

STATEMENT OF CONSIDERATIONS

REQUEST BY E.I. DU PONT DE NEMOURS AND COMPANY (DUPONT) FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN PATENT RIGHTS UNDER DOE CONTRACT NO. DE-FC36-07GO17056; W(A)-2008-012

The Petitioner, DuPont, has requested a waiver of domestic and foreign patent rights for all subject inventions arising from its participation under the above referenced cooperative agreement entitled "Improvement of *Zymomonas Mobilis* for Commercial Use in Corn-based Biorefineries."

The objective of the agreement is aimed at the development of improved organisms for the fermentation of mixed 5-carbon and 6-carbon sugars for use in processes to convert cellulosic biomass to fuel ethanol. The objectives of this project include improving the current recombinant *Zymomonas mobilis* strain to meet commercial targets of yield, titer, and rate on corn stover hydrolysates, increasing the yield from ~ 75% to 90% of ethanol from fermentable sugars, increasing ethanol titer from ~7% to 10%, and increasing the rate of production from ~ 1 g/L/hr to 2 g/L/hr.

The total anticipated cost of the agreement is \$7,914,928, with Petitioner providing 53 % cost share, totaling \$4,194,912. This waiver is contingent upon the Petitioner maintaining, in aggregate, the above cost sharing percentage over the course of the agreement.

Petitioner has an organization of over 150 researchers dedicated to industrial biotechnology, including biofuels and cellulosic ethanol. Petitioner has extensive experience in metabolic engineering of fermentative organisms to produce industrial materials, most notably propanediol, which it has successfully commercialized in a 100 million pound per year facility. Petitioner has been working in the field of cellulosic ethanol, and fermentative organisms for the production of cellulosic ethanol since 2003 and Petitioner has significantly advanced the state of the art of 5-carbon and 6-carbon sugar fermentation.

The subject of this agreement is cellulosic ethanol, which is an emerging technology, and in which there is as of yet no established commercial industry. Petitioner has made a public commitment to be a major participant in the development and commercialization of biofuels. Petitioner has invested over \$6,000,000 to develop and improve the *Zymomonas mobilis* organism, as well as processes for its use. Petitioner has engaged over six full-time equivalent scientists for over four years, as well as licensing key enabling technologies to support the improvement of the organism. Further, Petitioner has dedicated the use of multiple laboratories and has purchased analytical equipment to support this research. In addition to its investment in the *Zymomonas* organism, Petitioner has spent approximately \$14,000,000 over the last four years developing related technologies necessary to use the organism to produce cellulosic ethanol, involving the efforts of over 15 additional full-time equivalent researchers.


The commercialization of cellulosic ethanol will require abundant private funds and must overcome steep technological and financial risks. There are large financial requirements for process development, pilot plant construction, and building and operating a commercially viable

demonstration plant. Those entities developing and commercializing technology will therefore need to be assured of having a protected proprietary position to make a return on their investment. Granting this waiver will enable Petitioner to ensure for itself and its potential licensees that it will have a competitive position that encourages the necessary investment. Therefore, granting this waiver is an important component of accelerating broad deployment of this important technology.

Petitioner has agreed that this waiver shall be subject to the march-in and preference for U.S. industry provisions, as well as the U.S. Government license, comparable to those set out in 35 U.S.C. 202-204. Further, Petitioner has agreed to the U.S. competitiveness provisions as attached to this Statement. In brief, Petitioner has agreed that products embodying intellectual property developed under this agreement shall be substantially manufactured in the United States, and that Petitioner will not license, assign, or otherwise transfer any waived invention to any entity unless that entity agrees to these same requirements.

Referring to item 10 of the waiver petition, granting the requested waiver should not significantly impact the competitive market space in cellulosic ethanol technology, and because the acquisition of the waiver rights is not expected to place Petitioner in a dominant position in the field. There are a number of competitive fermentative organisms which are being developed and are suitable for use as alternatives. These are primarily recombinant yeasts, but also include at least one recombinant *E. coli* bacteria. Several of these are being developed and improved in parallel under DOE grants to serve this market. Entities developing such organisms include Mascoma Corporation, Purdue University and Verenium Corporation. The intellectual property Petitioner expects to create under this contract is anticipated to be specific to *Zymomonas mobilis*, and as such would not restrict either the further development or commercialization of these alternative organisms. Additionally, the market for cellulosic ethanol is expected to be so large, over 20 billion gallons by 2020, that there is ample space for multiple competitors to succeed. Therefore, granting this waiver will not result in diminished competition; rather, it will enhance competition by enabling Petitioner to enter this competitive space.

Considering the foregoing, it is believed that granting this waiver will provide Petitioner with the necessary incentive to invest its resources in commercializing the results of the agreement in a manner that will make the above technology available to the public in the shortest time. Therefore, upon evaluation of the waiver petition and in view of the objectives and considerations set forth in 10 CFR 784, all of which have been considered, it is recommended that the requested waiver be granted.


Julia Cook Moody
Patent Attorney
Golden Field Office

Date: 5/20/08

Based upon the foregoing Statement of Considerations and representations in the attached waiver petition, it is determined that the interests of the United States and the general public will best be served by a waiver of patent rights of the scope determined above, and therefore the waiver is granted. This waiver shall not apply to any modification or extension of the agreement, where through such modification or extension, the purpose, scope, or cost of the agreement has been substantially altered.

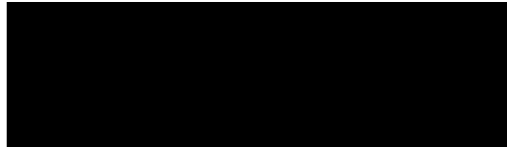
CONCURRENCE:



Jacques A. Beaudry-Losique, Program
Manager
Office of Biomass Program
EE-2A

Date: 12-11-08

APPROVAL:



Paul A. Gottlieb
Assistant General Counsel for Technology
Transfer and Intellectual Property

Date: 12-12-08

U.S. COMPETITIVENESS

The Contractor agrees that any products embodying any waived invention or produced through the use of any waived invention will be manufactured substantially in the United States, unless the Contractor can show to the satisfaction of DOE that it is not commercially feasible to do so. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., recoupment of the Government's investment, etc. The Contractor further agrees to make the above condition binding on any assignee or licensee or any entity otherwise acquiring rights to any waived invention, including subsequent assignees or licensees. Should the Contractor or other such entity receiving rights in any waived invention undergo a change in ownership amounting to a controlling interest, then the waiver, assignment, license, or other transfer of rights in any waived invention is suspended until approved in writing by DOE.