CALIFORNIA
ENERGY
COMMISSION

AB 2160 GREEN BUILDING REPORT

FOR SUBMISSION TO THE GOVERNOR'S GREEN ACTION TEAM

COMMISSION REPORT

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ABSTRACT

This report fulfills a requirement in Assembly Bill 2160 (Lieu, Chapter 742, Statutes of 2006) to report to the Governor's Green Action Team on several topics related to the 2004 Green Building Initiative:

For state buildings, the California Energy Commission, in consultation with the Department of General Services and the State Treasurer's office is responsible for identifying and developing "financing and project delivery mechanisms" for state energy- and resource-efficient (green building) projects, minimizing use of the General Fund.

For private sector commercial buildings, the Energy Commission, in consultation with the Department of General Services, the Treasurer's office, and the commercial building construction industry is responsible for identifying obstacles to, and identifying and recommending incentives for, private sector commercial energy and resource efficient (green building) projects.

KEYWORDS

AB 2160, obstacles and incentives, life cycle cost analysis, life cycle cost model, green building, energy and resource efficient building

EXECUTIVE SUMMARY

Assembly Bill 2160 (Lieu, Chapter 742, Statutes of 2006) directs the California Energy Commission to submit a report to the Governor's Green Action Team, a high-level interagency group established in the 2004 Green Building Initiative. The report is to include the Energy Commission's findings and recommendations on financial and other project delivery mechanisms for promoting energy and resource-efficient (green building) projects in the state's own buildings. AB 2160 also directs the Energy Commission to report findings and recommendations on obstacles to private sector commercial green building projects and to identify and recommend incentives to further private sector green building.

As directed by AB 2160, the state's Department of General Services developed a life cycle cost analysis model for evaluating the cost-effectiveness of state building design and construction decisions and their impact over a facility's life. Department of General Services posted the model and supporting documentation on its website (www.green.ca.gov/LCCA/) several months before the July 2007 deadline specified in AB 2160.

The state has established a number of mechanisms for implementing energy and resource efficient building projects in its own facilities. While some projects such as retro-commissioning are funded out of support budgets or, to a limited extent, by utilities, the majority of energy projects must be financed. Financing mechanisms include the following:

- GS $mart Low-Interest Municipal Lease Loans – an existing program for certain capital expenditures expanded to include energy efficiency measures.
- A formal partnership between the state and investor-owned utilities to provide energy audits and coordinate incentive program funds to help pay for energy efficiency retrofit projects.
- An informal partnership with the Sacramento Municipal Utility District in which the utility offers energy efficiency incentives to state building projects in its service territory.
- An energy services company program in which energy services companies provide upfront funding for project development costs (audits) and are repaid after project completion. GS $Mart loans and utility incentives provide additional funding.

To encourage agency efficiency efforts, the Department of Finance has promised not to reduce the energy budgets of departments that save money through energy efficiency measures in their buildings.

The Treasurer's Office has also proposed future funding through bonds and hopes to place an initiative to that end on the November 2008 ballot.

Non-financial project delivery mechanisms for facilitating state energy and green building projects include the following:

- Energy benchmarking of all state facilities to set a baseline from which to measure future energy savings.
- Retrocommissioning of state facilities to ensure that existing heating, cooling, and other energy systems are working as designed and efficiently.
- Retrofit (replacement) of outdated or failing heating, cooling, or other energy-related equipment.
- LEED[1] certification for new and existing buildings at the silver lever or higher.
- Installation of renewable energy, efficient cogeneration, and other distributed generation strategies.
- Leasing space in buildings rated as green or energy-efficient.
- Construction of state K-12 schools using Collaborative for High Performance Schools criteria.
- The Energy Commission's Public Interest Energy Research (PIER) project "State Partnerships for Energy Efficiency Demonstrations" for installing new and emerging technologies in state buildings.
- Establishment of the Energy Policy Advisory Committee, which promotes information sharing on efficiency and green building among state agencies, the university system, and utilities.
- Title 24 Building Energy Efficiency Standards.
- A proposed green building code to be phased into state regulations over two code update cycles.
- Program planning through the California Public Utilities Commission for "Big Bold" strategies to reach aggressive energy efficiency and AB 32 climate change reduction goals.

For the private sector directives in AB 2160, the Energy Commission gathered information from a variety of sources on obstacles to and possible incentives for furthering green building projects. The Energy Commission identified these ten obstacles:

1. Commercial building owners/managers/investors lack a compelling business case or value proposition to motivate them to increase energy efficiency or build/renovate green.

2. Finding financing for efficiency measures or green construction can be difficult.

3. Many building owners and managers are not technically knowledgeable about operating buildings for energy efficiency or sustainability and are not aware of the broad spectrum of available energy-saving opportunities and green strategies.

[1] LEED is the acronym for Leadership in Energy and Environmental Design, a green building rating program developed by the U.S. Green Building Council. LEED is the most commonly used green building rating system for commercial buildings in the country.

4. Other than Title 24 energy code for additions and alterations to buildings, California has no regulations mandating that existing buildings increase energy efficiency or be operated sustainably.

5. Title 24 building code for energy efficiency is implemented and enforced unevenly across the state.

6. Some green building strategies conflict with existing building codes.

7. Some local jurisdictions in California have adopted green building guidelines or mandates, and there is inconsistency from one jurisdiction to another across the state.

8. There is not an effective feedback and communication pathway between the research and development community (creating new construction-related products for sustainability), the cutting-edge architectural and design community, and the state and national building code development community.

9. Traditional construction practices do not coordinate and integrate all the specification, design, and construction disciplines and do not treat building projects holistically.

10. There is a difference in perspective and vocabulary related to green buildings in the world of utilities, energy policy makers, and commercial real estate.

Chapter 4 of this report describes actions that could address these obstacles. In summary, many of the actions call for increasing the flow of credible, clearly written, easily locatable information geared toward particular audiences within the real estate world – investors, building owners, facilities managers, appraisers, brokers, designers, builders, and contractors. California needs more technical training for facilities managers that address the specific needs of that audience. Existing cash incentives for energy efficiency need to be examined for possible realignment. California needs cash or service incentive programs to promote green building, as virtually none exist at this time. There is a strong need for increased communication and coordination among the many parties involved in building design and construction. The Energy Commission, the Contractors State License Board, builders and contractors, and building officials groups must continue efforts to implement and enforce existing energy code. Developers and building owners need more and flexible financing and loan options.

Though California has a landmark set of energy and resource efficiency goals through its Green Building Initiative, utility "Big Bold Initiative" program planning, Assembly Bill 32 (Nunez, Chapter 488, Statutes of 2006) climate change legislation, building energy efficiency standards, and other mandates, the state still has much work to do to achieve those goals in its own buildings and in the private commercial sector.

CHAPTER 1: Introduction

In December 2004, California Governor Arnold Schwarzenegger signed Executive Order S-20-04, which was accompanied by the Green Building Action Plan. Together they became known as the state's Green Building Initiative (GBI). The GBI requires that the State of California implement all cost-effective energy conservation measures in its own facilities to reduce energy consumption 20 percent by 2015. Existing buildings larger than 50,000 square feet in size must be certified through the U.S. Green Building Council's (USGBC) green building rating system, known as "LEED" - Leadership in Energy and Environmental Design. Further, the GBI directs the state to obtain LEED certification at the silver level or higher for its new buildings and major renovation projects larger than 10,000 square feet. New state buildings smaller than 10,000 square feet are to meet the LEED silver level (or higher) equivalent, but the GBI does not require that they undergo the LEED certification process. The GBI also strongly encourages the private sector to follow the state's lead for its commercial buildings.

The GBI directs these and a number of other actions. Assembly Bill 2160, authored by Assembly Member Ted Lieu (D-Torrance) and signed by Governor Schwarzenegger in September 2006, puts certain of the GBI directives into law, as follows[2]:

- For State Buildings -
    - The California Department of General Services (DGS) is responsible for defining a life cycle cost analysis model by July 2007 to "evaluate the cost-effectiveness of state building design and construction decisions and their impact over a facility's life cycle."
    - The Energy Commission, in consultation with DGS and the State Treasurer's office is responsible for identifying and developing "financing and project delivery mechanisms" for state energy- and resource-efficient (green) building projects, minimizing use of the General Fund.

- For Private Sector Commercial Buildings -
    - The Energy Commission, in consultation with DGS, the Treasurer's Office, and the commercial building construction industry is responsible for identifying obstacles to, and identifying and recommending incentives for, private sector commercial energy and resource-efficient building projects.

AB 2160 also directs the Energy Commission to provide a report (this document) on its findings to the Governor's Green Action Team.

[2] The full text of AB 2160 is contained in Appendix A.

The AB 2160 directives are being implemented as follows:

- DGS defined a life cycle cost analysis model and posted it to its website before the July 2007 deadline.

- The Energy Commission has been working with DGS, the Treasurer's Office, and Department of Finance to identify and develop financing and other mechanisms for delivering energy- and resource-efficient state building projects.

  The Energy Commission consulted with DGS, the Treasurer's Office, members of the commercial real estate industry, and other stakeholders to identify energy- and resource-efficient (green building) obstacles and incentives. Energy Commission staff started with a list of obstacles and incentives based on years of experience with energy efficiency loan programs, building and appliance standards, research and development, technical assistance, and other activities. This initial list was presented to stakeholders electronically via email and the AB 2160 report website[3] and at a public workshop in September 2007. (This draft list of obstacles and incentives and the list of workshop attendees are included in the appendices.) The Energy Commission received comments at and after the workshop. Additionally, through the fall of 2007, Energy Commission staff participated in a number of green building task groups, seminars, and discussions for further ideas for the obstacles and incentives list. In particular, the following activities proved informative:

  - A strategic issues conference called "Global Warming and the Business of Real Estate," sponsored by the California Business Properties Association, California Building Industry Association, Building Owners and Managers California, and the Retail Industry Leaders Association. This conference revealed a wide variety of opinions among real estate industry members about the validity of global climate change and the need for mitigation. Some of these opinions reflect attitudes that are essentially barriers to furthering sustainable building practices.

  - The Green Leases Pilot Project of the California Sustainability Alliance, a public goods charge-funded project sponsored by the Southern California Gas Company arm of Sempra Utilities. The Green Leases Pilot Project intends to improve the following statistic: Although about 90 percent of office space in California is leased, only 6 percent is certified as green or energy-efficient. This project's organizers and advisory committee have identified barriers to green and efficient building and contributed to this report.

  - A seminar presented by the Green Building Finance Consortium, at which the Consortium discussed a plan to produce tools for real estate investors and lenders to evaluate green buildings as investments.

[3] That website is www.energy.ca.gov/greenbuilding/ab2160/documents.

- Two Internet seminars organized by E-Source called "Overcoming Obstacles and Barriers to Energy Efficiency at Hotels" and "Overcoming Obstacles and Barriers to Energy Efficiency at Supermarkets and Convenience Stores."

Staff also identified a number of reports, news articles, and other resources that contained information on barriers and incentives for green and efficient building. These resources are posted on the Energy Commission's Assembly Bill 2160 website (see footnote) and are listed in Chapter 5: References.

CHAPTER 2: State Buildings: Life Cycle Cost Analysis Model

AB 2160 specifies cost-effectiveness as a key parameter for determining suitable measures that will help the state's buildings meet the GBI goal of 20 percent energy savings by 2015. "Cost effective" means that the economic benefits derived from energy efficiency measures outweigh all of the associated implementation costs over the expected life of the measures. AB 2160 establishes the Life Cycle Cost Assessment model as the main tool for determining the cost-effectiveness of measures that will help the state meet energy savings goals.

Per AB 2160, DGS developed a life cycle analysis model. DGS posted the model, a user's manual, a list of underlying assumptions, a list of inputs, and a fact sheet on its website (www.green.ca.gov/LCCA/) several months before the July 2007 deadline specified in AB 2160. The fact sheet is included in Appendix B.

DGS based the model on the guidelines that the state's Department of Finance (DOF) uses in determining cost-effectiveness of energy-related construction projects. This approach may not be ideal for the state to meet GBI energy efficiency and green building goals. In the 2004 *Green Building Action Plan Backup Technical Document*, the GBI Task Force found that the state, for its own buildings, experiences "difficulty in valuing environmental and occupant health and productivity benefits" and an "inadequate decision process to offset minor first cost capital increases with long term operating cost savings, increased [employee] attendance, or greater occupant productivity."[4]

[4] Green Building Initiative Task Force, *Green Building Action Plan Back-Up Technical Document – Rationale, Specific Actions, and Timeline*, 2004, (p. 17).

CHAPTER 3: State Buildings: Financing and Project Delivery Mechanisms

Shifting the State of California from traditional ways of designing, specifying, constructing, and managing its buildings toward a "green building" decision structure has been a challenge. Identifying funding mechanisms has been part of that challenge. Several programs and policies have been put in place, as follows:

A. Financing Mechanisms

GS $mart Low-Interest Municipal Lease Loans

After a concerted effort by the DGS, DOF, and the Energy Commission, DOF announced in Budget Letter 06-27[5] (September 2006) that an existing municipal lease program called GS $mart (pronounced "G S Smart") was being extended to include energy efficiency and sustainability projects in state buildings. In late 2007, GS $mart for energy and sustainability projects was renamed "Energy$mart," and DGS developed a new set of terms and conditions that are more appropriate for the commodity/services blend inherent in energy projects. The first state projects under this program are nearly underway. More recently, however, issues have arisen over the securing of loans for projects that will be implemented in lease-revenue financed facilities and over expectations that the state's bond rating will worsen. These issues have complicated the GS $Mart financing process and may restrain the use of this financing mechanism.

Ability for Departments to Keep Money from Energy Savings

Budget Letter 06-27 also stated that any savings on energy bills generated through efficiency or sustainability measures could be "retained by the department and not subjected to a budgetary savings reduction by [Department of] Finance." Under prior policy, the Department of Finance considered reducing a state department's budget if that department spent less than its annual budget in a given year. This new policy represents a major, positive departure from standard practice. DOF and DGS are still determining how it will be implemented.

Investor-Owned Utility/State Energy Partnership

The state and California's investor-owned utilities (IOUs) formed a partnership in 2006. The IOUs are providing almost $17 million to fund energy audits and to subsidize the cost of implementing retrofit projects for state facilities in IOU service territories.

[5] Budget Letter 06-27 is included in Appendix C.

Informal Partnership with the Sacramento Municipal Utility District

Preliminary accounting of state-owned properties shows that roughly 18 percent of state-owned buildings by square footage is in Sacramento Municipal Utility District (SMUD) territory. SMUD and the state have not signed any formal contracts or agreements. However, SMUD is applying its energy efficiency incentives to state buildings in its territory to deliver energy savings.

Energy Services Companies Program

DGS started an energy services company program to facilitate state agencies' and departments' ability to contract directly with energy services companies to retrofit buildings with energy efficiency measures. Energy services companies usually conduct detailed energy audits, analyze which measures to install, conduct the installations, and guarantee a level of energy savings from those measures. This is a performance-based system; it is in the energy services companies' best interest to accurately determine energy savings because they are paid only if the guaranteed savings are delivered. Moreover, sufficient savings are required to retire the GS $Mart loans that will be used to finance these projects. Those savings also cover the costs of any new or replacement equipment.

Possible Future Bond Funding

State Treasurer Bill Lockyer has proposed a $2 billion bond measure for the 2008 ballot and the use of prepay bonds to help "green" state buildings, meet the state's energy savings goals of 20 percent by 2015, and meet its commitment to reduce greenhouse gas emissions by 2020.

B. Non-Financial Project Delivery Mechanisms

Energy Efficiency Improvements to State Buildings

DGS is leading efforts for the state's entire portfolio of buildings for several energy efficiency improvement strategies:

- Energy benchmarking – that is, analyzing energy use per square foot per year for a designated year and using this information as a baseline against which to measure the success of efficiency measures. Benchmarking can also assist in understanding how a building's energy use compares to that of similar buildings in the same climate zone and in prioritizing program efforts.
- Retrocommissioning – that is, conducting systematic, diagnostic analyses of existing heating, ventilation, air conditioning (HVAC), and lighting systems and their controls and optimizing them to work properly and efficiently. This usually involves no capital

expenditures for equipment but could include minor repairs and adjustments that improve the operation of existing equipment.

- Retrofits – that is, identifying outdated or failing equipment and replacing it. The state is pursuing use of energy service companies for retrofitting its buildings because as noted above, energy service companies' service contracts provide a responsive way to implement projects such as HVAC, advanced lighting technologies, low-energy cooling systems, thermal energy storage, and control system retrofits without being encumbered by the normal design-bid-build process that would add considerable time to project development. Energy service companies' contracts also provide a more workable way to ensure that these projects deliver promised savings.

LEED Certification for New and Existing Buildings

DGS also leads the state's efforts to certify future and existing buildings under the U.S. Green Building Council's (USGBC) LEED green building rating program. As part of the effort for streamlining LEED certification of existing buildings, DGS has negotiated a "portfolio" agreement with the USGBC to simplify documentation and obtain volume discounts; developed guidelines for assessing buildings smaller than 10,000 square feet; developed a guidebook for small building commissioning; and developed a best practices manual for attaining LEED for Existing Buildings certification.

Renewable Energy Projects and Other Distributed Generation

The state is installing solar photovoltaic (PV), fuel cells, and cogeneration systems in its buildings. PV and large cogeneration fuel cell projects are funded through third-party power purchase agreements that provide outside capital and minimize risk. Smaller, cheaper, electric-only fuel cells that reduce dependency on toxic battery systems or eliminate diesel generators are now often cost-effective.

Green Leasing

Per the Governor's Green Building Initiative, the state is seeking to locate leased space in buildings with an Energy Star® rating for energy efficiency. DGS sent more than 2,000 letters advising lessors around the state of California's preference for Energy Star® buildings and 1,160 additional letters and e-mails to general commercial market entities advising them of California's Energy Star preference. New policies have been put in place that ensure all large build-to-suit and single occupancy leases will be in LEED-certified buildings at the silver level or higher. Additionally, DGS is working with a company called Enovity on the Innovative Energy Efficiency Partnership Program for DGS Leased Facilities, an incentive program targeted to implement immediate and sustainable energy efficiency improvements in buildings leased by DGS. The financial incentives are tailored to make projects more economically attractive to DGS and to lessors.

Green Schools

Efforts are underway to incorporate green building concepts and zero-net energy strategies into the state's kindergarten through 12th grade public schools. The Collaborative for High Performance Schools (CHPS) is working cooperatively with the State Architect to revise CHPS standards to include more green building requirements. The State Architect, along with the Office of Public Schools Construction, is conducting workshops to develop an action plan for making California schools grid-neutral and to promote the implementation of green building practices throughout the state's K-12 school system.

State Partnerships for Energy Efficiency Demonstrations

Because of limited budgets and extended approval processes, the state tends to lag behind in recognizing and installing in its own buildings the latest in energy-efficient technologies and strategies. To hasten deployment of such technologies, the Energy Commission's Public Interest Energy Research (PIER) Program in 2007 established the State Partnerships for Energy Efficiency Demonstrations program. This program uses state buildings and college campuses as demonstration sites for technologies developed through PIER and potentially other programs. PIER staff designed this program with the GBI goals in mind for 20 percent reduction in energy use in state and commercial buildings by 2015. It serves as an educational tool for state energy managers and other key decision makers on new cost-effective options for energy efficiency in buildings.

Energy Policy Advisory Committee

Following the 1970s oil embargoes, California established a state government energy conservation implementation program, including the Energy Commission and the Office of Energy Assessments within DGS. An ad hoc working group formed, composed of energy program managers from state departments, universities, and community colleges. Its goal was to coordinate the state's conservation efforts for its buildings. In 1986, Executive Order D-50-86 established the Energy Policy Advisory Committee, formalizing the ad hoc group. Its work continued, setting conservation goals for all departments and recommending actions to DGS even after the Office of Energy Assessments was disbanded in 2004. After Governor Schwarzenegger established the Green Building Initiative (Executive Order S-20-04) in December 2004, the Energy Policy Advisory Committee became associated with GBI implementation.

The GBI directed every state agency to designate a point person for implementing energy efficiency goals in its buildings. The Governor's Green Action Team strongly encourages those persons to join the Energy Policy Advisory Committee.

The Committee meets approximately quarterly. While it has no assigned staff, attendance is growing. Representatives from investor-owned and municipal energy utilities attend regularly.

Title 24 Building Energy Efficiency Standards

The Warren-Alquist Act of 1974 established the Energy Commission and its mandate to create energy efficiency standards for California's buildings. The standards become part of the state's building code and cover most building types including state buildings. (However, historic buildings, prisons, and hospitals have separate building codes for energy efficiency.) The Energy Commission periodically adopts updates to the energy standards in a public process, which culminates with the California Building Standards Commission incorporating the standards into Part 6 of California's Title 24 building code.

While private sector buildings are generally reviewed and permitted through local (city or county) building or planning departments, the state's buildings are not. The state self-certifies compliance with building codes through its building design and construction staff at the Real Estate Services Division within the Department of General Services.

Future Actions

Green Building Code

As of this writing, the California Building Standards Commission is updating the state's building code to include green building features. The Building Standards Commission expects to "green" the code over two code update cycles, so it is likely that by 2012 the state will have mandatory green building codes for residential and nonresidential buildings.

Proposals for the first round of green building code were due to the Building Standards Commission by November 5, 2007. The Building Standards Commission considered the proposals in late 2007 and early 2008, with an expected adoption date in mid-2008 and effective date of January 1, 2009. As of this writing, the proposed nonresidential building code in this cycle would be voluntary and based on green building features described in a proposed green building standard from the American Society of Heating, Refrigerating, and Air Conditioning Engineers and on the U.S. Green Building Council's LEED rating system. The proposed residential green building code appears to have very few features, and those items are likely to be mandatory, not voluntary.

California Public Utility Commission-Planning for Future Utility Incentive Programs and for Meeting Energy Efficiency Goals

The California Public Utilities Commission is in the process of conducting two key activities related to energy efficiency in buildings:

- Proceedings to determine utility incentive program goals for 2009-2011.
- Longer-term strategic planning looking toward 2020 for homes and 2030 businesses.

These incentive programs apply to private and public sector buildings including state buildings. They will include AB 32 greenhouse gas emissions reductions goals and may further include incentives for green buildings.

CHAPTER 4: Commercial Sector: Obstacles to and Incentives for Private Sector Commercial Building Energy and Resource-Efficient (Green Building) Projects

As indicated in Chapter 1, Energy Commission staff gathered information on green building obstacles and incentives from a variety of sources including the Energy Commission's experience with energy efficiency programs and activities, input from outside stakeholders, and data from a number of reports, news articles, and seminars.

While energy conservation and efficiency issues have been in the public consciousness since the oil embargoes of the 1970s, green building has only gained popularity in the last five or six years. Despite this difference, there is much overlap in the barriers facing each.

Obstacle 1. Commercial building owners/managers/investors feel a lack of a compelling business case or value proposition to motivate them to increase energy efficiency or build/renovate green. Many factors contribute to this situation, including the following:

- Green building is perceived to be much more costly than traditional construction.[6] Cost information on green building and energy efficiency is inconsistent.
- California has virtually no cash or service incentives to encourage green building. (However, a number of utility and state programs support energy efficiency and onsite renewable energy generation.)
- Some commercial building owners/managers/investors perceive that energy efficiency beyond existing levels is not important or necessary; it may compete with aesthetic building improvements such as marble floors that more commonly attract tenants or investors.
- The real estate world experiences "split incentive" dilemmas that hinder energy efficiency or green building investment. Project developers are reluctant to invest in green construction because most of the benefits are long-term and may not accrue to them, and not enough tenants or buyers are willing to pay the premium that would add value for the developer. In the "leased space" dilemma, building owners who lease out space often have little incentive to build or renovate green or beyond minimum energy code because many of the benefits accrue to the tenants, and tenants demanding green spaces are still a small minority**.** Tenants have little incentive to improve a leased space, since they are temporary in the space and the benefits may accrue to the owner or to the next tenant. (Approximately 90 percent of commercial space in California is leased space, and only about 6 percent is

[6] A 2006 study by Davis Langdon (*Cost of Green Revisited*, listed in References) shows that cost premiums for building green compared to standard construction are often zero, especially when design teams already have experience with green projects. The Davis Langdon report states, "Until design teams understand that green design is not additive, it will be difficult to overcome the notion that green costs more, especially in an era of rapid cost escalation " for construction in general.

certified as green under the LEED system[7] or as energy efficient under the federal Energy Star® program.)

- For building developers or owners, investment time horizons have shortened from five to ten years a decade ago to one to three years now. Some efficiency and green measures pay back within three years, but many are longer term and so are viewed as not worth the initial investment.
- Capital expenses for building improvements are usually a separate line item from long-term operating expenses, and this disconnect makes it difficult to see long-term cost advantages from upfront capital spent to improve efficiency or green a building. Additionally, traditional accounting methods do not evaluate and capture the intangible or societal benefits of energy efficiency or green building.
- Green building and energy efficiency are sometimes viewed as "too difficult" to undertake. Some building owners and managers don't know where to begin. Information on green building is scattered, and information on available utility energy efficiency incentive programs is confusing.
- Green building infrastructure is not yet in place – that is, it is not yet common to find a skilled and knowledgeable labor force, available products, product supply chains, specification guidelines, and so forth. Appraisers generally have difficulty evaluating highly efficient or green buildings.
- Some building owners and managers perceive that energy efficiency measures just don't work. To them, measurement and evaluation information is inconsistent.
- Some developers, building owners, and managers do not see a link between how they construct or manage their buildings for energy and sustainability and California's challenges in meeting electricity and natural gas demand. Some commercial real estate industry members remain skeptical about human-caused global climate change and are not convinced of the value of constructing and operating their buildings sustainably.

Obstacle 1-Potential Incentives and Options

- Raise awareness of green building and energy efficiency through education and information campaigns geared toward the real estate industry. Create a credible, centralized source of information that includes:

    - A website, hotline, downloadable information.
    - A list of real estate peers already implementing green building available as advisors or speakers[8].
    - Case studies on the benefits of energy efficient and green buildings, including initial costs, long-term operational costs, building and occupant performance, and other data showing value added by efficiency or sustainable building practices.

[7] LEED stands for Leadership in Energy and Environmental Design. The acronym is used to designate the U.S. Green Building Council's green building rating system, which is the most commonly used rating system for green commercial buildings.

[8] For example, Southern California Edison is conducting a pilot program in which a person with a commercial real estate background and knowledge about energy efficiency is conducting outreach to members of the Building Owners and Managers Association.

    - Tools to show future cost savings clearly and simply.
    - Lists of qualified green consultants and contractors.
    - Lists of certified green building products.
    - Lists of existing training opportunities such as the Building Owners and Managers Association Energy Efficiency Program and classes at community colleges and trade schools.
    - Tools for appraising energy-efficient and green buildings.
    - Information on climate change reduction goals in AB 32, emphasizing the connection between emissions, climate change, and energy use in buildings.
    - Available federal or state tax credits for energy efficiency measures.
- Create "Green Building 101" or "Energy Efficiency 101" classes and training geared toward each real estate industry audience (owners, appraisers, brokers, and so forth).
- Create market pull for leases in certified efficient or green buildings. The state, as a major lessee of space in California and with its mandate to lease green spaces, could serve as a model and encourage other large tenants to demand green spaces to help pull the market.
- Make a more appealing business case by offering cash rebates, performance-based incentives, free consultant services, faster permitting, discounted property insurance rates, or other incentives. Incentives should be in place for the long term to be most effective. Create a public goods charges-type fund to support green building incentives.
- Encourage or develop new methods for weighing initial investments against long-term returns.
- Examine current utility incentive programs for possible modification to address the leased space dilemma.[9]
- Offer tours of and conduct awards and recognition/publicity programs for successful green and highly energy-efficient building projects.
- Identify, publicize, coordinate, and expand existing programs and classes for training the labor force for jobs in green and energy efficient construction. Tap into economic development programs for supporting wider availability of green products.
- Several "green" members of the real estate industry have commented on the need for submetering of tenants in buildings that currently have only one master meter. (In these buildings, tenants pay for utilities based on the square footage of the leased space regardless of how much energy they use or save.) Metering each tenant and having the building owner or manager aware of the tenants' level of energy use offers a better incentive for both the building owner and the tenant to pay attention to efficiency.[10]
- The same "green" real estate individuals have suggested that commercial property owners be allowed to trade or sell carbon emissions credits.
- Encourage the commercial real estate industry to participate in planning future utility incentive programs (current efforts through the California Public Utilities Commission) to help shape incentive programs that will affect the industry in the foreseeable future.

[9] Several stakeholders mentioned the need to review the utilities' Savings by Design program to better place incentives, to begin earlier in the design process, and to apply the program more rigorously to renovations.

[10] The California Public Utilities Commission ruled in 2007 to allow submetering in the PG&E service territory. The real estate industry is working toward the same goal in the other major utility territories.

Obstacle 2. Finding financing for green construction or efficiency measures can be difficult.

Financing green buildings is still in its infancy. As noted in Obstacle 1, evaluating green buildings and their benefits is still a young effort. While a few small, relatively new lenders specialize in green building loans, large established lenders such as Bank of America are just beginning to embrace loaning for green construction.

According to analysis by the state's Green Building Initiative Task Force, financing needs for efficiency measures differ according to the size of a facility and its electricity demand. Large (existing) facilities tend to require financial incentives but not financing assistance. The Task Force found utility programs in other states that offered workable, nontraditional financing mechanisms for medium and small facilities tailored to their respective needs.[11] (The established lending community may not look favorably upon loans for certain energy efficiency measures because if the borrower defaults on a loan for a new space heating or cooling system, for example, taking possession of the system is undesirable.)

Obstacle 2-Potential Incentives and Options

- Characterize commercial customers by their energy demand needs or other market segment and tailor financing mechanisms or other incentives to their needs. Investigate on-bill financing, performance-based incentives, energy efficiency mortgages, and other alternatives. Create how-to guides or primers on financing tailored to defined market segments and make them widely available.
- Work with the lending industry to increase awareness of green and energy efficient construction success stories.

Obstacle 3. Many building owners and managers are not technically knowledgeable about operating buildings for energy efficiency or sustainability and are not aware of the broad spectrum of available energy-saving opportunities and green strategies.

Building owners often don't have budgets to train their facilities managers and lack technical background themselves about energy systems and sustainable building practices. Owners and managers often are unaware of available tools to help determine how well or poorly their buildings perform compared to similar buildings. California has no regulations requiring that facilities managers have training in energy efficiency or sustainable building operations.

Obstacle 3-Potential Incentives and Options

- Engage utilities in helping to identify and improve the worst-performing buildings in their service territories and involve the owners and/or managers to increase their technical knowledge. The state, utilities, and building owners and managers should collaborate to design trainings tailored to building managers' educational needs.

[11] Green Building Initiative Task Force, *Green Building Action Plan Back-Up Technical Document – Rationale, Specific Actions, and Timeline*, 2004, p. 18.

Conduct an information campaign on available energy management tools such as benchmarking, retrocommissioning, and interval meters.
- Identify, promote, and expand existing certificate and training programs.
- Encourage bonuses or other recognition for building managers who improve the energy performance of their buildings while maintaining or improving occupant comfort.
- Encourage better service contracts for building systems and contractors better trained in energy management.

Obstacle 4. Other than Title 24 energy code for additions and alterations to buildings, California has no regulations mandating that existing buildings increase energy efficiency or be operated sustainably.

Unless occupants of a building complain of discomfort or other inconvenience or unless a building manager proactively maintains and operates a building for efficiency or minimal environmental impact, the building most likely operates at less-than-optimal efficiency. Heating, ventilation, and cooling systems, for example, tend to degrade over time without regular maintenance and thus use more electricity or natural gas than needed. California has no mandates for regular maintenance or for upgrades to meet revised building codes. However, several policies are addressing this obstacle:

- Assembly Bill 549 (Longville, Chapter 905, Statutes of 2001) requires the Energy Commission to "investigate options and develop a plan to decrease wasteful peakload energy consumption in existing residential and nonresidential buildings." The Commission's 2005 report, *Options for Energy Efficiency in Existing Buildings*, recommended that commercial buildings be benchmarked and retro-commissioned and that further legislation be passed to mandate benchmarking when a building is financed or refinanced (see AB 1103 below).
- The Governor's Green Building Initiative (Executive Order S-20-04, December 2004) requires the benchmarking of energy use in state buildings and strongly encourages the private sector to follow the state's lead.
- AB 32 (Nunez, Chapter 488, Statutes of 2006) requires reductions in California's greenhouse gas emissions to 1990 levels by the year 2020 and to 80 percent below 1990 levels by 2050. Though not specifically mentioning buildings, increasing building energy efficiency is expected to play a significant role in meeting AB 32 goals.
- Assembly Bill 1103 (Saldana, Chapter 533, Statutes of 2007) requires that electric and gas utilities make energy usage data for nonresidential buildings in their territories available starting January 1, 2010; these energy data are to be released and uploaded to the U.S. Environmental Protection Agency's on-line database Portfolio Manager upon consent of the building owner. Energy data for the preceding 12-month period must, however, be provided to any prospective buyer, lessee, or lender of a building.
- The California Building Standards Commission, which oversees the state's building codes, is in the process of adding green building features to the code (see Obstacle 7).

Obstacle 4-Potential Incentives and Options

- Consider requiring point-of-sale energy audits or equipment upgrades.[12]
- Implement *Options for Energy Efficiency in Existing Buildings* recommendations:
    - That utilities provide energy audits and retro-commissioning for poorly performing buildings.
    - That the state work with utilities and stakeholders to develop and improve information and outreach programs to motivate the real estate industry to participate in energy efficiency actions.
- Publicize to affected real estate industry stakeholders the requirements of AB 1103 regarding benchmarking.
- The Energy Commission should continue to participate in the Building Standards Commission's process to green the state's building code and encourage energy efficiency measures beyond existing Title 24 energy code as appropriate.
- Work with building owners and facilities managers associations and utilities to create programs for ongoing maintenance and commissioning of building energy systems.

Obstacle 5. The Title 24 building code for energy efficiency is implemented and enforced unevenly across the state.

Through lack of awareness, disinterest, or willful intent, some builders, building contractors, building permitting/inspection agencies, and other entities do not meet existing energy codes. Implementing further efficiency measures is difficult if existing minimum codes are not observed or enforced.

The Energy Commission and California Building Officials have been taking steps to remedy this problem. In 2005, the Energy Commission signed a memorandum of understanding with the Contractors State License Board to increase outreach and education for licensed contractors on their Title 24 energy code. The Energy Commission has hired additional staff for outreach, education, and enforcement efforts. Building officials and the Energy Commission partnered in producing educational videos on Title 24 compliance.

Obstacle 5-Potential Incentives and Options

- Continue Energy Commission, building officials, and Contractors State License Board collaborative efforts and the Energy Commission's stepped-up enforcement and educational activities.
- Develop awards and recognition programs for outstanding energy code implementation and enforcement.
- Assess penalties for noncompliant builders and contractors. (There is a precedent for this action – the Contractors State License Board already fines or otherwise penalizes contractors for code infractions.)

[12] However, some stakeholders from the real estate industry have expressed disagreement on the need for further regulations.

Obstacle 6. Some green building strategies conflict with existing building codes.

This problem has frustrated a number of architects and other entities trying to earn as many credits as possible in the LEED green building rating system. One of the most common problems relates to waterless urinals; some local jurisdictions forbid them or require water pipes to be installed in the restroom walls even if waterless urinals are used. Another conflict has arisen around the use of gray water for irrigating landscape or other application where drinkable water is not needed; again, some jurisdictions forbid use of gray water for any use. An added complication is that not all entities agree on the definition of gray water.[13]

Obstacle 6-Potential Incentives and Options

- Identify, support, and work to resolve code conflicts.[14]

Obstacle 7. Some local jurisdictions in California have adopted green building guidelines or mandates, and these are inconsistent from one jurisdiction to another and across the state.[15]

Keeping track of and implementing the variety of green building ordinances is a problem for developers, builders, and contractors who work in multiple cities and counties. While this is an obstacle at the moment, two efforts are underway that will likely offer relief:

- The California Building Standards Commission, which oversees California's building code, has begun a process to incorporate green building criteria into the code. The Building Standards Commission intends to make green building mandatory for residential and commercial buildings in the code update cycle starting in 2010.
- Build It Green, a nonprofit organization based in Marin County, has been forming regional committees around the state to promote standardization of green building guidelines across jurisdictions, whether mandatory or voluntary. It is as yet unclear how Build It Green's efforts will interact with those of the Building Standards Commission.

Obstacle 7-Potential Incentives and Options

- Participate in "greening" the state's building code and in Build It Green's (and any other) efforts to standardize codes.

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[13] "Gray water" is water that has been used once in specified applications, for example, for clothes washing. If certain environmentally designed soaps are used, the drain water can be reused for irrigation or in toilets with or without treatment. Water from kitchen sinks and dishwashers is a point of disagreement.

[14] For example, refer to the two case studies from the Center for the Built Environment in which some code conflicts were resolved and to the International Code Council news release announcing the U.S. Green Building Council/Code Council partnership to further green building. These are all listed in References.

[15] A list of jurisdictions with active ordinances (over 35) is on www.consol.ws/calbo/ordinances.html, and jurisdictions with pending ordinances can be found on www.consol.ws/calbo/pending.html.

- Keep stakeholders apprised of these activities.

Obstacle 8. There is not an effective feedback and communication pathway between the research and development community, which creates new construction-related products for sustainability, the cutting-edge architectural and design community, and the state and national code development community.

One participant in the Energy Commission's September 2007 public workshop brought up this point. His company develops building products that could revolutionize how walls and ceilings are constructed and thermally insulated. His company's research and development efforts apparently operate in isolation from the most recent thinking in the design of buildings for sustainability and from building code update activities. This problem could affect a variety of promising new technologies. He suggested formation of a working group or consortium to increase communication among these parties.

Obstacle 8-Potential Incentives and Options

- Develop collaborative efforts that increase communication among the research, building design, and code communities and that help create green and energy efficiency products that meet new design needs. (The state could play a role in promoting this collaboration.)

Obstacle 9. Traditional construction practices do not coordinate and integrate all the specification, design, and construction disciplines and do not treat building projects holistically.

A green, energy-efficient building performs best when its structure, components, surroundings, energy systems, and other aspects are considered together to minimize environmental impact. In traditional design and construction, such an integrated approach is not common.

Obstacle 9-Potential Incentives and Options

- Provide experienced individuals and teams to interested commercial real estate developers, builders, owners, and so forth to facilitate a shift to a coordinated, integrated design/build approach. (Utilities and the state could partner with existing organizations such as the American Institute for Architects, U.S. Green Building Council, and real estate industry groups.)
- Develop step-by-step how-to energy efficiency and green building primers for the different parties. (The California Commissioning Collaborative developed and published detailed guidelines for commissioning new buildings and retrocommissioning existing buildings. These could serve as templates or models.)

Obstacle 10. There is a difference in perspective and vocabulary in the world of utilities, energy policy makers, and commercial real estate.

Members of the commercial real estate community have voiced frustration with the technical nature of information regarding energy efficiency incentive programs. Real estate industry members' backgrounds and concerns are business-oriented and are not reflected adequately in policy information and incentive program materials from utilities. Some real estate members have also expressed frustration with the difficulty of obtaining assistance when telephoning their utilities for efficiency incentive program information.

Obstacle 10-Potential Incentives and Options

- Improve communication through collaboration among the commercial real estate industry, state policy makers, and utility representatives. (The state could promote collaborative efforts.)
- Evaluate Southern California Edison's pilot project on outreach and education for members of the Building Owners and Managers Association for possible replication across the state.

Conclusion

For furthering energy- and resource-efficient building, more information and exchange of information are needed for and among individuals in virtually all aspects of building design, specification, construction, property brokerage, property appraisals, utility incentive programs, code development and enforcement, education and training, sustainability advocacy, and policy-setting.

While interest in sustainable construction and building operations is growing rapidly in the private commercial sector, there is still a need for leaders at individual companies to rise and champion energy and resource efficiency. Designing and constructing buildings to minimize environmental impact is gaining ground but is far from being standard practice. Sustainable practices represent a major shift for the industry. A multi-billion-dollar industry will take some time to shift its practices and perspective.

It is the Energy Commission's hope that this report will help hasten that shift in both the private and the public sectors as the state strives to lead by example.

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APPENDIX A

Text of AB 2160

AB 2160 (Lieu)
September 2006

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 15814.40 is added to the Government Code, to read:

(a) The Department of General Services shall define a life cycle cost analysis model that shall be used to evaluate the cost-effectiveness of state building design and construction decisions and their impact over a facility's life cycle, no later than July 1, 2007.

(b)(1) The State Energy Resources Conservation and Development Commission, in consultation with the Department of General Services and the Treasurer's office, shall identify and develop appropriate financing and project delivery mechanisms to facilitate state building energy and resource efficient projects. These mechanisms shall include the use of the life cycle cost analysis model as described in subdivision (a), and shall maximize the use of outside financing, including, but not limited to, loan programs, revenue bonds, municipal tax-exempt leases, and other financial instruments supported by project savings, and minimize the use of General Fund moneys for these purposes. In addition, the commission, in consultation with these entities and with representatives from the commercial building construction industry, shall do both of the following:

(A) Identify obstacles to private sector commercial building energy and resource efficient projects.

(B) Identify and recommend financial or other incentives to facilitate private sector commercial building energy and resource efficient projects.

(b)(2) The commission shall report its findings and recommendations made pursuant to paragraph (1) to the Green Action Team by January 1, 2008.

(c) For purposes of this section, the "Green Action Team" means the interagency team established to further the goals of Executive Order S-20-04.

APPENDIX B

LIFE CYCLE COST ASSESSMENT (ANALYSIS) MODEL

FACT SHEET

From www.green.ca.gov/LCCA/factsheet.htm

Life Cycle Cost Assessment and the Green Building Initiative

The Governor's Green Building Initiative (Executive Order S-20-04) requires that the state implement all cost effective energy conservation measures (ECM) as identified to achieve the goal of reducing energy consumption by 20 percent by 2015. "Cost effective," as established by the Green Building Initiative (GBI), means that the economic benefits derived from the ECM outweigh all of the associated implementation costs over the expected useful life of the measure.

The Life Cycle Cost Assessment (LCCA) model is a key tool in determining the cost effectiveness of implementing energy conservation measures, which can have a higher first cost than standard measures.

What Is the Life Cycle Cost Assessment Model?

The LCCA model is currently an Excel-based spreadsheet that uses the same financial principles as employed by a discounted cash flow analysis. The user is asked to input data and other project information at the "front end" of the model, such as applicable utility tariff information, project costs, energy savings, and operations and maintenance cost information as appropriate. The engine of the model then calculates a cash flow stream based on the data and information inputs, and produces economic evaluation information, such as the internal rate of return, net present value of the cash flows, simple and actual paybacks, and, more importantly, debt coverage ratios.

The LCCA can analyze as many as 25 ECMs, which are separately input into the model. The LCCA establishes cash flows for each ECM and aggregates the economic analysis of each ECM into one project level evaluation. The model is flexible in allowing the user to select one, all, or a combination of ECMs to evaluate, which can provide for optimizing project selection (or a portfolio of ECMs) and financing.

The LCCA model is controlled to ensure that the analysis is performed in accordance with guidelines established by the Finance and Execution Committee of the Green Action Team. The

"DGS Inputs" worksheet of the LLCA model contains key variable economic metrics that are integral to the cash flow calculations. These economic metrics include inflation, discount rates, and escalator rates for utility tariff pricing. The approved values of these metrics are posted along with the LCCA model and User's Manual and Instructions (Green California website). In using the LCCA model, the user will be limited by the posted values for these metrics (see "Recommended operation of the LCCA" below).

What Is the Role of the LCCA?

The primary role of the LCCA is to determine the cost effectiveness of proposed energy efficiency and conservation projects (project) and establish whether a submitted and evaluated project should be approved for GS $Mart financing (as per Budget Letter 06-27, issued September 8, 2006).

Given the flexible and scalable nature of the LCCA model, the LCCA could also be used to conduct preliminary reviews of proposed ECMs and Projects, develop "what if" scenarios for further analysis, and provide additional information for budget exercises related to pursuing GBI measures. The user should understand that the LCCA is primarily driven by kW and kWh savings, applicable utility tariffs, and project costs. The LCCA is not suited for performing Life Cycle Assessment (LCA) of green building sustainability measures, which typically utilizes a different methodology for determining cost effectiveness.

How Does It Fit Into the Overall Energy Efficiency Effort?

The LCCA will determine whether a project containing one or more ECMs is cost effective as per the established definition. For securing project financing using the GS $Mart program, the LCCA will substantiate that there is sufficient energy savings to repay all associated project costs, including financing. Hence, GS $Mart and the LCCA become the primary tools for implementing cost-effective energy efficiency and sustainability measures. The user is advised that the quality of the LCCA will depend on the quality of the engineering and economic studies that are necessary to develop each ECM and project.

Who Performs the LCCA analysis?

The LCCA analysis can be conducted by facility level energy and/or building managers, departmental level energy or facility utility managers, or approved contractors who have been selected to provide energy services in the implementation of energy efficiency and sustainability measures. User's Guide and User's Instructions documents are posted with the LCCA model (http://www.green.ca.gov/EnergyEffProj/default.htm).

For securing GS $Mart financing, a submitted LCCA will be reviewed for accuracy and compliance with established requirements by appropriate DGS staff (see Management Memo MM 06-14). For more information regarding GS $Mart, access the GS $Mart website at http://www.pd.dgs.ca.gov/gsmart/default.htm .

Recommended operation of the LCCA

The User's Manual and User's Instructions that accompany the LCCA Excel spreadsheet model provides the necessary operating instructions to perform an LCCA of proposed ECMs. It is recommended that the user have a firm knowledge of utility tariffs and billing (including where to obtain the most recent utility tariff information) and energy efficiency measures and how they save energy.

The recommended approach is to be conservative in the analysis. User should first run the LCCA using zero as values for inflation and utility pricing escalators. While this may seem unreasonable, the perspective is that, at a minimum, project savings need to be sufficient to cover the project costs over the expected useful life of the ECMs being implemented at the current utility tariff price.

The minimum required Project debt coverage ratio is 1.10 (debt coverage ratio is defined as annual energy cost savings divided by the annual financing costs). However, the user should adjust this value upwards based on the User's perceived level of project risk. The debt coverage ratio is used as the key "go no-go" metric to approving Projects for GS $Mart financing. It is the economic metric that most closely aligns with budgetary requirements as per Budget Letter 06-27 (savings from the utility line item budget is used to finance project costs over the term of financing).

The user can then run the LCCA using the approved key variable economic metrics to determine the debt coverage ratio under a more likely scenario, based on current information regarding inflation and widely understood and accepted utility tariff price escalators. The source of this information will be from California state agencies that issue authoritative information for these types of economic metrics (for example, Department of Finance for California inflation rates, the California Energy Commission for utility tariff price escalators, etc.).

Submit comments, questions, or requests for more information to:
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APPENDIX C

Budget Letter 06-27, issued September 8, 2006

(see next page)

BUDGET LETTER

SUBJECT: GS $MART AND OTHER MUNICIPAL LEASE FINANCING	**NUMBER:** 06-27
	DATE ISSUED: September 8, 2006
REFERENCES: DGS MANAGEMENT MEMO 06-14	**SUPERSEDES:**

TO: Agency Secretaries
Departmental Directors
Departmental Budget Officers
Departmental Accounting Officers
Departmental Chief Information Officers
Department of Finance Budget Staff
Department of Finance Accounting Staff

FROM: DEPARTMENT OF FINANCE

The purpose of this Budget Letter is to update departments on the availability of, and conditions for using, the Department of General Services' (DGS) Golden State Financial ($) Marketplace program (GS $Mart – pronounced "G S Smart").

The GS $Mart program enables state departments to finance essential items of equipment and other goods. The program is designed to meet the standard requirements of municipal lease financing, which ensure that the loans are not considered state debt and satisfy tax-exemption, securities disclosure, and contract validity concerns. While the GS $Mart program has been available for several years, it has recently undergone procedural modifications to further enhance the efficiency and fiscal oversight of the program.

GS $Mart contains a centralized listing of financing service providers for use by state and local governmental entities wishing to acquire tangible assets through the use of municipal lease arrangements. The providers on the list have been pre-approved by the DGS to reduce the time spent by acquiring entities in locating sound financing services. In addition, GS $Mart also standardizes the process for soliciting bids and arranging contracts to further reduce the time and expense needed to secure prudent financing assistance. The following discusses the **budgetary** process to be followed if a department desires to use GS $Mart. For further details about the GS $Mart program, please refer to Management Memo 06-14 and the GS $Mart website: http://www.pd.dgs.ca.gov/gsmart/default.htm.

Baseline Budget:

Approval of GS $Mart Financing Agreements. Departments may use their existing baseline operating expense budget allotments to make payments on GS $Mart financing arrangements. Departments do not need to secure Department of Finance (Finance) approval prior to committing to a GS $Mart contract for approved items (excluding software development and integration which would require support unit approval), however, approval by the DGS is required (see Management Memo 06-14). Departments are strongly advised to use great caution in considering financing to avoid over extending their operating expense budgets. Be advised that requests **will not** be entertained for budget augmentations to fund financed contracts previously entered into with baseline funding or to fund other operating expense items that were precluded by the financing costs.

Use of Financing Arrangements Other than GS $Mart. Use of any financing arrangement other than GS $Mart, even utilizing baseline budget resources, is prohibited without prior approval from Finance. A department proposing such financing must request approval in writing and must provide an analysis to support the basis for selection of the financing to Finance support unit. A proposed financing arrangement other than GS $Mart will be subjected to a rigorous evaluation that must demonstrate that it will provide

the state with better terms than GS $Mart and will provide comparable financial security regarding such issues as tax exempt qualifications, financial health of the lender, and the financing's effects on the state's credit rating.

Reporting Requirements. In addition to any reporting requirements of the DGS, all GS $Mart financing payments must be identified in relevant supplementary budget schedules (e.g. DF 300, DF 301, and DF 302) on an annual basis as part of the Governor's Budget. An addendum to the supplementary schedule shall also be submitted with the schedule that identifies each financed agreement, the lender, the asset being acquired through the financed agreement, the principal amount of the financing, and a summary of the financial terms of the agreement.

Budget Change Proposals (BCPs):

Financing Proposed as Part of a BCP. Departments must indicate if any purchase proposed in a BCP will be financed. If it will be financed, the BCP must indicate whether the financing is proposed through GS $Mart, the contractor, or some other means. The financing fiscal detail must be included on the BCP fiscal detail sheet. If the financing will be other than through GS $Mart, the department must also include an analysis to support the basis for selection of the financing. A proposed financing using an arrangement other than GS $Mart will be subjected to a rigorous evaluation as noted above in "Baseline Budget."

An Augmentation for the Purchase of a Specific Asset. If a BCP (or legislatively provided budget increase that is not part of a BCP) is approved which provides a funding augmentation to pay cash for a specific asset, that asset may not subsequently be financed. If any such asset is acquired through financing, any augmentation provided to pay cash for the asset will be reduced from the department's budget.

Feasibility Study Reports (FSR), Special Project Reports (SPR), and Economic Analysis Worksheets (EAW):

For information technology projects reportable to Finance, departments must indicate if any purchase proposed in an FSR or SPR will be financed and by what means. Again, financing other than GS $Mart will be subjected to rigorous evaluation. The financing fiscal detail must be included in the EAW.

Energy Efficiency and Sustainability Project Financing:

GS $Mart financing may also be used for energy efficiency and sustainability projects. However, the approval of these projects will be based on a cost-benefit analysis to substantiate that there is enough energy savings derived to repay all associated project costs including financing. A Life Cycle Cost (LCC) analysis model is available from the DGS to conduct this evaluation. The LCC model **must** be used for this analysis, and the DGS will not approve any GS $Mart financing for such projects unless the applicant department certifies that the model has been applied and the results justify the asset acquisition on a cost-benefit basis. Any savings generated—including those necessary to pay for financing the project and any savings continuing after completion of the project—will be retained by the department and not subjected to a budgetary savings reduction by Finance, if the project was financed within the baseline budget.

If you have any questions regarding this process, please contact your Finance Budget Analyst.

/s/ Fred Klass

Fred Klass
Program Budget Manager

/s/ Todd Jerue

Todd Jerue
Program Budget Manager

APPENDIX D

Draft List of Obstacles and Incentives for Comment

at the Energy Commission's Public Workshop

September 25, 2007

(see next page)

Working Document for 9/25/07 Public Workshop

Draft List of Obstacles to and Incentives for Energy-Efficient Private Sector Commercial Buildings

	Obstacles	Suggested Incentives
1	**Lack of sufficiently compelling value proposition or business case for building owners/managers** - Case studies of energy efficiency successes are difficult to obtain or understand - Metrics of "success" are not well understood (occupant comfort, environmental benefits, reduced callbacks for heating and air conditioning systems, better control of energy expenses) or metrics are inconsistent or disjointed - Payback on individual energy efficiency measures may be too long for owner's preferred rate of return (financial drivers not well understood)	- Make clear, understandable case studies more available (work with real estate industry on appropriate venues) - Develop consistent methodology and approach for measurement and verification of results - Develop a list of qualified contractors to assist in documenting energy savings, applying the approved methodology for payment of incentives or other assistance (possibly include further benefits such as greenhouse gas emissions reductions) - Based on lower risks, offer lower insurance rates - Create community recognition programs for exemplary buildings - Guarantee faster plan check/permitting for energy-efficient buildings going x percent beyond Title 24, Part 6 (energy code) - Exempt energy-efficient buildings that are x percent beyond Title 24 from power outages during rolling blackouts
2	**Perceived or real higher first costs and financial disconnect between first costs and long-term operating costs**	- "Frontload" incentives to minimize initial cash outlays o Option to frontload incentives to offset initial cash outlays/capital investment OR performance-based incentives over the life of the measure (let customers choose what best meets their needs) o Flexibility to offer incentives to whichever party (owner, manager, tenant) makes the investment o Ability to compensate investing party's initial investment AND have investing party share in future benefits - Subsidize higher efficiency air conditioning equipment - Offer low-interest financing (e.g., Energy Commission's Energy Efficiency Partnership Program, but for private entities) - Offer tax credits

		- Allow carbon trading/selling of emissions credits
3	**Perception of "too difficult"** - Too many choices in possible efficiency measures or incentive programs - Extra effort needed to identify and evaluate options, develop a project, and schedule it - Competes with other priorities - Human nature - resistant to change/easy to be habitual	- Create ESCO-like services (one-stop shopping for analyses and packaging of projects; structure payments to be virtually invisible) - Fine-tune "Savings by Design" programs to focus on packaging total solutions that provide full design, financing, and implementation - Provide case studies (see #1 above) - Identify real estate industry peers to help educate/persuade - Subsidize infrared photography services to show heat loss through building envelopes, air ducts, HVAC equipment, etc.
4	**In multi-tenant buildings with one meter, inability to submeter tenant spaces** - Utility bills are based on square footage rather than actual energy use - Creates disconnect between tenant energy consumption and costs	- Allow submetering (this is resolved in PG&E territory) - Have appropriate checks and balances so tenants are treated fairly - Tailor incentive programs for submetered tenants and building owners
5	**In multi-tenant buildings with individual utility meters, a disconnect between those who control/manage energy features and tenants who pay energy bills** - Tenants have no control over choice and maintenance of HVAC equipment, condition of air ducts, lighting fixtures, etc.	- Realign incentive programs to reward party(s) that take action/make energy efficiency investment(s)
6	**Insufficient technical knowledge among building operations staff** - Staff not knowledgeable about selecting, maintaining, and operating energy-related equipment for efficiency	- Provide affordable, convenient, practical education and information from credible sources o Include ongoing technical support to building operations staff (hotlines, on-site visits by trained outside technical staff, etc)

	- Staff not aware about how much their actions related to maintenance and operations impact energy use in their buildings - Job goals not structured around energy efficiency performance - Staff not knowledgeable about building components functioning as a system	
7	**Complexity of utility programs** - Utility incentive programs may be difficult to understand for all but the most sophisticated customers - Same for utility rate structures and utility bills	- Create utility/real estate industry collaboration to address this
8	**Utility communications with the private sector** - Anecdotal evidence of "utility-speak" differing from "real estate-speak (e.g., utilities speak "demand response" while real estate professionals need to understand financial drivers and more basic energy efficiency) - Business customer experiences reveal difficulty maneuvering through phone systems when calling utilities for information on energy efficiency incentive programs	- Create utility/real estate industry collaboration to address this
9	**Bigger picture issues** - Real estate industry may lack understanding about California's energy crisis (esp. peak demand) and about climate change and emissions issues	- Provide affordable, convenient, practical education and information from credible sources, including from real estate industry peers

	related to energy production and building energy use	
10	**Lack of a champion for energy efficiency at individual companies** to set corporate energy policy or urge employees to conserve	- Make clear, understandable case studies more available (work with real estate industry on appropriate venues and examples)
11	**Lack of an agency or other entity with authority to mandate beyond-code energy efficiency in new construction or to address energy efficiency in existing buildings not scheduled for renovations**	- Work to create legislation to address this
12	**Enforcement of existing energy code is inconsistent across the state**	- Energy Commission to continue efforts to work with and educate building departments and to make energy code more understandable to enforcers
13	**Building contractors and subcontractors sometimes ignore energy code**	- Energy Commission to continue efforts to work with Contractor State License Board to educate contractors and create penalties for contractors for noncompliance with energy code

Draft List of Obstacles to and Incentives for <u>Resource</u>-Efficient Private Sector Commercial Buildings

	Obstacle	Suggested Incentives
1	**Lack of sufficiently compelling value proposition or business case for building owners/managers** - Case studies of green building successes may be difficult to obtain - Metrics of successful green buildings may be inconsistent - Benefits of building green may not be well understood (increased market	- Make clear, understandable case studies more available (work with real estate industry on appropriate venues) o Include benefits and added value of green building and payback - Develop consistent methodology and approach for measurement and verification of results - Subsidize the cost of green building consultants - Based on lower risks, offer lower insurance premiums - Create community recognition programs for exemplary green buildings - Guarantee faster plan check/permitting

	value, occupant comfort, tenant retention, lower employee absentee rates in tenant businesses, increased indoor environmental quality, outdoor environmental benefits, risk mitigation, better control of expenses, etc.) - Payback on individual measures may be too long for owner's preferred rate of return	- Exempt green buildings from power outages during rolling blackouts
2	**Perceived or real higher first costs and a financial disconnect between first costs and long-term operating costs** **-** Because green buildings represent a change in business-as-usual, it is perceived to add cost **-** Certification and documentation of green buildings, e.g., through US Green Building Council, add cost and effort	- Make available case studies of successful green building projects that cost little or no more than traditional buildings - include o Proof of added value and enhanced marketability; evidence of faster leasing/selling of green buildings or spaces o Proof of higher profits (while keeping lease rate per square foot below competitors) o Proof of fewer callbacks o Testimony from satisfied tenants in green buildings – longer tenancies, lower employee absentee rates, increased comfort, etc. - Guarantee faster plan check/permitting
3	**Perception of "too difficult"** - Peers and consultants not experienced in green building - Difficult to know where to start - Human nature -resistant to change/easy to be habitual	- Make clear, understandable case studies more available - Provide lists of consultants, architects, etc. with green building experience - Subsidize the cost of these green building professionals - Identify real estate industry peers to help educate - Create a primer on green building that includes 'where to start' - Create centralized sources of credible information - Identify jurisdictions that have passed green building ordinances - Publicize the intent of the California Building Standards Commission (CBSC) to mandate green building through the state building code in the cycle starting in 2010
4	**Perception that green building is "new age" or for liberals or the environmental fringe only**	- Identify peers to help educate - Provide case studies of successful green buildings from a variety of building owners Offer evidence of added value/the business case for building green

5	**Lack of subsidies, incentives, or mandates**	- Identify and publicize all existing financial and other incentives for green building or green building components (e.g., lower insurance premiums for green buildings, rebates for solar PV systems, faster permitting in some jurisdictions, longer tenant stays, etc.) - Create new incentives (but note CBSC's intent to mandate green buildings via the state's building code in the cycle starting in 2010)
6	**Lack of consistent green building standards across jurisdictions**	- Create consistent standards across jurisdictions (but note CBSC's intent to mandate green buildings across the state) - (Build It Green, a nonprofit, and other entities have started promoting consistent green building guidelines across jurisdictions)
7	**Bigger picture issues** - Private sector real estate industry may lack understanding about how all aspects of building siting, design, construction, maintenance, operations, etc. affect indoor and outdoor environmental quality (including climate change impacts) and why these are important	- Make information available in commonly read (by real estate industry) trade publications, local newspapers, other media, and at trade shows and conferences - Create centralized, credible sources of information
		-

APPENDIX E

List of Attendees at the September 25, 2007 Public Workshop

(see next page)

In-person participants at the Energy Commission's AB 2160 Public Workshop
Sacramento September 25, 2007

First name	Last name	Organization	Email address	City
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		Phone participants		
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Hannah	Friedman	PECI		
Darin	Hanway	Southern California Edison		
Tracy	Narel	US Environmental Protection Agency		
Jennifer	Seguin	City of San Jose		
Tory	Weber	Southern California Edison		
Bill	Welker	California Commissioning Collaborative		
Eric	Yamashita	Southern California Edison		