



*Raphael Katzen*

# RAPHAEL KATZEN

1915–2009

Elected in 1996

*“For the advancement of biotechnology for chemicals  
from renewable resources worldwide.”*

BY DONALD JOHNSON

**R**APHAEL “RAY” KATZEN, leading visionary on fuels and chemicals from renewable resources and founder of the foremost cellulosic ethanol consulting firm, Katzen International, passed away in July 2009, 16 days short of his 94th birthday.

Dr. Katzen was born in Baltimore, Maryland, on July 28, 1915, to Isidor and Esther (nee Stein) Katzen, and was raised in New York, New York. He had one brother, Saul, who preceded him in death. Ray achieved his bachelor’s, master’s, and doctoral degrees, all in chemical engineering, from the Polytechnic Institute of Brooklyn (now the Polytechnic Institute of New York University). After teaching chemical engineering at the institute for a short while, Dr. Katzen began a long industrial career, starting as director of research for Northwood Chemical Company. Later, he joined the Diamond Alkali Company as technical supervisor in research and development and then moved on to manager of the Engineering Division of Vulcan Copper and Supply Company, which became Vulcan Cincinnati during his tenure.

While at Vulcan, Ray's engineering group designed and oversaw the construction and operation of an ethanol-from-wood plant in Springfield, Oregon, part of the federal government's program to produce ethyl alcohol for synthetic rubber during World War II when natural rubber supplies from the Far East were cut off. This and the other fermentation alcohol plants were either sold off or shut down after the war, victims of the superior economics of petrochemical-derived ethanol. The experience broadened Ray's expertise in biochemical processing, expertise that he had been gaining along his career path. Through Vulcan he gained international experience, especially in Cuba. Ray designed the Bacardi family's first modern distillation system in Santiago, Cuba, which led to an enduring friendship and business relationship with the Bacardi family.

Dr. Katzen resigned from Vulcan and formed his own consulting company in 1953. He took on partners and, as the group acquired international business, it evolved into Raphael Katzen Associates International, Inc., in 1955. In 1997 Ray and his wife of 71 years, Selma, sold their interest in the company, RKAIL, that was doing business on every continent and currently has 135 processes in 40 countries around the globe. Ray did not retire, though, for he was only in his early 80s. He and Selma set up a small independent consulting company in Bonita Springs, Florida, where they also resided and, until his death, traveled to meet with clients around the globe.

Ray was a registered professional engineer in 16 states. He was a member of the American Institute of Chemical Engineers (AIChE), the American Chemical Society (ACS), the Technical Association of the Pulp and Paper Industries, the American Institute of Chemists, the Pulp and Paper Technical Association of Canada, the advisory board of the annual Chemical Process Industries Exposition (Chem Show), and the Board of Fellows of the Polytechnic Institute of Brooklyn.

Ray was truly a pioneer in the renewable fuels effort and the cellulosic ethanol area in particular. As stated by Phil Madson, president of Katzen International: "Where the world is today with ethanol was very clear in his [Ray's] mind in the 1940s.

I think he has challenged more people in this field, scientists, engineers, owners, bankers, lawyers, and government officials, than any other one person has ever challenged the industry.”

Dr. Katzen was elected to the National Academy of Engineering in 1996 “for the advancement of biotechnology for chemicals from renewable resources worldwide.” He was a fellow of the AIChE, a trustee of the AIChE Foundation, and a member of AIChE’s Legacy Society. In 1986 he was honored by AIChE with the Award in Chemical Engineering Practice and in 2001 received the institute’s Founders Award for Outstanding Contributions to the field of chemical engineering. In 2008 he was recognized by the U.S. Department of Energy as the first recipient of its Raphael Katzen Award in recognition of his distinguished contributions to the deployment and commercialization of fuels and chemicals production from renewable feedstocks.

Ray also received a Lifetime Achievement Award in 1999 from the Renewable Fuels Association, a Special Lifetime Achievement Award in 2000 from the ACS, and the first Award of Excellence for Outstanding Technical Achievements at the Sixteenth Annual Fuel Ethanol Workshop.

Notwithstanding all the awards and achievements Dr. Katzen received, he will likely be remembered most by those who attended seminars, conferences, and technical meetings with him for the penetrating and insightful questions he always asked after a presentation, ensuring that the wheel would not be reinvented, that the economics made sense, and that the science or technology being presented was soundly grounded with credible data. He will be sorely missed in the bioprocess industries, but his legacy will live on in a flourishing renewable fuels and chemicals industry stimulated by his decades of inspiration and leadership.

His daughter wrote that:

In addition to his wife, Selma, Ray is survived by his daughter Nancy and her husband, Dick; grandchildren, Andy, Chris (Amy), Kim (Frank); and seven great grandchildren, Savannah, Casey, Jasmin, Bryce, Jackson, Sophia, and Dylan. Ray loved to travel and he

and Selma took their daughter on many trips to Cuba, South America, and Europe and later they took their grandchildren on various trips from Hawaii to Europe and South Africa, instilling in all of them a love of travel and adventure. He passed on to them a desire to excel with the determination and belief that they could realize their dreams. Their memories include his brilliant mind, his ready laugh, his positive attitude and his famous red Stuart tartan Christmas suit (jacket, pants, vest, tie) that he wore each year for more than 40 years.

Ray also loved his BMWs, participating in many races at the track in Midway, Ohio, and took many family members and friends on white-knuckle new car demonstration rides. Ray was always an optimistic person who looked forward to the future. His only regret may have been that he always wished that he would outlive Fidel Castro so that he could return to Cuba where much of early business began. He loved his family, friends, and peers deeply and they loved him back. He will be missed by his family and friends throughout the world. He was truly a unique person.

