

# Microorganisms one part of the solution to energy problem, says report

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The answer to one of the world's largest problems – the need for clean, renewable sources of energy – might just come from some of the world's smallest inhabitants – bacteria – according to a new report, *Microbial Energy Conversion*, released by the American Academy of Microbiology.

"Imagine the future of energy. The future might look like a new power plant on the edge of town – an inconspicuous bioreactor that takes in yard waste and locally-grown crops like corn and woodchips, and churns out electricity to area homes and businesses," says Judy Wall of the University of Missouri – Columbia, one of the authors of the report.

Or the future may take the form of a stylish-looking car that refills its tank at hydrogen stations. "Maybe the future of energy looks like a device on the roof of your home – a small appliance, connected to the household electric system, that uses sunlight and water to produce the electricity that warms your home, cooks your food, powers your television and washes your clothes. All these futuristic energy technologies may become reality some day, thanks to the work of the smallest living creatures on earth: microorganisms," Wall says.

The world faces a potentially crippling energy crisis in the next 30 to 50 years, according to the report. Additionally, the burning of fossil fuels and the resulting release of carbon dioxide and combustion pollutants have brought about global climate change, the effects of which we are only beginning to understand. The means of preventing the twin

catastrophes of energy scarcity and environmental ruin are unclear, but one part of the solution may lie in microbial energy conversion.

The primary method of microbial energy conversion highlighted by the report is the use of microbes to produce alternative fuels. The report describes in detail the various methods by which microorganisms can and are being used to produce numerous fuels including ethanol, hydrogen, methane and butanol. It also discusses the advantages, disadvantages and technical difficulties of each production methodology as well as outlining future research needs. The report also focuses on the relatively new field of microbial fuel cells, in which bacteria are used to convert food sources directly to electrical energy.

"The study of microbial fuel cells is in its infancy, and yield and current density are low in today's systems, but the potential to make great leaps of progress in yield and performance is great," says Wall.

Source: American Society for Microbiology

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