



Preventing Environmental Pollution using Microorganisms and a Smart Algorithm

An Israeli company has developed a novel technology that positions waste treatment at the doorstep of the circular economy era: “We are capable of transforming organic waste into the building blocks of sustainable agriculture while producing renewable ‘green’ energy without harming natural resources”

Agam Kedem Levi, partnered with SGTech

“Livestock waste is responsible for approximately 14% of overall global greenhouse gas emissions,” says Marat Voldman, COO at SGTech, an Israeli start-up which developed a groundbreaking treatment process for livestock waste. “Currently, this waste is commonly used as fertilizers, but in recent years the extensive pollution resulting from its use as fertilizers has reached worrisome levels. The organic matter of the waste, especially the nitrogen and phosphorus together with greenhouse gas emissions in the form of methane and nitrogen dioxide, saturates the soil and pollutes the groundwater.”

In Europe and the U.S., the increasingly strict regulations for treating livestock waste substantially limit the economic advantage of conventional anaerobic digestion treatment – a biological process that fragments the organic matter in the waste by using microorganisms in an oxygen-free environment. Anaerobic treatment transforms the waste into two main outputs: biogas, which is a source of stable renewable energy that is available year-round regardless of the weather, and digestate.

However, Voldman explains, the anaerobic digestion (AD) treatments commonly used today do not provide a sustainable solution. Production of renewable energy from waste creates digestate, which is an undesirable by-product. “The product of AD treatment, digestate, contains large concentrations of phosphorus and nitrogen, which cause considerable pollution to the soil, the groundwater and the air. SGTech’s revolutionary technology for treating livestock waste helps solve this problem, as it does not create harmful digestate.”

High-tech waste treatment

SGTech defines itself as a technology company that is intent on bringing the advantages of high-tech, big data and artificial intelligence to the field of agricultural waste treatment. The company developed an advanced algorithm that is a significant leap from the traditional anaerobic treatment process: it is capable of providing a sustainable solution for agricultural waste.

“We are actually a company that operates according to software-as-a-service (SaaS),” explains Shimshon Horn, the company’s CEO. “We offer licenses for using our algorithm and technology to companies building livestock waste treatment facilities. Thanks to our technology, they can substantially reduce the amount of greenhouse gas emissions as well as the peripheral environmental pollution of the waste treatment process.”

According to Voldman, the company’s most significant advantage lays in its deep understanding of managing microorganisms responsible for the biological treatment. “We have the ability to constantly manage the microorganisms responsible for the biological treatment. We know what happens at each stage of the biological process and can control it in a nearly perfect manner. The algorithm we developed is capable of managing the biological treatment with minimal hands-on intervention, thereby obtaining much better results than other solutions currently on the market.”

According to the company, the technological process it developed is able to produce 30% more energy, reduce around 60% of the greenhouse gas emissions, and remove up to 80% of the nitrogen and 60% of the phosphorus – compared with the removal of just 30% for other solutions currently available. The solution proposed by SGTech perfectly suits the goal of reducing greenhouse gas emissions as well as the global renewable energy production targets. “Some of the systems in the market are capable of either increasing energy production or reducing pollution,” says Horn, “but there is no comprehensive solution capable of improving both indices at the same time, certainly not by such large amounts.”

Indeed, the company’s system produces cleaner, higher-quality digestate than ever before, which can be used as an excellent and environmentally friendly agricultural fertilizer. Horn: “We succeeded in making the digestate so clean that it can even be disposed to the urban sewage systems.”

SGTech is located in Netanya and employs a multi-disciplinary team. The company successfully completed the development of its technology, and plans this year to broach its initial target market in Europe. “We designed a holistic solution,” Horn elaborates. “We can successfully handle the agricultural waste, produce renewable energy, reduce greenhouse gas emissions and prevent environmental pollution – all while complying with regulatory requirements.”

Responding to a global need

In the last few decades, the global agricultural industry has been facing a huge challenge: supplying food to the world's population while preserving natural resources. Environmental regulations in the U.S. and Europe require all livestock farm owners to provide a comprehensive solution to the various pollution issues, including the soil, water reservoirs and greenhouse gas emissions. Existing waste treatment facilities are unable to treat large quantities of waste without harming the environment.

According to estimates, in the United States alone, 8,000 additional biogas facilities are needed to treat the amounts of livestock waste produced. Throughout Europe, tens of thousands of facilities are needed. "In the U.S., one cannot receive permission to continue running a livestock business without an agricultural waste and by-product treatment facility," Horn points out. "A farmer who can't prove that the digestate can be treated won't be able to sustain livestock."

"Countries want food security, but today one cannot maintain a farm anywhere without dealing with the digestate. We are able to open this bottleneck and create sustainable agriculture," he affirms.

The solution offered by SGTech aspires to reach zero emissions while at the same time taking full advantage of the materials in the production process. The by-products are recycled and provide nutrients to the soil without harming the groundwater or the soil and without creating air pollution. In addition, the technology also reduces greenhouse gas and produces sustainable renewable energy, thereby transforming the agricultural waste into a revenue source. This process meets the WBA (World Biogas Association) standards and recommendations.

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