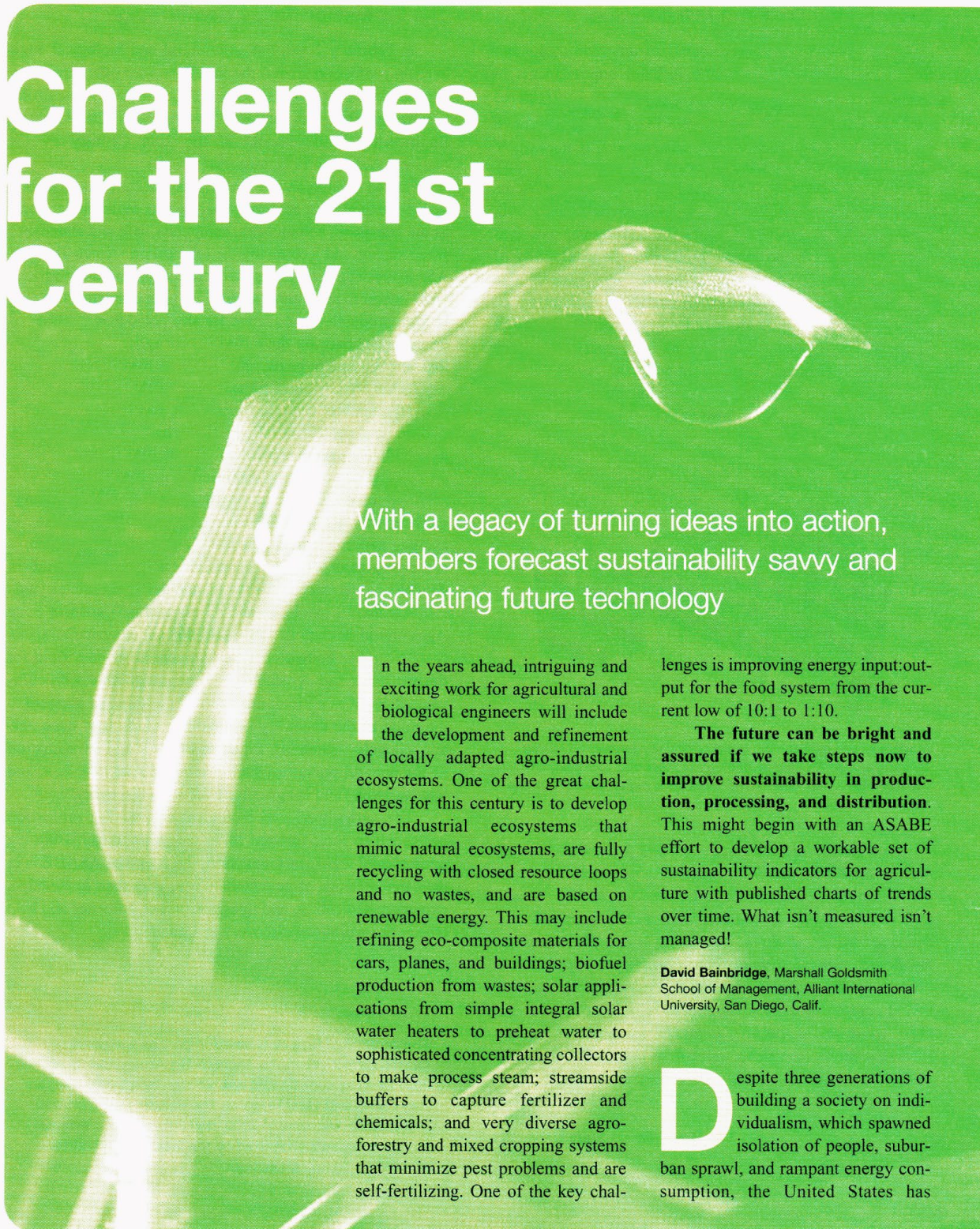


# Challenges for the 21st Century

A pair of hands, one in the foreground and one in the background, are holding a pair of glasses. The background is a solid green color. The hands are rendered in a semi-transparent, glowing style, making them appear to be holding the glasses from behind. The glasses are a simple, modern design with thin frames.

With a legacy of turning ideas into action, members forecast sustainability savvy and fascinating future technology

In the years ahead, intriguing and exciting work for agricultural and biological engineers will include the development and refinement of locally adapted agro-industrial ecosystems. One of the great challenges for this century is to develop agro-industrial ecosystems that mimic natural ecosystems, are fully recycling with closed resource loops and no wastes, and are based on renewable energy. This may include refining eco-composite materials for cars, planes, and buildings; biofuel production from wastes; solar applications from simple integral solar water heaters to preheat water to sophisticated concentrating collectors to make process steam; streamside buffers to capture fertilizer and chemicals; and very diverse agroforestry and mixed cropping systems that minimize pest problems and are self-fertilizing. One of the key chal-

lenges is improving energy input:output for the food system from the current low of 10:1 to 1:10.

**The future can be bright and assured if we take steps now to improve sustainability in production, processing, and distribution.** This might begin with an ASABE effort to develop a workable set of sustainability indicators for agriculture with published charts of trends over time. What isn't measured isn't managed!

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Despite three generations of building a society on individualism, which spawned isolation of people, suburban sprawl, and rampant energy consumption, the United States has