



Energy Blog



Understanding Electronic Waste (Page 1 of 3)

This week's blog is written by Jessica Martinez, one of CAP OC's Planning Interns. Jessica was born and raised in Orange County and is passionate about community health. In this blog, she will cover the topic of electronic waste, its health effects, and steps anyone can take to properly recycle electronics.

What is EEE and E-waste?

Take a moment and imagine yourself sitting in your living room. Now, take note of how many electronic devices you have around you. A few examples of what you may notice are a TV, your phone and its charger, a decorative lamp, a microwave, a coffee maker, an air fryer, a thermostat, a vacuum, a smoke detector, and other emergency systems. These devices are just some examples of what are known as Electrical and Electronic Equipment (EEE), products that are dependent on electric currents to work properly (Baldé et al., 2024). In this age where technology is indispensable to many of us, we may overlook just how many electrical devices and gadgets we use and have in our possession. As indispensable as these may be, there comes a time when we throw away EEE and add it to the ever-growing pile of e-waste.

E-Waste Generation

According to the Global E-waste Monitor (2024), the rate of e-waste generation has increased rapidly over the last few years. In 2022, there was an estimated 62 billion kg ton of e-waste generated on a global scale (Baldé et al., 2024) and it is expected

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to increase 3-4% annually (Forti et al., 2020). Where does all this waste come from you may ask? The accumulation of e-waste is complex, but it is primarily due to changes in consumer behavior and use of electronics, the diminishing lifespan of electronic devices, and the lack of reusing and recycling of electronics. As a result, e-waste has developed into a pressing environmental and health issue that requires attention.

Figure 1. Equipment Categories




1. TEMPERATURE EXCHANGE EQUIPMENT:

More commonly referred to as cooling and freezing equipment, this category comprises items such as refrigerators, freezers, air conditioners and heat pumps.



2. SCREENS AND MONITORS:

This category typically includes televisions, monitors, laptops, notebooks and tablets.



3. LAMPS:

This category typically includes fluorescent, high-intensity discharge and LED lamps.



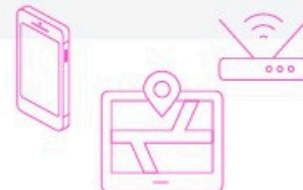
4. LARGE EQUIPMENT:

This category typically includes washing machines, clothes dryers, dishwashers, electric stoves, large printers, copying equipment and photovoltaic panels.



5. SMALL EQUIPMENT:

This category typically includes vacuum cleaners, microwave ovens, toasters, electric kettles, electric shavers, electronic scales, calculators, radios, video cameras, electrical and electronic toys, small electrical and electronic tools, small medical devices, small monitoring and control instruments, and e-cigarettes.



6. SMALL IT AND TELECOMMUNICATION EQUIPMENT:

This category typically includes mobile and other phones, personal computers, GPS devices, routers and printers.

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Consumer behavior has evolved over the years, and our use of electronics has greatly expanded. For instance, the COVID-19 pandemic led to the integration and obligatory switch to using laptops for virtual schooling, the integration of self-checkout stations at stores, and the exploration of how technology could be used to advance health. As we find new uses for technology and integrate it across various fields, then the amount of Electrical and Electronic Equipment (EEE) will increase, and inevitably, the time where they will be disposed of will follow. The lifespan of electronic devices is also decreasing. This refers to the actual durability of the product, its battery lifespan, and its functionality, its storage limit, as well as the period of ownership (Ylä-Mella, Keiski, & Pongrácz, 2022). Think about how often one may replace charging cables, upgrade phones, and buy new devices. And when we do replace these, do we recycle them? Probably not as most people do not know where to recycle their products, which adds to the pile of e-waste sitting in our homes and eventually finding its way to a landfill.

Sources:

(1) [Global e-Waste Monitor 2024](#)

(2) [The Global e-Waste Monitor 2020](#)

(3) [End-of-Use vs. End-of-Life: When Do Consumer Electronics Become Waste?](#)



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Impacts of Electronic Waste (Page 1 of 4)

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E-waste Management

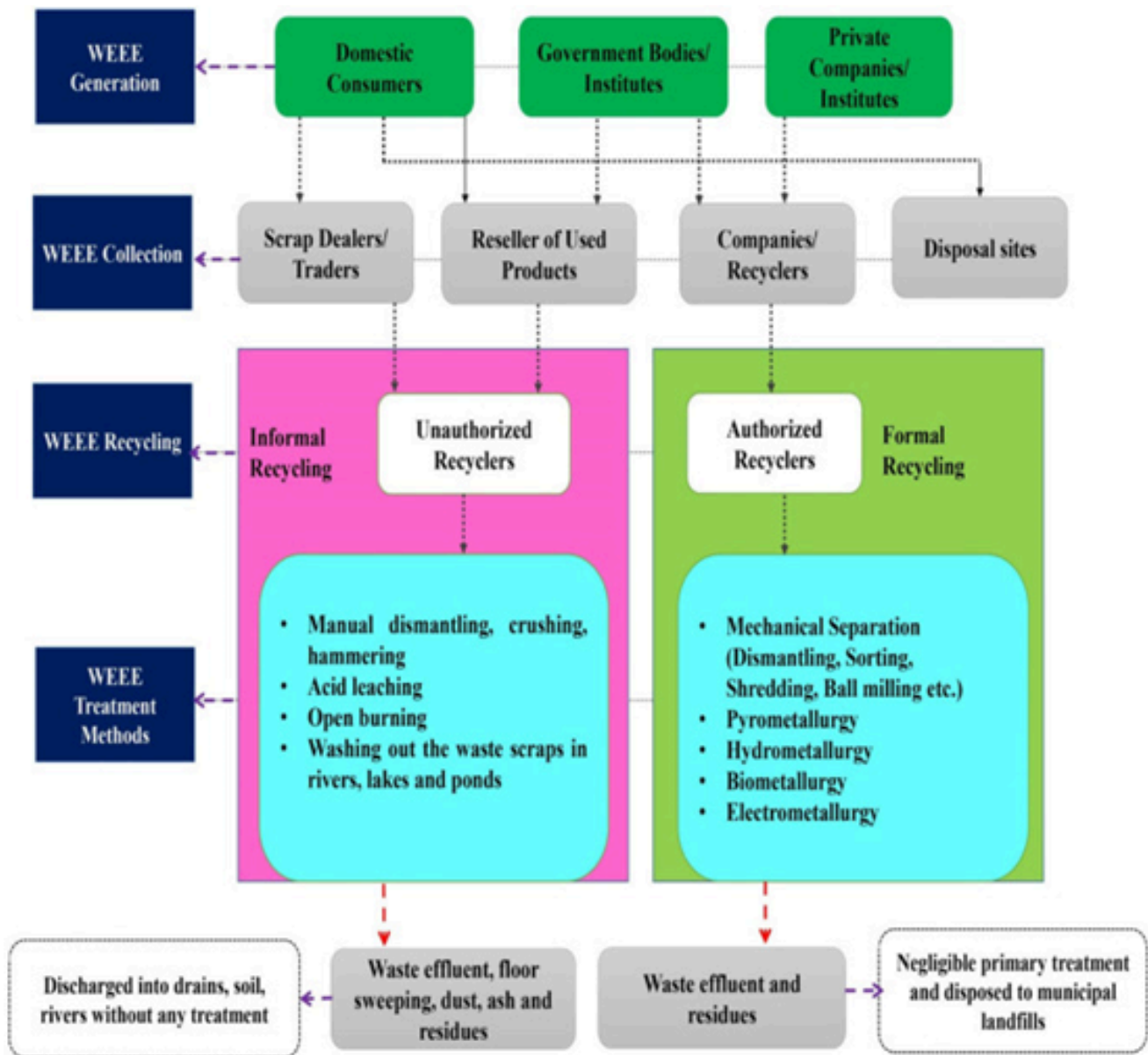
Management of electronic waste includes collection by government affiliated entities, collection by private and independent agencies, and informal collection. Formal collection of EEE is conducted by the government affiliated institutions as well as collection done by private companies. In the United States, this is done through curb side pick-ups, community collection events, take-back programs, and other local initiatives to encourage a safe disposal of e-waste (Rene et al., 2021). Formal collection and disposal of e-waste is preferred because EEE can contain hazardous chemicals and materials, posing a threat to the health of oneself, others, and the environment if disposed of improperly (Ahirwar & Tripathi, 2021).

Informal recycling of e-waste commonly occurs after individuals give or sell their e-waste to scrap dealers, traders, or resellers. Although it goes by the name of "e-waste," electrical and electronic equipment (EEE) contains valuable metals and parts that can be reused, refurbished, and recycled. Unauthorized resource recovery methods are dangerous as they generate byproducts if they incinerate, acid strip, or give acid baths to strip metals from devices (Rautela et al., 2021).

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Rautela et al. also highlights that the mass volume of e-waste generated often results in illegal exportation to countries like China, Ghana, and India for informal recycling (2021). In 2022, only about 22.3% of the world's total e-waste was formally collected and safely treated, leaving 77.7% of e-waste unaccounted for (Baldé et al., 2024). There is substantial improper disposal of e-waste, which is detrimental to the environment and human health and requires immediate attention.



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Effects on Human Health & Environmental Health

The processes of e-waste disposal can have a direct impact on human health and environmental health. Informal recycling poses risks to individuals and the environment because most waste ends up going into soil, drains, and rivers. Health hazards can come from when a person uses inadequate methods to treat waste. For example, hammering or using concentrated acids on products can create toxic fumes or lead to injuries. Failing to clean up properly is also a major issue as it is not sustainable and can cause harm if residue, like heavy metals, radioactive elements, plastic, and resin, is picked up by rain or carried by the wind (Rene et al., 2021). Informal recycling of e-waste makes it more likely that air or water be polluted, in turn endangering humans, animals, and the earth.

E-waste that is properly discarded poses fewer health risks than e-waste that was inadequately disposed of because those dismantling the items are professionals and use safer treatment methods. Although there is a risk of pollution from by-products if e-waste is treated by hydrometallurgy, pyrometallurgy, biohydrometallurgy, and electrometallurgy, the technology and process are always being researched and improved by knowledgeable and educated professionals. Another positive aspect is that safe resource recovery can prevent primary mining and excavations from occurring. The Global E-waste Monitor 2024 highlighted that the production of secondary raw materials from properly recycled e-waste helped prevent the excavation of 900 billion kg of ore through primary mining and prevented about 52 billion kg of greenhouse gas emissions from being made (Baldé et al., 2024). Extracting resources from waste rather than the Earth is called urban mining, and it is a more sustainable method to extract valuable materials. Additionally, urban mining prevents exposing workers in mines from inhaling toxic chemicals and fumes. Primary mining has been associated with several health risks, most notably with respiratory diseases (Baldé et al., 2024). Anything that cannot be salvaged after items are properly treated, then are disposed of in a municipal landfill (Rautela et al., 2021). Sadly, most e-waste that is generated is unaccounted for as mentioned previously, which calls for change, especially as we use and continue to innovate technology.

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Where To Properly Dispose of E-Waste?

If you want to formally recycle any electronics, there are various locations you can go to in Orange County. There are programs held by Best Buy stores that allow most devices and appliances to be dropped off in-store, mail waste, or be picked up. Best Buy also incentivizes proper disposal by offering discounts if you recycle items with them. Another location that accepts EEE is Goodwill. Goodwill of OC accepts working appliances as well as the Salvation Army and Habitat for Humanity sites. For non-working EEE, they can be taken to Household Hazardous Waste Collection Sites located in Anaheim, Huntington Beach, Irvine, and San Juan Capistrano. More information on where to dispose of batteries and boats, CDs, cell phones, and more can be found through the Orange County Recycle Guide.

Sources:

- (1) [E-waste management: A review of recycling process, environmental and occupational health hazards, and potential solutions](#)
- (2) [Global e-Waste Monitor 2024](#)
- (3) [OC Recycle Guide](#)
- (4) [E-waste management and its effects on the environment and human health](#)
- (5) [Electronic waste generation, recycling and resource recovery: Technological perspectives and trends](#)



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Healthy Living: How Mold can Affect Lung & Home Health (Page 1 of 3)

This week's blog is written by Briana Ancona, CAP OC's Climate Corps Fellow. They are a recent UC Berkeley graduate with interests in sustainable agriculture, local food systems and environmental health and justice.

With the onslaught of rain that has hit Southern California this past winter, mold concerns have risen amongst homeowners. According to the Environmental Protection Agency (EPA), “[m]olds are usually not a problem indoors, unless mold spores land on a wet or damp spot and begin growing,” stating that “[m]olds have the potential to cause health problems,” (EPA). Typically, mold grows in damp areas and can increase rapidly if conditions are right. Molds also produce allergens, irritants, and potentially toxic substances that can cause a variety of health problems (EPA). Several news outlets have reported mold causing illnesses in individuals, many of whom visited hospitals to no avail. It was only after they spent months wondering what the source of their symptoms was that these individuals found that mold was to blame.

For example, Women's Health published an article on how toxic mold caused unusual health symptoms in a Texan family, from frequent migraines to breathing problems to body aches and fatigue to dizzy spells (Toxic mold can hurt your health —climate change could make it worse). Mold exposure can cause symptoms in sensitive individuals that are similar to other illnesses, making it increasingly difficult to find the root cause of sickness. To avoid mold exposure, make sure your

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home is free of wet spots or areas with high humidity. Mold typically grows in moist environments and can spread rapidly if the problem is not addressed. Check areas in your living space that are prone to humidity often to ensure mold is not present.

There is also a concern for an increase in mold growth in homes due to our changing climate. With changes in weather patterns and an increase in the severity of storms hitting southern California, water damage is more likely to occur, increasing the likelihood of mold-related illnesses affecting individuals (Paudel B;Chu T;Chen M;Sampath V;Prunicki M;Nadeau KC;). Following the various storms that hit California in 2023, ABC 7 reported a spike in mold inspections due to water damage (Gonzalez, 2023). Mold can grow in as little as 72 hours which is why it is important to address any issues of excess moisture in the home as soon as possible.

Appliances like dehumidifiers and air purifiers can help prevent mold growing indoors. If you find mold present in your home, look for the source of excessive moisture and address it immediately. You should remove porous materials that have been damaged by mold to prevent further spread and toss any items with wet surfaces that cannot be thoroughly cleaned. Other ways to prevent mold growth include keeping areas with high moisture (e.g. bathrooms) as dry as possible. You can do this by running the bathroom exhaust fan until the room feels dry or opening a window to allow the moisture to escape. If your bathroom does not have a fan or a window, consider purchasing a small dehumidifier to run after showers. This can significantly decrease the chances of mold growth in your home, keeping you and your family safe.

As times change, it is important to be prepared and knowledgeable of changes that can affect your home and health. There are many educational resources available for homeowners on mold prevention and home health. Community Action Partnership of Orange County (CAP OC) also provides home modification services aimed at improving home health, including our Weatherization and Asthma Remediation programs.

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CAP OC's Asthma Remediation offers specific home modifications that can reduce asthma triggers in the home, including minor mold removal. For more information, contact CAP OC at energy@capoc.org or call (714) 893-6199.

Sources:

- (1) [Can mold cause health problems?](#)
- (2) [Toxic Mold Can Turn Your Life Upside Down—And Climate Change Might Be Making It Worse](#)
- (3) [Increased duration of pollen and mold exposure are linked to climate change](#)
- (4) [Mold growth and moisture damage becoming big concern for homeowners after recent storms](#)
- (5) [Mold and Your Home: What You Need to Know](#)



Energy Blog



Air Quality and How the 4th of July Affects It (Page 1 of 3)

This week's blog is written by Briana Ancona, CAP OC's Climate Corps Fellow. They are a recent UC Berkeley graduate with interests in sustainable agriculture, local food systems, and environmental health and justice.

The Fourth of July celebrates the signing of the Declaration of Independence, which declared the original 13 colonies independent from England and its monarchy. Year after year, families get together on July 4th to watch elaborate firework shows to celebrate.

Fireworks are made up of a mix of powdered chemicals that ignite and produce a colorful, controlled explosion. As iconic as they are, fireworks contribute heavily to air pollution and impair air quality. While most of the chemicals are burnt up in the process, fireworks and other pyrotechnics produce a lot of particulate pollution. Clean air has no harmful levels of pollutants in it whereas dirty air is filled with harmful chemicals or has been polluted. Heavily polluted air can cause risks for everyone. The quality of that air greatly affects people's quality of life; Therefore, it is valuable to understand how different factors affect ambient (outdoor) air quality.

IQAir, a leading research and clean air equipment manufacturer writes “[t]ypical types of particles that fireworks introduce into the atmosphere are PM2.5, PM10 (coarse particles ranging from 2.5–10 microns in diameter), PM0.1 (ultrafine particles, also known as UFPs, that are smaller than 0.3 microns in diameter – by far

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by far the most dangerous PM pollutant), and volatile organic compounds (also known as VOCs, airborne vapor or gaseous compounds responsible for many odors). [M]any of these particles are so tiny that they can be inhaled into the lungs where they infiltrate the bloodstream, causing many health problems (First in Air Quality).”

IQAir also notes that year after year, the air quality index (AQI) shows a spike in bad air quality on the 4th of July (First in Air Quality). In 2023, the LA Times noted that Fourth of July celebrations in several Southern California cities caused air quality to enter hazardous levels, meaning the air was heavily polluted and dangerous for everyone (2023). High air pollution or particulate exposure levels can have unintended consequences on sensitive populations. Sensitive populations are those whose health can be negatively affected by exposure to large amounts of air pollution. These often include children and infants, those pregnant, the elderly, and those immunocompromised. Polluted air can trigger breathing issues or chest tightness in individuals with asthma or other respiratory problems.

Some may argue that exposure to high pollution levels for a short period is a tradeoff to celebrate the holiday, but the health risk still presents itself. It is important to be mindful of how the environment can affect health because it can help those affected prepare. People can plan their day in anticipation of the holiday to avoid unnecessary exposure or purchase high-quality masks to protect themselves. ABC 7 recommends wearing an N95 mask to filter out pollutants or staying indoors, as indoor air quality is typically better than outdoor air (2023). They also suggested that those sensitive to pollution close windows, circulate air with the AC, and run an air purifier (Haskell, 2023).

While people cannot control the air quality outdoors, they can control indoor air quality. Exposure to lower levels of air pollution is better for heart and respiratory health. Maintaining good indoor air quality can create a safe home environment that does not trigger or worsen respiratory issues. Good indoor air quality also improves cognitive function, reduces the spread of airborne disease, and provides a safe, healthy place to rest and take a break from outdoor pollution (Kimmerling et al., 2022).

Air Quality and How the 4th of July Affects It (Page 3 of 3)

Community Action Partnership of Orange County offers an Asthma Remediation program open to all who qualify. CAP OC's Asthma Remediation offers specific home modifications that can reduce asthma triggers in the home, including minor mold removal. For more information, contact CAP OC at energy@capoc.org or call (714) 893-6199.

Sources:

- (1) [4th of July fireworks: Yay or nay?](#)
- (2) [July 4 fireworks create terrible air quality across L.A. — again](#)
- (3) [Biden-Harris Administration Announces Nearly \\$250 Million to Deliver Residential Solar, Lowering Energy Costs and Advancing Environmental Justice Across California](#)
- (4) [Doctors explain health risks to people due to poor air quality from 4th of July fireworks](#)