BERKELEY LAB

ECONOMIC IMPACT STUDY

Prepared for:

LAWRENCE BERKELEY
NATIONAL LABORATORY

MARCH 2010

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March 17, 2010

Mr. Jeffrey W. Miller
Lawrence Berkeley National Laboratory
Head of Public Affairs
One Cyclotron Road
M. S. 65
Berkeley, CA 94720

Re: Lawrence Berkeley National Laboratory Economic Impact Study

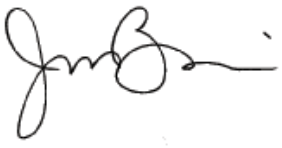
Dear Mr. Miller,

CBRE Consulting is pleased to present this economic impact study for Lawrence Berkeley National Laboratory ("Berkeley Lab"). As requested, this study demonstrates Berkeley Lab's economic benefits to the following regions: the Cities of Berkeley, Emeryville, and Walnut Creek; the Bay Area; the state of California; and the United States. These impacts are measured for Berkeley Lab's three Bay Area campuses: the Berkeley Campus, the Joint BioEnergy Institute in Emeryville; and the Joint Genome Institute in Walnut Creek. For presentation purposes, the main body of this report (Chapters I-VII, including Tables 1-14 and Figures 1-3) presents the aggregated economic impacts of the three Bay Area campuses. The tables provided in Appendix B provide full documentation of each campus's contribution to the totals.

The first chapters present a brief memorandum of our findings. Chapters II-V document the economic impact methodology and findings for the three campuses combined. Chapter VI discusses the impacts associated with commercialization of LBNL-developed technology. Finally, Chapter VII compares the economic impacts from LBNL's FY 2005 operations with those found for FY 2009, and also assesses the degree to which Federal stimulus funding recently awarded to the Lab may increase future economic impacts.

It has been a pleasure working with you on this interesting project and we look forward to our continued work on behalf of Lawrence Berkeley National Lab. Please call with questions or comments.

Sincerely,



Amy L. Herman, AICP
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Enclosures

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I. SUMMARY OF FINDINGS

PURPOSE OF STUDY

CBRE Consulting was engaged to conduct an economic impact analysis demonstrating the benefits of Lawrence Berkeley National Laboratory ("Berkeley Lab", "LBNL", or "the Lab") to the Cities of Berkeley, Emeryville, and Walnut Creek, the Bay Area region, the state of California, and the United States. LBNL operates a campus in each of the cities chosen. The study was therefore designed to help Berkeley Lab understand and demonstrate its impacts on these local communities, the surrounding region, and beyond. These impacts are many, but for the purpose of this study CBRE Consulting focused on job generation, wages, and local and regional spending. Appendix A, at the end of this report, explains the study methodology and the various impact effects. Appendix B includes expanded results tables that document each campus's contribution to the estimated overall economic impacts.

SPENDING IMPACTS

The following table summarizes the spending impacts associated with LBNL's Bay Area operations. It was determined that during its 2009 fiscal year, which spans from October 1, 2008 through September 30, 2009, Berkeley Lab contributed approximately $501.0 million directly to the Bay Area economy through the lab's spending. Including indirect and induced spending, the contribution rises to approximately $690.1 million. Of these $690.1 million in spending impacts in the Bay Area, approximately $236.1 million occurred in Berkeley, Emeryville, and Walnut Creek.[1] The total spending impacts on California for the same period were estimated to be $794.5 million, and Berkeley Lab's gross economic impact on the U.S. economy was estimated to be nearly $1.6 billion.

Table 1: LBNL Total Spending, FY 2009

Geography	Direct Spending (1)	Output Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)	Percentage of U.S. Impacts
GRAND TOTAL - BAY AREA CAMPUSES					
City of Berkeley	$155,446,775	0.30	$45,887,307	$201,334,082	12%
City of Emeryville	$6,315,326	0.12	$778,831	$7,094,157	0%
City of Walnut Creek	$22,726,849	0.22	$4,930,497	$27,657,347	2%
Bay Area (4)	$501,017,387	0.38	$189,069,438	$690,086,825	43%
California (4)	$533,108,046	0.49	$261,405,079	$794,513,126	49%
United States (4)	$698,021,967	1.31	$915,046,819	$1,613,068,786	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Multipliers are not additive; totals represent weighted averages.

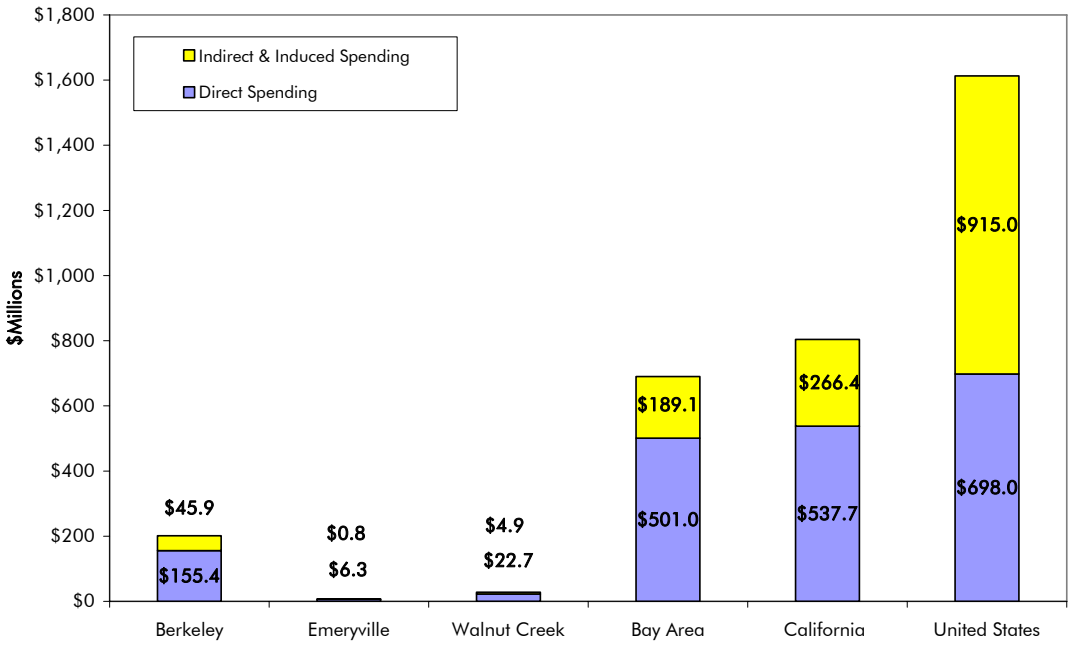
(3) Total spending is equal to direct spending plus indirect and induced spending.

(4) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; United States includes California.

The findings from Table 1 are also graphically presented in Figure 1. From this, one can visually see that 49 percent of combined direct, indirect, and induced spending occurred in California and 43 percent occurred within the Bay Area.

[1] Total direct, indirect, and induced spending impacts in Berkeley, Emeryville, and Walnut Creek were estimated to be $201.3 million, $7.1 million, and $27.7 million, respectively.

Figure 1: Total Spending Impacts
Lawrence Berkeley National Lab, Combined Bay Area Campuses
FY 2009



A summary of Berkeley Lab's spending in FY 2009 is presented in Table 2, which highlights that total direct spending equaled approximately $698.0 million and that $501.0 million occurred within the Bay Area.

Table 2: Summary of Lawrence Berkeley Lab Spending, FY 2009

Type of Expenditure	Total Spending in the United States	Spending in the Bay Area	Bay Area Spending as % of U.S.
GRAND TOTAL - BAY AREA CAMPUSES			
Purchasing (1)	$333,632,165	$156,314,498	47%
Payroll	$320,689,144	$301,002,231	94%
Capital Expenditures (2)	$43,700,657	$43,700,657	100%
GRAND TOTAL	**$698,021,967**	**$501,017,387**	**72%**

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Includes purchasing for goods and services but excludes construction-related expenditures.

(2) Includes all hard construction costs (i.e., labor and materials) and soft construction costs (i.e., architectural and engineering consultants, etc.).

Table 2 indicates that Berkeley Lab's spending in the Bay Area accounts for 72 percent of its total spending. It also indicates that almost all of the Lab's payroll dollars – 94 percent – went to Bay Area residents.[2]

[2] Payroll dollars include payments made to retired LBNL employees and their survivors.

EMPLOYMENT IMPACTS

LBNL's Bay Area laboratories have approximately 806 full-time-equivalent employees who are residents of Berkeley, Emeryville, and Walnut Creek. Total full-time-equivalent employment in the Bay Area, California, and United States are 2,769, 2,832, and 2,898, respectively. The study findings suggest that these levels of direct employment generate the following total direct, indirect, and induced jobs:

- 1,745 in the City of Berkeley;
- 184 in the City of Emeryville;
- 363 in the City of Walnut Creek;
- 5,612 in the entire Bay Area;
- 6,855 statewide; and
- 12,507 nationally.

This indicates that every 1.0 direct, full-time-equivalent employee of Berkeley Lab contributes to another 3.3 jobs in the United States.

PERSONAL INCOME IMPACTS

On top of spending impacts, which generally benefit businesses, the Lab's Bay Area operations also contribute to household personal incomes locally, regionally, and beyond. These impacts are described as personal income impacts. The Lab pays its own employees directly in the form of direct personal income impacts. These employees then spend their wages on goods and services, creating indirect personal income impacts. Finally, the employees of companies that benefit from the Lab's spending – including its payroll but also its procurement of goods and services – are recipients of induced personal income impacts. LBNL's Bay Area operations were found to have the following personal income impacts:[3]

- In the City of Berkeley, direct payroll of $67.0 million generated another $50.9 million of indirect and induced personal income impacts, for total personal income impacts of $117.9 million;
- In the City of Emeryville, direct payroll of $4.3 million generated another $5.7 million of indirect and induced personal income, for total personal income impacts of $10.0 million;
- In the City of Walnut Creek, direct payroll of $15.7 million generated another $10.7 million of indirect and induced personal income, for total personal income impacts of $26.3 million;
- In the entire Bay Area, direct payroll of $301.0 million generated another $145.5 million of indirect and induced personal income impacts, for total personal income impacts of $446.5 million.

Across the country, the Lab's direct payroll of $320.7 million – which includes payments to retired employees – generated another $400.5 million of indirect and induced personal income, for total personal income impacts of $721.1 million.

[3] Direct payroll figures, as well as indirect and induced impacts, also take into account the payments made to retired employees of LBNL, or in some cases, their survivors.

ECONOMIC IMPACTS OF LBNL TECHNOLOGY TRANSFER

Since 1990, Berkeley Lab technologies have formed the basis for close to 30 start-up companies, creating a current job count of 2,393 jobs. The technologies licensed by these start-ups reflect the mission of a national laboratory to tackle society's most difficult problems in medicine, energy, and the environment. As with the Lab, these start-up companies contribute significantly to the economy through the multiplier impacts of their jobs and expenditures. Based upon the matching of each start-up company to an appropriate industry sector, CBRE Consulting estimated the economic impacts associated with each company's jobs.

The economic impacts of the start-up companies are substantial, and exceed the impacts of the Lab itself. This is attributable to the much greater aggregate level of employment at the start-up companies. The spending impacts of the start-up companies, their vendors, and associated employees totals $2.8 billion throughout the United States. Bay Area businesses as a whole benefit by $904.0 million, while throughout California, inclusive of the Bay Area, businesses benefit by $1.6 billion. The job impacts associated with the start-up firms total 12,979 nationally. This comprises 10,586 indirect and induced jobs in addition to the 2,393 direct jobs. The job impacts total 3,714 throughout the Bay Area and 6,456 throughout California. The start-up company wage impacts indicate that personal incomes are greatly enriched as a result of their operation. These impacts are estimated at $695.2 million nationwide, inclusive of $283.1 million throughout the Bay Area and $411.0 million through California. Finally, the impacts to more local areas of California include $14.8 million of spending in Berkeley and $8.6 million in Emeryville, 122 jobs in Berkeley and 54 in Emeryville, and $6.5 million in personal income generated in Berkeley and $4.1 million in Emeryville.

These findings suggest that start-up companies based on Berkeley Lab technologies and innovations provide a substantial economic contribution, with an overwhelming share conveyed to the regional and statewide economies.

COMPARISON OF FY 2005 AND FY 2009 ECONOMIC IMPACTS

CBRE Consulting conducted a similar economic impact study for FY 2005.[4] The comparative findings indicate that between FY 2005 and FY 2009, Berkeley Lab's spending on goods and services and payroll increased, while employment modestly declined. Total spending on Purchasing, Payroll, and Capital Expenditures increased from $518.8 million to $698.0 million, while Payroll alone increased from $237.8 million to $320.7 million. Total employment declined from 2,977 to 2,898.

These results indicate that nationally, the Berkeley Lab's spending impacts increased from $1.2 billion to $1.6 billion. Total jobs impacts stayed approximately the same, increasing only modestly from 12,460 to 12,507. Income impacts increased from $599.5 million to $721.1 million. The relative parity in jobs impacts indicates a shift in the underlying jobs multipliers, likely reflecting that between 2002 and 2008 (the years to which the studies' multipliers correspond), companies have improved worker productivity and therefore lowered the

[4] The prior study for FY 2005 study was issued in July 2007. To adjust for methodological changes and corrections to facilitate comparison with the FY 2009 analysis, the FY 2005 study was reissued in March 2010.

proportion between employment and output. Impacts increased at all geographic levels, with the exception of job impacts in the Bay Area, which declined nominally.

These increased figures indicate that the Berkeley Lab's budgetary growth and geographic expansion has resulted in increased local, regional, state, and national economic impacts. As the Lab's budget increases over time, these impacts will continue to increase, enhancing the Lab's contribution to the economy and economic development at all levels.

PROSPECTIVE IMPACTS OF FEDERAL STIMULUS FUNDING

CBRE Consulting understands that Lawrence Berkeley National Laboratory was recently awarded with $221.0 million in stimulus funds under the Federal government's American Recovery and Reinvestment Act of 2009 (ARRA). These funds are anticipated to increase the Lab's budget such that the direct spending, direct payroll, and direct jobs supported by the Lab in FY 2009 will increase proportionally. The associated future budget augmentation is estimated to have indirect and induced impacts, such that total impacts of the $221.0 million are projected as follows:

- In the City of Berkeley, total spending of $63.7 million, 553 full-time-equivalent jobs, and $37.3 million in personal income;
- In the City of Emeryville, total spending of $2.2 million, 58 full-time-equivalent jobs, and $3.2 million in personal income;
- In the City of Walnut Creek, total spending of $8.8 million, 115 full-time-equivalent jobs, and $8.3 million in personal income;
- In the entire Bay Area, total spending of $218.5 million, 1,777 full-time-equivalent jobs, and $141.4 million in personal income;
- In all of California, total spending of $254.6 million, 2,170 full-time-equivalent jobs, and $155.9 million in personal income.

Nationally, the stimulus is estimated to support total spending of $510.7 million (comprising the $221.0 million spent directly as a result of the budget augmentation, plus another $289.7 million of indirect and induced spending), 3,960 full-time-equivalent jobs, and $228.3 million in personal income.

NOTE ON GUEST RESEARCHERS

In the interest of conservatively estimating Berkeley Lab's total economic impacts, CBRE Consulting did not include the impacts of guest researchers. Over 1,200 researchers worked for Berkeley Lab as guests during FY 2009. It is estimated that approximately 40 percent of these guest researchers work at Berkeley Lab on an average day. While Berkeley Lab does not compensate them, these researchers unavoidably spend money in Berkeley, Emeryville, Walnut Creek, and the surrounding areas during their visits. This spending goes towards accommodations, food, transportation, and more.

The following chapters present the above findings in more detail.

II. PAYROLL AND EMPLOYMENT

Payroll and employment for Berkeley Lab have direct, indirect, and induced impacts locally and beyond. Labor covers full-time and part-time employees and includes employees in both research and non-research positions. Part-time employees also include those on variable schedules. All findings relate to FY 2009.

EMPLOYMENT AND PAYROLL

- Berkeley Lab had 2,593 full-time and 708 part-time employees in FY 2009. The majority of these employees are employed by the LBNL Berkeley Campus (2,468 full-time employees and 681 part-time employees).
- Total Fiscal Year 2009 payroll amounted to $261.4 million. When an additional $60.2 million in payments to retired LBNL employees and their survivors are added, this figure totals $320.7 million.
- It was found that 669 full-time and 332 part-time Lab employees reside in the Cities of Berkeley, Emeryville, and Walnut Creek combined.
- Payroll to employees residing in these three cities totaled $74.5 million. Including retiree payments, this figure totals $87.0 million.

Table 3: Lawrence Berkeley Lab Employment and Payroll by Residence Location, FY 2009

	City of Berkeley		City of Emeryville		City of Walnut Creek		Bay Area (2)		California (2)		United States (2)	
Type of Employee (1)	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
GRAND TOTAL - BAY AREA CAMPUSES												
Research	348	222	42	3	60	8	1,441	411	1,473	426	1,509	445
Non-Research	141	90	12	3	66	6	1,047	240	1,067	251	1,084	263
Grand Total	**489**	**312**	**54**	**6**	**126**	**14**	**2,488**	**651**	**2,540**	**677**	**2,593**	**708**
Payroll	$57,298,441		$4,080,973		$13,078,059		$253,959,508		$258,575,300		$261,419,243	
Guest Employees (3)	178	173	6	4	9	4	518	358	597	388	790	448

Sources: LBNL Human Resources Department; LBNL Controller's Office; and CBRE Consulting.
Note: Figures may not total due to rounding. FT= full-time; PT=part-time.
(1) Employment figures reflect actual headcount, not full-time equivalents. LBNL employees are divided into Researchers and Non-Research employees.
(2) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.
(3) Guest employees are not paid by LBNL, and therefore are not included in the LBNL totals.

FULL-TIME-EQUIVALENT EMPLOYMENT

- Full-Time-Equivalent Employment levels in the Cities of Berkeley, Emeryville, and Walnut Creek were 620, 57, and 129, respectively.
- Bay Area Full-Time-Equivalent Employment was 2,769.
- California Full-Time-Equivalent Employment was 2,832.
- All U.S. Full-Time-Equivalent Employment was 2,898.

Table 4: Total Full-Time-Equivalent Employment Generated by Lawrence Berkeley Lab Spending, FY 2009

Geography (1)	Direct Jobs (LBNL FTE Employment)	Direct Spending (2)	Multiplier (3) (4)	Indirect and Induced Jobs	Total Direct, Indirect, & Indirect Jobs	Percent of U.S. Jobs
GRAND TOTAL - BAY AREA CAMPUSES						
City of Berkeley	620	$155,446,775	7.24	1,125	1,745	14%
City of Emeryville	57	$6,315,326	20.11	127	184	1%
City of Walnut Creek	129	$22,726,849	10.33	235	363	3%
Bay Area	2,769	$501,017,387	5.67	2,843	5,612	45%
California	2,832	$537,692,640	7.48	4,023	6,855	55%
United States	2,898	$698,021,967	13.77	9,609	12,507	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

(2) Includes purchasing, payroll, and construction spending.

(3) Job multipliers are calculated per $1 million of spending.

(4) The Multiplier is equivalent to Indirect and Induced Jobs divided by the result of Direct Spending divided by one million.

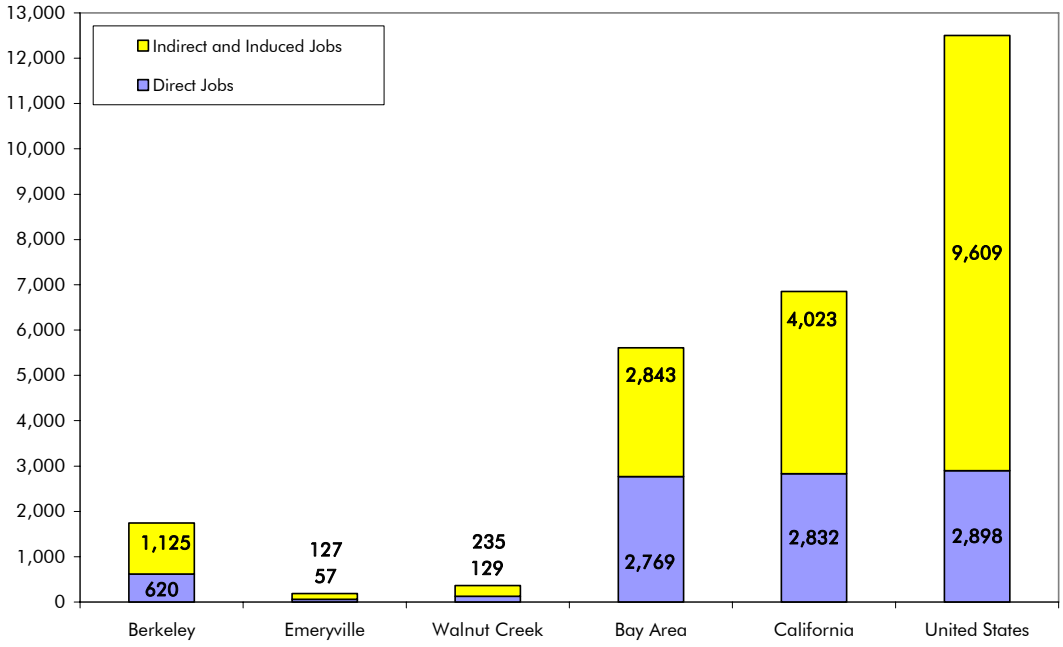
TOTAL INDIRECT AND INDUCED JOBS

- Indirect and induced jobs produced by LBNL in the Cities of Berkeley, Emeryville, and Walnut Creek were estimated to be 1,125, 127, and 235, respectively.
- Indirect and induced jobs in the Bay Area were estimated to equal 2,843.
- Indirect and induced jobs in California were estimated to equal 4,023.
- Total jobs resulting from indirect and induced spending across the entire United States were estimated to be 9,609.

TOTAL DIRECT, INDIRECT, AND INDUCED JOBS PRODUCED BY BERKELEY LAB SPENDING

- Jobs resulting from Berkeley Lab's spending totaled 6,855 in California, including both direct, indirect, and induced jobs, comprising 55 percent of all jobs.
- 45 percent of the direct, indirect, and induced jobs were in the Bay Area, totaling 5,612 jobs.
- 2,293 direct, indirect, and induced jobs, or 18 percent of all jobs, were generated in the Cities of Berkeley, Emeryville, and Walnut Creek.

Figure 2: Total Employment Impacts
Lawrence Berkeley National Lab, Combined Bay Area Campuses
FY 2009



III. PURCHASING AND CAPITAL EXPENDITURES

Purchasing for Berkeley Lab encompasses spending for goods and services, which has direct, indirect, and induced impacts on each of the geographies studied. Capital expenditures include spending related to the construction of new buildings, as well as tenant improvements such as retrofitting, demolition, and upgrading of facilities. All findings are presented for FY 2009.

The methodology for estimating indirect and induced economic impacts is based on estimates of direct Berkeley Lab purchasing in particular geographic areas. In order to estimate direct purchasing in this way, Berkeley Lab staff identified the addresses of all vendors and employees that received payments from Berkeley Lab during the 2009 fiscal year.

Table 5 shows the economic multiplier effects of Berkeley Lab's $333.6 million in U.S. purchasing of goods and services, sorted by the geography of impact. Approximately 28 percent – or $217.2 million of the total $778.1 million in direct, indirect, and induced spending – were directed to the Bay Area.

Table 5: Total Purchasing Impacts from Lawrence Berkeley Lab, FY 2009

Geography (1)	Direct Purchasing	Output Multiplier (Weighted Average) (2)	Indirect and Induced Purchasing	Total Direct, Indirect, and Induced Purchsing (3)
GRAND TOTAL - BAY AREA CAMPUSES				
City of Berkeley	$45,229,688	0.33	$14,728,875	$59,958,563
City of Emeryville	$1,559,664	0.09	$133,900	$1,693,564
City of Walnut Creek	$7,041,255	0.22	$1,543,681	$8,584,936
Bay Area	$156,314,498	0.39	$60,922,096	$217,236,595
California	$182,983,148	0.51	$92,755,309	$275,738,457
United States	$333,632,165	1.33	$444,418,779	$778,050,945

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; U.S. includes California.

(2) Multipliers are not additive; they represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

DIRECT PURCHASING

- Direct spending for goods and services in the Cities of Berkeley, Emeryville, and Walnut Creek were approximately $45.2 million, $1.6 million, and $7.0 million, respectively.
- Direct purchasing in the Bay Area totaled $156.3 million.
- Berkeley Lab's direct spending in all of California amounted to nearly $183.0 million.
- Nationwide, direct purchasing exceeded $333.6 million.

INDIRECT AND INDUCED PURCHASING

- Indirect and induced spending created by Berkeley Lab's purchasing within the Cities of Berkeley, Emeryville, and Walnut Creek were estimated to be $14.7 million, $133,900, and $1.5 million, respectively.
- Bay Area indirect and induced spending was estimated to equal $60.9 million.
- Berkeley Lab indirect and induced spending in California was estimated to equal $92.8 million.

- Total Berkeley Lab indirect and induced spending in the United States was estimated to be $444.4 million.

TOTAL DIRECT, INDIRECT, AND INDUCED PURCHASING IMPACTS

- Direct, indirect, and induced spending created in the Cities of Berkeley, Emeryville, and Walnut Creek were estimated to total $60.0 million, $1.7 million, and $8.6 million, respectively.
- Bay Area direct, indirect, and induced spending was estimated to equal $217.2 million.
- Berkeley Lab direct, indirect, and induced spending in California was estimated to equal $275.7 million.
- Total Berkeley Lab direct, indirect, and induced spending in the United States was estimated to be $778.1 million during Fiscal Year 2009.

MAJOR CAPITAL PROJECTS

- The majority of capital expenditures were incurred for construction and improvement projects at the Berkeley Campus, where $43.2 million were spent. Another $481,226 were spent at the Joint BioEnergy Institute in Emeryville, while only $13,045 in capital expenditures were occurred at the Joint Genome Institute in Walnut Creek.
- In total, approximately $43.7 million in capital expenditures were incurred by these three campuses combined.

Table 6: Lawrence Berkeley Lab Major Capital Projects by Campus, FY 2009	
Campus / Name of Project	Total Expenditures (1)
LBNL Berkeley Campus	
ALS User Support Bldg - Cnstr	$9,254,709
B50/74 Cnst-Seismic Safety Ph1	$8,798,617
B51 Excess Facilities - DOE	$6,796,686
B77 Ph2 Construction	$5,805,754
Seismic Safety Ph 2 (PED)	$2,365,541
B6 - AHU Upgrade	$945,771
B70A R4431 Clean Room	$585,633
Sitewide Radio Com System Upg	$584,012
B72B Upgr 1.0 TEAM Microscope	$537,588
All Others	$7,532,074
Subtotal - Berkeley	**$43,206,386**
Joint BioEnergy Institute, Emeryville	
B74 Move to B977/B84/B1	$481,226
Subtotal - Emeryville	**$481,226**
Joint Genome Institute, Walnut Creek	
B400 Eng Study Chiller Replace	$13,045
Subtotal - Walnut Creek	**$13,045**
GRAND TOTAL - BAY AREA CAMPUSES	$43,700,657

Sources: LBNL Office of Capital and Physical Planning; and CBRE Consulting.

(1) Total excludes labor costs incurred by LBNL's direct employees. These labor costs are reflected in Payroll figures.

CAPITAL EXPENDITURES

- The $43.7 million in capital expenditures incurred during Fiscal Year 2009 resulted in another $91.4 million of indirect and induced spending impacts across the country. Total direct, indirect, and induced spending impacts from the lab's capital expenditures were estimated to be $135.1 million.
- Of these $135.1 million in impacts, approximately 53 percent – or $72.1 million – were directed to the Bay Area.
- The Cities of Berkeley, Emeryville, and Walnut Creek benefited from a combined total of $63.1 million in total spending impacts, almost all of which were in Berkeley.

Table 7: Lawrence Berkeley Lab Capital Expenditures, FY 2009				
Geography (1)	Direct Spending	Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)
GRAND TOTAL - BAY AREA CAMPUSES				
City of Berkeley	$43,206,386	0.45	$19,276,061	$62,482,447
City of Emeryville	$481,226	0.29	$138,081	$619,307
City of Walnut Creek	$13,045	0.45	$5,857	$18,902
Bay Area	$43,700,657	0.65	$28,369,181	$72,069,838
California	$43,700,657	0.83	$36,193,996	$79,894,653
United States	$43,700,657	2.09	$91,419,290	$135,119,948

Sources: LBNL Office of Design and Construction; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; U.S. includes California.

(2) Multipliers are not additive, they represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

IV. INCOME

Adding direct, indirect, and induced impacts show Berkeley Lab's total income benefits locally and within the Bay Area, California, and United States geographies. Total direct, indirect, and induced income generates a total personal income figure that is unique and separate from total spending.

This indirect and induced income can be thought of as income earned by non-Berkeley Lab employees, but as a consequence of Berkeley Lab's existence. Indirect and induced personal income is income in addition to the direct payroll of University faculty and staff. The indirect and induced personal income impacts are generated by the spending associated with Berkeley Lab payroll as well as goods and services purchases and capital expenditures made by the Lab. The estimated personal income multiplier associated with the Lab's total spending was 0.57 in FY 2009, which indicates that each $1.00 of Berkeley Lab spending generated an additional $0.57 in personal income. All findings are presented for FY 2009.

INDIRECT AND INDUCED INCOME FROM BERKELEY LAB SPENDING

- Berkeley Lab's total direct spending of $698.0 million – including spending associated with purchases of goods and services, payroll, and capital expenditures – generated approximately $400.6 million of indirect and induced personal income within the United States. These impacts exclude Berkeley Lab's direct payroll to its employees.
- Of the $400.6 million, approximately $145.5 million were directed to Bay Area residents. $67.3 million were directed to residents of Berkeley, Emeryville, and Walnut Creek specifically.

Table 8: Total Personal Income From Lawrence Berkeley Lab Payroll, FY 2009

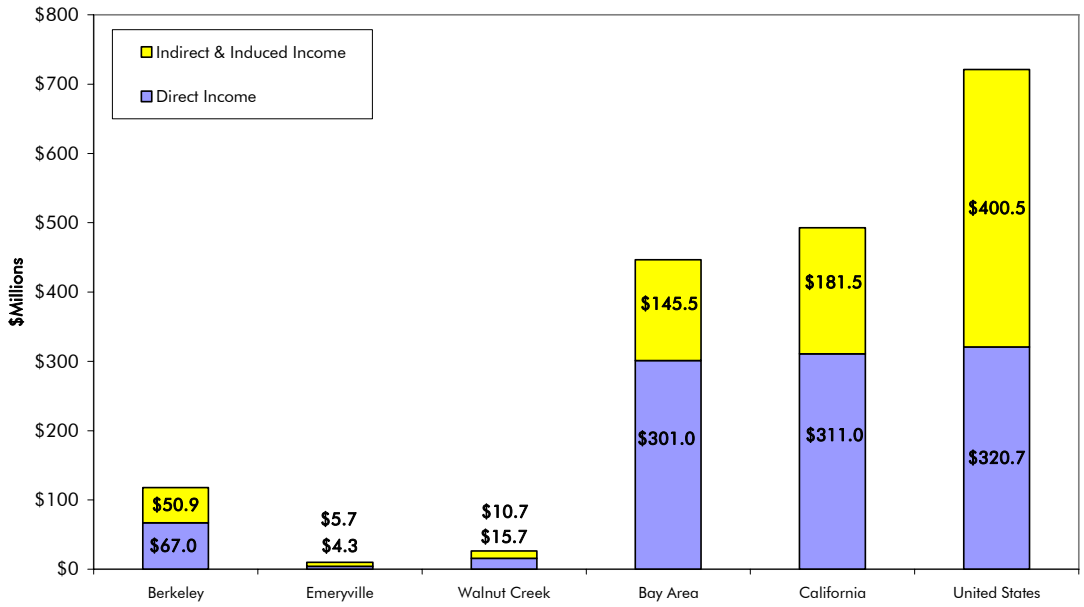
Geography (1)	Direct Spending (2)	Multiplier (3)	Indirect & Induced Income	Total Personal Income Generated	Percent of Total U.S. Income Impacts
GRAND TOTAL - BAY AREA CAMPUSES					
Berkeley	$155,446,775	0.33	$50,915,847	$117,926,548	16%
Emeryville	$6,315,326	0.91	$5,716,975	$9,991,410	1%
Walnut Creek	$22,726,849	0.47	$10,653,599	$26,326,148	4%
Bay Area	$501,017,387	0.29	$145,503,031	$446,505,262	62%
California	$537,692,640	0.34	$181,544,943	$492,553,778	68%
United States	$698,021,967	0.57	$400,452,612	$721,141,756	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting.
Note: Figures may not total due to rounding.
(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.
(2) Direct spending includes LBNL purchasing, payroll, and capital expenditures. See Exhibits 1.1 through 1.4.
(3) Multipliers are not additive; they represent weighted averages.

DIRECT, INDIRECT, & INDUCED PERSONAL INCOME GENERATED BY BERKELEY LAB

- The total direct, indirect, and induced personal income impacts represent the lab's direct payroll to its employees, plus income impacts to people who are not affiliated with the lab. When combined with Berkeley Lab's total direct payroll of $261.4 million and its payments of $60.2 million to retired lab employees, the total personal income impacts amount to $721.1 million nationwide.

Figure 3: Total Personal Income Impacts
Lawrence Berkeley National Lab, Combined Bay Area Campuses
FY 2009



Of the total $721.1 million of income generated by the lab, $446.5 million, or 62 percent, is directed to residents of the Bay Area. Including the lab's direct employees, residents of Berkeley, Emeryville, and Walnut Creek benefited from $154.2 million in personal income generated by Berkeley Lab.

V. SUMMARY OF FISCAL YEAR 2009 LBNL ECONOMIC IMPACTS

Berkeley Lab is responsible for millions of dollars of spending not only in the Cities of Berkeley, Emeryville, and Walnut Creek – where its three Bay Area campuses are located – but also throughout California and the United States. Furthermore, the Lab's Bay Area operations generate direct and indirect employment and income gains throughout the country.

OVERALL BENEFITS TO THE CITIES OF BERKELEY, EMERYVILLE, AND WALNUT CREEK

- From the overall direct, indirect, and induced spending of Berkeley Lab, businesses within the Cities of Berkeley, Emeryville, and Walnut Creek gained a total of $201.3 million, $7.1 million, and $27.7 million, respectively, in FY 2009.
- In FY 2009, Berkeley Lab was also responsible for 1,745 full-time-equivalent jobs in Berkeley, 184 in Emeryville, and 363 in Walnut Creek.
- The combined impacts of Berkeley Lab's spending and payroll bolstered the incomes of Berkeley, Emeryville, and Walnut Creek residents by $117.9 million, $9.9 million, and $26.3 million, respectively, in FY 2009.

Table 9: Summary of Lawrence Berkeley Lab Economic Impacts By Geography, FY 2009

Impact	Berkeley	Emeryville	Walnut Creek	Bay Area (1)	California (1)	United States (1)
GRAND TOTAL - BAY AREA CAMPUSES						
Spending						
Direct	$155,446,775	$6,315,326	$22,726,849	$501,017,387	$537,692,640	$698,021,967
Indirect & Induced	$45,887,307	$778,831	$4,930,497	$189,069,438	$266,409,984	$915,046,819
Total Spending	$201,334,082	$7,094,157	$27,657,347	$690,086,825	$804,102,624	$1,613,068,786
Employment						
Direct	620	57	129	2,769	2,832	2,898
Indirect & Induced	1,125	127	235	2,843	4,023	9,609
Total Jobs	1,745	184	363	5,612	6,855	12,507
Income						
Direct	$67,010,701	$4,274,435	$15,672,549	$301,002,231	$311,008,835	$320,689,144
Indirect & Induced	$50,915,847	$5,716,975	$10,653,599	$145,503,031	$181,544,943	$400,452,612
Total Income	$117,926,548	$9,991,410	$26,326,148	$446,505,262	$492,553,778	$721,141,756

Sources: CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; United States includes California.

The total of $236.1 million in spending impacts within these local cities, plus the generation of 2,293 full-time-equivalent jobs and over $154.2 million in personal income, show that Berkeley Lab has a tremendous positive impact on the local economy. The Lab acts as a vehicle for both non-research and high-paying research positions in the local economy. The prospect for graduate students as well as newly matriculated students from the University of California Berkeley to obtain higher paying research jobs is also dramatically increased with the opportunities offered by Berkeley Lab. Berkeley Lab also acts as a catalyst for construction jobs, which will continue in the long term with new development and building improvements at each of the three existing campuses in the Bay Area.

OVERALL BENEFITS TO THE BAY AREA, CALIFORNIA, AND THE UNITED STATES

- The Bay Area benefited from $690.1 million in spending impacts, 5,612 jobs, and $446.5 million in person income impacts generated by Berkeley Lab.
- Statewide, these impacts totaled $804.1 million in spending, 6,855 jobs, and $492.6 million in personal income.
- Nationally, the total spending impacts amounted to $1.6 billion, jobs impacts totaled 12,507, and personal income impacts were estimated to be $721.1 million.

These regional and national impacts suggest that Berkeley Lab is not only a valuable economic generator locally, but also creates an economic ripple effect that benefits the region, state, and nation.

VI. IMPACT OF COMMERCIALIZATION OF BERKELEY LAB TECHNOLOGIES

TRANSFER OF TECHNOLOGY

In addition to direct, indirect, and induced economic impacts from payroll, purchasing, and capital expenditures, Berkeley Lab also contributes significantly to economic development through the innovation of new technologies. Unlike typical Federal investments in a community, such as a military base, a national laboratory provides the added economic benefit of licensing these new technologies to start-up companies as well as to existing companies – creating new companies and new jobs.

Since 1990, Berkeley Lab technology has formed the basis for close to 30 start-ups, creating over 2,000 new jobs in these companies alone. The technologies licensed by these start-ups reflect the mission of a national laboratory to tackle society's most difficult problems in medicine, energy, and the environment. A quick sampling of technologies licensed from Berkeley Lab includes genomics-related software, nanotechnology, drug development, x-ray imaging, materials sciences processing, biomolecular tagging, and energy-efficiency home improvements. The transfer of Berkeley Lab research, technology, and intellectual property into the marketplace provides direct and quantifiable economic impacts to local, regional, state, and national economies, most notably in the form of sales revenues, local employment opportunities, and personal income.

ECONOMIC IMPACTS OF START-UP COMPANIES

Berkeley Lab provided information on the close to 30 start-ups spawned by Berkeley Lab technology to support economic impact analysis of the Lab's technology transfer. CBRE Consulting matched these businesses with their NAICS code and then matched these codes to the relevant IMPLAN sector and its associated multipliers to assess the geographical economic impacts of each business based upon their employment count. [5] The multipliers assume that each company has spending, employment, and payroll characteristics that are "average" for its industry.

This matching process occurred in three different ways. First, businesses were looked up on Dun & Bradstreet, which classifies businesses according to their NAICS code. When available, the primary NAICS code listed by Dun & Bradstreet was selected. NAICS codes for approximately one-half the start-up companies were identified in this manner. Second, the Lab's Technology Transfer Licensing Manager provided input based on knowledge about the individual businesses and/or researching the businesses through the SEC EDGAR database. Finally, CBRE Consulting reviewed individual company websites, discussed the nature of the company's activities with the Lab's Licensing Manager (focusing on stage of business development, especially regarding research and development or manufacturing capabilities), and reviewed the NAICS directory to determine a NAICS code best fit.

The list of start-up companies included in the analysis, their year founded, and current location is included in the following text table (see Table 10). Business locations are matched to the

[5] NAICS is the North American Industrial Classification System, the industrial classification system formulated jointly by Mexico, Canada, and the United States in 1997. NAICS divides the economy into 20 sectors, with a focus on grouping economic units that have similar production processes in the same industry.

geographies included in this economic impact analysis. These companies currently have total employment of 2,393, with 62 percent of jobs located in the Bay Area. In total, 90 percent of jobs are in California, with the remaining 10 percent located elsewhere in the United States. The start-up company job generation exceeds the job count at the Lab, which totaled 790 full-time and 448 part-time employees during FY 2009.

Table 10: List of Companies Originating from LBNL Technologies

Company Name	Location	Year Founded
Data Logic Division of Gene Logic Corp.	Berkeley	1997
Morris Research, Inc.	Berkeley	1990
Polyplus Battery Company	Berkeley	1990
Seeo, Inc.	Berkeley	2007
Nanomix, Inc.	Emeryville	2001
Ariel Technologies	Other Bay Area	1998
Artery Therapeutics, Inc.	Other Bay Area	2006
Berkeley HartLab, Inc.	Other Bay Area	1997
Dynamic Throughput	Other Bay Area	2008
Fluigence	Other Bay Area	2009
Neomorphic Software	Other Bay Area	1997
Nanosys, Inc.	Other Bay Area	2002
Soladigm	Other Bay Area	2008
Solexant	Other Bay Area	2008
Symyx Technologies, Inc.	Other Bay Area	1995
VSOM, Inc.	Other Bay Area	2002
Xradia, Inc.	Other Bay Area	2000
Cargo Technology, Inc.	Other California	2000
Quantum Dot Corporation	Other California	1998
Syrrx, Inc.	Other California	1999
WaterHealth International	Other California	1996
Carrier Aeroseal, LLC	Other U.S.	1997
Interactive Supercomputing (Acquired by Microsoft)	Other U.S.	2004
Momenta Pharmaceuticals, Inc.	Other U.S.	2002
RSL Energy, Inc.	Other U.S.	2006

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

The economic impacts of the start-up companies are substantial, and exceed the impacts of the Lab itself. This is attributable to the much greater aggregate level of employment at the start-up companies. The results presented in Table 11 below indicate that the output, or spending impacts of the start-up companies, their vendors, and associate employees totals $2.8 billion throughout the United States.[6] Given the location of the start-up companies, a small amount of

[6] Each company's direct output was calculated based on its direct employment. Direct output, in millions of dollars, is calculated by dividing a company's direct employment by its direct jobs multiplier. For example, a company with 30 direct employees and a direct jobs multiplier of 3.00 jobs per $1.000 million of output has total direct output of $10.00 million.

this impact, $14.8 million, is located in the City of Berkeley, with a smaller level of $8.6 million in the City of Emeryville. Bay Area businesses as a whole benefit by $904.0 million, inclusive of the local impacts, while throughout California businesses benefit by $1.6 billion. Given the size of the business and the nature of its operations, a significant share of this contribution is attributable to Symyx Technologies, Inc., a 700-employee software firm focused on serving companies engaged in scientific R&D for life sciences, chemicals and energy, and consumer and industrial products.

Table 11: Summary of Economic Impacts Associated with LBNL Technology Spin-Offs

Type of Impact	City of Berkeley	City of Emeryville	City of Walnut Creek	Bay Area (1)	California (1)	United States (1)
Output						
Direct	$9,226,934	$6,348,312	$0	$515,212,544	$840,586,816	$992,590,856
Indirect/Induced	$5,525,498	$2,225,471	$0	$388,739,914	$736,641,516	$1,848,348,701
Total Output	$14,752,432	$8,573,783	$0	$903,952,458	$1,577,228,332	$2,840,939,557
Employment						
Direct	84	40	0	1,482	2,153	2,393
Indirect/Induced	38	14	0	2,232	4,303	10,586
Total Employment	122	54	0	3,714	6,456	12,979
Personal Income						
Direct	$4,786,258	$3,374,705	$0	$162,941,290	$202,784,913	$209,257,963
Indirect/Induced	$1,741,240	$693,246	$0	$120,156,153	$208,177,305	$485,930,417
Total Income	$6,527,498	$4,067,951	$0	$283,097,443	$410,962,218	$695,188,380

Sources: Lawrence Berkeley National Laboratory Licensing Manager; company websites; Dun & Bradstreet; and CBRE Consulting.
(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

The job impacts associated with the start-up firms totals 12,979 nationally. This comprises 10,586 indirect and induced jobs in addition to the 2,393 direct jobs. The total job impacts are relatively small in Berkeley and Emeryville, at 122 and 54, respectively, but they increase substantially to 3,714 throughout the Bay Area and 6,456 throughout California.

Finally, the start-up company wage impacts indicate that personal incomes are greatly enriched as a result of their operation. Throughout the United States, these impacts are estimated at $695.2 million. Locally, the wage impacts are $6.5 million in Berkeley and $4.1 million in Emeryville. These impacts increase to $283.1 million throughout the Bay Area, inclusive of the local impacts. In all of California, the personal wage impacts are estimated at $411.0 million, which is a substantial boost to the state economy.

In summary, the start-up company economic impacts by geography are as follows:

- Total direct, indirect, and induced impacts in the United States are $2.8 billion in spending, 12,979 jobs, and $695.2 million in personal income generated.
- The vast majority of the impacts are realized in the State of California, including: $1.6 billion, or 55 percent of spending; 6,456, or 49 percent of jobs; and $411.0 million, or 59 percent of all personal income generated within the nation.
- Impacts in the Bay Area are $904.0 million in spending, 3,714 jobs, and $283.1 million in personal income generated.
- Finally, the impacts to more local areas of California include $14.8 million of spending in Berkeley and $8.6 million in Emeryville, 122 jobs in Berkeley and 54 in Emeryville, and $6.5 million in personal income generated in Berkeley and $4.1 million in Emeryville.

These findings suggest that start-up companies based on Berkeley Lab technologies and innovations provide a substantial economic contribution, with an overwhelming share conveyed to the regional and statewide economies.

VII. HISTORIC AND PROJECTED IMPACTS COMPARISON

COMPARISON TO FY 2005

This FY 2009 economic impacts study is an update to a similar study conducted by CBRE Consulting for the Lab's FY 2005. The exceptions include that the FY 2005 study originally included additional international expenditures for the Lab and did not include payments to Lab retirees (totaling $60.2 million in FY 2009). In addition, the FY 2009 study highlights expenditures associated with the Joint BioEngergy Institute in Emeryville and the Joint Genome Institute in Walnut Creek.

The FY 2005 study was prepared in July 2007, and reissued March 2010. The reissue reflects slightly adjusted figures from the earlier study due to methodological changes and corrections to facilitate comparison with the FY 2009 analysis. All figures cited below comparing the two studies reflect FY 2005 figures from the reissued study.

Between FY 2005 and FY 2009, Berkeley Lab's spending on goods and services and payroll increased, while employment modestly declined. Total spending on Purchasing, Payroll, and Capital Expenditures increased from $518.8 million to $698.0 million, while Payroll alone increased from $237.8 million to $320.7 million. Total employment declined from 2,977 to 2,898.

A summary of the FY 2005 and FY 2009 economic impact findings is presented in Table 12. These results indicate that nationally, the Berkeley Lab's spending impacts increased from $1.2 billion to $1.6 billion. Total jobs impacts stayed approximately the same, increasing only modestly from 12,460 to 12,507. Income impacts increased from $599.5 million to $721.1 million. The relative parity in jobs impacts indicates a shift in the underlying jobs multipliers, likely reflecting that between 2002 and 2008 (the years to which the studies' multipliers correspond), companies have improved worker productivity and therefore lowered the proportion between employment and output.

Table 12: Comparison of FY 2005 and FY 2009 Economic Impact Findings			
	Total Direct, Indirect, and Induced Impacts		
	FY 2005		FY 2009
Spending			
Berkeley	$144,233,280		$201,334,082
Emeryville	N/A	(1)	$7,094,157
Walnut Creek	N/A	(1)	$27,657,347
Bay Area	$483,836,391		$690,086,825
California	$598,069,152		$804,102,624
United States	$1,176,815,493		$1,613,068,786
Employment			
Berkeley	1,735		1,745
Emeryville	N/A	(1)	184
Walnut Creek	N/A	(1)	363
Bay Area	5,733		5,612
California	6,924		6,855
United States	12,460		12,507
Personal Income			
Berkeley	$103,945,719		$117,926,548
Emeryville	N/A	(1)	$9,991,410
Walnut Creek	N/A	(1)	$26,326,148
Bay Area	$369,845,101		$446,505,262
California	$403,224,788		$492,553,778
United States	$599,530,164		$721,141,756

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

(1) The FY 2005 study did not examine impacts on the local jurisdictions of Emeryville or Walnut Creek.

In addition to the trend in national impacts, Berkeley Lab Impacts by location also increased between the fiscal years. Highlights of these changes are as follows:

- In Berkeley, spending impacts increased by 40 percent, from $144.2 million to $201.3 million. Job impacts remained relatively the same, increasing from 1,735 to 1,745. Income impacts increased 13 percent, from $103.9 million to $117.9 million.
- There are no noted increases in the impacts in Emeryville or Walnut Creek because these facilities were not present in FY 2005, and thus were not available for impact assessment.
- Throughout the Bay Area, spending impacts increased only a modest 4 percent, from $483.8 million in FY 2005 to $690.1 million in FY 2009. Job impacts actually declined, dropping from 5,733 in FY 2005 to 5,612 in FY 2009. Income impacts, however, increased disproportionately with these changes, increasing 21 percent, growing from $369.8 million in FY 2005 to $446.5 million in Fiscal Year 2009.
- In California, spending impacts increased by 34 percent, growing from $598.1 million in FY 2005 to $804.1 million in FY 2009. Job impacts, however, declined 10 percent,

dropping from 6,924 in FY 2005 to 6,855 in FY 2009. In contrast to the job impacts, however, income impacts increased by 22 percent, increasing from $403.2 million in Fiscal Year 2005 to $492.6 million in FY 2009.

In summary, the Berkeley Lab's budgetary growth and geographic expansion has resulted in increased local, regional, state, and national economic impacts. As the Lab's budget increases over time, these impacts will continue to increase, enhancing the Lab's contribution to the economy and economic development at all levels.

FUTURE ECONOMIC IMPACTS ANTICIPATED FROM LBNL STIMULUS FUNDING

CBRE Consulting understands that LBNL has been awarded with at least $221.0 million in American Recovery and Reinvestment Act of 2009 (ARRA) stimulus funding. The funds are anticipated to be deployed by several of the lab's research initiatives, and will substantially bolster the institution's total budget above its FY 2009 level. The $221.0 million in stimulus funds, in fact, are equivalent to approximately 32 percent of the lab's $698.0 million spending in FY 2009.

The spending of these $221.0 million will impact the local, regional, state, and national economies directly, and will also have indirect and induced economic effects. In order to estimate the total impacts of the stimulus funds, CBRE Consulting employed a two-step process. First, the spending allocation – across purchasing, payroll, and capital expenditures – of the $221.0 million was estimated, using the FY 2009 allocation as a benchmark. Then, the resulting direct impact projections were multiplied by the weighted average multipliers found in the analysis of the FY 2009 impacts.

Table 13, below, provides documentation of the first step, in which the $221.0 million in stimulus funds are allocated across spending categories based on the FY 2009 benchmark. The top third of the table shows Berkeley Lab's FY 2009 actual spending and full-time-equivalent employment.

The middle third of the table shows the FY 2009 percentage allocation by category (Purchasing, Payroll, and Capital Expenditures) and by geography. The percentages shown for the United States are by category; the percentages shown for each of the other locations are by geography.

Table 13: Projection of $221 Million Stimulus Fund Budget Allocation and Direct Employment						
FY 2009 Budget Allocations ($)	**Berkeley**	**Emeryville**	**Walnut Creek**	**Bay Area**	**California**	**United States**
Purchasing	$45,229,688	$1,559,664	$7,041,255	$156,314,498	$182,983,148	$333,632,165
Payroll	$67,010,701	$4,274,435	$15,672,549	$301,002,231	$311,008,835	$320,689,144
Capital Expenditures	$43,206,386	$481,226	$13,045	$43,700,657	$43,700,657	$43,700,657
Total Spending	$155,446,775	$6,315,326	$22,726,849	$501,017,387	$537,692,640	$698,021,967
Jobs (FTE)	620	57	129	2,769	2,832	2,898
Jobs (FTE) per $1 Million in Payroll	9.25	13.34	8.20	9.20	9.10	9.04
FY 2009 Budget Allocations (%) (1) (2)	**Berkeley (1)**	**Emeryville (1)**	**Walnut Creek (1)**	**Bay Area (1)**	**California (1)**	**United States (2)**
Purchasing	13.6%	0.5%	2.1%	46.9%	54.8%	47.8%
Payroll	20.9%	1.3%	4.9%	93.9%	97.0%	45.9%
Capital Expenditures	98.9%	1.1%	0.0%	100.0%	100.0%	6.3%
Total						100.0%
Prospective Allocation of $221.0 Million Stimulus Funds (3)	**Berkeley**	**Emeryville**	**Walnut Creek**	**Bay Area**	**California**	**United States**
Purchasing	$14,320,124	$493,804	$2,229,324	$49,490,569	$57,934,102	$105,630,929
Payroll	$21,216,187	$1,353,324	$4,962,069	$95,300,000	$98,468,180	$101,533,052
Capital Expenditures	$13,679,528	$152,361	$4,130	$13,836,019	$13,836,019	$13,836,019
Total Spending	$49,215,840	$1,999,489	$7,195,524	$158,626,587	$170,238,301	$221,000,000
Jobs (FTE)	196	18	41	877	896	917

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

(1) Percentages shown for local jurisdictions, the Bay Area, and California represent each geography's share of the total for that category during 2009. For example, purchasing of $45,229,688 in Berkeley comprised 13.6 percent of the total $333,632,165 purchasing in 2009.

(2) Percentages shown for the U.S. represent each each category's share of the total budget allocation in 2009. For example, Purchasing comprised $333,632,165 of the total $698,021,967, or 47.8 percent.

(3) Total U.S. spending in each category (purchasing, payroll, and capital expenditures) is calculated by multiplying the total $221.0 million in stimulus funding by the associated total percentages of 52.2, 40.9, and 6.8 percent, respectively. Each geography's share of the total U.S. spending is then calculated based on the geographic allocation from FY 2009. For example, in 2009, 13.6 percent of purchasing occurred within the city of Berkeley.

(4) Jobs from stimulus funding are projected based on total payroll projections for the stimulus funds and the Jobs (FTE) per $1 Million in Payroll shown for the 2009 budget.

The bottom third of Table 13 shows the allocation estimates that result when the $221.0 million in total stimulus funding are multiplied by the percentage allocations. This table also provides an estimate of the net new direct employees that the stimulus funding will enable Lawrence Berkeley National Lab to hire. These jobs are calculated based on the relationship between FY 2009 payroll and FTE jobs, as documented in the table.

Table 14 documents the economic impact estimates that result when the direct allocation of the $221.0 million in stimulus funds are input into the economic impact model. These findings assume that the relationship between direct impacts and indirect/induced impacts during FY 2009 remain consistent. For example, direct spending in the City of Berkeley during FY 2009 was $155.4 million, while indirect and induced spending in Berkeley during that year were estimated to be $45.9 million (see Table 9 in Chapter V). Thus, the multiplier relationship was 0.30. As shown in Table 14, the $49.2 million in direct spending in Berkeley, which is anticipated to result from the stimulus funds granted to LBNL, is therefore estimated to add $14.2 million of indirect and induced spending in that geography.[7]

[7] The $14.2 million is calculated as $49.2 million times the 0.30 multiplier.

Table 14: Projected Direct, Indirect, and Induced Impacts of LBNL Stimulus Funds						
Impact	Berkeley	Emeryville	Walnut Creek	Bay Area (1)	California (1)	United States (1)
GRAND TOTAL - BAY AREA CAMPUSES						
Spending						
Direct	$49,215,840	$1,999,489	$7,195,524	$158,626,587	$170,238,301	$221,000,000
Indirect & Induced	$14,528,332	$246,585	$1,561,040	$59,861,076	$84,347,784	$289,712,010
Total Spending	$63,744,172	$2,246,073	$8,756,563	$218,487,663	$254,586,085	$510,712,010
Employment						
Direct	196	18	41	877	896	917
Indirect & Induced	356	40	74	900	1,274	3,042
Total Jobs	553	58	115	1,777	2,170	3,960
Income						
Direct	$21,216,187	$1,353,324	$4,962,069	$95,300,000	$98,468,180	$101,533,052
Indirect & Induced	$16,120,413	$1,810,045	$3,373,025	$46,067,561	$57,478,753	$126,786,880
Total Income	$37,336,600	$3,163,370	$8,335,094	$141,367,561	$155,946,933	$228,319,932

Sources: Lawrence Berkeley National Lab; and CBRE Consulting.
Note: Figures may not total due to rounding.
(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; United States includes California.

Based on the above methodology, the $221.0 million in ARRA stimulus funds granted to LBNL are anticipated to have the following economic impacts:

- Total spending impacts of $510.7 million nationwide. Within the Bay Area and California, the spending impacts are estimated to be $218.5 million and $254.6 million, respectively.
- Total spending impacts of $74.7 million directed to the local Cities of Berkeley, Emeryville, and Walnut Creek combined.
- Approximately 3,960 jobs in the United States, 2,170 of which are estimated to be in California and 1,777 of which are estimated to be in the Bay Area.
- A total of 726 jobs in Berkeley, Emeryville, and Walnut Creek combined.
- Approximately $228.3 million in personal income in the United States, $155.9 million of which is estimated to benefit California residents, and $141.4 million of which is estimated to benefit Bay Area residents.
- A total of $48.8 million in personal income gains directed to the collective residents of Berkeley, Emeryville, and Walnut Creek.

Federal funds allocated to LBNL's Bay Area laboratories clearly have a positive economic impact, not only locally but also regionally, statewide, and nationally. In fact, for every $1.00 in stimulus funds awarded, CBRE Consulting estimates that a total of $2.31 will be spent within the United States, and for every $1.0 million in stimulus funding, approximately 17.9 full-time-equivalent jobs will be generated. Likewise, every $1.00 in stimulus funding will generate approximately $1.03 in personal income.

APPENDIX A: ECONOMIC IMPACT METHODOLOGY

The Multiplier Concept

The impact of Lawrence Berkeley National Lab (the "Lab") on the local, regional, state, and national economy is greater than the total of Berkeley Lab's direct spending on salaries and wages, goods and services, and construction. The reason behind this is that funds spent by Berkeley Lab are spent again by Lab employees and suppliers. Employees use their salaries and wages to purchase from local businesses. Businesses make their own purchases and hire employees, who also spend their salaries and wages in the local, regional, state, and national economy. The multiplier represents the number of times each dollar spent by the Berkeley Lab cycles through the relevant economy, generating additional income and jobs before it effectively leaves the system through savings, taxes, and expenditures made outside the region of study.

The Mechanics of the Input-Output Model

Economic multipliers are generated through the use of input-output models. These are statistical models that quantify relationships among industries. They examine the pattern of purchases by industries and the associated distribution of jobs and wages by industry. Input-output models identify, for example, all the industries from which a construction contractor purchases its supplies and in what proportion. In turn, the model then identifies the industries that are suppliers to these suppliers, or "second generation" suppliers. This continues until all major purchases are accounted for contributing to the construction contractor's original purchases. These original purchases are called the "direct sales." All other associated sales from within the supply chain are considered "indirect and induced sales." There are other indirect and induced effects associated with the contractor purchases. These include retail and other expenditures made by the construction workers paid to use the materials purchased by the construction contractor.

The size of these indirect and induced effects depends upon the definition of the region being examined as well as the nature of the economy within the region. A large region with a closed economy, which means that most needs are being met by industries located within the region, would keep many of the sales, earnings, and jobs impacts within the region. In a region like this, the multiplier effects would be relatively large, with a large share of the effects captured within the region. In contrast, a small region with an open economy, which means an economy with a limited array of producers providing goods and services, would leak sales to other regions. Because many purchases would be made from industries outside the local economy, the multiplier impacts on the local economy would be relatively small.

Indirect and Induced Impacts Defined

Input-output models measure output, or impacts, in two different ways – "indirect" impacts and "induced" impacts. "Indirect" impacts are the changes in inter-industry purchases as they respond to new demands of directly affected industries. In the case of the Lab, indirect impacts reflect the spending that the Lab's suppliers make when purchasing goods and services from second, third, and fourth generation suppliers in order to meet the demand generated by the Lab. Indirect impacts of Lab spending also include the share of suppliers' payroll (or employee's wages) that is supported by Lab spending. For example, when the Lab constructs a new lab building, the general contractor purchases lumber, rents construction equipment, hires engineers, and employs construction workers to build the lab. The spending on the raw

materials, equipment rentals, engineer fees and employee payroll that is generated by the Lab contract reflects the indirect impacts of Lab construction spending. Lab construction spending also supports a certain number of jobs and generates a share of the personal income of the employees of these suppliers – and this represents the indirect employment and personal income impacts of Lab construction spending.

On the other hand, "induced" impacts typically reflect changes in spending from households as income increases due to additional production. In the case of the Lab, induced impacts reflect the additional spending by the employees of Lab suppliers. Using the Lab construction example, the additional wages received by the employees of the general contractor, lumberyard, equipment rental company and engineering firm "induce" spending at the grocery store, movie theater and clothing store. The jobs and income that result from these consumer purchases are considered induced employment and personal income impacts.

The IMPLAN Input-Output Model

There are several input-output models commonly used by economists to estimate indirect and induced economic impacts. Because of the difficulty of measuring these effects, all of the models have limitations. Still, economists generally agree that the models can provide an approximate measure of the indirect and induced spending, jobs, and personal income generated by a given amount of direct impact in a particular geographic area. To calculate the multiplier effects of the Lab's spending and employment, CBRE Consulting used an input-output model developed by the U.S. Department of Agriculture known as IMPLAN (IMpact Analysis for PLANning).

The IMPLAN model organizes the economy into 440 separate industries and has comprehensive data on every area of the United States. CBRE Consulting organized all Lab purchasing and payroll into the IMPLAN industry classifications and used the 2008 IMPLAN tables of multipliers for the Cities of Berkeley, Emeryville, and Walnut Creek, the nine-county Bay Area, the State of California, and the United States to calculate the total effect of the Lab's spending for Fiscal Year 2009. The IMPLAN model is based on incorporating regional purchase coefficients, which measure trade flows, i.e., the proportion of local demand purchased from local producers.

Methodology for Estimating Direct, Indirect, and Induced Economic Impacts

In conducting this analysis of the Lab's total spending impacts, CBRE Consulting worked with the Lab to limit the estimates of direct spending to those expenditures that could be identified as having occurred in a specific location. For example, the spending associated with a catered event on the Lab campus is counted as direct spending in the location of the vendor providing the catering. On the other hand, the estimates of direct Lab spending do not include spending that cannot be attributed to the location where the actual purchase or expenditure occurred. For example, the estimate of direct Lab spending for the City of Berkeley does not include the Lab's reimbursement of a faculty member for a journal subscription, since the reimbursement itself does not reflect the actual location where the journal purchase took place. Because of this, the estimates of total spending, employment, and income impacts associated with Lab spending likely underestimate the total economic impact of the Lab on the state, regional, and local economies, albeit modestly.

Another important note regarding the assumptions for the geography of impacts is that jobs are counted in the location of the employer, while payroll is assumed to reflect the address of the employee. For example, for the 2009 fiscal year, all direct employment by the Lab occurs in the City of Berkeley, Emeryville, and Walnut Creek, yet direct Lab payroll is broken down based on whether the employees live in the Cities of Berkeley, Walnut Creek or Emeryville, the nine-county Bay Area, or elsewhere in California and the United States.

The impact of Lab payroll is analyzed differently than the impact of the Lab's goods and services purchasing and capital expenditures. This is because the Lab's payroll is a direct expenditure of the Lab, but is also direct income to the residents who are Lab employees. The full amount of the Lab's payroll is counted as direct income, based on employees' places of residence. However, the indirect spending, employment, and income impacts of the Lab's payroll are based on the spending of Lab employees. Employee spending reflects an assumption, provided by the Bureau of Labor Statistics' Consumer Expenditure Survey 2007, that employee disposable income is equal to 82 percent of earned income. However, this disposable income is not all spent within the location in which the employee lives. Therefore, it was necessary for CBRE Consulting to create assumptions for employee household spending patterns in the local jurisdictions and the surrounding geographies. These estimated "capture rates" are based on several factors, such as the distribution of retail and entertainment venues, the expectation that employees who do not live in Berkeley make expenditures there because of time spent at the Lab, and a baseline assumption that 30.0 percent of disposable household income is spent on housing (both rent and mortgage payments) within the employees' home geography. These geographically-specific capture rates were then applied to total disposable income and aggregated within their respective geographies to arrive at a total of indirect impacts of Lab payroll expenditures. Induced spending, employment, and income multipliers were then applied to the calculated indirect spending estimates in the same way that they were applied to goods and services purchasing and capital expenditures.

Model Implementation

Data provided by Berkeley Lab were entered into a series of linked spreadsheets prepared by CBRE Consulting. All data collected and analyzed pertained to the most recent fiscal year for which data were uniformly available from Berkeley Lab (Fiscal Year 2009). The data provided included payroll, purchasing of goods and services, and capital expenditures.

Data from Berkeley Lab were generated for six geographic regions, as follows: City of Berkeley, City of Walnut Creek, City of Emeryville, Bay Area (nine-county), the State of California, and the United States. The individual city locations correspond with existing Lab operations, with the main Lab facilities in Berkeley, the Joint Genome Institute in Walnut Creek, and the Joint BioEnergy Institute in Emeryville. The intent is to examine the economic impacts of the Lab as a whole, as well as for the additional facilities located away from the main Berkeley campus. CBRE Consulting then analyzed and summarized the data to identify Berkeley Lab's direct impacts on the study geographies. CBRE Consulting quantified the associated indirect impacts (e.g., multiplier impacts) pursuant to the IMPLAN model for each study geography.

Expenditures Excluded from Baseline Estimates of Lab Spending

The Lab expenditures for healthcare benefits are not considered in the analysis because the amount of the health benefit contribution is not necessarily equal to the value of the healthcare-related goods and services purchased by Berkeley Lab employees. Furthermore, the location of

the actual purchase of healthcare-related goods and services is difficult to track based on the patterns of Lab health benefits contributions, and therefore does not lend itself to inclusion in this type of analysis. Despite the exclusion of this benefits contribution from the analysis of the Lab's economic impact, these sizable contributions do play an important role in supporting the personal and financial needs of Berkeley Lab employees and undoubtedly make important yet distinct economic contributions to the local, regional, and state economies.

APPENDIX B: DETAILED OUTPUT TABLES

The following tables provide a breakdown of the economic impact contributions from each of the three campuses that contribute to Berkeley Lab's Bay Area presence. The grand totals shown in each table correspond to the findings presented in the main body of this report (Chapter I-VII). The details by campus – the Berkeley Campus, the Joint BioEnergy Institute in Emeryville, and the Joint Genome Institute in Walnut Creek – inform the degree to which each research campus contributes to the total impact.

Table 1.1: LBNL Spending, FY 2009, Berkeley Campus Only

Table 1.2: LBNL Spending, FY 2009, Joint BioEnergy Institute (Emeryville) Only

Table 1.3: LBNL Spending, FY 2009, Joint Genome Institute (Walnut Creek) Only

Table 1: LBNL Total Spending by Bay Area Campus, FY 2009

Table 2: Summary of Lawrence Berkeley Lab Spending by Bay Area Campus, FY 2009

Table 3: Lawrence Berkeley Lab Employment and Payroll by Residence Location, FY 2009

Table 4: Total Full-Time-Equivalent Employment Generated by Lawrence Berkeley Lab Spending, by Bay Area Campus, FY 2009

Table 5: Total Purchasing Impacts from Lawrence Berkeley Lab, by Bay Area Campus, FY 2009

Table 6: Lawrence Berkeley Lab Major Capital Projects by Campus, FY 2009

Table 7: Lawrence Berkeley Lab Capital Expenditures by Bay Area Campus, FY 2009

Table 8: Total Personal Income from Lawrence Berkeley Lab Payroll, by Bay Area Campus, FY 2009

Table 9: Lawrence Berkeley Lab Impacts by Geography and Bay Area Campus, FY 2009

Table 10: List of Companies Originating from LBNL Technologies

Table 11: Summary of Economic Impacts Associated with LBNL Technology Spin-Offs, FY 2009

Table 12: Comparison of FY 2005 and FY 2009 Economic Impact Findings

Table 13: Projection of $221 Million Stimulus Fund Budget Allocation and Direct Employment

Table 14: Projected Direct, Indirect, and Induced Impacts of LBNL Stimulus Funds

Table 1.1: LBNL Spending, FY 2009
Berkeley Campus Only

Spending by Geography	Direct Spending (1)	Output Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)	Percentage of U.S. Impacts
City of Berkeley					
Purchasing	$44,186,771	0.33	$14,416,674	$58,603,445	
Payroll	$64,841,695	0.18	$11,496,930	$76,338,625	
Capital Expenditures	$43,206,386	0.45	$19,276,061	$62,482,447	
Total:	$152,234,852	0.30	$45,189,665	$197,424,517	13%
City of Emeryville					
Purchasing	$1,357,533	0.08	$114,642	$1,472,175	
Payroll	$3,718,056	0.12	$440,943	$4,158,999	
Capital Expenditures	$0	--	$0	$0	
Total:	$5,075,589	0.11	$555,585	$5,631,174	0%
City of Walnut Creek					
Purchasing	$4,346,095	0.22	$967,006	$5,313,101	
Payroll	$12,770,571	0.22	$2,755,209	$15,525,781	
Capital Expenditures	$0	--	$0	$0	
Total:	$17,116,666	0.22	$3,722,215	$20,838,882	1%
Bay Area (4)					
Purchasing	$141,082,894	0.38	$54,130,701	$195,213,595	
Payroll	$290,968,605	0.33	$96,452,835	$387,421,441	
Capital Expenditures	$43,206,386	0.65	$28,048,314	$71,254,700	
Total:	$475,257,885	0.38	$178,631,851	$653,889,736	44%
California (4)					
Purchasing	$162,631,929	0.50	$80,890,452	$243,522,381	
Payroll	$300,685,480	0.44	$132,901,664	$433,587,144	
Capital Expenditures	$43,206,386	0.83	$35,784,628	$78,991,014	
Total:	$506,523,795	0.49	$249,576,743	$756,100,538	51%
United States (4)					
Purchasing	$292,902,717	1.33	$388,411,311	$681,314,028	
Payroll	$310,231,592	1.18	$366,842,065	$677,073,657	
Capital Expenditures	$43,206,386	2.09	$90,385,303	$133,591,689	
Total:	$646,340,695	1.31	$845,638,679	$1,491,979,374	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Multipliers are not additive; totals represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

(4) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; United States includes California.

Table 1.2: LBNL Spending, FY 2009 Joint BioEnergy Institute (Emeryville) Only					
Spending by Geography	Direct Spending (1)	Output Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)	Percentage of U.S. Impacts
City of Berkeley					
Purchasing	$669,020	0.37	$248,714	$917,735	
Payroll	$1,008,027	0.18	$178,500	$1,186,527	
Capital Expenditures	$0	--	$0	$0	
Total:	$1,677,047	0.25	$427,215	$2,104,262	4%
City of Emeryville					
Purchasing	$146,529	0.12	$17,046	$163,574	
Payroll	$355,164	0.12	$42,612	$397,776	
Capital Expenditures	$481,226	0.29	$138,081	$619,307	
Total:	$982,919	0.20	$197,739	$1,180,658	2%
City of Walnut Creek					
Purchasing	$1,014	0.00	$0	$1,014	
Payroll	$4,640	0.22	$1,002	$5,642	
Capital Expenditures	$0	--	$0	$0	
Total:	$5,654	0.18	$1,002	$6,656	0%
Bay Area (4)					
Purchasing	$3,324,076	0.46	$1,539,118	$4,863,195	
Payroll	$4,613,115	0.33	$1,529,420	$6,142,535	
Capital Expenditures	$481,226	0.65	$312,398	$793,624	
Total:	$8,418,418	0.40	$3,380,937	$11,799,354	24%
California (4)					
Purchasing	$4,077,490	0.56	$2,301,752	$6,379,243	
Payroll	$4,684,451	0.44	$2,071,369	$6,755,820	
Capital Expenditures	$481,226	0.83	$398,564	$879,790	
Total:	$9,243,168	0.52	$4,771,686	$14,014,853	29%
United States (4)					
Purchasing	$15,704,689	1.37	$21,504,064	$37,208,753	
Payroll	$4,684,451	1.18	$5,539,108	$10,223,559	
Capital Expenditures	$481,226	2.09	$1,006,698	$1,487,925	
Total:	$20,870,367	1.34	$28,049,870	$48,920,236	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Multipliers are not additive; totals represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

(4) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; United States includes California.

Table 1.3: LBNL Spending, FY 2009 Joint Genome Institute (Walnut Creek) Only					
Spending by Geography	Direct Spending (1)	Output Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)	Percentage of U.S. Impacts
City of Berkeley					
Purchasing	$373,897	0.17	$63,486	$437,383	
Payroll	$1,160,979	0.18	$206,941	$1,367,920	
Capital Expenditures	$0	--	$0	$0	
Total:	$1,534,876	0.18	$270,427	$1,805,303	3%
City of Emeryville					
Purchasing	$55,603	0.04	$2,212	$57,815	
Payroll	$201,215	0.12	$23,295	$224,510	
Capital Expenditures	$0	--	$0	$0	
Total:	$256,818	0.10	$25,507	$282,325	0%
City of Walnut Creek					
Purchasing	$2,694,146	0.21	$576,676	$3,270,821	
Payroll	$2,897,338	0.22	$624,748	$3,522,086	
Capital Expenditures	$13,045	0.45	$5,857	$18,902	
Total:	$5,604,529	0.22	$1,207,280	$6,811,809	9%
Bay Area (4)					
Purchasing	$11,907,528	0.44	$5,252,277	$17,159,805	
Payroll	$5,420,511	0.33	$1,795,905	$7,216,416	
Capital Expenditures	$13,045	0.65	$8,468	$21,513	
Total:	$17,341,084	0.41	$7,056,650	$24,397,734	34%
California (4)					
Purchasing	$16,273,729	0.59	$9,563,105	$25,836,834	
Payroll	$5,638,904	0.44	$2,487,645	$8,126,549	
Capital Expenditures	$13,045	0.83	$10,804	$23,849	
Total:	$21,925,678	0.55	$12,061,554	$33,987,232	47%
United States (4)					
Purchasing	$25,024,759	1.38	$34,503,404	$59,528,163	
Payroll	$5,773,101	1.18	$6,827,577	$12,600,678	
Capital Expenditures	$13,045	2.09	$27,289	$40,334	
Total:	$30,810,905	1.34	$41,358,271	$72,169,176	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Multipliers are not additive; totals represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

(4) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; United States includes California.

Table 1: LBNL Total Spending by Bay Area Campus, FY 2009					
Campus / Geography	Direct Spending (1)	Output Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)	Percentage of U.S. Impacts
LBNL Berkeley Campus					
City of Berkeley	$152,234,852	0.30	$45,189,665	$197,424,517	13%
City of Emeryville	$5,075,589	0.11	$555,585	$5,631,174	0%
City of Walnut Creek	$17,116,666	0.22	$3,722,215	$20,838,882	1%
Bay Area	$475,257,885	0.38	$178,631,851	$653,889,736	44%
California	$506,523,795	0.49	$249,576,743	$756,100,538	51%
United States	$646,340,695	1.31	$845,638,679	$1,491,979,374	100%
Joint BioEnergy Institute, Emeryville					
City of Berkeley	$1,677,047	0.25	$427,215	$2,104,262	4%
City of Emeryville	$982,919	0.20	$197,739	$1,180,658	2%
City of Walnut Creek	$5,654	0.18	$1,002	$6,656	0%
Bay Area	$8,418,418	0.40	$3,380,937	$11,799,354	24%
California	$9,243,168	0.52	$4,771,686	$14,014,853	29%
United States	$20,870,367	1.34	$28,049,870	$48,920,236	100%
Joint Genome Institute, Walnut Creek					
City of Berkeley	$1,534,876	0.18	$270,427	$1,805,303	3%
City of Emeryville	$256,818	0.10	$25,507	$282,325	0%
City of Walnut Creek	$5,604,529	0.22	$1,207,280	$6,811,809	9%
Bay Area	$17,341,084	0.41	$7,056,650	$24,397,734	34%
California	$21,925,678	0.55	$12,061,554	$33,987,232	47%
United States	$30,810,905	1.34	$41,358,271	$72,169,176	100%
GRAND TOTAL - BAY AREA CAMPUSES					
City of Berkeley	$155,446,775	0.30	$45,887,307	$201,334,082	12%
City of Emeryville	$6,315,326	0.12	$778,831	$7,094,157	0%
City of Walnut Creek	$22,726,849	0.22	$4,930,497	$27,657,347	2%
Bay Area	$501,017,387	0.38	$189,069,438	$690,086,825	43%
California	$537,692,640	0.50	$266,409,984	$804,102,624	50%
United States	$698,021,967	1.31	$915,046,819	$1,613,068,786	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Multipliers are not additive; totals represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

(4) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; United States includes California.

Table 2: Summary of Lawrence Berkeley Lab Spending by Bay Area Campus, FY 2009			
Campus / Type of Expenditure	Total Spending in the United States	Spending in the Bay Area	Bay Area Spending as % of U.S.
LBNL Berkeley Campus			
Purchasing (1)	$292,902,717	$141,082,894	48%
Payroll	$310,231,592	$290,968,605	94%
Capital Expenditures (2)	$43,206,386	$43,206,386	100%
Subtotal - Berkeley Campus	**$646,340,695**	**$475,257,885**	**74%**
Joint BioEnergy Institute, Emeryville			
Purchasing (1)	$15,704,689	$3,324,076	21%
Payroll	$4,684,451	$4,613,115	98%
Capital Expenditures (2)	$481,226	$481,226	100%
Subtotal - Emeryville Campus	**$20,870,367**	**$8,418,418**	**40%**
Joint Genome Institute, Walnut Creek			
Purchasing (1)	$25,024,759	$11,907,528	48%
Payroll	$5,773,101	$5,420,511	94%
Capital Expenditures (2)	$13,045	$13,045	100%
Subtotal - Walnut Creek Campus	**$30,810,905**	**$17,341,084**	**56%**
GRAND TOTAL - BAY AREA CAMPUSES			
Purchasing (1)	$333,632,165	$156,314,498	47%
Payroll	$320,689,144	$301,002,231	94%
Capital Expenditures (2)	$43,700,657	$43,700,657	100%
GRAND TOTAL	**$698,021,967**	**$501,017,387**	**72%**

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Includes purchasing for goods and services but excludes construction-related expenditures.

(2) Includes all hard construction costs (i.e., labor and materials) and soft construction costs (i.e., architectural and engineering consultants, etc.).

Table 3: Lawrence Berkeley Lab Employment and Payroll by Residence Location, FY 2009

Campus / Type of Employee (1)	City of Berkeley FT	City of Berkeley PT	City of Emeryville FT	City of Emeryville PT	City of Walnut Creek FT	City of Walnut Creek PT	Bay Area (2) FT	Bay Area (2) PT	California (2) FT	California (2) PT	United States (2) FT	United States (2) PT
LBNL Berkeley Campus												
Research	334	213	30	2	47	8	1,368	395	1,397	410	1,433	429
Non-Research	135	87	10	3	47	5	1,002	229	1,020	240	1,035	252
Subtotal - Berkeley Campus	**469**	**300**	**40**	**5**	**94**	**13**	**2,370**	**624**	**2,417**	**650**	**2,468**	**681**
Payroll	**$55,129,435**		**$3,524,594**		**$10,176,081**		**$243,925,882**		**$248,251,945**		**$250,961,691**	
Guest Employees (3)	172	168	5	4	7	4	492	343	568	372	755	430
Joint BioEnergy Institute, Emeryville												
Research	9	7	12	1	1	0	51	12	52	12	52	12
Non-Research	1	3	0	0	0	0	14	10	15	10	15	10
Subtotal - Emeryville Campus	**10**	**10**	**12**	**1**	**1**	**0**	**65**	**22**	**67**	**22**	**67**	**22**
Payroll	**$1,008,027**		**$355,164**		**$4,640**		**$4,613,115**		**$4,684,451**		**$4,684,451**	
Guest Employees (3)	2	4	0	0	0	0	16	14	17	14	18	14
Joint Genome Institute, Walnut Creek												
Research	5	2	0	0	12	0	22	4	24	4	24	4
Non-Research	5	0	2	0	19	1	31	1	32	1	34	1
Subtotal - Walnut Creek Campus	**10**	**2**	**2**	**0**	**31**	**1**	**53**	**5**	**56**	**5**	**58**	**5**
Payroll	**$1,160,979**		**$201,215**		**$2,897,338**		**$5,420,511**		**$5,638,904**		**$5,773,101**	
Guest Employees (3)	4	1	0	0	2	0	10	2	11	2	16	4
GRAND TOTAL - BAY AREA CAMPUSES												
Research	348	222	42	3	60	8	1,441	411	1,473	426	1,509	445
Non-Research	141	90	12	3	66	6	1,047	240	1,067	251	1,084	263
Grand Total	**489**	**312**	**54**	**6**	**126**	**14**	**2,488**	**651**	**2,540**	**677**	**2,593**	**708**
Payroll	**$57,298,441**		**$4,080,973**		**$13,078,059**		**$253,959,508**		**$258,575,300**		**$261,419,243**	
Guest Employees (3)	178	173	6	4	9	4	518	358	597	388	790	448

Sources: LBNL Human Resources Department; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding. FT= full-time; PT=part-time.

(1) Employment figures reflect actual headcount, not full-time equivalents. LBNL employees are divided into Researchers and Non-Research employees.

(2) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

(3) Guest employees are not paid by LBNL, and therefore are not included in the LBNL totals.

Table 4: Total Full-Time-Equivalent Employment Generated by Lawrence Berkeley Lab Spending, by Bay Area Campus, FY 2009

Campus / Geography (1)	Direct Jobs (LBNL FTE Employment)	Direct Spending (2)	Multiplier (3) (4)	Indirect and Induced Jobs	Total Direct, Indirect, & Indirect Jobs	Percent of U.S. Jobs
LBNL Berkeley Campus						
City of Berkeley	596	$152,234,852	7.27	1,106	1,702	15%
City of Emeryville	43	$5,075,589	23.16	118	161	1%
City of Walnut Creek	97	$17,116,666	11.86	203	300	3%
Bay Area	2,643	$475,257,885	5.69	2,704	5,347	46%
California	2,701	$506,523,795	7.50	3,797	6,498	56%
United States	2,765	$646,340,695	13.75	8,888	11,653	100%
Joint BioEnergy Institute, Emeryville						
City of Berkeley	14	$1,677,047	7.24	12	26	7%
City of Emeryville	12	$982,919	7.21	7	19	5%
City of Walnut Creek	1	$5,654	415.67	2	3	1%
Bay Area	73	$8,418,418	5.86	49	122	31%
California	75	$9,243,168	8.22	76	150	39%
United States	75	$20,870,367	15.10	315	390	100%
Joint Genome Institute, Walnut Creek						
City of Berkeley	10	$1,534,876	4.50	7	17	4%
City of Emeryville	2	$256,818	9.31	2	4	1%
City of Walnut Creek	31	$5,604,529	5.27	30	61	13%
Bay Area	53	$17,341,084	5.19	90	143	31%
California	56	$21,925,678	6.84	150	206	44%
United States	58	$30,810,905	13.17	406	464	100%
GRAND TOTAL - BAY AREA CAMPUSES						
City of Berkeley	620	$155,446,775	7.24	1,125	1,745	14%
City of Emeryville	57	$6,315,326	20.11	127	184	1%
City of Walnut Creek	129	$22,726,849	10.33	235	363	3%
Bay Area	2,769	$501,017,387	5.67	2,843	5,612	45%
California	2,832	$537,692,640	7.48	4,023	6,855	55%
United States	2,898	$698,021,967	13.77	9,609	12,507	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

(2) Includes purchasing, payroll, and construction spending.

(3) Job multipliers are calculated per $1 million of spending.

(4) The Multiplier is equivalent to Indirect and Induced Jobs divided by the result of Direct Spending divided by one million.

Table 5: Total Purchasing Impacts from Lawrence Berkeley Lab, by Bay Area Campus, FY 2009				
Campus / Geography (1)	Direct Purchasing	Output Multiplier (Weighted Average) (2)	Indirect and Induced Purchasing	Total Direct, Indirect, and Induced Purchasing (3)
LBNL Berkeley Campus				
City of Berkeley	$44,186,771	0.33	$14,416,674	$58,603,445
City of Emeryville	$1,357,533	0.08	$114,642	$1,472,175
City of Walnut Creek	$4,346,095	0.22	$967,006	$5,313,101
Bay Area	$141,082,894	0.38	$54,130,701	$195,213,595
California	$162,631,929	0.50	$80,890,452	$243,522,381
United States	$292,902,717	1.33	$388,411,311	$681,314,028
Joint BioEnergy Institute, Emeryville				
City of Berkeley	$669,020	0.37	$248,714	$917,735
City of Emeryville	$146,529	0.12	$17,046	$163,574
City of Walnut Creek	$1,014	0.00	$0	$1,014
Bay Area	$3,324,076	0.46	$1,539,118	$4,863,195
California	$4,077,490	0.56	$2,301,752	$6,379,243
United States	$15,704,689	1.37	$21,504,064	$37,208,753
Joint Genome Institute, Walnut Creek				
City of Berkeley	$373,897	0.17	$63,486	$437,383
City of Emeryville	$55,603	0.04	$2,212	$57,815
City of Walnut Creek	$2,694,146	0.21	$576,676	$3,270,821
Bay Area	$11,907,528	0.44	$5,252,277	$17,159,805
California	$16,273,729	0.59	$9,563,105	$25,836,834
United States	$25,024,759	1.38	$34,503,404	$59,528,163
GRAND TOTAL - BAY AREA CAMPUSES				
City of Berkeley	$45,229,688	0.33	$14,728,875	$59,958,563
City of Emeryville	$1,559,664	0.09	$133,900	$1,693,564
City of Walnut Creek	$7,041,255	0.22	$1,543,681	$8,584,936
Bay Area	$156,314,498	0.39	$60,922,096	$217,236,595
California	$182,983,148	0.51	$92,755,309	$275,738,457
United States	$333,632,165	1.33	$444,418,779	$778,050,945

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Office of Design and Construction; LBNL Controller's Office; and CBRE Consulting.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; U.S. includes California.

(2) Multipliers are not additive; they represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

Table 6: Lawrence Berkeley Lab Major Capital Projects by Campus, FY 2009

Campus / Name of Project	Total Expenditures (1)
LBNL Berkeley Campus	
ALS User Support Bldg - Cnstr	$9,254,709
B50/74 Cnst-Seismic Safety Ph1	$8,798,617
B51 Excess Facilities - DOE	$6,796,686
B77 Ph2 Construction	$5,805,754
Seismic Safety Ph 2 (PED)	$2,365,541
B6 - AHU Upgrade	$945,771
B70A R4431 Clean Room	$585,633
Sitewide Radio Com System Upg	$584,012
B72B Upgr 1.0 TEAM Microscope	$537,588
All Others	$7,532,074
Subtotal - Berkeley	**$43,206,386**
Joint BioEnergy Institute, Emeryville	
B74 Move to B977/B84/B1	$481,226
Subtotal - Emeryville	**$481,226**
Joint Genome Institute, Walnut Creek	
B400 Eng Study Chiller Replace	$13,045
Subtotal - Walnut Creek	**$13,045**
GRAND TOTAL - BAY AREA CAMPUSES	**$43,700,657**

Sources: LBNL Office of Capital and Physical Planning; and CBRE Consulting.

(1) Total excludes labor costs incurred by LBNL's direct employees. These labor costs are reflected in Payroll figures.

Table 7: Lawrence Berkeley Lab Capital Expenditures by Bay Area Campus, FY 2009

Campus / Geography (1)	Direct Spending	Multiplier (Weighted Average) (2)	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending (3)
LBNL Berkeley Campus				
City of Berkeley	$43,206,386	0.45	$19,276,061	$62,482,447
City of Emeryville	$0	--	$0	$0
City of Walnut Creek	$0	--	$0	$0
Bay Area	$43,206,386	0.65	$28,048,314	$71,254,700
California	$43,206,386	0.83	$35,784,628	$78,991,014
United States	$43,206,386	2.09	$90,385,303	$133,591,689
Joint BioEnergy Institute, Emeryville				
City of Berkeley	$0	--	$0	$0
City of Emeryville	$481,226	0.29	$138,081	$619,307
City of Walnut Creek	$0	--	$0	$0
Bay Area	$481,226	0.65	$312,398	$793,624
California	$481,226	0.83	$398,564	$879,790
United States	$481,226	2.09	$1,006,698	$1,487,925
Joint Genome Institute, Walnut Creek				
City of Berkeley	$0	--	$0	$0
City of Emeryville	$0	--	$0	$0
City of Walnut Creek	$13,045	0.45	$5,857	$18,902
Bay Area	$13,045	0.65	$8,468	$21,513
California	$13,045	0.83	$10,804	$23,849
United States	$13,045	2.09	$27,289	$40,334
GRAND TOTAL - BAY AREA CAMPUSES				
City of Berkeley	$43,206,386	0.45	$19,276,061	$62,482,447
City of Emeryville	$481,226	0.29	$138,081	$619,307
City of Walnut Creek	$13,045	0.45	$5,857	$18,902
Bay Area	$43,700,657	0.65	$28,369,181	$72,069,838
California	$43,700,657	0.83	$36,193,996	$79,894,653
United States	$43,700,657	2.09	$91,419,290	$135,119,948

Sources: LBNL Office of Design and Construction; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; U.S. includes California.

(2) Multipliers are not additive, they represent weighted averages.

(3) Total spending is equal to direct spending plus indirect and induced spending.

Table 8: Total Personal Income From Lawrence Berkeley Lab Payroll, by Bay Area Campus, FY 2009					
Campus / Geography (1)	Direct Spending (2)	Multiplier (3)	Indirect & Induced Income	Total Personal Income Generated	Percent of Total U.S. Income Impacts
LBNL Berkeley Campus					
Berkeley	$152,234,852	0.33	$50,171,546	$115,013,241	17%
Emeryville	$5,075,589	1.04	$5,260,432	$8,978,488	1%
Walnut Creek	$17,116,666	0.57	$9,712,330	$22,482,902	3%
Bay Area	$475,257,885	0.29	$137,876,494	$428,845,099	63%
California	$506,523,795	0.34	$170,939,680	$471,625,160	69%
United States	$646,340,695	0.57	$370,929,502	$681,161,094	100%
Joint BioEnergy Institute, Emeryville					
Berkeley	$1,677,047	0.27	$447,413	$1,455,440	9%
Emeryville	$982,919	0.36	$348,974	$704,138	4%
Walnut Creek	$5,654	20.36	$115,118	$119,758	1%
Bay Area	$8,418,418	0.32	$2,673,436	$7,286,551	43%
California	$9,243,168	0.35	$3,267,468	$7,951,919	47%
United States	$20,870,367	0.58	$12,152,412	$16,836,863	100%
Joint Genome Institute, Walnut Creek					
Berkeley	$1,534,876	0.19	$296,889	$1,457,868	6%
Emeryville	$256,818	0.42	$107,570	$308,785	1%
Walnut Creek	$5,604,529	0.15	$826,150	$3,723,488	16%
Bay Area	$17,341,084	0.29	$4,953,102	$10,373,613	45%
California	$21,925,678	0.33	$7,337,796	$12,976,700	56%
United States	$30,810,905	0.56	$17,370,699	$23,143,800	100%
GRAND TOTAL - BAY AREA CAMPUSES					
Berkeley	$155,446,775	0.33	$50,915,847	$117,926,548	16%
Emeryville	$6,315,326	0.91	$5,716,975	$9,991,410	1%
Walnut Creek	$22,726,849	0.47	$10,653,599	$26,326,148	4%
Bay Area	$501,017,387	0.29	$145,503,031	$446,505,262	62%
California	$537,692,640	0.34	$181,544,943	$492,553,778	68%
United States	$698,021,967	0.57	$400,452,612	$721,141,756	100%

Sources: LBNL CFO Office - Procurement and Property; LBNL Office of Capital and Physical Planning; LBNL Controller's Office; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

(2) Direct spending includes LBNL purchasing, payroll, and capital expenditures. See Exhibits 1.1 through 1.4.

(3) Multipliers are not additive; they represent weighted averages.

Table 9: Lawrence Berkeley Lab Impacts By Geography and Bay Area Campus, FY 2009						
Campus / Impact	**Berkeley**	**Emeryville**	**Walnut Creek**	**Bay Area (1)**	**California (1)**	**United States (1)**
LBNL Berkeley Campus						
Spending						
Direct	$152,234,852	$5,075,589	$17,116,666	$475,257,885	$506,523,795	$646,340,695
Indirect & Induced	$45,189,665	$555,585	$3,722,215	$178,631,851	$249,576,743	$845,638,679
Total Spending	$197,424,517	$5,631,174	$20,838,882	$653,889,736	$756,100,538	$1,491,979,374
Employment						
Direct	596	43	97	2,643	2,701	2,765
Indirect & Induced	1,106	118	203	2,704	3,797	8,888
Total Jobs	1,702	161	300	5,347	6,498	11,653
Income						
Direct	$64,841,695	$3,718,056	$12,770,571	$290,968,605	$300,685,480	$310,231,592
Indirect & Induced	$50,171,546	$5,260,432	$9,712,330	$137,876,494	$170,939,680	$370,929,502
Total Income	$115,013,241	$8,978,488	$22,482,902	$428,845,099	$471,625,160	$681,161,094
Joint BioEnergy Institute, Emeryville						
Spending						
Direct	$1,677,047	$982,919	$5,654	$8,418,418	$9,243,168	$20,870,367
Indirect & Induced	$427,215	$197,739	$1,002	$3,380,937	$4,771,686	$28,049,870
Total Spending	$2,104,262	$1,180,658	$6,656	$11,799,354	$14,014,853	$48,920,236
Employment						
Direct	14	12	1	73	75	75
Indirect & Induced	12	7	2	49	76	315
Total Jobs	26	19	3	122	150	390
Income						
Direct	$1,008,027	$355,164	$4,640	$4,613,115	$4,684,451	$4,684,451
Indirect & Induced	$447,413	$348,974	$115,118	$2,673,436	$3,267,468	$12,152,412
Total Income	$1,455,440	$704,138	$119,758	$7,286,551	$7,951,919	$16,836,863
Joint Genome Institute, Walnut Creek						
Spending						
Direct	$1,534,876	$256,818	$5,604,529	$17,341,084	$21,925,678	$30,810,905
Indirect & Induced	$270,427	$25,507	$1,207,280	$7,056,650	$12,061,554	$41,358,271
Total Spending	$1,805,303	$282,325	$6,811,809	$24,397,734	$33,987,232	$72,169,176
Employment						
Direct	10	2	31	53	56	58
Indirect & Induced	7	2	30	90	150	406
Total Jobs	17	4	61	143	206	464
Income						
Direct	$1,160,979	$201,215	$2,897,338	$5,420,511	$5,638,904	$5,773,101
Indirect & Induced	$296,889	$107,570	$826,150	$4,953,102	$7,337,796	$17,370,699
Total Income	$1,457,868	$308,785	$3,723,488	$10,373,613	$12,976,700	$23,143,800
GRAND TOTAL - BAY AREA CAMPUSES						
Spending						
Direct	$155,446,775	$6,315,326	$22,726,849	$501,017,387	$537,692,640	$698,021,967
Indirect & Induced	$45,887,307	$778,831	$4,930,497	$189,069,438	$266,409,984	$915,046,819
Total Spending	$201,334,082	$7,094,157	$27,657,347	$690,086,825	$804,102,624	$1,613,068,786
Employment						
Direct	620	57	129	2,769	2,832	2,898
Indirect & Induced	1,125	127	235	2,843	4,023	9,609
Total Jobs	1,745	184	363	5,612	6,855	12,507
Income						
Direct	$67,010,701	$4,274,435	$15,672,549	$301,002,231	$311,008,835	$320,689,144
Indirect & Induced	$50,915,847	$5,716,975	$10,653,599	$145,503,031	$181,544,943	$400,452,612
Total Income	$117,926,548	$9,991,410	$26,326,148	$446,505,262	$492,553,778	$721,141,756

Sources: CBRE Consulting, Tables 1.4, 4, and 8.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; United States includes California.

Table 10: List of Companies Originating from LBNL Technologies		
Company Name	Location	Year Founded
Data Logic Division of Gene Logic Corp.	Berkeley	1997
Morris Research, Inc.	Berkeley	1990
Polyplus Battery Company	Berkeley	1990
Seeo, Inc.	Berkeley	2007
Nanomix, Inc.	Emeryville	2001
Ariel Technologies	Other Bay Area	1998
Artery Therapeutics, Inc.	Other Bay Area	2006
Berkeley HartLab, Inc.	Other Bay Area	1997
Dynamic Throughput	Other Bay Area	2008
Fluigence	Other Bay Area	2009
Neomorphic Software	Other Bay Area	1997
Nanosys, Inc.	Other Bay Area	2002
Soladigm	Other Bay Area	2008
Solexant	Other Bay Area	2008
Symyx Technologies, Inc.	Other Bay Area	1995
VSOM, Inc.	Other Bay Area	2002
Xradia, Inc.	Other Bay Area	2000
Cargo Technology, Inc.	Other California	2000
Quantum Dot Corporation	Other California	1998
Syrrx, Inc.	Other California	1999
WaterHealth International	Other California	1996
Carrier Aeroseal, LLC	Other U.S.	1997
Interactive Supercomputing (Acquired by Microsoft)	Other U.S.	2004
Momenta Pharmaceuticals, Inc.	Other U.S.	2002
RSL Energy, Inc.	Other U.S.	2006

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

Table 11: Summary of Economic Impacts Associated with LBNL Technology Spin-Offs						
Type of Impact	City of Berkeley	City of Emeryville	City of Walnut Creek	Bay Area (1)	California (1)	United States (1)
Output						
Direct	$9,226,934	$6,348,312	$0	$515,212,544	$840,586,816	$992,590,856
Indirect/Induced	$5,525,498	$2,225,471	$0	$388,739,914	$736,641,516	$1,848,348,701
Total Output	$14,752,432	$8,573,783	$0	$903,952,458	$1,577,228,332	$2,840,939,557
Employment						
Direct	84	40	0	1,482	2,153	2,393
Indirect/Induced	38	14	0	2,232	4,303	10,586
Total Employment	122	54	0	3,714	6,456	12,979
Personal Income						
Direct	$4,786,258	$3,374,705	$0	$162,941,290	$202,784,913	$209,257,963
Indirect/Induced	$1,741,240	$693,246	$0	$120,156,153	$208,177,305	$485,930,417
Total Income	$6,527,498	$4,067,951	$0	$283,097,443	$410,962,218	$695,188,380

Sources: Lawrence Berkeley National Laboratory Licensing Manager; company websites; Dun & Bradstreet; and CBRE Consulting.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes the Bay Area; U.S. includes California.

Table 12: Comparison of FY 2005 and FY 2009 Economic Impact Findings			
	Total Direct, Indirect, and Induced Impacts		
	FY 2005		FY 2009
Spending			
Berkeley	$144,233,280		$201,334,082
Emeryville	N/A	(1)	$7,094,157
Walnut Creek	N/A	(1)	$27,657,347
Bay Area	$483,836,391		$690,086,825
California	$598,069,152		$804,102,624
United States	$1,176,815,493		$1,613,068,786
Employment			
Berkeley	1,735		1,745
Emeryville	N/A	(1)	184
Walnut Creek	N/A	(1)	363
Bay Area	5,733		5,612
California	6,924		6,855
United States	12,460		12,507
Personal Income			
Berkeley	$103,945,719		$117,926,548
Emeryville	N/A	(1)	$9,991,410
Walnut Creek	N/A	(1)	$26,326,148
Bay Area	$369,845,101		$446,505,262
California	$403,224,788		$492,553,778
United States	$599,530,164		$721,141,756

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

(1) The FY 2005 study did not examine impacts on the local jurisdictions of Emeryville or Walnut Creek.

Table 13: Projection of $221 Million Stimulus Fund Budget Allocation and Direct Employment

FY 2009 Budget Allocations ($)	Berkeley	Emeryville	Walnut Creek	Bay Area	California	United States
Purchasing	$45,229,688	$1,559,664	$7,041,255	$156,314,498	$182,983,148	$333,632,165
Payroll	$67,010,701	$4,274,435	$15,672,549	$301,002,231	$311,008,835	$320,689,144
Capital Expenditures	$43,206,386	$481,226	$13,045	$43,700,657	$43,700,657	$43,700,657
Total Spending	$155,446,775	$6,315,326	$22,726,849	$501,017,387	$537,692,640	$698,021,967
Jobs (FTE)	620	57	129	2,769	2,832	2,898
Jobs (FTE) per $1 Million in Payroll	9.25	13.34	8.20	9.20	9.10	9.04

FY 2009 Budget Allocations (%) (1) (2)	Berkeley (1)	Emeryville (1)	Walnut Creek (1)	Bay Area (1)	California (1)	United States (2)
Purchasing	13.6%	0.5%	2.1%	46.9%	54.8%	47.8%
Payroll	20.9%	1.3%	4.9%	93.9%	97.0%	45.9%
Capital Expenditures	98.9%	1.1%	0.0%	100.0%	100.0%	6.3%
Total						100.0%

Prospective Allocation of $221.0 Million Stimulus Funds (3)	Berkeley	Emeryville	Walnut Creek	Bay Area	California	United States
Purchasing	$14,320,124	$493,804	$2,229,324	$49,490,569	$57,934,102	$105,630,929
Payroll	$21,216,187	$1,353,324	$4,962,069	$95,300,000	$98,468,180	$101,533,052
Capital Expenditures	$13,679,528	$152,361	$4,130	$13,836,019	$13,836,019	$13,836,019
Total Spending	$49,215,840	$1,999,489	$7,195,524	$158,626,587	$170,238,301	$221,000,000
Jobs (FTE)	196	18	41	877	896	917

Sources: Lawrence Berkeley National Laboratory; and CBRE Consulting.

(1) Percentages shown for local jurisdictions, the Bay Area, and California represent each geography's share of the total for that category during 2009. For example, purchasing of $45,229,688 in Berkeley comprised 13.6 percent of the total $333,632,165 purchasing in 2009.

(2) Percentages shown for the U.S. represent each each category's share of the total budget allocation in 2009. For example, Purchasing comprised $333,632,165 of the total $698,021,967, or 47.8 percent.

(3) Total U.S. spending in each category (purchasing, payroll, and capital expenditures) is calculated by multiplying the total $221.0 million in stimulus funding by the associated total percentages of 52.2, 40.9, and 6.8 percent, respectively. Each geography's share of the total U.S. spending is then calculated based on the geographic allocation from FY 2009. For example, in 2009, 13.6 percent of purchasing occurred within the city of Berkeley.

(4) Jobs from stimulus funding are projected based on total payroll projections for the stimulus funds and the Jobs (FTE) per $1 Million in Payroll shown for the 2009 budget.

Table 14: Projected Direct, Indirect, and Induced Impacts of LBNL Stimulus Funds						
Impact	Berkeley	Emeryville	Walnut Creek	Bay Area (1)	California (1)	United States (1)
GRAND TOTAL - BAY AREA CAMPUSES						
Spending						
Direct	$49,215,840	$1,999,489	$7,195,524	$158,626,587	$170,238,301	$221,000,000
Indirect & Induced	$14,528,332	$246,585	$1,561,040	$59,861,076	$84,347,784	$289,712,010
Total Spending	$63,744,172	$2,246,073	$8,756,563	$218,487,663	$254,586,085	$510,712,010
Employment						
Direct	196	18	41	877	896	917
Indirect & Induced	356	40	74	900	1,274	3,042
Total Jobs	553	58	115	1,777	2,170	3,960
Income						
Direct	$21,216,187	$1,353,324	$4,962,069	$95,300,000	$98,468,180	$101,533,052
Indirect & Induced	$16,120,413	$1,810,045	$3,373,025	$46,067,561	$57,478,753	$126,786,880
Total Income	$37,336,600	$3,163,370	$8,335,094	$141,367,561	$155,946,933	$228,319,932

Sources: Lawrence Berkeley National Lab; and CBRE Consulting.

Note: Figures may not total due to rounding.

(1) Bay Area is inclusive of Berkeley, Emeryville, and Walnut Creek; California includes Bay Area; United States includes California.

ASSUMPTIONS AND GENERAL LIMITING CONDITIONS

CBRE Consulting, Inc. has made extensive efforts to confirm the accuracy and timeliness of the information contained in this study. Such information was compiled from a variety of sources, including interviews with government officials, review of City and County documents, and other third parties deemed to be reliable. Although CBRE Consulting, Inc. believes all information in this study is correct, it does not warrant the accuracy of such information and assumes no responsibility for inaccuracies in the information by third parties. We have no responsibility to update this report for events and circumstances occurring after the date of this report. Further, no guarantee is made as to the possible effect on development of present or future federal, state or local legislation, including any regarding environmental or ecological matters.

The accompanying projections and analyses are based on estimates and assumptions developed in connection with the study. In turn, these assumptions, and their relation to the projections, were developed using currently available economic data and other relevant information. It is the nature of forecasting, however, that some assumptions may not materialize, and unanticipated events and circumstances may occur. Therefore, actual results achieved during the projection period will likely vary from the projections, and some of the variations may be material to the conclusions of the analysis.

Contractual obligations do not include access to or ownership transfer of any electronic data processing files, programs or models completed directly for or as by-products of this research effort, unless explicitly so agreed as part of the contract.