STATEMENT OF CONSIDERATIONS

CLASS WAIVER OF U.S. AND FOREIGN PATENT RIGHTS IN INVENTIONS MADE BY LARGE BUSINESS SUBCONTRACTORS DURING THE PERFORMANCE OF WORK UNDER THE BIOENERGY SCIENCE CENTER (BESC) AT OAK RIDGE NATIONAL LABORATORY UNDER DOE CONTRACT NO. DE-AC05-00OR22725; W(C) 2012-004 [ORO-806]

In June 2007, the BioEnergy Science Center (BESC), led by UT-Battelle, LLC (UT-Battelle), Management & Operating Contractor for the Oak Ridge National Laboratory (ORNL), was awarded $25 million per year for five years for its successful proposal submitted in response to Department of Energy (DOE) Funding Opportunity Announcement DE-PS02-06ER64304. The ORNL BESC is one of three Bioenergy Research Centers funded by DOE's Office of Science. BESC focuses on the fundamental understanding and elimination of biomass recalcitrance— the resistance of cellulosic biomass to enzymatic breakdown into sugars. BESC approaches the problem of biomass recalcitrance from two directions by closely linking (1) plant research to make cell walls easier to deconstruct and (2) microbial research to develop multitalented biocatalysts tailor-made to produce biofuels from this modified plant material in a single step.

Since June 2007, BESC has been pursuing the following research areas:

1. Biomass formation and modification: Develop a thorough understanding of the genetics and biochemistry of plant cell wall biosynthesis so the process can be modified to reduce biomass recalcitrance.
2. Biomass deconstruction and conversion: Develop an understanding of enzymatic and microbial biomass deconstruction, characterize and mine biodiversity, and use this knowledge to develop superior biocatalysts for consolidated bioprocessing (CBP).
3. Characterization and modeling: Develop a high-throughput (HTP) pretreatment and characterization pipeline that enables study of the structure, composition, and deconstruction of biomass to elucidate the underlying causes of recalcitrance. Apply cross cutting science to integrate the knowledge gained using chemical, spectroscopic, and imaging methods and computational modeling and simulation. This approach will harness the power of systems biology to overcome biomass recalcitrance.

The BESC currently has eighteen members comprising primarily universities, small businesses, other DOE national laboratories, and several nonprofit organizations. A list of current (and anticipated) members is attached in Appendix A. DOE provides BESC funding directly to ORNL and ORNL awards subcontracts to the various BESC members for the BESC Program work. Funding for BESC at present is expected to continue until September 30, 2012.

On September 16, 2011, in response to a DOE request, BESC submitted a renewal proposal to the DOE Office of Science requesting an additional $25 million a year for another five years beginning October 1, 2012. The proposal sets forth the justification for a five-year extension of the program. As a result of the advances made to date by BESC, the integrated disciplinary and institutional foundation established over BESC's first 4 years, and BESC's singular thematic focus, BESC is in a unique position to (1) bring to fruition the comprehensive efforts aimed at advancing understanding of the fundamentals of the multiple dimensions of recalcitrance, (2) develop and field-test less recalcitrant biomass feedstocks, and (3) realize the potential of microbial cellulose utilization. The BESC program will continue to examine the combined benefits of plants and microbes engineered to overcome recalcitrance, and to evaluate milder biomass pretreatments that are tuned to the properties of new feedstocks and biocatalysts.

BESC's research goals are enabled by strong relationships with leading industrial biotechnology members involved in both producing and processing cellulosic feedstocks. For example, BESC member Ceres has initiated field trials on a genetically modified herbaceous feedstock (switchgrass) for which ethanol yields from greenhouse-grown plants exceeded controls by 25%. Another member, ArborGen has played an instrumental role in developing and field-testing engineered *Populus* species and in deploying improved woody feedstocks. In the next 6 months, Mascoma Corporation plans to break ground on a 20 million gallon cellulosic ethanol plant that will utilize recombinant cellulase-producing yeasts developed with partial support from BESC. DuPont, a leader in next-generation biofuels and bioproducts, has a conversion process under commercialization for cellulosic ethanol from corn stover. DuPont plans on joining the BESC team and will test improved BESC feedstocks using its technology and, as warranted by bench performance, progress into process-development unit evaluations.

As part of the proposed project, BESC members have executed an Intellectual Property Management Plan (IPMP) which specifies how the intellectual property resulting from the funded work will be protected, allocated among the BESC members, and commercialized. The BESC IPMP is attached as Appendix B. The IPMP indicates that each BESC member will own any inventions made under their subcontracts with ORNL. Furthermore, the IPMP contains the following provision which states that DOE may issue a waiver for entities who are not small businesses or non-profits:

> *The Federal Non Nuclear Energy Act of 1974, 42 U.S.C. 5908, will govern disposition of title for all other parties, regardless of whether they receive government funding, and it requires that the Government obtains title to new inventions unless a waiver is granted.*

As stated above, during the final year of the first five years of funding, Dupont plans to join BESC. It is also possible that other for-profit large businesses may become subcontractors under BESC if the funding for the program is extended for another five years.

Thus, it is intended for this Class Waiver to cover not only the subject inventions of any for-profit large business subcontractors made during the current BESC funding period, but for subject inventions made by such subcontractors during any subsequent five year renewals funded by DOE.

Rights to Inventions

As mentioned, per the IPMP, intellectual property resulting from the BESC work will be protected and allocated between ORNL and the BESC members and commercialized. Accordingly, this Class Waiver waives title to subject inventions to those BESC subcontractors (other than small businesses and non-profit organizations) who agree to substantial U.S. manufacture of resulting technology or provide other acceptable economic benefit to the U.S. Cost sharing is not a requirement under the subcontracts, but each subcontractor is expected to have at least an in-kind contribution. The Class Waiver will put these subcontractors in the same position as small business and non-profit BESC members with respect to ownership of subject inventions so that members will be able to commercialize the inventions in a way to achieve the goals of the BESC. This waiver is subject to the government license, march-in rights, and other restrictions and obligations set forth in Sections 202-204 of P.L. 96-517 as implemented by applicable regulations.

BESC subcontractors subject to this Class Waiver also agree 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 subcontractors 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.

Granting of this Class Waiver should have little effect on competition and market concentration due to the fact that there are several competing technology options for biofuel production being developed and commercialized.

Accordingly, in view of the Congressional and statutory objectives to be obtained and the factors to be considered under DOE's Statutory Patent Waiver Policy, all of which have been considered, it is determined that this Class Waiver will best serve the interests of the United States and the general public. It is therefore recommended that the waiver be granted.

[redacted]

Emily G. Schneider
Assistant Chief Counsel for Intellectual Property
Oak Ridge Office

4/25/2012
Date

Pursuant to the authority provided in Section 152 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2182), Section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974, as amended (42 U.S.C. 5908), and the implementing regulations promulgated there under for waivers of patent rights, it is concluded that it is in the best interests of the United States and the general public to grant a waiver of patent rights to the ORNL subcontractor members of the BESC Program other than small businesses and non-profit organizations who agree to substantial U.S. manufacture or provide other acceptable economic benefit to the U.S. Therefore, the waiver of U.S. and foreign patent rights to the class of subcontractors as described in the foregoing Statement of Considerations is hereby granted. The waiver is subject to all the limitations, terms and conditions set forth in the foregoing Statement of Considerations. The Assistant General Counsel for Technology Transfer and Intellectual Property shall be responsible for issuing instructions for implementation of this waiver in accordance with DOE regulations for waiver of patent rights.

CONCURRENCE

[redacted]

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Program Manager
DOE Bioenergy Research Centers
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05/09/2012
Date

APPROVED:

John T. Lucas
Assistant General Counsel for Technology Transfer
And Intellectual Property (GC-62)

5/15/2012
Date