your plants

9. Outdoors: Use a broom or brush instead of water to clean outdoor areas
10. Get a free rain barrel from West Basin to install under your gutter or install a grey water system to water your landscape
11. Water your garden at night or early morning
12. Forget the water intensive turf! Use drought tolerant plants (adapted to the local dry climate), and choose a drip irrigation system instead of sprinklers
13. Cover your soil with mulch and/or ground cover to prevent evaporation: you will need less water to irrigate

14. Buy food that is local and less water intensive: Check out the water footprint of common foods here
15. Drink filtered tap water instead of buying bottled water: learn about the footprint of bottled water here

More tips here! Do your part!

ENERGY - BEST PRACTICES FOR ALL

"Reduce and Renew!"

Conserving energy means using less resources to produce it, and less greenhouse gases released in the atmosphere which slows down global warming. Using renewable energy instead of fossil fuel-based energy will help reduce energy use and get us on clean energy!

1. Use LED light bulbs instead of incandescent light bulbs; they use 75% less electricity
2. Turn off the light when you are not in the room
3. Think of using motion sensors or occupancy sensors to switch off lights automatically when no one is in the room.
4. Make sure your computer monitor turns off after 10 minutes of inactivity and your computer goes into sleep mode after 15 minutes of inactivity (or less).
5. Do you know what phantom loads are? Check it out here.
6. Set your thermostat properly to avoid overheating and overcooling when it is unnecessary. Temperatures recommended are 68°F for heating and 78°F for cooling.
7. Proper insulation is key to energy conservation (roof, walls, windows/doors, hot and cold-water pipes)
8. When buying any electric appliance, always look for more energy efficient ones; even if they are a bit more costly, you will save electricity overtime
9. Know about Energy Star and EPEAT certifications

10. Check for local rebates from your utilities companies : SoCal Gas and Southern California Edison.
11. Enroll in your local Community Choice Aggregation Program (Clean Power Alliance in Culver City) to be powered by 100% renewable energy
12. Install solar on your roof
13. Choose to carpool, take public transportation, bike, skate or walk

14. When buying a new car, choose an EV, a hybrid, or a low gas mileage car

15. Use things as long as you can; repair them; donate them
16. Use less. Shop local. Educate yourself and hold your elected officials and leaders accountable!