Ren Energy Solutions has partnered with Sunshine Seedlings Services in the EEP funded Midlands Biogas Project to install a 110 kW biogas digester at Sunshine’s nursery near Pietermaritzburg in KwaZulu-Natal, South Africa. The biogas plant was completed in October 2017 and has started producing biogas.

EEP committed support for this new and innovative technology (IBR) which was developed at the University of Utah in the United States, and for which Renen Energy has secured an African exclusivity licence. The technology looks and operates in a vertical configuration unlike most commercial digesters and allows for high performance processing of certain waste streams with a minimal ecological footprint and hydraulic retention time (HRT). The tall silo-like tanks are fed continuously with a waste stream entering the bottom of the tank. The waste passes through a sludge blanket, inoculating it thoroughly and allowing it to make its way naturally through the tank with rapid biological action. The thorough inoculation of digestate allows for a target HRT of only 5-6 days with 50% solids reduction.

The biodigester is fed with a combination of cattle manure from a nearby feedlot and green nursery waste from Sunshine Seedlings – who supply the forestry industry with approximately 66 million seedlings per year. The majority of the biogas will be used to generate electricity for the seedling nursery as well as heating the green houses. Some of it will also be used for the cooking and hot water heating needs of the 30 families on the property. It will also provide to an oils distillery which has been erected adjacent to the biogas plant. The fertiliser generated by the plant will be a substantial contributor to the income potential of the plant. The liquid organic fertiliser outputs will be used in the nursery and the digested solids will be bagged and sold after being processed in a rotating drum composter that has been designed and developed by the Renen team in conjunction with XLB Engineering.

The expected success of this project is built on the strength of the team. While Renen has brought the technical expertise, Sunshine Seedlings added significant value, not only as the full off-taker of energy, but a successful seedling nursery who will be trialing the effluent (solids and liquids) to certify its value as an alternative fertiliser. The United Nations Industrial Development Organisation (UNIDO) has committed further support to the ongoing project to ensure that third-party results ratification can be undertaken, and to assist in identifying the next 10 sights for establishment.

The Midlands Biogas Plant includes a 110 kW Combined Heat and Power system, while relatively small, it is specifically designed to provide fertiliser, gas, heat and power alternatives for medium to large agricultural operations – of which there are thousands in South Africa. These farms are fraught with power security problems and are responsible for pollution in the form of chemical fertiliser use and animal waste being washed into natural water courses. Projects like the Midlands Biogas Project provide a decentralised opportunity for sustainable power, organic fertiliser and pollution avoidance. Renen is convinced that decentralisation of services is pivotal to Africa’s future and will continue to seek opportunities to realise its implementation.