# INTRODUCTION TO TWERLY STREET LIGHTS

Nikolas Jankovich-Bèsàn has been an entrepreneur his whole life, from the day that he can remember selling produce at the side of the road as a young boy, to building a successful investment brokerage that offered advice to investors looking at investing their money, or to teaching his young children and their friends how to create food security in one of the harshest environments, the Karoo, by building bee hives and growing fruit trees and olives or planting vegetables and then selling the produce to local shops and the surrounding community.

All of this and more has been achieved by developing a work ethic that comes not only from hard work, but from using the God-given resources that are freely available to us all, such as the soil that we can plant our veggies in, the sun that makes our plants grow, the water that we drink and feeds our plants, the wind that blows freely through our hair and brings us the rain that we need when we need it most. So when Nikolas was first introduced to the Twerly Street light as a concept, all that he was shown was a scaled model of what it could look like and what it's potential could be. On that day and in his mind, the Twerly Street Light had already been manufactured and was already lighting the streets of rural & urban South Africa, bringing "GREEN" off-grid power to the people.

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That journey started exactly two years ago after his visit to the East London International Convention Centre where he was first introduced to the Twerly by Mary-Ann Chetty, Senior Manager, Department of Innovation Support and Technology Transfer at the Nelson Mandela Metropolitan University (NMMU). He wasted no time in making contact with the NMMU so that they could enter into discussions that would ultimately allow him the opportunity to take the Twerly Concept to Commercialization. After successfully completing a comprehensive business plan that included a marketing and sales plan as well as a skills development plan that would enable previously disadvantaged South Africans to participate in the development of the next generation of off-grid energy power supply, he was awarded the project.

It was agreed that a company be established, Twerly Street Lights (PTY) Ltd, to allow for potential BBBEE partners (equity partners), as well as to create an entity that all who worked to make the company as success could benefit from these success through a share incentive/part ownership in the company. There are many skills development opportunities that exist within the company, from welding, to manufacturing specialist parts, to assembly, installation and maintenance of the Twerlies.

The Twerly Street Light has been designed in such a way that it is modular by nature. All of the parts that make up the whole can be easily added or removed from the pole (mast) should they be damaged or need to be maintained. The energy that is harvested from the wind is done so by the use of a vertical axis wind turbine

(VAWT). Through the VAWT, wind speeds as low as 6m/sec can generate enough power to re-charge the Twerly batteries. The sun's energy is harvested using photovoltaic (PV) panel/s. The PV panel/s also switches the light on when the sun sets or off when the sun rises. This is achieved using technology designed by the engineers at the NMMU and is called the Master Power Point Tracker (MPPT). All of the data that is accumulated by the Twerlies' MPPT is then sent using GSM/Wi-Fi technology to a central offsite database management solution that resides on a server for ongoing analysis and observation. This technology allows the Twerly team to remotely track, manage and monitor the VAWT, PV Panel, Batteries and LED of every Twerly that they install. Furthermore, they are able to pinpoint every Twerly on a map using the Twerly Dashboard on a web interface that they are currently building. This technology makes the TwerlyTM somewhat more expensive than some of their competitors; however the upside of having this technology imbedded in their product is that they are able to offer their customers a robust product that can be managed remotely, thus reducing unnecessary maintenance costs and loss of equipment due to theft or vandalism.

Thankfully, the East London Industrial Development Zone (ELIDZ) was offering seed funding for the development of new technology, specifically originating from the Eastern Cape, and the Twerly easily met all of the criteria. The seed funds offered by the ELIDZ allowed Nikolas and the very capable engineering team at eNtsa (NMMU), who had made the TwerlyTM their project for the


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last five years, to go to work and build a commercially viable, renewable, off-grid street light that could serve the street lighting needs of those communities that were completely off the grid and had no immediate hope of being placed onto the ESKOM grid.

Last year, Nikolas successfully entered the Global Cleantech Innovation Program (GCIP), which provided the platform for him to showcase the Twerly Street Light, both locally and abroad, as a Cleantech innovation that was designed and developed in the Eastern Cape and is also being manufactured in the Eastern Cape. The Twerly reached the finals of the GCIP process and was rewarded by being in the top eight innovations in the competition.

The Twerly team is currently holding discussions with Dave Lello, CEO of Khaya Power, to assist with the re-charging of the Juz boxes (batteries) that are used to light up houses in informal settlements and low cost houses where there is no electricity supply to the house. The partnership that they are looking into will make the "Twerly Power Tower"---- an off-grid, renewable energy power source and power supplier that will recharge the Khaya Power Juz boxes (batteries) that are used to light up households using an LED light and to power a cooker that Khaya Power has designed and developed as an alternative solution to paraffin burners. This initiative will bring low cost power to low income households, offering them an alternative to candles and toxic paraffin cookers. The Twerly Power Tower will also mean that all of the renewable technology that the Twerly currently offers in the form of wind generated (VAWT) and solar power (PV Panel) will be kept safe at the top of the Twerly mast, thus the


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name, the Twerly Power Tower. All of the power that will be needed to recharge the Khaya Power batteries will be harvested using renewable energy provided by the wind and the sun – a completely off-grid power solution that benefits the poor in an affordable way.

The Twerly Street Lights will revolutionize the way that we light up our streets, using an alternative “green” energy that is freely available to us all. The Twerly technology has been designed and developed and is ready for immediate use in areas that do not have access to the electricity grid. Furthermore, the Twerly offers Government Departments and Municipalities an alternative solution that will not draw energy from the grid, thus saving electricity while still lighting up the streets.

There are many additional benefits that the Twerly offers, including the potential to deliver secure, sustainable and fully integrated street lights, Wi-Fi communications, video surveillance and micro-enterprise utility services in disadvantaged communities through a single "tower of green power" utilizing South African hybrid wind and solar energy technology.

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