

# Solar Powered Micro Forge

## Full Project Description

### **Elvis & Kresse**

Elvis & Kresse is a multi-award winning certified social enterprise and B Corp based in Kent. The founders have significant experience in R&D related to the total transformation in value of waste materials. In the case of their key raw materials the team has delivered material revaluation well beyond that sought by the original 'alchemists'. Elvis & Kresse take £0.00 value fire-hose waste and achieve a retail value of £60,000.00 / tonne, they take £0.00 value leather waste and achieve a retail value of £100,000.00 / tonne.

### **The Micro Forge Project**

Elvis & Kresse is currently working with a small research team from Queen Mary University to design an entirely novel solar powered micro-forge which will enable Elvis & Kresse to manufacture their own metal hardware (belt buckles, rivets etc.) from littered aluminium cans (approximately 16 million cans are discarded into the UK environment each year). The team has discovered that their work could have huge potential for the circular re-manufacture of many other materials, including plastic. Additionally, as this machine will work by producing concentrated heat, we are also exploring and planning to adapt its use for distributed heat, displacing the reliance on gas.

This application primarily addresses the need to decarbonise energy, business and industry. It fits very snugly into the scope of the London Design Biennale; it is innovative in the sense that there are no renewably powered (net zero) machines, which are available for less than £1000.00, that can re-manufacture pernicious litters like plastic. Equally, there are no renewably powered (net zero) heating technologies that could be easily adapted to augment a wet heating system, which cost less than £1000.00. The practical, simple machines we are designing will be radically scalable as the open source design can be 'downloaded' and built by anyone. There will be no patents and roll-out could be swift and impactful with respect to the UK's net zero goals. We are well known within the upcycling / circular economy sphere and have many collaborating organisations which are very keen to trial the prototypes. We are also a leader within the B Corp movement and have many potential roll-out partners within this growing business community. We don't anticipate negative outcomes for the environment, as this is a renewable energy innovation and we don't expect negative outcomes for society as we will embed health and safety considerations into the design. We will be able to measure our impact based on the displacement of fossil fuel based energy and the elimination of shipping as these machines are low cost, and could exist in small footprint spaces, which means local and regional manufacture can replace imports.

This project will help to 'build back better' as it is designed to ignite the use of renewable energy in re-manufacturing across the UK. By not patenting the technology we aim to move very

quickly, and have a true impact on the UK's net zero goals. The affordability focus of the project will ensure that it can have a genuine impact on helping manufacturing businesses to recover from the pandemic; they can build their own machines at low cost AND have no ongoing fossil fuel based utility costs. The behaviour we hope this will change is the over-reliance on complex supply chains which often start outside of the UK, when we have proven that UK waste materials can be easily converted into new UK goods we can shorten those supply chains and prevent a reliance on waste export. Elvis & Kresse also hopes to quickly assess the international impact of these machines. We have an established partnership with Barefoot College, a charity based in India which trains female solar engineers. Barefoot is already keen to test any technology (the build costs should make them suitable for microloans) and deploy any technology across its network of 'solar mamas' if successful. We believe that our work, particularly as it is open sourced and designed for affordability, will be fantastic for 'levelling up' within the UK and beyond. It also has the potential to generate thousands of jobs, particularly for entrepreneurs and within SMEs.

One of the key impacts of COVID-19 has been and will continue to be the fracturing and breaking of long, distant supply chains. In order for manufacturing to truly contribute to our recovery it needs to be local, affordable and scalable. We will also be working out how to adapt our micro-forge technology research (designed to tackle aluminium waste) to do two things:

1. Generate heat to decarbonise manufacturing processes that require heat less than or equal to 660 degrees celsius (the temperature we work to for aluminium). This will allow us to recycle and re-manufacture problem plastics littered in our public spaces at much lower costs than traditional recycling or 3-D printing.
2. Generate heat to reduce the need for gas in heating systems, particularly in rural areas where space is not an issue. Given that gas heating is one of the biggest threats to UK climate goals a low cost, distributed, open source technology that can displace gas will be enormously beneficial.