



Project Goal (Please provide description of project goal in 250 words or less.):

To organize, promote, and conduct a 1 ½ day educational workshop that will illuminate science, engineering, environmental, and economic challenges that must be addressed to establish viable biomaterials & bioenergy platforms. We will have experts in their respective fields provide us topical lectures updating the advancements, gaps, and future work on-going or necessary to supplant the current petroleum-based economy with one that is biomass-based. The 1 ½ day workshop will feature a set of 6 speakers/1 ½ days (4 in the morning, DAYS 1 & 2, and 2 in the afternoon, DAY 1 only), informal coffee break time for discussions, three panels that include expert lead panelists, and a wrap up that will focus on outcomes including future objectives/projects. It will target not only scientists working in the field, but high school and college students who hunger for knowledge about ways to create a sustainable energy economy. We will also heavily focus on getting media coverage (NPR, Raleigh N&O newspaper, advertisement on NCSU & VaTech university web sites, www.biosucceed.com, facebook, blog site, etc.) so as to be able to use this symposium to communicate to the public the potential of bio-based energy and materials.

Describe the innovative aspects of the project:

This project will be the first of its kind in the CELL Division to address a very timely, engaging, and important topic, i.e., the rational use of biomass for advanced applications, by the use of a workshop format. We intend to structure the overall workshop to be small, focused, and very interactive so that the educational value is maximized. We will involve local high schools and 4 year liberal arts college teachers and students (including, but not limited to: Broughton H.S., Green Hope H.S., Meredith College, St. Augustine's College, North Carolina A&T, and North Carolina Central) in the workshop to effectively increase their understanding of the state-of-the-art and potential for sustainable bioenergy & biomaterials. The involvement of students and teachers will be active, as we will include student panel discussions of the issues raised in the workshop. This project will also have provide a final survey (hardcopy & surveymonkey.com) to gauge the effectiveness of the workshop and allow the participants to develop future workshops, proposals for other media for enhancing student awareness and participation in the project topic, and a review of the work going on at the host site (NC State University) including, but not limited to a visit to the facilities, instrumentation, and personnel). A number of the concepts at play will be derived from the successful USDA-funded initiative known as *BioSUCCEED* (see www.biosucceed.com) which we can introduce to the participants during the last day of the workshop. All 6 papers that will be presented will have the opportunity to be published in an issue of *Cellulose* that features advances in lignocellulosics research and reviews of related pertinent topics. Finally, the results of the conference (compilation of surveys, panel discussion summaries, and path(s) forward will be disseminated on www.biosucceed.com for all of the workshop participants).



Project Background:

The rational use of biomass to supplant petroleum is a complex and important topic which is the subject of much current research. The realization of a biomass-based economy requires integration of multiple complex steps, and must also be judged in relation to other sustainable approaches. It is crucial for scientists, teachers, students, and the general public to understand the state of the art, the challenges ahead, the potential vs. other routes, and the chances of success.

The CELL Division has maintained a strong commitment to doing science that not only educates, but also has practical benefits. CELL organized a very successful workshop co-sponsored with EPNOE, the European Network of Polysaccharide Research under the traditional format of a series of talks to the participants in the national meeting held in Salt Lake City. Results were very encouraging. It was apparent that CELL, with its membership at 1300 members, can reach out much more.

However, under the auspices of the present project, this special workshop will build on that history by providing an educational forum that will help a number of students and secondary instructors appreciate the challenges and hurdles that must be overcome to achieve practical implementation of biomass conversion strategies to materials and energy, and to begin to participate in their solution. For the CELL division, the biorefinery-based economy offers an excellent opportunity for membership growth, and for growth in service to the ACS and to society. Finally, the topic is extremely timely given the fact that recent and future national meetings organized by the ACS encompass the Chemistry for a Sustainable World and the Chemistry of Renewable Materials.

Project Outline:

Overview:

We will assemble a group of 6 expert speakers over one and half days on special topical areas. The southeastern US is a prime location for the developing biorefinery science and industry and therefore a large participation from the Southeast can be expected. The following format is envisioned:

The workshop will be held at the McKimmon Center in Raleigh, North Carolina to best accommodate a group of up to 200 attendees from Southeast high schools, community colleges, and colleges. We will specifically target student participation by advertising through our CELL Division site and membership list, *BioSUCCEED* sites (including *facebook* & *blog*), and by directly contacting Southeastern Universities, Colleges, and area high schools in VA, NC, SC, GA. Special efforts will be in place to reach out minority communities, including African-American, Native American, and Hispanic communities. The funding from ACS, CELL, and NCSU will help to keep conference fees low at a symbolic rate of \$10/student and \$25 for non-student (professionals, retired). We plan to provide a buffet-style lunch and coffee throughout the workshop.

Proposed format for the workshop:

DAY 1

- 8:30 A.M. COFFEE & DOUGHNUTS
- 8:45 A.M. INTRODUCTION & OVERVIEW OF PROGRAM & TODAY'S AGENDA
- 9:00 A.M. PROPOSED SPEAKER 1: Arthur J. Ragauskas
Chemistry & Biochemistry
Georgia Institute of Technology
901 Atlantic Drive
Atlanta, GA 30332-0400
- “Challenges of a Biomass-Based Economy: Science & Technology”
- 9:45 A.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 10:00 A.M. PROPOSED SPEAKER 2: Timothy G. Rials
Department of Forestry, Wildlife and
Fisheries
University of Tennessee Agricultural
Campus
2506 Jacob Drive
Knoxville, TN 37996-4750
- “Challenges of a Biomass-Based Economy: Life Cycle Analysis,
Environmental, and Economics”
- 10:45 A.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 11:00 PANEL DISCUSSION; Panelist leader: Charles Buchanan (Eastman
Chemical Co.)
- 12:00 BUFFET STYLE LUNCH CATERED
- 1:30 P.M. PROPOSED SPEAKER 3: Stephen S. Kelley
Department of Forest Biomaterials
North Carolina State University
Campus Box 8005
Raleigh, NC 27695-8005
- “Emerging Biomass Substrates and Technology Platforms”
- 2:15 P.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 2:30 P.M. PROPOSED SPEAKER 4: Michael E. Himmel



National Renewable Energy Laboratory
1617 Cole Blvd.
Golden, CO 80401-3305

“The Reality and the Myth of the Biorefinery”

- 3:15 P.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 3:30 P.M. PANEL DISCUSSION; Expert Panelist leader: Hasan Jameel (NC State University)
- 4:30 P.M. CLOSE OF DAY 1

DAY 2:

- 8:45 A.M. COFFEE & DOUGHNUTS
- 9:00 A.M. PROPOSED SPEAKER 5: Catchlight Energy, LLC Representative (or Robert Eckert/Weyerhaeuser)
- “Challenges of a Bioenergy-Based Economy: Science & Technology”
- 9:45 A.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 10:00 A.M. PROPOSED SPEAKER 6: Richard Phillips
Department of Forest Biomaterials
North Carolina State University
Campus Box 8005
Raleigh, NC 27695-8005
- “Challenges of a Bioenergy-Based Economy: Life Cycle Analysis, Environmental, and Economics”
- 10:45 A.M. SURVEY & COFFEE BREAK (Discussions encouraged)
- 11:00 PANEL DISCUSSION; Panelist leader: Richard Venditti (NC State University)
- 12:00 P.M. Final Survey, Conclusions, Path Forward, Small Group Student-Led NC State Facility Visit



Objective:

We will help to increase the awareness of the challenges associated with a bio-based economy by identifying the key technological, environmental, and economic hurdles that must be overcome. As a result of this workshop, discussion, panel participation, and surveys, we will be able to provide participants with a real appreciation and knowledge of how they can help educate their students and prepare them for the future.

Detailed Budget: justify the expenses for the funds requested from IPG.
(Attach spreadsheet if necessary)

Item	Cost
Speaker/Panelist Travel & Per Diem	\$4,000
Food: Lunch & Coffee (assuming 200 participants, not including attendance fees to assist in defraying cost)	\$2,500
Rental of Facilities	\$500
Brochures, name tags, booklets, & miscellaneous	\$500
TOTAL	\$7,500