Driving High-Performance, Sustainable New Construction Through Campus Policy
Agenda

1. What is green building policy at Berkeley Lab?

2. Why have campus-level green building policy?
# Green Building Policy at Berkeley Lab

- **Title:** Sustainability Standards for New Construction
- **Location:** Online in a Requirements and Policy Manual
- **Purpose:** Create a clear sustainability performance target for major new construction that is responsive to a wide range of sustainability requirements
- **Audience:** Design teams for major new construction
- **Related Docs:** Design Guidelines and Master Specifications
- **Timing:** Issued as policy September 2013
  Updated April 2019

Sustainability Standards for New Construction (SSNC)

1. Living Laboratory
2. Energy Efficiency - Whole Building Performance Targets
3. Energy Efficiency - ASHRAE Std 90.1 Compliance
4. Energy Efficiency - Mechanical Systems
5. Energy Efficiency - Lighting Systems
6. Fossil Fuel
7. Renewables
8. Green Building
9. Waste Minimization and Diversion
10. Water
11. Transportation
12. Metering and Metrics
13. Design Assumptions
14. Reporting
15. Procurement of High-Performance Computing Systems
16. Peer Reviews
Applications of SSNC at Berkeley Lab

Integrative Genomics Building (IGB)
- 80,880 sq ft
- Genomics laboratory
- 4 stories two lab and two office
- Construction - complete fall 2019

Berkeley Lab “Welcome Center”
- 46,000 sq ft
- Cafeteria and event space
- Conceptual design complete

BioEPIC
- 72,000 sq ft
- Biological and Environmental Sciences research center (~60% laboratory)
- Conceptual design complete
Key IGB Sustainability Approaches

- All-electric (heat pump) design
- Very low energy use
- Maximized solar PV
- Comprehensive performance metrics
- District medium temperature chilled water plant
- Energy-saving plug load controls, heat recovery and air cascading strategies, and facade optimization
- 30-40\% reduction in indoor water use
- LEED Gold

Design target = 50\% of baseline
Stretch target = 35\% of baseline
Achieved design target = 28\% of baseline

\$650K annual energy utility cost savings
Why have campus-level green building policy?

Campus-level policy:

▪ Can be customized (and appropriately aggressive)

▪ Can be comprehensive

▪ Helps build coalitions

▪ Institutionalizes continual improvement
## Campus-level policy can be customized

<table>
<thead>
<tr>
<th></th>
<th>UC Policy on Sustainable Practices</th>
<th>Berkeley Lab SSNC</th>
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</thead>
<tbody>
<tr>
<td><strong>Fossil Fuel</strong></td>
<td>No natural gas use</td>
<td>No natural gas use</td>
</tr>
<tr>
<td><strong>Whole Building</strong></td>
<td><em>Choose either targets or code compliance path</em></td>
<td><em>Mandatory</em></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>40-65% of benchmark</td>
<td>35-50% of benchmark</td>
</tr>
<tr>
<td><strong>Targets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Code</strong></td>
<td><em>Choose either targets or code compliance path</em></td>
<td><em>Mandatory</em></td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td>20% better than Title 24</td>
<td>30% better than ASHRAE 90.1</td>
</tr>
<tr>
<td><strong>Green Building</strong></td>
<td>Minimum LEED Silver</td>
<td>Minimum LEED Gold</td>
</tr>
<tr>
<td><strong>Waste Diversion</strong></td>
<td>Nothing explicit</td>
<td>Zero Waste Plan required</td>
</tr>
<tr>
<td><strong>Water Efficiency</strong></td>
<td>Minimum two LEED credits</td>
<td>Minimum six to eight credits</td>
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</table>
Campus-level policy can be comprehensive

To hire the right design team -
in the A/E Team RFP:
A/E Team should have relevant experience with cost effective environmentally sustainable design, as described in the Berkeley Lab Sustainability Standards for New Construction.

To set the design on the right path -
as a comment in a Conceptual Design Report:
Metering shall conform with the Berkeley Lab Sustainability Standards for New Construction.

To make sure your requirements are contractually relevant -
in the A/E contract:
The design shall meet the sustainability requirements as noted in the LBNL Sustainability Standards for New Construction found at LBNL Requirements and Policy Manual.
## Campus-level policy helps build coalitions

### Policy Committee, Convened Sept 2012
- Co-Chair, Jennifer Ridgeway, Facilities Director
- Co-Chair, John Elliott, Chief Sustainability Officer
- Peter Denes, Directorate
- Brent Draney, NERSC
- Joseph Harkins, Facilities
- Lisa McNeilly, UC Berkeley (external)
- Mary Ann Piette, ETA
- Edward Rubin, JGI

### Parallel Working Group, Fall 2012
- Karl Brown, CIEE (external)
- Laura Chen, Facilities
- Steve Greenberg, ETA
- Kirk Haley, Facilities
- Blair Horst, Facilities
- Paul Mathew, ETA
- Cynthia Regnier, ETA
- Gerald Robinson, ETA
- Karen Salvini, ETA
- Stephen Selkowitz, ETA
- John Speros, OCFO
- Richard Stanton, Facilities
- Patrick Thorson, EHS
- Bill Tschudi, ETA

### Presented for Approval, January 16, 2013
- Paul Alivisatos, Laboratory Director
- Glenn Kubiak, COO
- Horst Simon, Deputy Laboratory Director

### External Reviewers, 2013
- Zorana Bosnic, Senior Principal, HOK Architecture
- Shanti Pless, Senior Energy Efficiency Research Engineer, NREL
- Robert Socolow, Professor, Princeton University, Lab Advisory Board Member

### SME Reviewers, February 2019
- Richard Stanton
- Joe Harkins
- Misha Gonzalez
- Oren Rieger
- Doug Burkhardt
- Mark Friedrich
- Dean Sedlachek
- Tim Hart
- Steve Alford
- Joy Fleming
- Bill Beedle
- Dave Dovichi
- Kirk Haley
- Michael Maguire
- Sherwin Mendoza
- Beth Streeper
- Gwynne Bankert

### Briefing to Top Management, February 2019 - With Joe Harkins and Richard Stanton
- Mike Witherell, Laboratory Director
- Michael Brandt, Deputy Director for Operations
- Horst Simon, Deputy Director for Research

### Updates and Feedback
- Kem Robinson (January 22, 2019)
- Stan Tuholski (February 2019)

### Work on Large Procurement Item, 2019
- Jeff Broughton
Campus-level policy institutionalizes continual improvement

- Policy updates protect advances in practice

- Implementation Guide provides a less formal opportunity to document new practices:
  - Language to include in the A/E Team RFP, contracts
  - Guidance that isn’t ready to be policy
  - Any written material that was developed as input to the design process
Contact

John Elliott
jdelliott@lbl.gov
510-486-7188

Sustainability Standards for New Construction | bit.ly/2XyOI7T

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