

Title: Biogas power plants**Wolfgang Bauer**, Michigan State University, USA**Abstract**

Biogas power plants are a renewable power source, which is not intermittent, if deployed properly in concert with appropriately sized storage tanks. Therefore, biogas power plants have the ability to firm intermittent renewable power sources (wind farms, solar arrays) without the need for fossil fuel backup generation or large-scale battery storage solutions. These renewable power plants can convert organic waste into electricity, heat, and high-quality organic fertilizer. This organic waste can be of a wide variety, such as food scraps, food preparation waste, discarded produce, cooking oil, grease, restaurant waste, and even animal excrements. Alternatively, the feedstock for biogas power plants can also be dedicated energy crops, most frequently maize/corn, but also other cereals, sweet sorghum, grasses, and any other energy crop with a high yield. The efficiency of harvesting solar radiation energy through growing energy crops and converting them into energy for transportation is up to a factor of 3.8 higher than converting the same energy crops to transportation fuel via the bioethanol distillation process.

Biography

Wolfgang Bauer obtained his Ph.D. in Physics in 1987. He joined the faculty at Michigan State University in 1988, with a dual appointment at the National Superconducting Cyclotron Laboratory. In 2007 he was named University Distinguished Professor. He has served the university in various administrative roles: Chairperson of the Department of Physics and Astronomy 2001-2013, Founding Director of the Institute for Cyber-Enabled Research 2009-2013, Senior Consultant 2013-2018, and Associate Vice President for Administrative Services since 2018. For the last decade his primary research interests have been in renewable energies and mitigation of global warming. He is one of the authors of the MSU Energy Transition Plan. Dr. Bauer serves on various Boards in the USA and Europe. His numerous awards include the 1992 US Presidential Faculty Award, the 1999 Alexander-von-Humboldt Foundation Distinguished Senior U.S. Scientist Award, and Fellowship in the American Physical Society in 2003.