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BURNING ISSUES IN ECOLOGY – TIRES RECYCLING

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Think of all the things, large and small, that we use every day. None of these things lasts forever. Eventually people get rid of many everyday things from pens and paper to washing machines and automobiles. Luckily for our planet, people have found ways to reduce the amount of garbage we create. They have also figured out how to reuse or recycle much of what we used to haul off to the dump. We still make a lot of garbage, however, and people are working hard to find creative ways to deal with it.

One of the most urgent problems is tire recycling. In the United States alone, there are more than two billion used tires. That's just too many tires. If the tires were stacked one on top of the other, they'd reach halfway to the moon! In Russia it is a great problem too. Old tires are a problem for a number of reasons. First, tires take hundreds of years to decompose. Second, the tires sometimes catch on fire and can burn uncontrollably, sending toxic smoke into the air. That could be a serious danger to our health. Another problem comes from tires that are buried in garbage dumps. These tires can trap poisonous gases that would otherwise escape into the air. When the gases trapped by tires escape all at once, they can be dangerous for anyone who is nearby. Sometimes the trapped gases make the tires shoot straight up out of the ground! A good solution to tire pollution would be to reuse these tires, not bury them.

Ecotoxicity may be a bigger problem than first thought. Studies show that zinc, heavy metals, a host of vulcanization and rubber chemicals leach into water from tires. Shredded tire pieces leach much more, creating a bigger concern, due to the increased surface area on the shredded pieces. Many organisms are sensitive, and without dilution, contaminated tire water has been shown to kill some organisms.

People have come up with creative ways of dealing with the tire problem. Some companies have begun to burn tires to make energy. At first, many people were against this idea. It seemed like the smoke from the burning rubber would cause dangerous air pollution. However, scientists and engineers have found ways to control the burning process so that there is very little pollution. Burning tires can create more energy with less cost and less pollution than burning coal. As a result, some energy plants are now using up piles of old tires. For a problem this big, however, we need more than one solution.

Luckily, tires can be recycled.

Tire recycling or rubber recycling is the process of recycling vehicles' tires that are no longer suitable for use on vehicles due to wear or irreparable damage. These tires are among the largest and most problematic sources of waste, due to the large volume produced and their durability. The same characteristics, which make waste tires such a problem, also make them one of the most re-used waste materials, as the rubber is very resilient and can be reused in other products. Approximately, one tire is discarded per person per year. Tires are also often recycled for use on basketball courts and new shoe products. However, material recovered from waste tires, known as "crumb," is generally only a cheap "filler" material and is rarely used in high volumes.

· Whole tires can be reused in many different ways. One way is for a steel mill to use the tires as a carbon source, replacing coal or coke in steel manufacturing. Instead of mining coal from the ground and then burying tires in landfills, the tires are used directly. Tires are also bound together and used as different types of barriers such as: collision reduction, erosion control, rainwater runoff, wave action that protects piers and marshes, and sound barriers between roadways and residences. Entire homes can be built with whole tires by ramming them full of earth and covering them with concrete, known as Earthships.

Some Artificial reefs are built using tires that are bonded together in groups, there is some controversy on how effective tires are as an artificial reef system, and an example is the Osborne Reef Project which has become an environmental nightmare that will cost millions of dollars to rectify.

· The process of stamping and cutting tires is used in some apparel products, such as sandals and as a road sub-base, by connecting together the cut sidewalls to form a flexible net.

· Chipped and shredded tires are used as Tire Derived Fuel (TDF); this is not the same as recycling, but TDF helps to eliminate tires from our waste stream and produces a fuel source. They are used in civil engineering applications such as sub-grade fill and embankments, backfill for walls and bridge abutments, sub-grade insulation for roads, landfill projects, and septic system drain fields.

· Shredded tires, known as Tire Derived Aggregate (TDA), have many civil engineering applications. TDA can be used as a backfill for retaining walls, fill for landfill gas trench collection wells, backfill for roadway landslide repair projects as well as a vibration damping material for railway lines.

· Ground and crumb rubber, also known as size-reduced rubber, can be used in both paving type projects and in moldable products. These types of paving are: Rubber Modified Asphalt (RMA), Rubber Modified Concrete, and as a substitution for an aggregate. Examples of rubber-molded products are carpet padding or underlay, flooring materials, dock bumpers, patio decks, and railroad crossing blocks, livestock mats, sidewalks, rubber tiles and bricks, moveable speed bumps, and curbing edging. The rubber can be molded with plastic for products like pallets and railroad ties. Athletic and recreational areas can also be paved with the shock absorbing rubber-molded material. Rubber from tires is sometimes ground into medium-sized chunks and used as rubber mulch. Rubber crumb can also be used as an infill, alone or blended with coarse sand, as in infill for grass-like synthetic turf products such as FieldTurf.

Due to heavy metalsand other pollutants in tires there is a potential risk for the of toxins into the groundwater when placed in wet soils. This impact on the environment varies according to the pH level and conditions of local water and soil. Research has shown that very little leaching occurs when shredded tires are used as light fill material; however, limitations have been put on use of this material; each site should be individually assessed determining if this product is appropriate for given conditions.

Old tires and rubber products are a great problem of international importance. This paper describes some of the directions available for its solution. There are numerous developed technologies. Among them are well-known methods of grinding, which can be used to produce rubber powder as raw material for current and future technologies. New environment friendly technologies are needed. However, with so many people coming up with creative solutions, we seem well on our way to solving it. There is no doubt about that.