

The Proposed Energy Biosciences Institute (EBI) summary, March 23, 2007

The Energy Biosciences Institute (EBI) is a proposed joint project between the oil giant BP, UC Berkeley (UCB), Lawrence Berkeley National Laboratory (LBNL), and the University of Illinois at Urbana-Champaign (UIUC). BP issued a request for proposals last June, promising \$500 million over 10 years for the project.

This is a summary of the proposal submitted jointly by UCB, LBNL, and UIUC, which was announced as the winning proposal on February 1st. Under the proposal, UCB would be the host institution, subcontracting out to LBNL and UIUC. Keep in mind that this is only the proposal to BP – the final details are currently in negotiation.

This means the final terms could be much worse – as it stands, we have no input into the bargaining process, or even information about it.

Location:

For the first three years, the EBI – including proprietary BP research – would be housed on the UCB campus (in Calvin and Hildebrand halls). At UIUC, the EBI would occupy part of the new Institute of Genomic Biology building. The main location would be in a proposed new building in Strawberry Canyon, a building whose “green construction” would “showcase BP’s environmental commitment and leadership”. (p.18)

... even though BP would pay for none of the building.

Purpose:

In the words of the grant proposal, the EBI would be “an extraordinary marshalling of human and infrastructure resources” to “seek total-system solutions to the production of biofuels that are cost effective and carbon neutral.” (p.1) The inspiration for such a vision comes, for instance, from “The development of the atomic bomb at Los Alamos [and other large projects, which] are striking examples of how large-scale problems were solved by establishing the proper multidisciplinary scientific culture.” (p.1, first line, second paragraph, “Vision for the EBI”)

We are worried precisely because of examples like this, in which problems were solved by technically brilliant scientists cut off from society’s needs – in this case, “solved” by creating the threat of global annihilation.

The EBI would showcase BP’s commitment to sustainability by establishing the “world’s premier energy research institute” at three of our nation’s foremost public research institutions.

Stanford has lost credibility and contributions as a result of a smaller deal it cut with Exxon-Mobil. UC Berkeley will suffer the same fate if it is party to green-washing.

BP would have a major role in the EBI – the dozens of BP research employees at the institute and the University employees would work together and communicate extensively, but the facilities at the EBI would be divided into two pieces: one for “open” research, where faculty and students work, and one for “proprietary” research, where BP employees develop

profitable technology. The \$500 million promised by BP would be divided between those two sections.

BP will be “giving” the part of the \$500 million earmarked for proprietary research directly back to itself.

The primary goal would be to produce fuel from plant matter – leftovers from food crops, or new, dedicated energy crops – by decomposition and fermentation. Researchers would investigate how to do this on an industrial scale by breeding and genetically modifying both crops and the microorganisms that would ferment them into fuels. This would include attempting to make fundamental changes to the energy crops’ cell wall structure (“a major objective of the program in this area will be the development of new types of lignin that are not known to occur in nature,” p.39), and to create microorganisms that have completely new decomposition capabilities (“we will also develop organisms capable of producing fuels from the aromatic monomers found in lignin...” p. 48) and can tolerate the toxins that they produce. The new energy crops – likely candidates are perennial grasses or poplar trees – could be genetically modified to make them suitable for intensive monocropping, including the introduction of herbicide resistance (p.38).

*There is **no** proposed research into the potential hazards of creating highly engineered plants with crippled cell walls, introducing new biological structures unknown in nature, or bacteria that break down plants – potentially our food crops – into fuels. They are assuming that such work is safe.*

The EBI proposal recognizes that “the introduction of biofuels will have a significant impact on energy, agricultural and food systems, and the environment.” (p. 56) Most of the resources are dedicated to the technical aspects of biofuel production or the market-based aspects of biofuel introduction, but a few EBI-associated researchers would also study the social and environmental implications of biofuels.

Calling such impacts “significant” is probably an understatement. Although biofuels have potential for doing social and ecological good, biofuel crops such as sugar cane in Brasil and palm oil in Indonesia are already displacing food, driving deforestation, and provoking outrage. Regardless of how much good research is done, there is no indication that the recommendations of such research will be followed. For instance, it is stated that the director and deputy director of the EBI will get to read confidential material related to BP’s business plan, so as to better direct the EBI research agenda, but there is no indication that the bioengineers in charge will have any obligation to listen to any affiliated social scientists.

Not all the non-biotech research will be on potentially negative impacts: a main focus is on identifying and overcoming “barriers that could prevent deployment” (p.56) of the newly-developed biofuels, and “the modeling of social adoption”, “paying significant attention to the evolving regulatory framework and societal response to genetically modified organisms.” (p.57)

Public opinion is presented as an engineering problem. They’d like to learn how to gloss over potential hazards, drown out opposition, and avoid the past public relations mistakes of the nuclear and biotech industries.

The EBI would not be working solely on biofuels — there would also be significant

programs related to fossil fuels. Work on “Microbial Enhanced Oil Recovery” would use microbiology to help BP get more petroleum out of difficult underground deposits, while “Fossil Fuel Bioprocessing” helps BP refine petrochemicals.

If this is a “green” research institute, dedicated to sustainable biofuels, then why is it researching how to get more oil out of the ground?

Finally, a significant, undetermined chunk of the money would go right back into BP’s proprietary research, which would work secretly on turning the inventions conceived of by the rest of the program into marketable, profitable processes.

This means that BP would choose which inventions get developed and marketed – and would be free to ignore the results of research into social and environmental consequences.

Direction:

The structure for governance and oversight outlined in the proposal is described as “a starting point for discussion.”

BP could well push for even more control.

Under the proposal, the EBI would be headed by a director selected by BP and approved by a joint panel of BP, UCB, LBNL, and UIUC people (the Governance Board). (p.4) “It is expected,” the proposal reads, “that he/she will hold a faculty/scientist appointment at UCB and at LBNL.” The director would be “responsible for implementation of research and education goals, administration of all programs, and fiscal oversight; will implement the long-term plans” and would “be the public face of the EBI.” (p.26) The director, associate director (a BP employee), and deputy director (at UIUC) would be responsible for allocation of funding, space, researcher affiliation, and the research agenda, subject to approval by the Governance Board (pp. 10&11).

The primary direction of the EBI would be given by the director, but major decisions are approved by the Governance Board, consisting of the UCB Vice Chancellor for Research (currently Beth Burnside), the LBNL director (currently Steven Chu), the UIUC Vice Chancellor for Research (currently Charles F. Zukoski), and two BP representatives. The director, associate director, and deputy director will be ex-officio (in this case, non-voting) members.

The director is selected by BP, the associate director is a BP employee, and BP gets 2 of the 5 seats on the Governance board – this means that under UCB’s proposal, BP would have more influence on allocation of funding and direction of research than any one of the public institutions!

Funding:

BP’s \$500 million would be divided between the different components as decided by the Directors and the Governance Board — this includes the split between the “proprietary” and the “open” research. The BP funds would not pay for the proposed new building; this would be paid for by funds raised by the UC — so far including \$40 million from the state of California (promised by Schwarzenegger, still to be voted on by legislature), \$60 million in bonds, and \$15 million in private donations. At UIUC, the EBI would use a building

recently constructed by the state of Illinois at a cost of \$20m. (p. 87)

Research Details:

Under the proposal's outline, the EBI would be divided into five (somewhat overlapping) "programs", subdivided into 23 "labs", plus a separate "applications lab" where BP scientists conduct proprietary BP research. The main programs are: feedstock development, biomass depolymerization, biofuels production, fossil fuel bioproduction and carbon sequestration, and socio-economic systems. Of the 23 labs:

- six are devoted to developing, growing, and processing biofuel crops;
- nine are devoted to (broadly speaking) the (bio-)chemical processes to extract fuel from the crops, including engineering new organisms to do the job;
- one would research ways to use microorganisms to "enhance recovery of petroleum from underground reserves" (the "Microbial Enhanced Oil Recovery" lab);
- one would investigate the use of microbes for processing coal into fuel (the "Fossil Fuel Bioprocessing" lab);
- one would research ways to engineer biological processes to store more carbon ("Carbon Sequestration");
- two would study how to make the transition to biofuels economically viable and acceptable by the public ("Biofuels Evaluation & Adoption" and "Biofuels Markets & Networks");

Or, how to make biofuels profitable, and engineer their public image into acceptance.

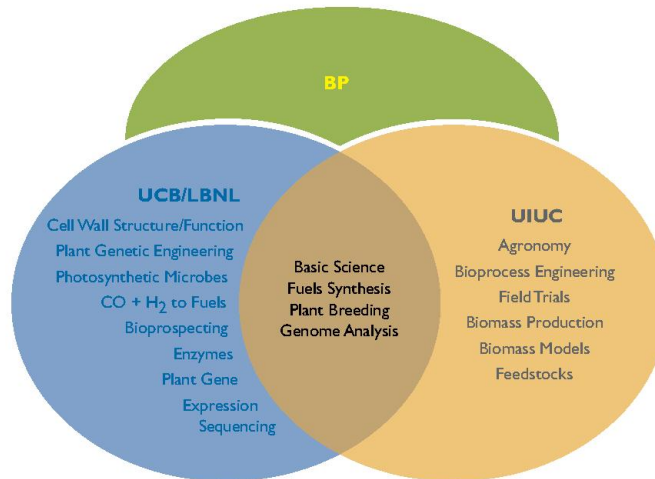
- two would study the social and environmental implications of biofuels, including long-term impacts of changes in land use ("Environmental Impact and Sustainability Assessment" and "Next-Generation Assessment");

Much of this is worthwhile, but currently BP has no obligation to implement any such findings. Will the recommendations be accepted? There is even here a worrisome focus on profit, for instance, research into how many carbon credits a field of an energy crop could generate.

- one would "consider the design of institutions and policies to mitigate potential negative impacts of the adoption of biofuels" ("Social Interactions and Risks")

The "applications lab", the space for proprietary BP research, is connected to all of these, waiting to develop potentially profitable technologies arising from the work in the above labs.

See the next section.



Partner contributions to the EBI.

BP employees in the EBI:

The role of BP and the “proprietary research” component is very vague throughout (see, for instance, the wonderful Venn diagram above, from page 68!) but the general structure is a division into “open” and a “proprietary” sections of the EBI. The “open” sections are described above, and the proprietary section – the “applications lab” – would be staffed by up to 50 BP employees. According to one section, there would be “a high degree of ‘flow’ between personnel in the open and proprietary components”. (p.4) But according to another section, “the proprietary component would be carried out by BP personnel in a central Berkeley campus location... UCB, LBNL, and UIUC research personnel should be excluded entirely from the space in the performance of their university activities.” (p.73) The arrangement for who gets what patents, etc. resulting from the “flow” is summarized: “Although there is no formula... we believe that they can be managed by scrupulous attention to fairness”. (p.34)

The BP employees – up to 50 of them – would also be involved with all aspects of education at UCB, from K-12 outreach to developing and teaching undergraduate classes to graduate student mentoring. They would be involved with the EBI’s efforts to, e.g. “educate the general public about the benefits of EBI research and technology advances”.

We would have BP employees on campus who would function in many ways like professors, and who would get to use UC Berkeley’s name in telling the media, policy makers, and students about biofuels – and, no doubt, about BP.

Intellectual property:

Any publications coming out of the EBI are subject to a several-month “pre-publication review” period, in which time BP “will be able to check that publications... do not include any inadvertently included confidential information belonging to BP and/or to request that UCB, LBNL, and/or UIUC file a patent on certain subject matter prior to its public disclosure”. (p.29)

Also (more significantly), “BP will have an exclusive, time-limited, first right to exercise

a pre-defined option to obtain an exclusive license” to any inventions “made by UCB, LBNL, or UIUC under a project that is fully funded by BP”.

BP will effectively be able to choose which technologies are developed for large-scale adoption, and – as any corporation is legally required to do – their choice must provide the maximum profit for their shareholders. Additionally, there is no indication of when, if ever, new technologies would pass into the public domain.