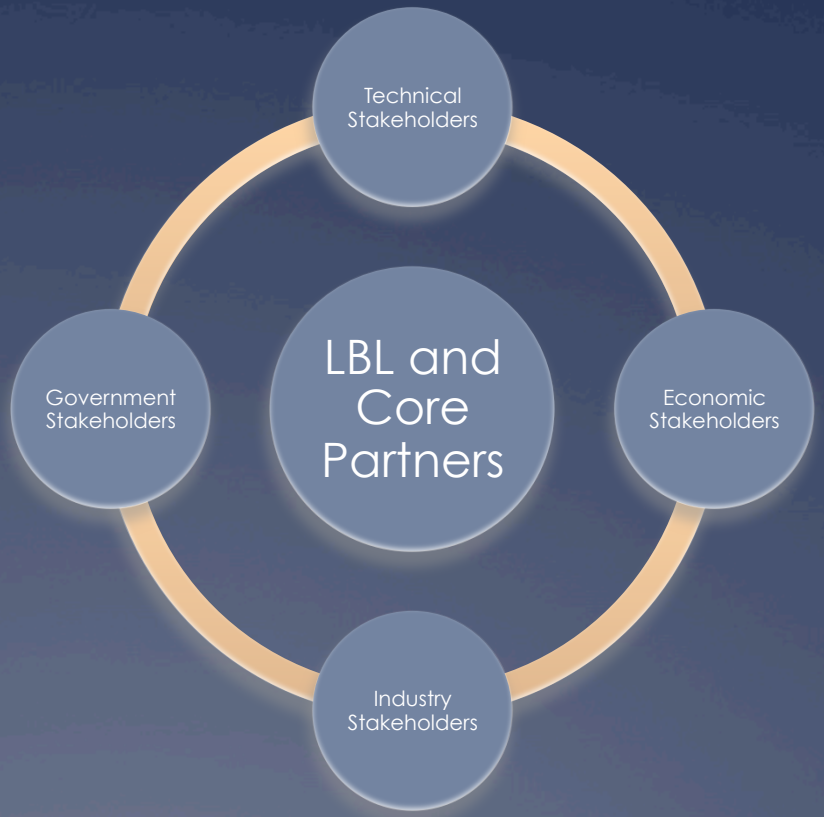
Overview Slides – Initiatives program

EETD Special Initiatives

- Develop Partnerships with Industry, Government, and Stakeholders that:
  - *Leverage our expertise and resources* to address barriers to technology development and deployment
  - *Establish scalable proving grounds* for demonstration of emerging technologies

Leveraging Our Expertise

- Develop focused Consortiums with Industry, Stakeholder membership
- Institutional efforts that addresses a key systemic challenge
- Focal point for extending LBNL's value directly to stakeholders
- Bring LBNL expertise to membership to drive common solutions

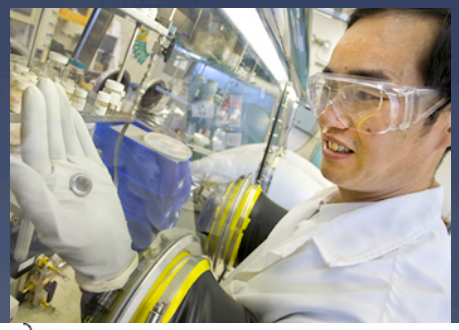


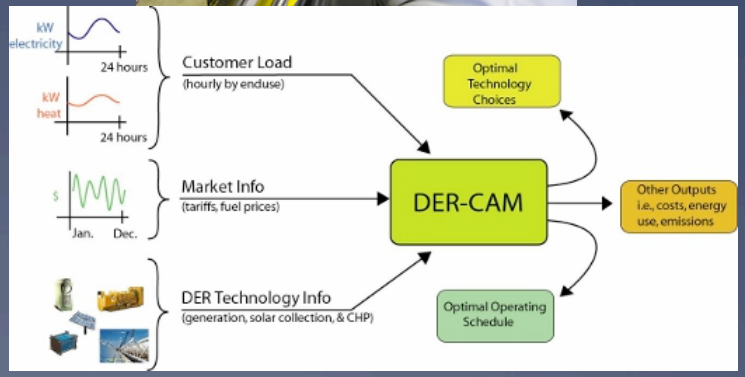
Establishing Proving Grounds

- Establish Integrated Research & Demonstration Sites
- Committed infrastructure for hands-on research
- Focal point for testing, demonstrations, applications, solutions
- Direct partnering with Industry, Government around common agenda

Smart Grid and DER

- Address integration of *Distributed Energy Resources* and development of *Micro-grids* to address power needs of growing industries
- Address innovation barriers in *battery and energy storage* for transportation and grid-scale systems
- Prove out new measures to manage *grid resources, demand response, and major end uses* such as transportation and buildings





Community Grid/DER Demonstration

- Partnership between LBNL and Joint Venture: Silicon Valley Network
- Businesses, Cities, NASA coming together to form centralized effort and coordinated on-site energy production
- Defined grid and infrastructure with access to a long-term project
- Focal point for our Micro Grid, DR, Buildings, Integrated Controls, Electricity Markets, CERTS activity
- "Community scale" grid project is unique – offers coordination of private sector investment in renewables
- Ability to deploy approach, tools, results elsewhere

Potential Project Collaborators

- Lawrence Berkeley National Lab and Joint Venture: Silicon Valley Network
- EPRI
- PG&E
- NASA Ames
- University Associates
- Moffett Park Business
  - Juniper Networks
  - Net Apps
  - Yahoo
  - Lockheed Martin
  - Lab Site
  - Jay Paul
- Google
- Cities of Sunnyvale and Mountain View

Local Benefit

- Enable integration of on-site power generation
- Lower net carbon footprint of member facilities
- Improve power quality through local contribution
- Responds to an intensifying demand issue as infrastructure develops and density increases
- Provides a pathway to economic growth and job creation – expansion and evolution of power grids

R&D Benefit

- Defined power grid infrastructure with known resources and demand
- Opportunity to foster innovation within a real-world grid context
  - Develop tools for the smart-grid space to enable further community scale grid development
  - Accommodate high density of renewables and energy resources without sacrificing controllability by Utility & CAISO
- Enables pathway to demonstrating building resource management as a local grid management strategy (resources, demand response)

Batteries Consortium

- Emerging Batteries and Materials firms need LBNL's expertise to overcome technical challenges to compete with major foreign Battery companies
- Critical mass of end users, venture capital, and communities share a vested interest in energy storage advancements.
- An organized consortium ties technology development, investment focus, and business collaboration, and attracts attention at a level that no individual small company can.

Industry Funded Model

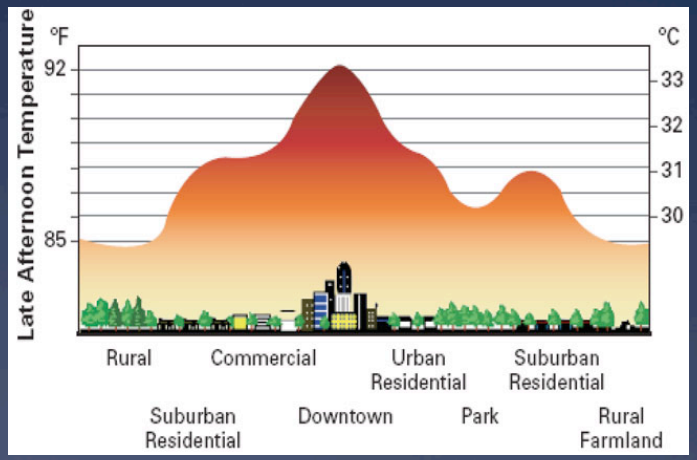
- Tech Assistance and Collaboration: *Bring LBNL expertise to development challenges.*
- Reliable Performance Data: *LBNL is a trusted source of performance data for Industry.*
- Productive Networks: *LBNL Experts, Emerging Innovators, Users, and Investors together under one roof.*
- Industry Intelligence: Collective insight on industry challenges, trends, needs.
- Platform for business collaborations beyond LBNL's direct involvement.

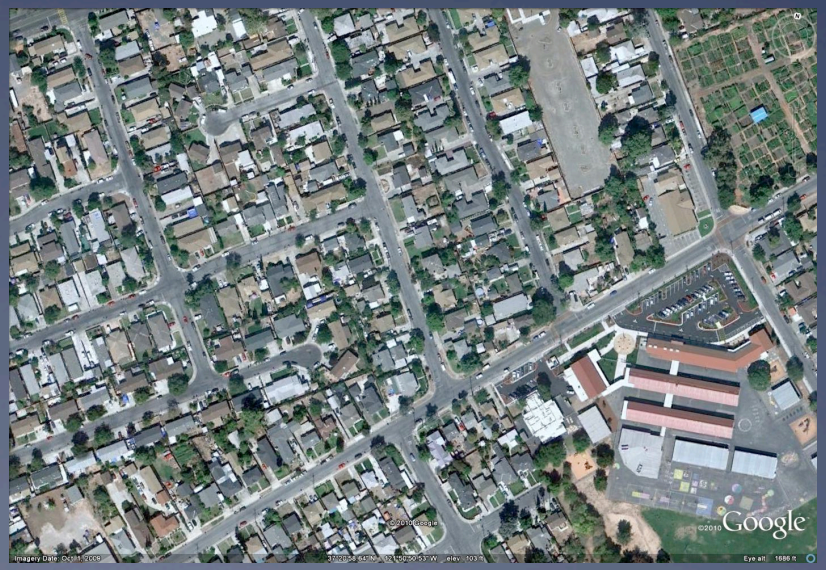
Urban Infrastructure

- Measure *performance and effects of cool materials* to address Urban Heat Islands at a broad scale
- Address the cost of improving *building energy performance and smart-grid integration* and the return on investment in smart buildings
- Open LBNL expertise and facilities to developers of *low-energy building technologies* to accelerate products to market

San Jose Cool Cities Pilot

- San Jose to delineate 2-4 Km^2 "Cool Zone" within San Jose city limits
- Enables research on cool materials technology and its effect (energy, heat)
- Focal point for Heat Islands, Cool Materials, Urban Air Quality research





Benefit to Communities

- Infrastructure for materials demonstration and evaluation, including advanced or experimental systems
- Insights on repeatable programs for accelerating cool roof and pavement transformation at Urban scale
- Pathway to deployment across California cities (e.g., Fresno) through Global Cool Cities Alliance

Buildings User Facility

- **Due to open 2013** – DOE funded $16M construction via ARRA.
- **Focus on Integration Science** for Low-Energy Buildings and Retrofits
  - Integrated Systems
  - Whole Buildings
  - Integrate technology, controls, people
  - Link simulation, test bed, occupied environments
- **Build Pathways to Market** with Aggressive Industry Engagement, Partnership
  - Designers/Engineers, Manufacturers, Small Business, Venture Capital, Public Sector
  - Multiple test beds allow broader industry engagement

Buildings Energy Info Consortium