DISCLAIMER

The Center for Building Science Applications Team

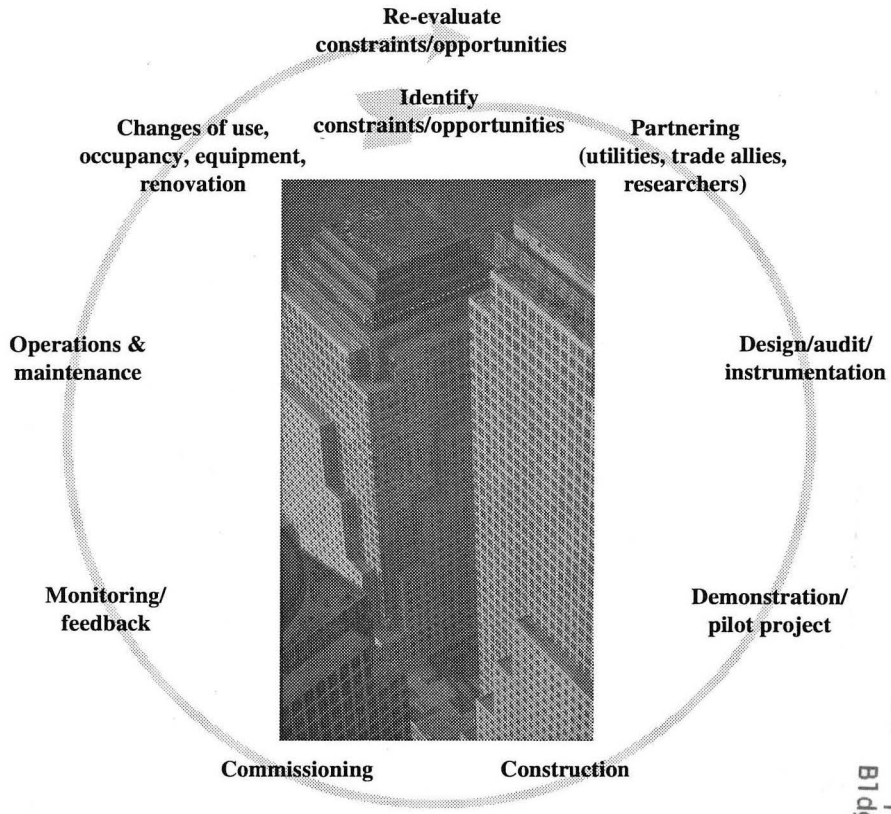
Lawrence Berkeley National Laboratory

The Center's newly founded Applications Team (the A-Team) is ready to do business. It marshals LBL's unique capabilities and networks to conduct field projects aimed at deploying advanced energy efficiency and indoor environmental quality concepts in both the U.S. and overseas building sectors. Among the goals of the A-Team are:

- demonstrating proven and emerging building technologies as a means of accelerating their adoption by consumers and building professionals
- elevating professional standards of practice
- transferring new energy management methods and tools to the private sector
- providing feedback to the Federal energy R&D planning process.

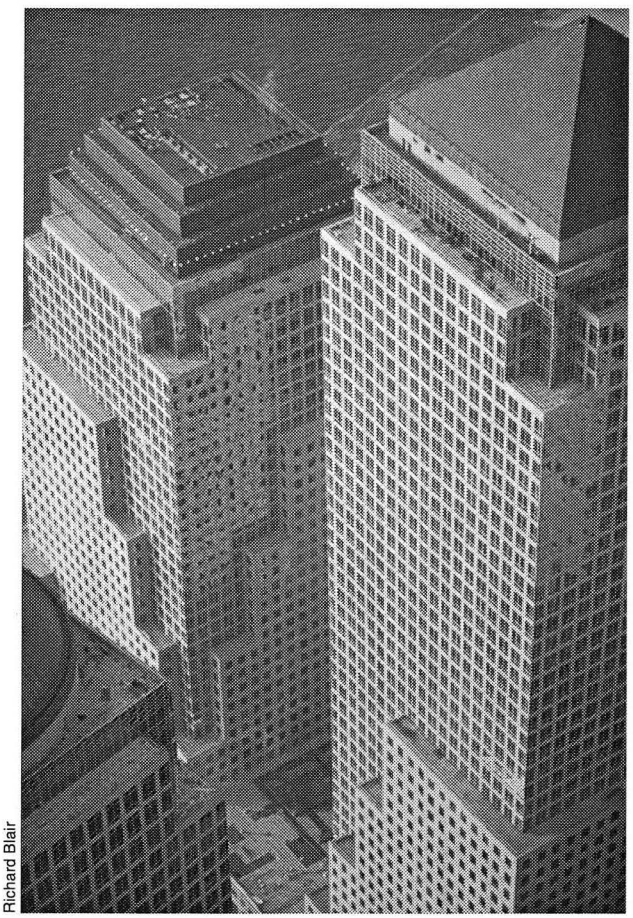
The A-Team's philosophy calls for applying an integrated approach to retrofitting existing buildings or designing new ones. This approach encompasses the various stages of a building life cycle as seen from the perspective of facilities management, addressing the areas of energy, illumination, comfort, and the indoor environment.

Opportunities for Energy Efficiency in the Building Lifecycle



The A-Team assembles project teams drawn from the 250-person staff of the Center's three research programs, LBL's In-House Energy Management Program (IHEM), other research organizations and laboratories, and private firms. The Center programs include Building Technologies, Energy Analysis, and Indoor Environment. The award-winning IHEM Program has managed a retrofit project slate of $18 million through 1994 for LBNL's own facilities, including project planning, financial analysis, engineering, procurement, construction management, commissioning, monitoring, and evaluation. One of IHEM's recent notable achievements was its completion of the Department of Energy's first comprehensive performance contracting agreement with a private energy services company for retrofit of a laboratory building.

To accomplish its goals, the A-Team also draws on a rich pool of relationships with other professionals in energy efficiency implementation from R&D centers across the country, government agencies, electric and gas utilities, state energy offices, manufacturers of energy-efficient technologies, technical committees that define energy-related standards and guidelines, other national laboratories, and private architectural/engineering firms.



Richard Blair

Bridging R&D and Practice

The A-Team forges a new link between existing DOE building R&D activities and deployment initiatives. A-Team activities will benefit R&D program planners by providing improved feedback and recommendations for eliminating missed opportunities during the implementation of new technologies and methods in the field. More specifically, the A-Team will:

(1) Develop, implement, and evaluate proven, cost-effective energy efficiency measures in existing buildings.

(2) Assemble confidence-building demonstrations of emerging technologies and energy management practices not commonly used by building professionals.

(3) Develop and disseminate state-of-the-art field guidelines and protocols, for example, for savings measurement and verification.

(4) Demonstrate the potential for achieving energy savings while maintaining or improving indoor environmental conditions influencing human productivity and well-being, such as reduced indoor air pollution, better lighting quality, and thermal comfort.

(5) Transfer design and application methods and tools to private-sector practitioners such as architecture and engineering firms that collaborate with the A-Team on projects.

(6) Support energy savings performance contracting at the national level.

The CBS Applications Team

Current A-Team Projects — 1995

The Applications Team (A-Team) is a joint venture of Lawrence Berkeley National Laboratory's Energy & Environment Division and Facilities Department/In-House Energy Management (IHEM) Section. The A-Team's goals are to speed the transfer of new and under-utilized technology, support replicable demonstration projects, and improve two-way communication between the lab and the field.

Focus Areas: Education, training, and broad technical assistance such as standard specifications and application guides

Project specific technical assistance generally involving innovative or advanced technologies, and generally related to LBNL R&D, but often requiring broader multi-disciplinary integration

Building performance measurement, evaluation, and verification

Projects Underway

- *Presidio of San Francisco* (DOE-FEMP, DOI-NPS)
  - Major retrofit coupled to PG&E DSM contract
  - Showcase demonstrations

    Staff: Dale Sartor, Karl Brown, Helmut Feustel, Joe Huang, Michael Siminovitch, Jack Kromer, Eleanor Lee, and Rick Diamond. Work is also being coordinated with NREL.
- *S.F. Federal Building* (GSA, DOE-FEMP, PG&E)
  - Advanced lighting technology demonstration
  - Performance measurement & evaluation

    Staff: Francis Rubinstein, Jack Kromer, Doug Avery, a lighting designer practicing in California is collaborating.
- *Rebuild America* (DOE-OBT)
  - Local government design assistance

    Staff: Rick Diamond, Jack Kromer, Dale Sartor.
- *Energy-Efficiency in Laboratory-Type Buildings* (CIEE)
  - Characterization and design guidelines

    Staff: Evan Mills, Geoffrey Bell, Allan Chen, Steve Greenberg, Dale Sartor and George Marton an independent expert on the topic.
- *Carson City Post Office* (DOE-FEMP, USPS)
  - Advanced lighting/daylighting

    Staff: Eleanor Lee
- *Data Visualization* (PG&E, DOE-FEMP, UCEI)
  - Advanced techniques for buildings performance analysis

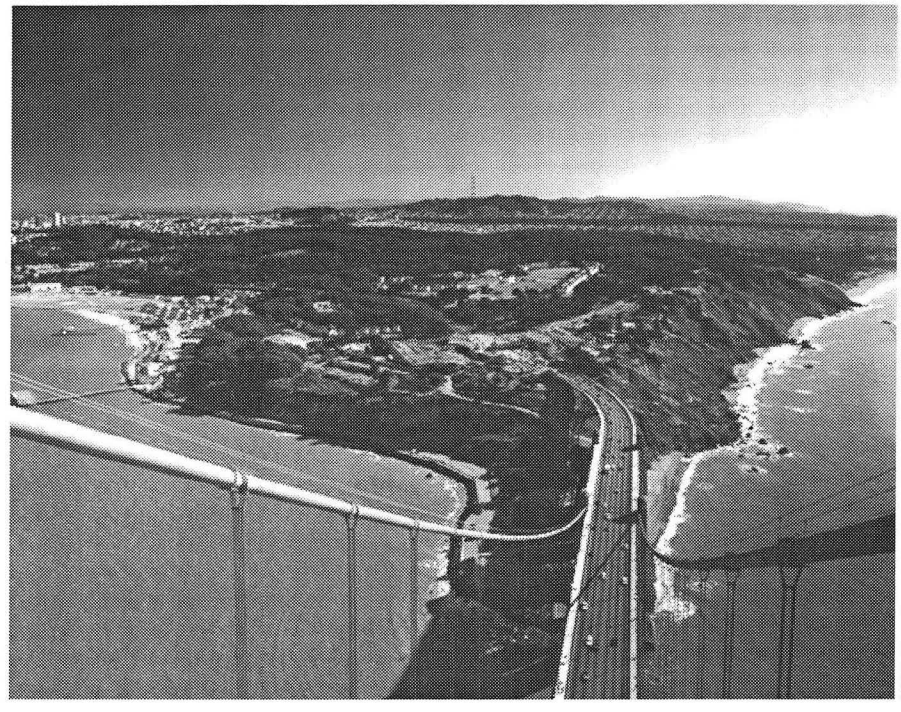
    Staff: Steve Meyers
- *Energy Savings Performance Contracting Measurement and Verification (M&V)* (DOE-FEMP, OBT)
  - Development of M&V protocols; technical support

    Staff: Brad Gustafson, Jack Kromer.
- *Integrated Chiller Retrofit Action Plan* (DOE-IHEM)
  - Implementation guide and sample Energy Savings Performance Contracting (ESPC) documents
  - Chiller plant monitoring tool kit

    Staff: Dale Sartor, Doug Lockhart
- *FAA Facilities* (DOT-FAA)
  - Audits and facility program planning; advanced tower design

    Staff: Geoffrey Bell, Dale Sartor, Evan Mills, with outside support from Newcomb Anderson Associates.
- *Design Assistance* (DOE-FEMP)

  Staff: Rick Diamond, Dale Sartor, Michael Siminovitch, Eleanor Lee, Francis Rubinstein, Geoffrey Bell, Brad Gustafson, Jack Kromer, Tai Voong, Steve Greenberg, Vladimir Bazjanac, and others



Ernest Braun

The A-Team is supporting DOE's Federal Energy Management Program and the National Park Service in the "Greening" of the Presidio of San Francisco.

In the Field

The A-Team benefits private-sector building professionals by raising the market's general awareness of the value of energy efficiency. This is achieved through high-profile demonstrations and independent verifications of performance and cost-effectiveness and by partnering with private-sector firms on specific projects. This kind of feedback will also prove valuable in the product development and marketing activities of private firms.

Prospective clients for the A-Team include federal agencies, utilities, states, regional or national efficiency program designers, and large public, private, or institutional building owners. To maximize their impact, the A-Team will choose projects very selectively, emphasizing high-visibility, replicability, and the specialized services and resources possessed by LBNL and project collaborators.

Specific assets of the Applications Team and benefits of its location at LBNL

Existing Resources

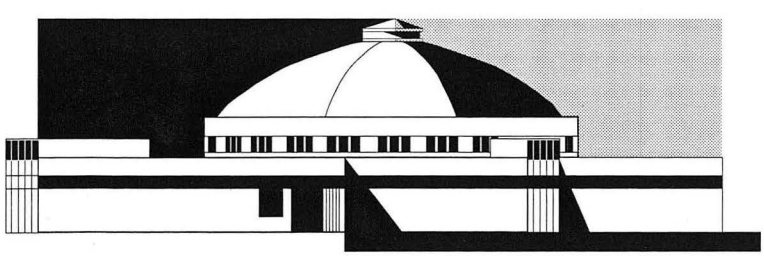
- International reputation for innovation, objectivity, and technical rigor
- Broad knowledge base from which to assemble project teams (architecture, lighting design, energy engineering and analysis, energy and IAQ monitoring and diagnostics, ventilation and indoor air chemistry, financial analysis, electric and gas utility operations, energy planning and policy)
- Special ability to address interactive systems aspects of building design and operations
- Access to LBNL research facilities (e.g. lighting laboratory, infrared thermography laboratory, mobile outdoor window thermal test facility, sky simulator, environmental chamber, radon research house, multimedia laboratory)
- Home of DOE-2 and other state-of-the-art software tools
- In-House Energy Management Program: current project slate of nearly $3 million/year in energy-efficiency capital improvements in LBNL's own facilities. Includes project planning, financial analysis, procurement, construction management, commissioning, monitoring, and evaluation. IHEM is also implementing a state-of-the art energy management and control system that will have 12,000 data points at full build-out.
- National and international networks that can be utilized to locate high-value project sites, identify new technologies, and disseminate results to practitioners

Building on Partnerships

- "Built-in" linkages with other national labs (as Team members)
- Existing relationships with numerous utilities across the country
- Experience with energy services performance contracting
- Existing cooperative relationships with manufacturers of energy-efficient technologies provide access to the latest technology and the opportunity to supply feedback to manufacturers for product development and refinement
- Relationship with the University of California provides the opportunity to involve graduate students in projects and help prepare them for future professional practice, as well as to work with University staff and utilize University resources (e.g. research facilities)

Positioned for Communicating the Results

- Expertise in utilizing the "information superhighway" to provide a broad-band channel for spreading non-proprietary information on the results of A-Team activities (e.g. via World Wide Web/Internet)
- Involvement in standards-setting activities for building envelopes, equipment, and indoor air quality
- Representation on technical committees and co-authorship of standard technical reference materials and guidelines. Provides a "built-in" conduit for transferring A-Team field results to industry guidelines and standards of best practice



For more information, contact:

Evan Mills
Center for Building Science
tel: +510.486-6784
emills@lbl.gov

Dale Sartor
Applications Team Leader
+510.486-5988
dasartor@lbl.gov

Center for Building Science
Energy & Environment Division
Lawrence Berkeley Laboratory
Berkeley, CA 94720 USA
fax: +510.486-5394
http://eande.lbl.gov/CBS/CBS.html

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