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Dr. Nancy W. Y. Ho received her Ph.D. from Purdue University's Department of Biological Sciences. After completing her studies, she remained at Purdue to further research on the methods for the study of DNA. Since 1980, she has focused her efforts on using recombinant DNA techniques to improve industrial microorganisms. Her most noted work has been the development of recombinant Saccharomyces yeast, widely known as the Ho-Purdue yeast, which can effectivelyproduce cellulosic ethanol from all types of cellulosic plant materials – such as corn stalks, wheat straws, wood, and grasses. Her lab at Purdue University continuously improves the yeast to make it to produce cellulosic ethanol even more efficiently. Ho foresaw the need to have a global company to produce and market the yeast as well as to provide other services for cellulosic ethanol production. Dr. Ho founded Green Tech America, Inc. in West Lafayette, Indiana in 2006. Its immediate mission is to commercialize the best Ho-Purdue Yeast developed at Purdue University for the production of low-cost renewable fuel ethanol from cellulosic biomass. It will also continue to develop and market new co-products producing derivatives of the Ho- Purdue yeast, making industrial cellulosic ethanol production a prosperous business and making renewable transportation liquid fuel a sustainable reality. On March 23, 2011, Purdue University launched its the Difference Makers website: www.purdue.edu/ difference makers. Dr. Ho was honored to be one of the five difference makers in energy: http://www.purdue.edu/differencemakers/energy.html>.

Title: Technologies Are Ready For Cost-Effective Production of Cellulosic Ethanol by Yeast-Based Biochemical Conversion

Abstract: After the first worldwide energy crisis in the 1970's, the US government agencies strongly focused on supporting the development of technologies for the production of ethanol from non-food renewable resources (ligonocellulosic biomass). The efficient production of such ethanol, known as cellulosic ethanol, from cellulosic biomass requires effective microorganisms that are able to convert all sugars, particularly the major sugars glucose and xylose, to ethanol. Effective pretreatment/hydrolysis processes to convert the polymers of cellulosic biomass to fermentable sugars are needed as well. In order to achieve the latter, inexpensive cellulases for the conversion of cellulose as well as enzymes for the conversion of hemicellose to fermentable sugars (depending upon the pretreatment process) must be developed. These technologies are now a reality. Since 1980, my laboratory at Purdue University has developed effective Saccharomyces yeast that efficiently ferment not only glucose, but also xylose, as well as other minor sugars to ethanol. Our current yeast has been used by industry to produce cellulosic ethanol, albeit still in small scale. Green Tech America, Inc. (GTA), of which I am the Founder and President, has been established to closely collaborate with Purdue University to market and continue improving the yeast for more cost effective cellulosic ethanol production. Our recently developed new yeast can convert nearly 90% of all glucose and xylose to produce nearly 10% ethanol within 48 hrs. Using the hydrolysates provided by one of the companies specializing in effective pretreatment and hydrolysis processes, we will demonstrate that our yeast can ferment the hydrolysates containing high concentrations of glucose and xylose very effectively. Our yeast will be made to produce high value

co-products, which allows producing two types of valuable products in a single process. For example, various industrial enzymes can be the co-products of cellulosic ethanol production. These new yeast may dramatically lower the cost to produce cellulosic ethanol. Thus, now is the time to ramp up industrial cellulosic ethanol production. We predict industrial production of cellulosic ethanol will soon become cost effective and very profitable.