

## Overview of Agri-Energy Research at Saginaw Valley State University

Christopher Schilling, Ph.D.  
C. J. Strosacker Professor and Chair of Engineering  
Saginaw Valley State University  
University Center, Michigan

In February 2010, *Science* magazine reported that the world faces an unprecedented challenge of meeting projected increases in food demand, given record constraints in agricultural and financial resources. At the same time, *Mechanical Engineering* magazine warned of a second challenge that world energy demand is expected to double between now and 2030. Because fossil energy is so vital to the mass production of food, it's no surprise these two industries are today forming creative, strategic partnerships to solve two problems at once: rebuilding the energy infrastructure while using less fossil fuel to feed the world. Along this line, researchers at Saginaw Valley State University are focused on the following agri-energy projects:

- Transforming Michigan crop residues into solid biofuels and biodegradable plastics.
- Biofuel from glycerin wastes of biodiesel processing.
- Sustainable intensification by integrating aquaponics with renewable energy.
- Modeling geothermal heating in partly subterranean greenhouses of Asian design.
- Economic prospects of re-tasking waste management operations with greenhouse agriculture.