



The project aims to explore how technology could form a symbiotic relationship with nature. | Photo source Nicole Marnati

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DESIGNER POWERS SERVER WITH ENERGY FROM TOMATO PLANTS

 COMPUTING & TECH

The design swaps the batteries in server systems with living plants to highlight how technology could form a symbiotic relationship with nature

Spotted: Ilja Schamle, a design graduate from the Eindhoven [Design Academy](#) in the Netherlands, has created a project to highlight how renewable energy derived from tomato vines could be used to run a cloud server.

The project aims to explore how technology could form a symbiotic relationship with nature. In turn, the heat generated by the computer offers optimal growing temperatures for the tomatoes. The design was exhibited at the Missed Your Call graduate exhibition at Milan Design Week.

According to Schamle, the system, which is named Warm Earth, is designed for a hypothetical apocalyptic future (or utopian depending on how you look at it) that requires people to rely on living plants as an alternative source of energy.

“Having the whole internet run on plants, it wouldn’t be possible with the way that we’re using servers right now and how much content there is,” Schamle explains. “We wouldn’t be able to function in this way and that is a very harsh reality. It can help us understand how much energy is needed to run these systems and how far detached we are from them.”

Schamle envisions tomato plants living within traditional server rack cabinets. Tomatoes and servers would be connected by the ventilation shaft, with a fan helping to funnel the hot air from the computer, turning it into a greenhouse for the tomatoes. It also aims to highlight the concept of reclaiming data centres from being foreign entities and bringing these back into our homes.

Simultaneously, the tomatoes would provide energy to the computer through plant-microbial fuel cell technology which turns the vegetables into batteries. The technology has been developed by researchers at Wageningen University in the Netherlands and uses the excess sugars and proteins left over from photosynthesis.

These excesses are released from the roots as waste and broken down by the bacteria in the soil. Once broken down, the energy is released as electrons that can then be harnessed as electricity. These electrons are then caught by a grid placed in the bottom of the plant pot, which acts as a conductor.

The server currently has enough energy to host one single website. Poetically speaking, the server brings to the fore questions about how our network infrastructure impacts the natural environment.

Written By: Katrina Lane

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Takeaway:

Lights and batteries powered by plant-microbial fuel cells are already in development. With further development it is possible that the technology could be scaled up to generate enough energy to power small buildings. However, when we consider that in 2019, global centre electricity demand **amounted to 200 terawatt-hours** (that's more than the yearly carbon emissions emitted by pre-coronavirus air travel), this process alone is not sufficient. That said, the design powerfully demonstrates how nature and technology can co-exist and work together in the 21st century.