



Smart Eco-Highway

ENTREPRENEUR: Yvon François Tsolefack

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Smart Eco-Highway is a tech startup based in Burkina Faso that is developing an innovative device that can harness the kinetic and thermal energy of roads to produce affordable electricity for energy-strapped populations in Africa. They hope to do this using raw materials recovered from e-waste and recycled tyres, that will be recycled again once the device has reached the end of its life.

“Sometimes it’s difficult for scientists to take all their theoretical knowledge and apply it to real life. I’m always asking about how we could apply all of this knowledge to solving real life problems.”

Words by Chris de Beer-Procter; Photography by David Armel Relwende Sawadogo



ABOUT THE BUSINESS

The year was 2020 and Yvon François Tsolefack, who was completing his energy engineering masters in Burkina Faso, was searching everywhere for practical, real-world applications of the theoretical knowledge he was gaining in his studies. "They were always speaking about kinetic and mechanical energy and I wondered how I could harness this source of energy to resolve Africa's power crisis," he reflects.

One afternoon in April, the hottest month in Burkina Faso, while Yvon and a few of his friends were driving to a party, they were hailed by a broken-down taxi. The vehicle had run out of petrol and needed to be pushed. It was not an easy task, the taxi was heavy and the sun was burning down, Yvon says. But as he directed his strength towards the taxi, his attention was drawn to the road and to the potential energy that lay beneath its

hot, weighty tyres. "I realised I was witnessing kinetic and thermal energy, but where was this energy going?" he recalls. It was then that Yvon started researching if it was possible to recover mechanical and heat energy from highways to produce electricity.

Today, Yvon is the co-founder and CEO of Smart Eco-Highway, a circularity-minded startup based in Burkina Faso that hopes to harness the thermal and kinetic energy generated on Africa's highways to bring electricity to underserved populations. They plan to do this using two types of raw materials, piezoelectric which converts mechanical stress into electricity and thermoelectric materials which does the same for heat. With two years' worth of research and theory in place, they are weeks away from attempting to build their first feasible prototype.

“Waste in Africa, especially e-waste harms the environment. We plan to give e-waste a second life in our product.”

From the very beginning, Yvon was on the lookout for points of potential circularity in his business. Most notably he plans to source the majority of their raw materials from e-waste, a process which has already been fraught with the challenges of pioneering a circular business in a non-circular economy. "There are startups in west Africa who recycle e-waste, but many of them don't know that those particular materials have value," explains Yvon. By creating a demand for the materials and building relationships with e-waste companies, Yvon hopes that he can "open their eyes to all the valuable electronic components" which are often overlooked and wasted.

But the circularity doesn't end there. By recovering mechanical and thermal energy from roads, Yvon says, their device will provide a sort of cooling service for roads because heat represents one of the three major factors which reduce their life cycle. They also plan on integrating used tyres into protective covers which will increase the lifespan of the device as well as the roads they're embedded in. And then, once a device has come to the end of its life, it will be taken back to e-waste companies who will recover the raw materials for reuse. "This is how we see our circularity model," says Yvon.

The open road has long been a near-mystical setting for stories we tell ourselves about modern life, progress and dreams of endless opportunity. But for Yvon, they represent something much greater - a powerful source of energy and maybe, just maybe, an answer to Africa's power crisis.

VISION FOR THE FUTURE

"We want to prove that there is also a huge amount of energy in our roads and pavements, especially in Africa. The long-term vision is to install our devices in all major roads in all major cities in Africa to contribute to the power supply of African populations."



ADVICE ON CIRCULARITY FOR ENTREPRENEURS

“The business of waste is a business which has a very high added value. So, I would advise many entrepreneurs, especially youths, to develop their interest in this business.”

There is huge potential for value in the textile industry, for example. The business of waste is a gold mine especially in Africa where our waste management is poor. Young people should get involved and add value into our economies.

