Sustainable Electronics
What are the issues?

Ownership of electronic and electrical products, such as refrigerators, washing machines, mobile phones, personal computers, printers, and television sets, has been rapidly increasing around the world.

Continuing technological innovation has resulted in early obsolescence of many electronic/electrical products; e.g., the average lifespan (2 yr) of a new computer in 2005 was less than half of that (4.5 yr) in 2000, and has been continually declining.

A combination of increasing ownership and shortened lifespan has led to rapid growth in the amounts of unwanted and obsolete electronics (commonly known as e-waste). It is estimated that the rate of e-waste generation globally is approximately 20-50 million tons per yr.

In addition, a major issue is the vast amount of precious metals (gold and silver) and rare earth minerals that make up components in the millions of electronic devices. Not only are these valuable resources lost when electronics are dumped in landfills but many of these are so called “conflict minerals” since much of their supply is from countries, such as the Congo in Africa, where they are mined from areas under control of militia and finance war efforts. For example, Eastern Congo produces 20 to 50 percent of the world’s tantalum. Many countries that produce electronics are now tracing their supply chains of these minerals to try to avoid conflict areas.

Management of e-waste has been recognized as a great challenge because of the following issues.
• The volume of e-waste generated.
• Toxic chemicals associated with e-waste such as heavy metals, polychlororinated biphenyls (PCBs), and polybrominated diphenyl ethers (PBDEs) pose serious risks to environmental and human health.
• Electronics also contain valuable and/or rare materials such as gold, palladium, copper, and plastics, among others, which are lost resources if thrown into landfills or not recycled properly.
• There is a relatively high cost for e-waste recycling because many products are not designed with recycling in mind. This has led to e-waste being shipped to developing countries for processing in some cases, where informal recycling may lead to environmental contamination.