

Office of the President

TO MEMBERS OF THE COMMITTEE ON GROUNDS AND BUILDINGS:

ACTION ITEM

For Meeting of March 13, 2007

AMENDMENT OF THE BUDGET FOR CAPITAL IMPROVEMENTS AND THE CAPITAL IMPROVEMENT PROGRAM AND APPROVAL OF INTERIM AND EXTERNAL FINANCING, HELIOS ENERGY RESEARCH FACILITY, BERKELEY CAMPUS

EXECUTIVE SUMMARY

- Campus: Berkeley
- Project: Helios Energy Research Facility
- Action: Approval of project budget for \$159.4 million and approval of external financing of \$74.4 million and interim financing of \$15 million
- Total Cost: \$159.4 million to be funded from State lease revenue bonds (\$70 million), external financing (\$74.4 million), and gifts (\$15 million)
- Previous Actions: **November 2006:** The Regents approved the 2007-08 Budget for State Capital Improvements which included the Lawrence Berkeley National Laboratory (LBNL)-Helios Research Facility, a smaller project excluding the Energy Biosciences Institute (EBI).
- Project Summary: This project would construct a laboratory and office building of approximately 88,000 assignable square feet (asf), comprised of wet research laboratory space, analytical research laboratory space, research support space, office and administrative support space, and shared conference and building operations space. The project will house the Berkeley campus and LBNL Helios Research Program including the new BP-funded Energy Biosciences Institute.
- Issues:
- Approval of external financing of \$74.4 million requires a policy exception to pledge the University Education Fund as the source of repayment.

- Building cost per gsf: \$758.
- Project is included in the Governor's Budget for 2007-08, which provides \$30 million in State lease revenue bonds for the Berkeley-Helios Research Facility and an additional \$40 million in State lease revenue bonds for the Universitywide-Energy Biosciences Institute.

RECOMMENDATION

The President recommends that the Committee on Grounds and Buildings recommend to The Regents that:

- (1) The 2006-07 and the 2007-08 Budgets for Capital Improvements and the Capital Improvement Program be amended to include the following project:

Campus: Berkeley: Helios Energy Research Facility – preliminary plans, working drawings, and construction – \$159.4 million total project cost to be funded from State lease revenue bonds (\$70 million), external financing (\$74.4 million), and gifts (\$15 million).
- (2) The President be authorized to obtain external financing not to exceed \$74.4 million to finance the Helios Energy Research Facility project, subject to the following conditions:
 - a. Interest only, based on the amount drawn down, shall be paid on the outstanding balance during the construction period.
 - b. Repayment of any financing shall be from the facility's lease income and the Berkeley campus' share of the University Education Fund.
 - c. The general credit of The Regents shall not be pledged.
- (3) The President be authorized to obtain interim financing not to exceed \$15 million prior to awarding a construction contract for any gift funds not received by that time and subject to the following conditions:
 - a. Interest only, based on the amount drawn down, shall be paid on the outstanding balance during the construction period.
 - b. Repayment of any financing shall be from gift funds and, in the event such gift funds are insufficient, from the Berkeley campus' share of the University Opportunity Fund.
 - c. The general credit of The Regents shall not be pledged.
- (4) The Officers of The Regents be authorized to provide certification to the lender for any component of this project for which tax exempt financing is used that interest paid by The Regents is excluded from gross income for purposes of federal income taxation under existing law
- (5) The Officers of The Regents be authorized to execute all documents necessary in connection with the above.

A Key to the abbreviations and the project description are attached.

KEY

Capital Improvement Program Abbreviations

S	Studies
P	Preliminary Plans
W	Working Drawings
C	Construction
E	Equipment
-	State Funds (no abbreviation)
F	Federal Funds
G	Gifts
HR	Hospital Reserve Funds
I	California Institutes for Science and Innovation
LB	Bank Loans or Bonds (External Financing includes Garamendi, Bonds, Stand-By, Interim and Bank Loans)
LR	Regents' Loans (Internal Loans)
N	Reserves other than University Registration Fee (Housing and Parking Reserves)
R	University Registration Fee Reserves
U	Regents' Appropriations (President's Funds, Educational Fund)
X	Campus Funds
CCCI	California Construction Cost Index
EPI	Equipment Price Index

2006-07 and 2007-08 Budgets for Capital Improvements and
Capital Improvement Program
Scheduled for
Regents' Allocation, Loans, Income Reserves, University Registration Fee Reserves,
Gift Funds, and Miscellaneous Funds

Campus and Project Title (Total Cost)		Proposed <u>2006-07</u>		Proposed <u>2007-08</u>
Berkeley	P	\$5,806,000	LB	\$7,675,000
Helios Energy				C \$62,325,000
Research				C \$68,594,000 LB
Facility				C \$15,000,000 G
 (\$159,400,000)				

DESCRIPTION

The proposed project would consist of a laboratory and office facility of approximately 88,000 asf devoted to programs focused on developing new biological and materials processes that are optimized for the efficient collection, processing, and storage of energy, with the ultimate goal of manufacturing transportation fuels from sunlight. The goals for these programs include developing the enabling technologies that can ultimately provide significant quantities of fuel to reduce the dependence on fossil fuels, and providing the technical basis for carbon neutral sources of energy to mitigate global climate change.

BACKGROUND

Global energy use has grown to the point where the by-products of man's energy consumption are significantly influencing the atmosphere and climate, with costly and potentially disastrous consequences. Leading scholars forecast that an increasing availability of alternative energy sources will be necessary to maintain and grow California's economic and technological development. Motivated by a strong desire to provide solutions to global energy and environmental problems, concerned scientists and engineers from across a diverse range of disciplines have come together to form the Helios Research Program, a long-term research effort organized by the University of California, Berkeley and the Lawrence Berkeley National Laboratory (LBNL).

The ultimate goal of Helios is to develop the science and technology necessary to use sunlight to create energy sources. Transportation fuels would be the most costly but most valuable form of solar energy. There are several fuels that are potentially practical for widespread use, including hydrocarbons, ethanol, and methanol. Hydrogen is also a possibility, provided a method is developed to store and release its energy in a practical way. In addition to research into biofuels for transportation, research into photovoltaics, the storage of electrical energy, and artificial

photosynthesis are other key parts of the program. The goals include developing the enabling technologies that can ultimately provide significant quantities of fuel to reduce the dependence on fossil fuels and provide the technical basis for carbon neutral sources of energy to mitigate global climate change.

BP (formerly British Petroleum) recently selected the Berkeley campus and its partners, LBNL and the University of Illinois, Urbana-Champaign (UIUC), to create and operate the Energy Biosciences Institute (EBI) with a grant of approximately \$50 million per year for ten years, to be managed jointly by the partners including BP. A portion of the space in the Helios Energy Research facility will be dedicated to the EBI for an initial term ending in 2018, including space leased to BP for proprietary research. The EBI will focus primarily on renewable biofuels for transportation and simultaneously pursue bioscience-based research in three other key areas: the conversion of heavy hydrocarbons to clean fuels, improved recovery from existing oil and gas reservoirs, and carbon sequestration.

Helios Research Program

The ambitious goals of the Helios Research Program can be achieved only by advances in basic sciences. The program brings together experts in technical topics as diverse as nano-materials synthesis, advanced solar cell design, electrochemistry, synthetic biology, genome sequencing, and the control of light. The Helios Research Program will directly sponsor research in these areas, with very close cooperation among a range of UC Berkeley energy, science, and technology-related departments (including those in the College of Chemistry, College of Engineering, and College of Letters and Science), as well as the research units at LBNL (such as the Materials Sciences Division, Physical Biosciences Division, and Energy and Environmental Technologies Division).

Support for the Helios Research Program is being developed from many institutions, including collaborations with academic institutions, industry, and foundations, and research seed funding from internal LBNL funds and private donors. That support will provide funding for graduate and postdoctoral fellowships, guest scientists, and visiting scholars. On a larger scale, backing of specific program areas will be through grants and contracts with a range of federal, State, industry, and foundation sponsors. One of the most important features of the project is its broad and integrated outlook on the problem of renewable energy, especially the tight coupling of biological and nanoscience approaches. The Helios Program will provide a mechanism to overcome the barriers among disciplines, including differences in language and scientific approach.

Energy Biosciences Institute (EBI)

Within the Helios Program, the EBI will perform bioscience research aimed at increasing energy production using biofuels and reducing the impact of energy consumption on the environment. Organizationally, the EBI will be divided into two components, with the primary component including open research by UCB and LBNL researchers and staff in the proposed facility. In addition, a small group of BP scientists and engineers will conduct proprietary research and

technology development in a segregated area of the facility. This two-part structure will accommodate the collaborative needs of the institute as a whole and the proprietary needs of BP. UIUC researchers and staff will conduct their work in Illinois and will not have space allocated to them in the new facility.

The EBI will assemble teams of scientists who will seek solutions to the production of biofuels that are cost effective and carbon neutral. The EBI will create the next generation of scientists deeply knowledgeable in all areas of bioenergy and will serve as a model for the type of large-scale, academic-industry partnerships that will play an increasingly important role in solving the major global energy problems of the 21st century.

A research facility with multi-disciplinary laboratories designed specifically to obtain improvements in the efficiency of solar-to-electrical energy and solar-to-chemical energy conversion is needed for these programs. The research space needs to be flexible to support accelerated progress of scientific and technology development.

The bioengineering disciplines within the Helios Program, including the EBI require wet research laboratories and research support space such as molecular and microbial biology laboratories, fermentation laboratories, and greenhouse facilities. Additional research and support space is required for analytical work. The nano-structured materials component requires research laboratory and support space for work with specialized equipment such as scanning probe and electron microscopes. Research activities also include catalysis, electrochemistry, and chemical separations, which require research laboratory space. The EBI project requires that approximately 16 percent of the facility be segregated from the rest of the building occupants in order for proprietary research to be conducted. This space would be for research that is deemed sensitive for competitive business reasons.

Sharing specialized equipment and operational building functions within a single facility is essential to maximize the assignable space available to the various parts of the Helios Program. To minimize duplication of research capabilities, all elements of the Helios Program, including EBI, will benefit by being located adjacent to unique scientific facilities such as the Advanced Light Source, the Molecular Foundry, and the National Center for Electron Microscopy located at LBNL.

Office and administrative support space are required for office-based research activities and management of the overall Helios Program and the EBI. Shared space, such as an auditorium, additional conference and interaction space, and food service, is needed to support all building occupants. Interim space will be provided for the Helios Program and the EBI on a short-term basis in LBNL and campus buildings respectively until the new facility is available.

Project Description

The proposed project would consist of a laboratory and office building of approximately 88,000 assignable square feet, comprised of wet research laboratory space, robotic and analytical

research laboratory space, research support space, office and administrative support space, and shared conference and building operations space, as follows:

- *Wet research laboratory space* (approximately 25,000 asf) would include molecular and microbial biology, fermentation, and chemical separation laboratories.
- *Analytical research laboratory space* (approximately 18,000 asf) would include areas of low vibration and electrical noise suitable for use of scanning probe microscopes and custom-built electron microscopes, and workspace for robotics, catalysis, and electrochemistry research.
- *Research support space* (approximately 11,000 asf) would include greenhouse facilities, warm and cool rooms, and shared-instrumentation rooms.
- *Office and administrative support space* (approximately 24,000 asf) would include office, workroom, and conference space.
- *Shared conference and operations space* (approximately 10,000 asf) would include a 250-seat auditorium, food service, building reception, material management, and interaction space.

Furniture and movable equipment to outfit initially the facility will be relocated from temporary leased and campus space to the new facility; additional movable equipment will be provided as needed from operating funds.

The proposed project site is a two-acre, University-owned parcel adjacent to the Materials Sciences Research Cluster area of LBNL. The site is at the Hill Area east of the main Berkeley campus, on the southern side of the LBNL. The UC Berkeley main campus chemistry, physics and biotechnology and bioengineering research facilities at the eastern side of campus would be easily accessible by a short shuttle bus trip or a walk through Strawberry Canyon. Utility service to the building is available from the existing LBNL utility infrastructure. Improvements to an existing road are part of this project to provide primary access to the facility. The facility will be directly accessible without passing through LBNL.

Green Building Design and Clean Energy Standard

This project will comply with the *University of California Policy on Green Building Design, Clean Energy Standards, and Sustainable Transportation Practices*. As required by this policy, the project will adopt the principles of energy efficiency and sustainability to the fullest extent possible, consistent with budgetary constraints and regulatory and programmatic requirements. The facility would be designed to be consistent with the proposed 2006 LBNL Long Range Development Plan and design guidelines. It would be designed and constructed to feature innovative solar energy use, meet the U.S. Green Building Council's LEED Gold level for

sustainability, and outperform the required provisions of the California Energy Code by at least 40 percent.

CEQA Classification

This project has been reviewed and initially classified as not Exempt from CEQA or not Categorically Exempt. An Initial Study will be prepared to determine if the project may have a significant effect on the environment that has not been substantially and adequately analyzed in a certified program Environmental Impact Report. This environmental documentation will be presented for consideration in conjunction with the project design review.

Financial Feasibility

The total project cost of \$159.4 million would be funded with State lease revenue bond funds (\$70 million), external financing (\$74.4 million), and gifts (\$15 million).

As of February 13, 2007, the receipt of gifts was as follows:

Gifts Received	\$	0
Pledges Received		0
<u>Gifts To Be Raised</u>		<u>15,000,000</u>
Total		\$15,000,000

The campus requests approval of interim financing of \$15 million in gift funds, in order to meet Regental policy to have funds on hand for bid advertisement and award. The Berkeley campus anticipates being able to raise the total amount of gift funds. To the extent that gifts are received prior to completion of the project, the amount of interim financing will be reduced and outstanding balances will be repaid. Should the Berkeley campus be unable to raise all the gift funds, the campus would return to The Regents at the end of construction to request the conversion of up to \$15 million of interim financing to external financing. The source of repayment for the interim financing is gifts, and should the gifts be insufficient, repayment would be made from the Berkeley campus' share of the University Opportunity Fund. In compliance with Regents' policy, all funds necessary to complete construction will be in hand prior to issuing the project for bid.

Should this external financing be necessary, the annual estimated debt service for \$15,000,000 at 5.75 percent for a term of 30 years is \$1,061,000. In fiscal year 2012, the first year of principal and interest payments on this external financing, if any, would result in 61 percent of the Opportunity Fund's being pledged for debt service. Combined with other Opportunity Fund supported external financing being presented for approval at the March 2007 meeting, the pledge on Opportunity Funds will peak at 64 percent in fiscal year 2019; the pledge percentage is projected to decrease thereafter.

The source of repayment for the \$74.4 million of external financing is the lease income from BP and the Berkeley campus' share of the University Education Fund. The Education Fund is the

indirect cost recovery from private contract and grants, similar to the Opportunity Fund, which is the indirect cost recovery on federal contracts and grants. Historically, the Education Fund has been taken into consideration when campuses have requested a Presidential waiver to the Opportunity Fund pledge limit of 65 percent. Over the past several years, the Education Fund has been discussed as a new stand-alone fund source for financing, and at this time, the President and his staff are in the process of finalizing a policy regarding this fund source which is similar to the Presidential policy in place for the Opportunity Fund, such as the 65 percent pledge limit. This project has been granted an exception by the President to pledge the Education Fund for the interim and external financing in anticipation of the formal announcement expected in the coming month. There are several Items being presented at this March 2007 meeting with a policy exception granted by the President to use Education Funds as the source of repayment.

BP would have a formal lease of space in the facility for proprietary use, which would generate approximately \$1,484,000 of lease income in FY 2011, increasing to approximately \$2,000,000 per year thereafter. This space would be financed using taxable debt due to private business use limitations on tax exempt financing pursuant to the IRS code. Under the IRS code, the federal government is considered a private person; therefore, whether the space to be used by LBNL needs to be financed on a taxable or tax exempt basis remains under discussion with tax counsel and will be determined prior to the time that financing is required. A memorandum of understanding between the University and the Department of Energy has been drafted and is under discussion, which may allow the use by LBNL to be eligible for tax exempt financing.

For financing feasibility purposes, the campus has modeled a combination of taxable and tax exempt financing for the \$74.4 million of external financing:

- Debt of \$8,000,000, financed taxable for seven years at 7 percent to be repaid from the BP lease income and backstopped by the Education Fund, results in an estimated annual debt service of \$1,484,000. Estimated annual lease income of \$1,852,000 results in a debt service coverage of 1.25 times in FY 2012.
- Debt of \$20,300,000, financed on a taxable basis at 7 percent for 30 years to be repaid from the Education Fund, results in a estimated annual debt service of \$1,636,000.
- The remaining \$46,100,000, financed on a tax exempt basis at an interest rate of 5.75 percent for 30 years to be repaid from the Education Fund, results in an estimated annual debt service of \$3,260,000.

From mid-FY 2009 to FY 2018, the campus anticipates receiving indirect cost recovery from additional BP contracts and grants that will augment the Education Fund by approximately \$9 million annually. Projections show that in FY 2012, the first full year of principal and interest payments, 54 percent of the Education Fund would be pledged for debt service, and in FY 2019 when the additional indirect cost recovery from BP grants has ceased, the campus will reach the 65 percent pledge limit for the Education Fund and the percentage pledged will decrease thereafter.

The proportion of the \$74.4 million in external financing to be repaid from the BP lease income and the Education Fund may change based the actual lease contract negotiated and tax counsel's

determination of taxable versus tax exempt financing for the space occupied and used by LBNL. In the event that the ratio of taxable to tax exempt financing changes, the campus and the Office of the President would ensure that the 65 percent pledge limits for the Opportunity Fund and the Education Fund are not exceeded. If necessary, the campus and LBNL would return to The Regents for approval to pledge additional funds or sources of repayment to support this project.

Additional financial feasibility information may be found in Attachment 2.

(Attachments)

ATTACHMENT 1

**PROJECT STATISTICS
HELIOS ENERGY RESEARCH FACILITY
CAPITAL IMPROVEMENT BUDGET
BERKELEY CAMPUS
CCCI 4890**

<u>Cost Category</u>	<u>Amount</u>	<u>% of Total</u>
Site Clearance	\$540,000	0.3%
Building	\$121,291,000	76.1%
Exterior Utilities	\$4,100,000	2.6%
Site Development	\$3,000,000	1.9%
A/E Fees	\$11,088,000	7.0%
Campus Administration ^(a)	\$4,642,000	2.9%
Surveys, Tests	\$1,031,000	0.6%
Special Items ^(b)	\$7,261,000	4.6%
Contingency	\$6,447,000	4.0%
Total	\$159,400,000	100.0%
Group 2 & 3 Equipment	0	
Total Project	\$159,400,000	

Statistics

Gross Square Feet (GSF) ^(c)	160,000
Assignable Square Feet (ASF) ^(c)	88,000
Ratio ASF/GSF (%) UC	55%
Building Cost/GSF ^(c)	\$758
Building Cost/ASF ^(c)	\$1,378

Comparable University Projects at CCCI 4890

<u>CIB Date</u>	<u>UC Campus</u>	<u>Project Name</u>	<u>Building Cost/gsf</u>	<u>Ratio gsf/asf</u>
12/1/06	Berkeley	Stanley Hall QB3	\$404	54%
10/3/06	Los Angeles	CNSI Court of Sciences Building	\$645*	63%

*Includes building only. Does not include program improvements or moving of electrical substation.

- (a) Campus administration includes project management and inspection.
- (b) Special items include independent structural and historical reviews; hazardous materials survey/monitoring; acoustic, theater, audio visual, interior, color, roofing, graphics, lighting, multi-media and telecommunications consultants; planning and environmental; agency review; and moving costs totaling \$2,061,000; and interest expense totaling \$5,200,000.
- (c) Gross square feet (gsf) is the total area, including usable area, stairways, and space occupied by the structure itself. Assignable square feet (asf) is the net usable area

ATTACHMENT 2

SUMMARY FINANCIAL FEASIBILITY ANALYSIS

Project Title: Helios Energy Research Facility

Total Estimated Project Cost: \$ 159,400,000

Proposed Sources of Funding:

State Funds	\$ 70,000,000
External Financing	74,400,000
Gifts	<u>15,000,000</u>
Total	\$ 159,400,000

PROPOSED FINANCING TERMS

Interim Financing Converted to Permanent Financing

Interest rate: 5.75 percent for 30 years \$ 15,000,000

Berkeley Campus Opportunity Fund (2011-12) ⁽¹⁾

Opportunity Funds Allocated	\$ 22,327,000
Garamendi Generated	<u>1,427,000</u>
Total Revenues	\$ 23,754,000

Proposed Debt Service	\$ 1,061,000
Existing Garamendi Debt Service and OMP	1,427,000
Existing Debt Service	<u>12,115,000</u>
Total Debt Service	\$ 14,603,000

Opportunity Funds Pledged for Debt Service 61%

Debt Service Coverage 1.63 x

(1) First full year of principal and interest payments

External Financing Supported by Education Funds

Taxable:	Interest rate: 7 percent for 30 years	\$ 20,300,000
Tax Exempt:	Interest rate: 5.75 percent for 30 years	\$ 46,100,000

Financing Supported by Lease Income	FY 2012 ⁽¹⁾	FY 2019 ⁽³⁾
Lease Income from BP ⁽²⁾	\$ 1,852,000	n/a
Estimated Annual Debt Service	1,484,000	n/a
Income Available after Debt Service	\$ 368,000	n/a
Debt Service Coverage	1.25x	n/a
Financing Supported by Education Fund		
Education Fund (base)	\$ 9,822,000	\$11,282,000
Education Fund from BP contracts and grants	8,907,000	0
Total Education Fund	\$18,729,000	\$11,282,000
Estimated Debt Service		
Proposed Project ⁽⁴⁾	\$ 4,896,000	\$ 4,896,000
Biomedical Health Sciences ⁽⁵⁾	5,307,000	2,437,000
Existing Debt Service	0	0
Total Debt Service	\$10,203,000	\$ 7,333,000
Education Fund Pledged for Debt Service	54%	65%
Debt Service Coverage	1.84x	1.54x

- (1) First full year of principal and interest payments.
- (2) BP lease and debt payments both cease in fiscal year 2018.
- (3) Fiscal year 2019, additional Education Funds from BP grants cease and projected pledge ratio is at maximum of 65 percent. Pledge ratio decreases thereafter.
- (4) Debt service is for \$20.3 million taxable debt and \$46.1 million tax exempt debt for Helios.
- (5) Biomedical Health and Sciences is being presented for approval at the March 2007 meeting. The project will request \$75,053,000 of external financing with the source of repayment being the Berkeley campus share of both the Education Fund and the Opportunity Fund as necessary to keep the pledge for debt service within the 65 percent limit for both funds. In fiscal year 2012, the full debt service payment for this project is shown against Education Funds. In fiscal year 2019, a portion of the debt service payment will be supported against Opportunity Funds with a pledge ratio of 64 percent, which will decrease thereafter.