

GREEN CHEMISTRY



WHAT IS GREEN TECHNOLOGY

- ▶ It is a technology which is environmentally friendly; developed and used in such a way so that it doesn't disturb our environment and conserves natural resources.
- ▶ It is also known as environmental technology and clean technology.



GOALS OF GREEN TECHNOLOGY

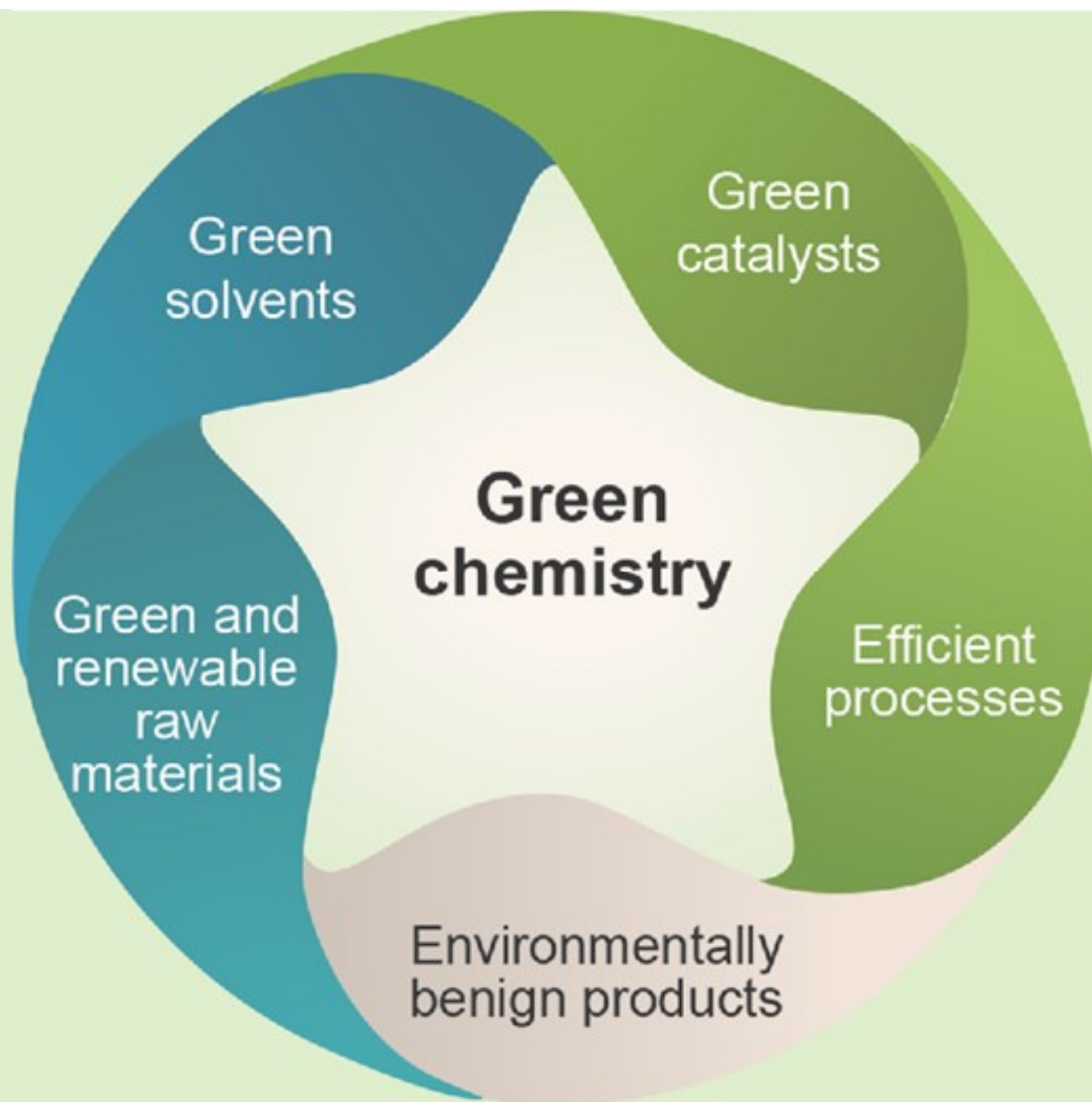
- ▶ REDUCE
- ▶ RECYCLE
- ▶ RENEWING
- ▶ REFUSE
- ▶ RESPONSIBILITY



BRANCHES OF GREEN TECHNOLOGY

- ▶ Green Chemistry
- ▶ Green Energy
- ▶ Green IT
- ▶ Green Building
- ▶ Green Nanotechnology





GREEN ENGINEERING AND PRODUCTS

- ▶ It should be emphasized that green chemistry covers engineering aspects and green products. Chemicals and materials are produced by industrial chemical processes, and therefore, clean, energy-efficient and mass-efficient processes and technologies are essential tools for achieving the goal of maximizing efficiency and minimizing wastes.
- ▶ Many current pharmaceuticals, fine chemicals, commodity chemicals and polymers are harmful. Products that are benign to human health and the environment need be designed and produced to replace hazardous products.
- ▶ Clearly, the exploration of synthetic routes, design of sustainable products and solvents, and exploration of new catalysts and chemical processes are closely related, and should be integrated. In addition, economic benefits are the central driver for the development of green chemistry and technology.

ZERO WASTE TECHNOLOGY



What is Zero Waste?

- Generally, “Zero Waste” is a philosophy of eliminating the generation of materials that have no viable or economic option for end-of-use management.
- The generation of waste can be lowered through a variety of options, including reducing, reusing, recycling, or taking appropriate action to prevent waste through design and engineering solutions.



Zero Waste Certification

All organizations use different definitions and standards in their certification programs, Waste Management has relied on the premier global standards company UL to validate the Waste Management Phoenix Open zero waste claims. UL has created definitions for Zero Waste to Landfill and a corresponding certification process, under which are three levels:

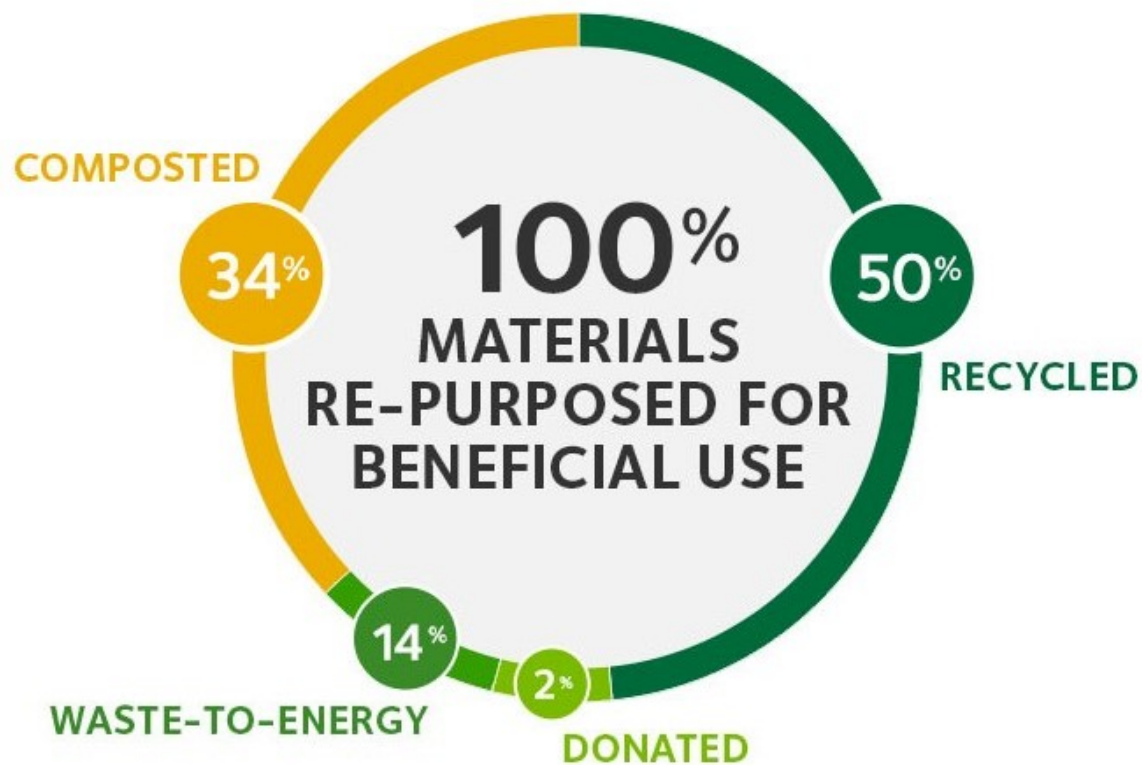
- ▶ 100% diversion from landfill - which allows some waste to go to waste-to-energy facilities
- ▶ “Virtually Zero Waste” with 98% landfill diversion - UL has other levels
- ▶ “Landfill Diversion” label - 80 percent or more of material is diverted from landfill

How is zero waste measured?

To meet UL's strict standards, the Waste Management Phoenix Open is planned year-round with zero waste in mind, and we do lots on-course to make sure waste material is reduced, reused, recycled, donated or avoided entirely (more on that here). After the tournament, Waste Management conducts audits at our recycling facilities to ensure compliance with the prescribed zero waste guidelines, and then works with UL for third party oversight and validation.



A LOT GOES INTO ACHIEVING ZERO WASTE



Is zero waste the best goal for the environment?

The answer may be more complex than you think. That's because - in the end - diversion for its own sake has no value if the materials collected for recycling and composting are not turned into worthwhile commodities that can be sold and made into marketable products. In fact, in some cases, diverting materials can increase negative impacts on the environment if a net increase in energy or emissions are a result of the diversion process. That's to say that some materials may contribute to higher greenhouse gas emissions through either the recycling and composting process, or through transportation to a recycling facility.



Three steps to waste diversion:

- ▶ Understanding: Determine the current waste streams and approximate volumes
- ▶ Measuring: Establish goals for waste diversion and building processes for diverting the waste
- ▶ Rerouting: Divert waste from the landfill whether by routing it to other facilities that can use that waste as a raw material, sending materials for recycling, or leveraging waste products for energy production

