

Waste Batteries



Batteries

Batteries are electrochemical device with stored chemical energy (a form of potential energy), that can be easily converted in electrical energy when the end of the batteries (electrodes) are connected with conductor.

Batteries are basic sources of electrical energy because they have the ability to transform the chemical energy to electrical and they can be refilled as required.

The difference between every day batteries and a car battery for example is that the car battery is electro-chemical (reversible) source of electrical energy and it can convert the chemical into electrical energy and vice versa (it can be emptied and refilled as required).



Type of batteries

- ▶ Batteries are classified in primary and secondary forms:
- ▶ **Primary batteries** are designed to be used to exhaust energy, and then discarded. Their chemical reactions are usually not reversible, so they can not be recharged. When the power supply of the reactants in the battery is depleted, the battery stops producing electricity and is useless.
- ▶ **Secondary batteries** can be recharged; that is, they can have their own chemical reactions with their electric current in the cell. This regenerates the original chemical reactants so that they can be used, complemented and re-used multiple times.

Application of batteries

- ▶ Batteries are widely used in everyday use of humans. They are all around us. Used in remote controls, cell phones, children's toys, watches and where not yet. Most of these batteries end up in a waste bin and then at landfills. Batteries contain dangerous substances like zinc, lithium, lead, cadmium and even mercury.
- ▶ Batteries that have landed at landfills can, after a certain period of time, come out and cause contamination of soil and water. This contamination is harmful to animals, man and the whole environment.



Alkaline batteries



- ▶ Alkaline battery is a device for storing electricity. In it, the active mass of the negative electrode is a plate made of porous cadmium or iron. As a positive, a nickel skeleton is used, which is filled with trivalent oxide from the same material.
- ▶ Electrolyte is a 20% solution of caustic potassium. Electrical properties are manifested through the conversion of energy from electrical to chemical and vice versa.
- ▶ The first process is called charging. The second - discharge. Charging alkaline batteries is not a problem if you use high-quality tools to keep the batteries in the working order.

Application of alkaline batteries

- ▶ Locomotives and passenger cars;
- ▶ Alarm system and emergency power supply system;
- ▶ Mining electric locomotives;
- ▶ All types of floor electrical equipment (different forklifts in warehouses and industries, for example, alkaline battery);
- ▶ For starting internal combustion engines.

Situation in Macedonia



- ▶ In Macedonia "It is prohibited to dispose of waste batteries or places in places marked for collecting and selecting municipal waste from households or other types of waste." Refers to batteries (all batteries, battery packs, buttons in the shape of a button, car batteries , industrial batteries), regardless of their shape, volume, weight, the material from which they are composed or the purpose of use. Macedonia annually collects over 300 tons of waste batteries.
- ▶ According to the research, in Macedonia, households spend 0.3 to 0.7 kg of batteries a year on average, small and medium-sized businesses from 0.6 to 0.9, and the media to 0.5 kg. At the end of 2009, there were over 30 million batteries in Macedonia that were stored improperly and pollute the environment.

Why should waste batteries and accumulators be recycled?

- ▶ Reducing the amount of hazardous waste in the environment
- ▶ Preservation of natural resources
- ▶ reducing possible risks to the environment



What can we do?

Participation of end users in reducing the negative impact of waste batteries to the environment is crucial:

- ▶ Do not dispose of refined batteries in the same place with municipal waste, thus make a way to the landfills, ie give them a direct opportunity to pollute the soil and water.
- ▶ Make sure your batteries do not affect the environment with harmful mercury by selecting silver oxide batteries without mercury or lithium-manganese batteries. Selecting products without mercury can reduce the annual use of mercury by 470 kg.
- ▶ Use rechargeable batteries and save energy (for example multi-purpose batteries are an ideal environmental alternative to conventional alkaline batteries - their use drastically reduces the number of alkaline batteries discharged)
- ▶ It is important to note that scientists have been involved in this fight with dangerous substances and are working intensively to reduce the negative impact of batteries on the environment and people. One of the innovations is so-called. Bio-batteries that generate electric current using carbonic acid breakage enzymes, in the form of glucose. These batteries apply the innate ability of organisms to receive energy from nutrients, which, instead of being used for life activities, are used to generate electricity.



**KEEP
CALM
AND
RECYCLE
BATTERIES**

Heavy metals have adverse effects on the environment and on the health of humans, animals and plants. With the breakdown of batteries, heavy metals come into the soil and groundwater, and thus in the food chain and if they ignite in the air. According to some research one kilogram of batteries permanently contaminates about 10 m³ of water and more than 100 m² of land.

A family of four in Macedonia spends more than 20 batteries a year.





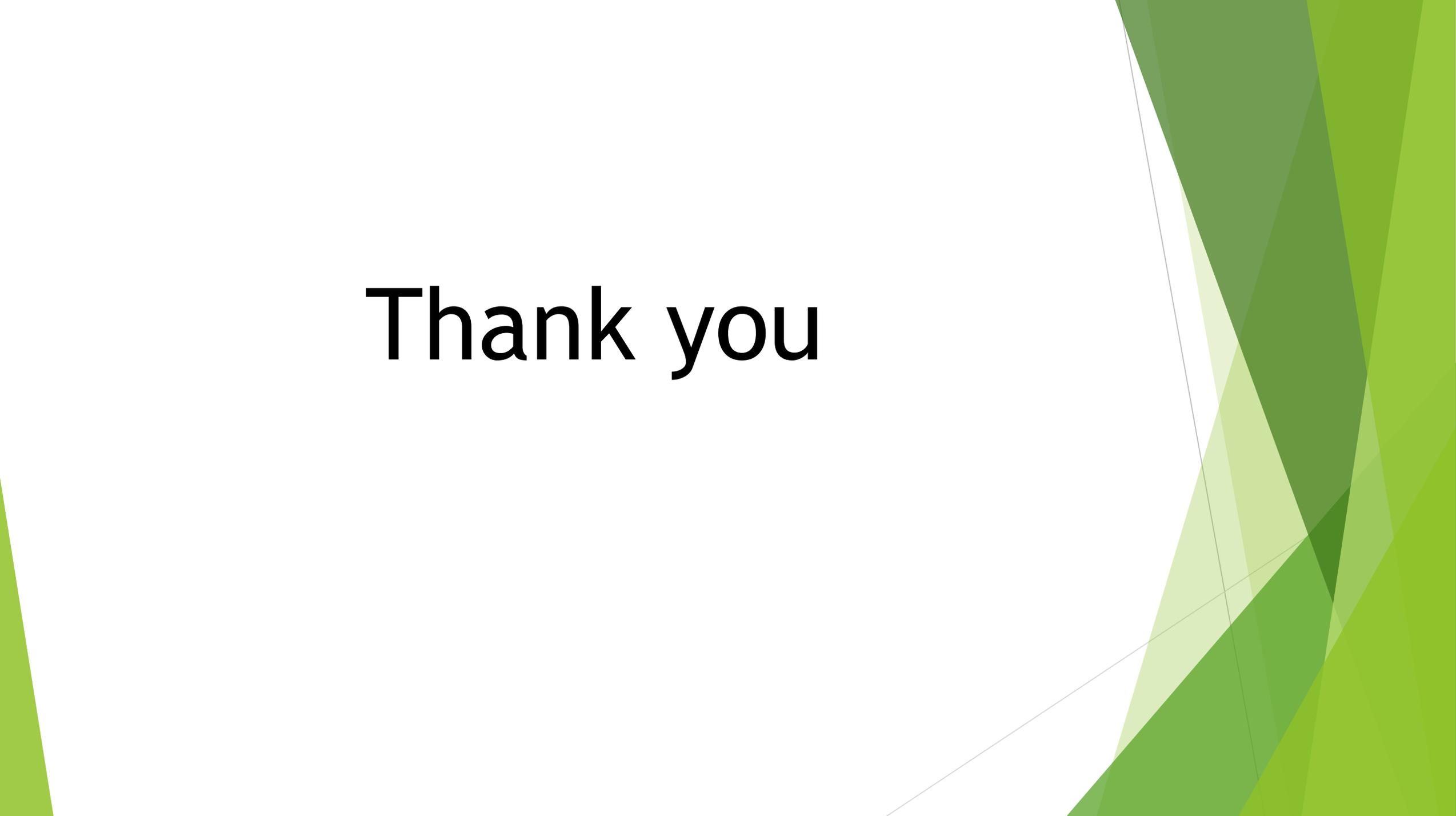
It is high time to be environmentally conscious and start recycling waste batteries.

One battery means nothing to you but it would mean a whole different world to your children!

Be environmentally conscious **RECYCLE!**

Recycle because we do not have a spare planet!!!

Thank you

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side of the frame, creating a modern, layered effect against the white background.