

Are Electric Vehicles, Solar Panels, and Windmills Environment-Friendly?

Fred Aprim

April 4, 2022

Are all the renewed energies applications good for our mother earth? Not really. Electric vehicles, solar panels, wind turbines and many other renewed energies applications require rare minerals or metals, such as Gallium, Indium, Selenium, Lithium, Cerium, Europium, Graphite, Copper etc. Some of these rare metals are used for the the vehicles dashboard screen colors, or windshields, but most of them are essential components for the electric vehicle to run and the solar panels to work.

When it comes to vehicles, the fundamental difference between the gas (thermal) vehicles and electric vehicles has to do with the process of transforming the potential (stored) energy into kinetic (movement) energy. In gas vehicles, this energy is released via the combustion engine. Meanwhile in the electric vehicles this energy is released electrochemically via the lithium-ion batteries. We know that gas vehicles emit Carbon Dioxide (CO₂). Are the electric vehicles on the other end green? Not necessarily. Some recent studies indicate that production of coal has increased in some regions, because coal is burned to charge up the new charging stations being built throughout the US, for example. While the electric vehicle might not release CO₂, but pollution might be released in some distant power plants that rely on fossil fuels to run the charging stations. Electric vehicles are not 100% CO₂ free emitters. An all-electric Chevrolet Bolt, for instance, could produce 189 grams of CO₂ for every mile driven. By contrast, a new gasoline-fueled Toyota Camry is estimated to produce 385 grams of CO₂ per mile.

Oil gets most of the criticism because many oil fields and refineries are in the view of the Western person. Rare metals are extracted far away regions and the normal person in the West does not have the whole picture of what is involved and how these metals are made available. Do industrialists and western governments care enough to investigate the source and the process involved to have these rare metals ready in the West? While experts broadly agree that electric vehicles are a more climate-friendly option than traditional vehicles, they can still have their own environmental impacts, depending on how they're charged up or what is involved in their production.

Graphite, for example, is one essential rare element. Around 70% of the world's Graphite mines and refineries is completed in China. Large fields and many villages are ruined by Graphite. People have deserted their homes because of the pollution caused by Graphite. Factories often contain radioactive substances that can emit radioactive water and dust.

Copper is an essential part of the electric vehicle. Chile is one of the biggest production countries of copper. The town of Chuquicamata has 13% of the world reserve. The copper mine close to the town is ½ mile deep and some 3 miles in diameter. The site produces 470,000 tons of fine copper. To extract and refine copper, 2000 liters/Sec water is urgently needed. In some areas near by the factory, there has been no rain in the last 500 years. Furthermore, the deeper the digging gets, the less copper is found. Thus, digging in other sites must be initiated. The copper is transferred on trains and trucks to Antofagasta on the Pacific Ocean for shipping. The whole area between Chuquicamata and Antofagasta are contaminated with copper and people have been getting sick from lung cancers and transferring the disease to future generations. The contamination on schools buildings by heavy metals has caused devastating consequences on children. 10% of the population of Antofagasta is diagnosed with lung cancer.

Lithium is abundant in Bolivia. The country has 50-60% of the world's reserves. Since the explosion in demand for Lithium, the Bolivian government has built huge factory to refine Lithium and China is a partner in the project. The Lithium is extracted from a 4000 square miles field. It is expected that Lithium in Bolivia will be a \$45 billion business. While Bolivia does not need all that Lithium, the world need to answer the question of what to do with the waste Lithium batteries. While 99% of lead-acid batteries are recycled in the US, estimated recycling rates for lithium-ion batteries are about 5%.

Norway is dominated by green energies, they are everywhere. The technology transfer to clean energy started 20 years ago. The country prides itself for being the best country in the world with its low Carbon Dioxide (CO₂) emissions. One in two cars in Norway is electric. Today there are more than 200,000 electric cars on its streets. In Oslo, the capital city, there are 400 charging stations. By 2025, Norway's plans is to have all vehicles on its streets electric. Some 8,000 charging stations will be available. Will this solve the world's current problems? It will be naive to think that the CO₂ in the air from around the world stops at Norway's borders?

Do the European politicians think where the copper will be coming from as the explosion in the demand for copper will soon be realized? Do they think about the ecological impact where the copper is extracted and refined? Electric vehicles operates by its main unit, the battery, which makes ½ of the weight of the car. Each electric car requires 175 pounds of copper for its generators, which is 4 times more than some gasoline cars. To understand the big picture, the world has used 800 million tons of copper since the dawn of humanity. With the planned expansion of electric vehicles and wind turbines, the world will need 800 million tons of copper in the coming 30 years alone. The Lithium-ion cells that power most electric vehicles rely on raw materials – like Cobalt that is largely extracted and purified in the Democratic Republic Congo (70%) – have been linked to grave environmental and human rights concerns.

China has 75% of the rare metals reserves. To produce clean energy we need rare metals and with the increase demand, we must increase rare metal demands. China does not want to be only the exporters of cheap labor and raw material. China is planning bigger. BYD, a Chinese sub-contractor of battery manufacturer has built 250,000 electric vehicles. BYD is producing 400 cars a day in its factory. China is building factories in countries around the world. China plans to have a monopoly on manufacturing of the new green world.

Windmills are labeled very green, but one wind turbine requires 20 tons of Aluminum and 500 tons of steel. The blades have limited life-span. Blades have been dumped in the fields of Germany, because companies utilizing them did not know what to do with them when they were replaced. In Germany alone 20,000-30,000 tons of blades must be recycled every year. The same is the case with solar panels waste or used panels.

What are we doing with the used Lithium batteries, solar panels, and wind blades? How will they be recycled? Consider the fact that there are no defined procedures for the recycling of most rare metals. Is the supply of copper and other rare metals indefinite? The rush demand for rare metals, lack of serious plans for their recycling and the lack of safe processes of their extraction and purification will destroy our planet. Where from will power for the increased numbers of charging stations come? There is no doubt that the world needs alternatives to Fossil fuels. However, the full affect of these alternatives on the environment and our earth must be thoroughly and collectively investigated. The Western politicians are the cause of toxifying many parts of our world in order to purify Europe and the US.