Highlights from the Washington Biotechnology & Biomedical Association's (WBBA) "Emerging Biomass Innovation" program held Tuesday morning, April 27

In a program designed to highlight the state's most innovative discoveries, technologies and innovation that Washington has to offer, four panelists discussed the opportunities and challenges of biomass development as part of the WBBA's Breakfast for Success Life Science Innovation Series.

Alternative fuels produced from algae, seaweed and other natural sources may result in substantial benefit to the Northwest, including treatment of industrial wastewater, increased crop production and growing synergy between the life sciences and information technology.

The trick is to find and fund commercialization strategies that recognize customer-driven needs and a defined route to the market place.

The panelists were Margaret McCormick, general manager, bio-based materials for Targeted Growth; Rick LeFaivre of the University of Washington Center for Commercialization; Rose Ann Cattolico, a UW research biologist; and Linda Beltz, director of Technology Partnerships/Open Innovation at Weyerhaeuser. The discussion was moderated by John Gardner, vice president of Washington State University's Office of Economic Development and Extension and a member of the Washington Clean Energy Leadership Council, and helping to lead the charge for alternative energy technologies in Washington state.

The group agreed that the biomass funding landscape is multi-faceted, involving a combination of public-private partnerships, including venture capital, private equity and grants from the U.S. Department of Energy. There also was consensus that the geography of the Northwest works to its advantage and that forest sustainability is critical to industry growth.

Dr. Cattolico, having studied the physiology of algae for more than 30 years, is convinced the plant life found in oceans and ponds can be a major source of environmentally friendly fuels for everything from cars and lawn mowers to jet airplanes. Cattolico said biomass is critical on a global basis because of its potential for solving challenges to energy, food and water security. She said that new strains of algae from both nature and the laboratory may help alleviate these and other challenges.

“Identifying algae nutrients from wastewater streams and utilizing them in the production of biofuels or secondary products,” Dr. Cattolic said, “not only benefits energy production, but also results in a water track that has been cleared of nutrients.”

Dr. Beltz said Weyerhaeuser is seeking biomass applications for the Northwest’s abundance of land and forests. She predicted growing cooperation between agriculture and forestry in activities such as inter-cropping, where a secondary energy crop may be grown on the forest floor before it is covered by the canopy of mature trees.

Dr. LeFaivre, who also serves as a venture partner at OVP Venture Partners, said “A bridge exists in the Northwest between biomass and information technology, as people from both fields embrace the green movement.”

“We have people with strong talents in both information technology and biomass who want to have an impact,” Dr. LeFaivre said. “It’s part of the culture of our region.”
Dr. McCormick cited her company’s development of camelina, a renewable fuel feedstock, as a major breakthrough in alternative fuels for jet propulsion. Recently, a 50-50 blend of camelina-based fuel combined with traditional jet fuel powered a 90-minute flight of a U.S. Air Force A-10C Thunderbolt II. It was the first time that an airplane was powered by conventional and biomass-based fuel in all engines.

Camelina is a domestically-grown, non-food crop with extremely high oil content that results in an 84 percent reduction in greenhouse gases, compared to a mere 20 percent for ethanol. It is drought tolerant, requires less fertilizer and herbicides and an excellent rotation crop with wheat.

Dr. McCormick said camelina represents a fuel source that is molecularly similar to petroleum – a quality her company now emphasizes in its research and investments.

Other points made by panelists included:

- A call for state government to provide incentives to enable Washington to compete for biomass manufacturing facilities, predicted to be one of the nation’s strongest growth sectors in the next 30 to 40 years.
- A need for a carbon tax to even the playing field for biomass to compete against less expensive, petroleum-based fuels. “Something must be done from a public policy standpoint,” Dr. Faivre said.
- A major issue facing biomass, according to Dr. Cattolico, is “efficient scale-up” to produce mass quantities of organisms required for significant production of fuels, feeds and energy.
- Successful commercialization strategies for biomass energy alternatives must fall into one of three categories: generation, storage or efficiency – “All three require different commercialization strategies,” Dr. Faivre said. “Who is the customer and what is the route to get to that customer?”