



Will it recycle?

1. What?

A Permanent Magnet Alternator (PMA) is a component from an aeroplane engine. It is an electrical machine that converts kinetic energy into electrical energy. It is used to start engines and power electrical systems. When an engine is taken out of service, these components are often discarded and not recycled.



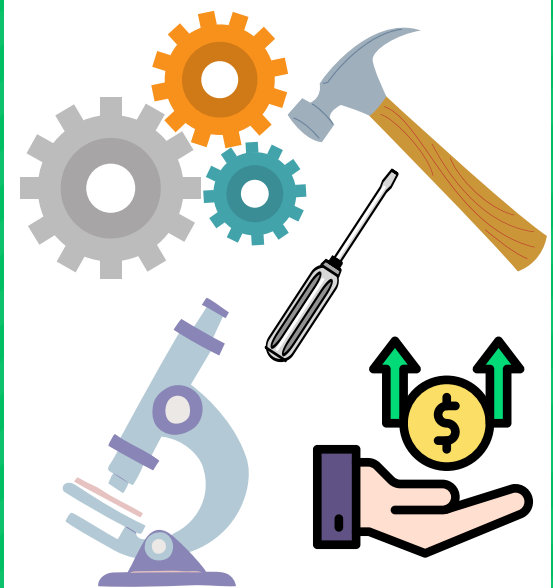
2. Why?

Lots of electrical components contain valuable materials that are considered to be finite resources. One of the key components is magnets containing rare-earth metals. These are in high demand, and mining them causes lots of damage to the environment and community.

3. How?

There are three steps in the approach:

1. Disassemble the component
2. Characterise the materials
 - using techniques such as Scanning Electron Microscopy (SEM), Energy Dispersive X-ray spectroscopy (EDX) and Differential Scanning Calorimetry (DSC).
3. Assess their recyclability
 - consider energy intensity, scalability and cost



4. Things to consider

Considerations when assessing recyclability:

- How easy is it to take apart? Could a machine do it?
- What are the different components made of?
- What is the value of the individual components?
- Can components be re-used or recycled?
- How much energy is required to recycle the components?
- Is it economically worthwhile to recycle?