

Sustainable Science at LBNL: A Living Laboratory for Carbon Reduction

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Presented to:
Berkeley Lab Community Advisory Group

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Lawrence Berkeley
National Laboratory



A vision for the future



**To perform world-class science while
reducing our ecological & carbon footprint**



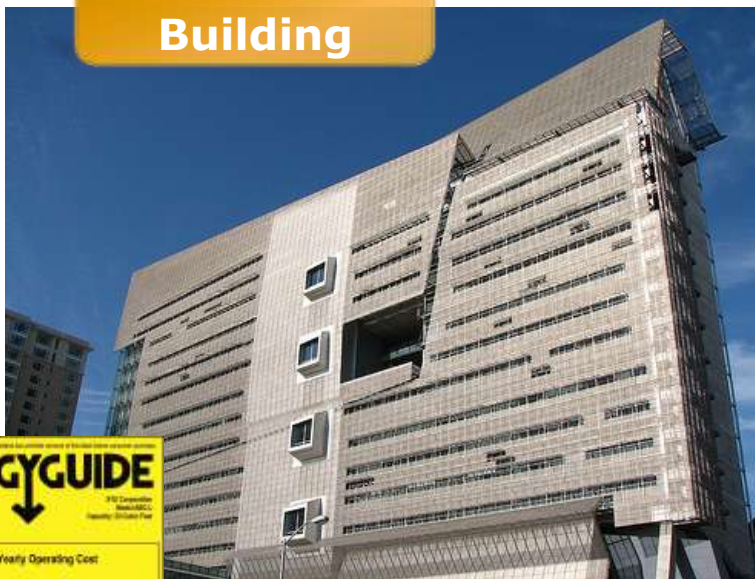
Berkeley Lab contributions have saved US consumers **over \$250 billion**

- **LBNL** contributed to design of:
New York Times Building and
San Francisco Federal Building

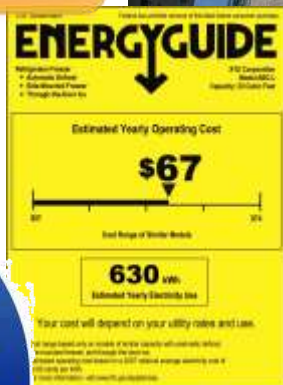
NY Times Building



SF Federal Building



Energy efficiency standards



Partnering with our local community in the public and private sector



April 2011 Berkeley Lab joined the EPA's Federal Green Challenge

Voluntary partnership program challenging federal agencies to reduce their greenhouse gas emissions by 5% in a year in key target areas



Berkeley Lab founding partner of East Bay Green Corridor

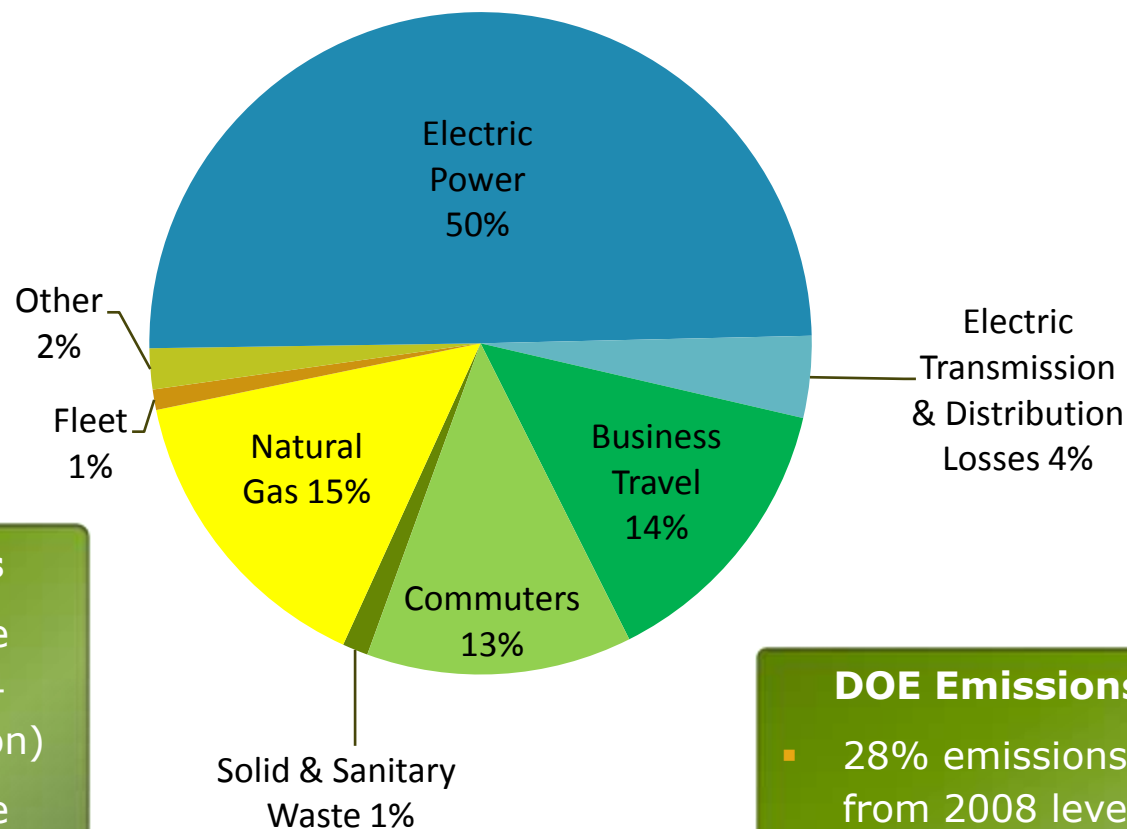
Commitment to build upon the region's existing strength as a center for emerging green technology, innovation and entrepreneurship

And many more local sustainability-related partnerships including...



Greenhouse gas emissions: where we are today

59,550 metric tonnes CO₂ equivalent emissions Fiscal Year 2010



UC Emissions Goals

- 2000-level greenhouse gas emissions by 2014 (approx. 18% reduction)
- 1990-level greenhouse gas emissions by 2020 (approx. 18% reduction)

DOE Emissions Goals

- 28% emissions reduction from 2008 level by 2020
- 13% "indirect" emissions reduction by 2020

Focus Areas

Energy

Buildings

Operations &
maintenance

Water

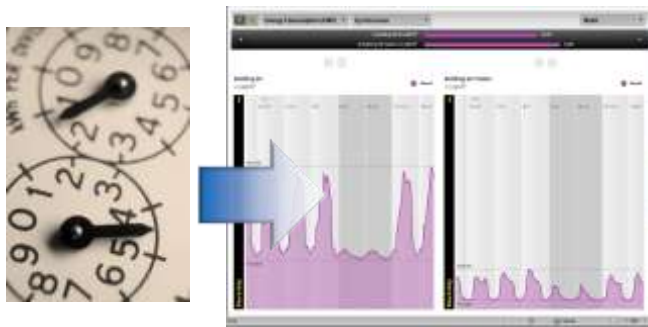
Waste
management

Procurement

Transportation

Business
policies

- **Today:** Reduced energy use intensity by **44%** since 1985
- **Tomorrow:** Upgrade, retrofit, implement Living Laboratory



“Smart” controls



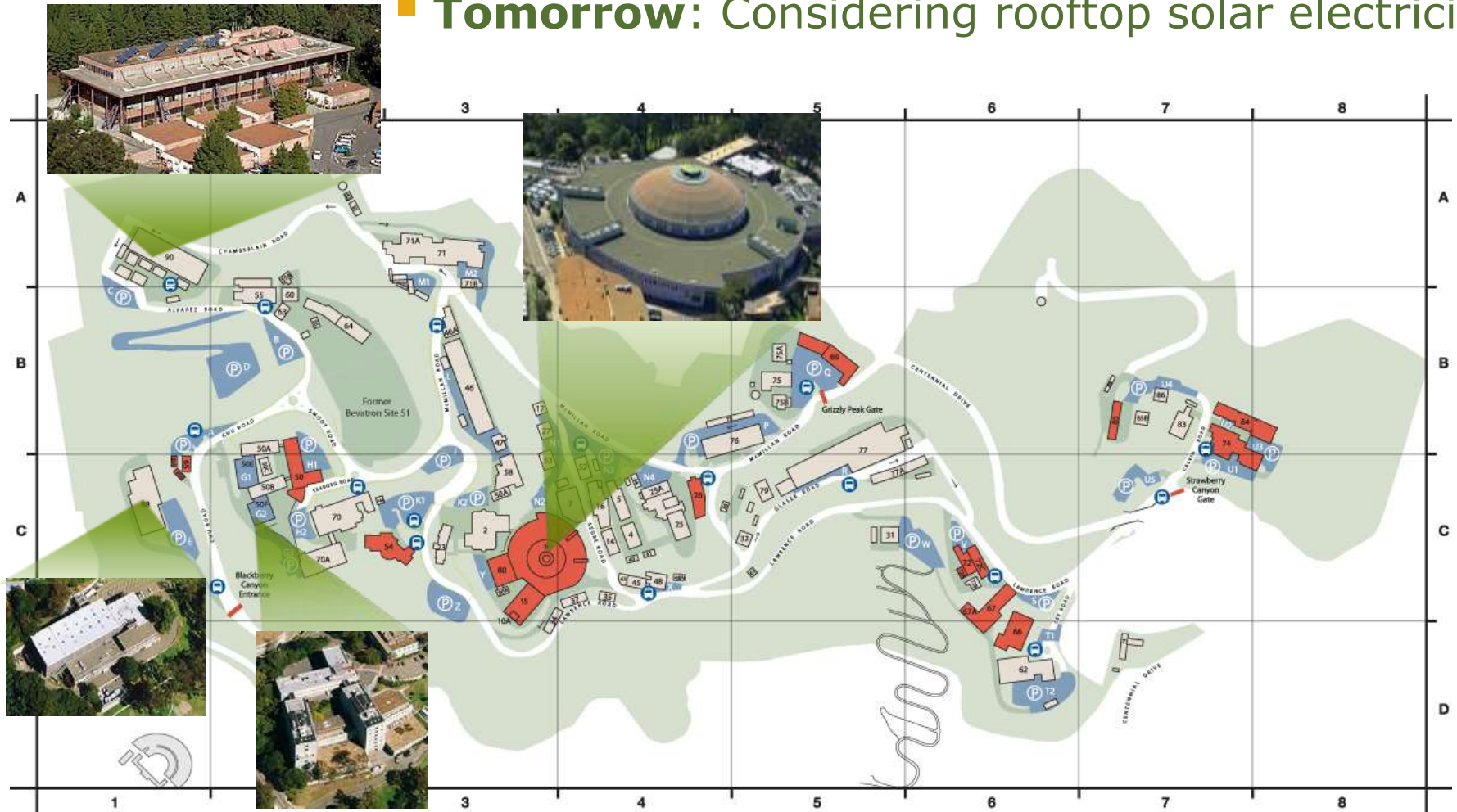
New efficient boilers



Legacy facilities → State-of-the-art labs

Energy – Renewable Energy

- **Today:** Installing solar hot water heaters
- **Tomorrow:** Considering rooftop solar electricity



Buildings

- **Today:** 4 existing/under construction LEED – Gold buildings
- **Tomorrow:** New buildings must be *at least* LEED Gold → Platinum
Renovate 15% of existing buildings by 2015; work towards 100%

Building 15
User Support Building



Building 74
Lab Renovation



Building 67
Molecular Foundry



Building 33
General Purpose Lab

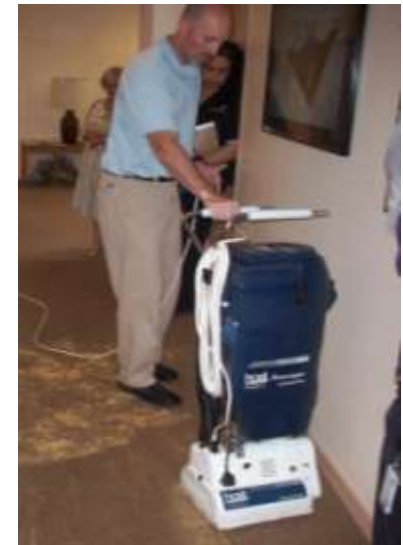


■ Today

- Use green cleaning products & practices
- Employ integrated pest management
- Use recycled & bio content standards for construction materials

■ Tomorrow

- Continue to improve and expand best practices



■ Today

- Water use intensity reduced by **8.2%** from 2007
- Drought tolerant landscaping
- Building 70 water-reuse project

Conservation



■ Tomorrow

- Water use intensity reduction goals:
 - 16% by 2015
 - 26% by 2020

Cooling Towers



■ Today

- Total solid waste reduced **60%** since 1993
- **46%** non-hazardous solid waste diverted from landfills
- **85%** of recent construction waste diverted from landfill

■ Tomorrow

- Continue to expand composting & recycling programs



**Waste diversion defines
new best practices**

**"3R" Program
Collection Bins**



- **Today**
 - Online procurement simplifies buying green products
 - Procurement policies include energy efficiency standards
- **Tomorrow**
 - Stronger policies to increase green purchasing



Berkeley Lab procurement website

Pacific Supply & Safety, LLC

Products: Toner & Ink Shopping Lists

Your Easy Links

- Buy Recycled Paper Now
- Furniture, Ready to Order
- My Contacts
- Online Returns
- Special Orders
- Shopping Lists Help
- Order Guide & FAQ

Customer Service: 888-258-8325

Account #s:
Berkeley - 14410889
Walnut Creek - 14585540
Washington DC - 14797849

News & Information

- Learn more about Staples Ink and toner recycling program.
- Did You Know? Staples offers a full range of Ice Melt products. See our selection.

Featured Products

- Back to Business
- Breakroom Supplies
- Diversity Products Solutions
- Education
- Environmental Facilities
- Furniture
- Promotional Products
- Staples Brand Sustainable Earth Technology
- Telecommuting Solutions

Featured Suppliers

- Avery
- Bic
- Brother
- Georgia Pacific
- GOJO
- Hewlett Packard
- HQN
- Lexmark
- Post-it®
- Scotch®
- Sharpie®

Berkeley Lab
LAWRENCE BERKELEY NATIONAL LABORATORY

Simply sustainable.
Eco-solutions for your office.

Going Green

- Recycled Paper
- Eco-Conscious Cleaning Supplies
- Recycled Filing Products
- Compostable Break Room Supplies
- Pens and Pencils
- Recycled Storage and Organization Supplies
- Eco-Conscious Furniture
- Energy-Efficient Technology
- Remanufactured Ink and Toner

Go green.
View and share our Green Guide.

View now

Sustainable Transportation

■ Today

- New biodiesel shuttles
- Almost **50%** of staff commute sustainably (do not drive alone)
- Fleet includes **59** electric service vehicles and **15** hybrids

■ Tomorrow

- Goal: 100% alternative fueled fleet
- Continue increasing sustainable commuting

New biodiesel shuttles



zimride

**Carpooling program,
Bicycle culture**



**Electric Service
Vehicles**

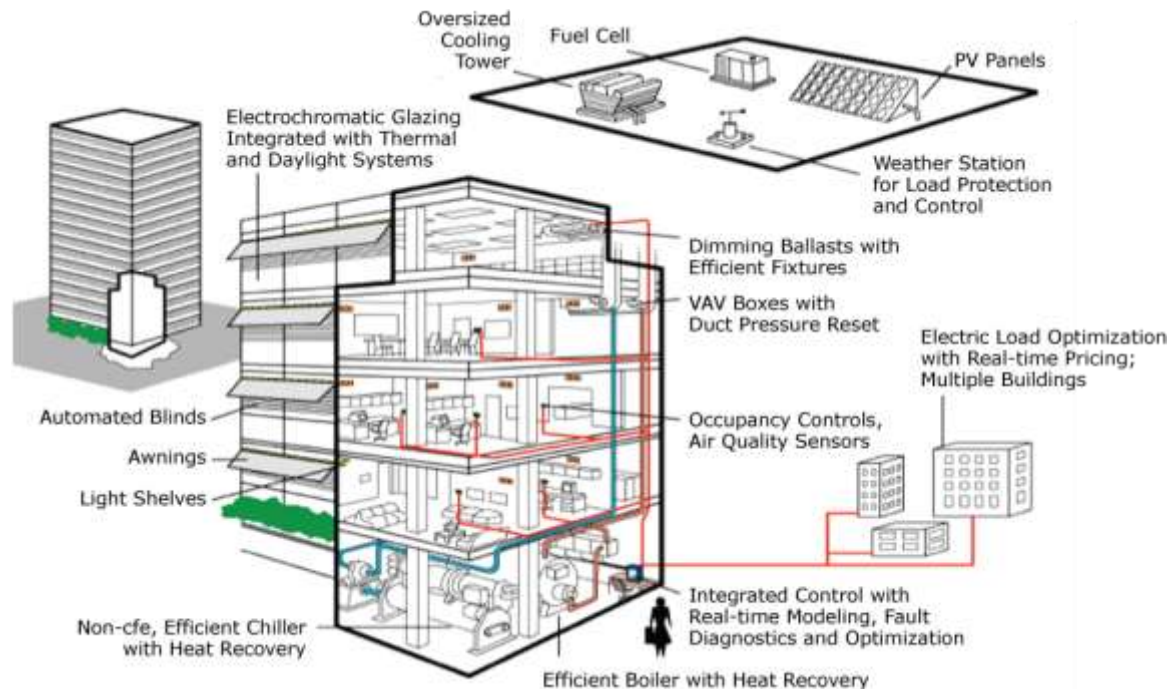


■ Today

- Sustainability is standard practice

■ Tomorrow

- *Sustainable Science Initiative* will combine Berkeley Lab's world-class scientific expertise with operations
- Will continue high-value measures

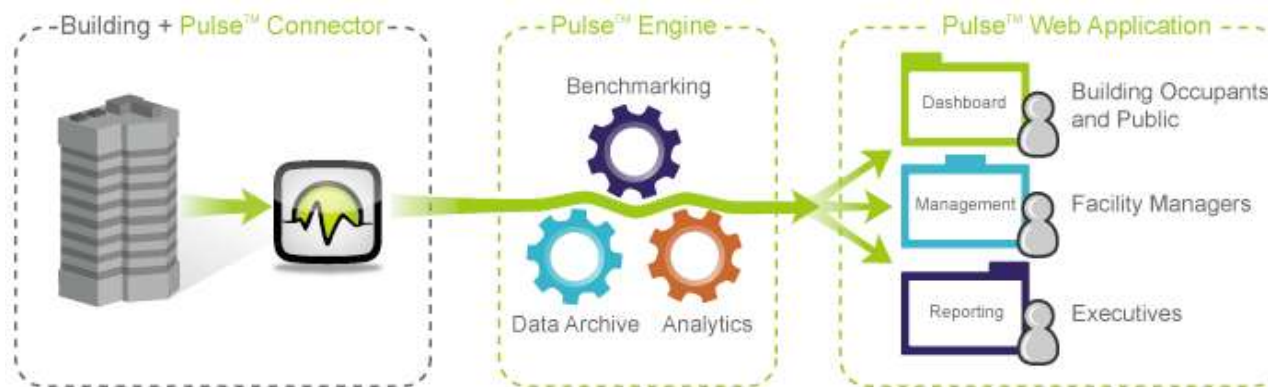


Building 90 energy information system

- **Today:** Integrate electric & gas meters, wireless sensors, and a legacy energy management control system
- **Tomorrow:** Install and network plug load meters and better network of wireless temperature sensors

Building 90 dashboard study

- Review existing commercial energy information systems and dashboards
- Demonstrate select dashboards as case study for user & operator interface
- Evaluate and make recommendations for other organizations



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for more info:

www.lbl.gov/sustainlbl

- What additional sustainability strategies should the Lab consider?
- Do you have any suggestions for how the Lab could facilitate sustainable resource use within the region?
- Any other ideas or recommendations?