

# CASE STUDY: CALIFORNIA GREEN BUILDING CODE

## 1. THE POLICY

In July 2008 California introduced the first statewide green building code, which will come into effect in January 2009 and will help California achieve its goal, mandated in Assembly Bill 32 and signed into law in 2006, of reducing the state's greenhouse gas emissions to 1990 levels by the year 2020. The code is designed to set the minimum requirements for green buildings in California and was developed in order to provide a consistent, statewide approach for green building within the state, which should reduce the confusion surrounding the number of green building programs available to developers and builders.

Although currently voluntary under state law, the code was written in "code language" in order that local jurisdictions could easily implement it into local building standards. Beginning in 2010 parts of the code may become mandatory under state law for all new building design and construction projects in the state. The current Green Building Standards will also be reviewed and updated within a new rulemaking process before any mandatory requirements are established. Some state agencies think that making compliance with the code mandatory will limit its scope, and that achieving exemplary green building performance in all new construction projects will be unrealistic. Therefore, it is expected that areas of the code will always be voluntary, in order to avoid the "mandatory green washing" of all buildings in the State and to allow truly sustainable buildings to excel. This approach is designed to help drive forward sustainable design in the State through the construction of fewer, but truly exceptional sustainable buildings. As implemented, compliance with the code is likely to be comparable to achieving a "LEED® Silver" rating.

The code is designed to improve public health, safety and general welfare by enhancing the design and construction of buildings, through the use of building concepts which have a positive environmental impact, and by encouraging sustainable construction practices in the following areas:

### **Planning and design**

Design and development standards cover environmentally responsible site selection, building design, building siting and development in order to protect, restore, and enhance the environmental quality of the site and respect the integrity of adjacent properties.

### **Energy efficiency**

Energy efficiency standards demonstrate an enhanced level of building efficiency using a performance based approach or prescriptive approach.

### **Water efficiency and conservation**

Water efficiency and conservation standards help to reduce indoor and outdoor water use and wastewater conveyance through the reduction of potable water use in water fixtures, the reduction or elimination of potable water use for irrigation and the use of recycled rainwater or grey water.

### **Material conservation and resource efficiency**

The standard requires reusing existing building stock and materials, the use of recycled, regional, rapidly renewable and certified wood materials and the employment of techniques to reduce pollution through the recycling of materials and reduction of building pollutants.

### **Environmental air quality**

Environmental air quality standards quantify airborne contaminants that are odorous, irritating or otherwise harmful to the comfort and well being of a building's installers, occupants and neighbors.

## 2. ENERGY EFFICIENCY POTENTIAL

### 2.1. Policy Uptake

The code was written in a way that allows it to be easily implemented into the building standards of local jurisdictions within the state. The level of uptake of the code is therefore largely dependent on the number of local jurisdictions which make compliance with the code mandatory. This figure is currently unknown, although the Building Standards Commission indicated that they had so far has interest from a handful of local jurisdictions. For any single jurisdiction that does adopt the code, all new construction projects would be required to comply with its mandatory provisions.

## **2.2. Energy Savings Potential**

As implemented, the impact of the program on overall energy saving in new construction is likely to be limited as compliance with the code is voluntary under State law. However, the overall energy savings achieved through the implementation of the code will be dependent on the number of local jurisdictions which make compliance mandatory. For those that do, the code is designed to achieve a minimum of a 15% improvement in energy use over Title 24 mandatory standards (Tier 1), with a desired target of exceeding current California Energy Code requirements by 30% (Tier 2). Thus, energy savings for new construction projects will be at least 15%.

## **3. COST OF IMPLEMENTATION**

### **3.1. Program Cost**

Exact figures for the cost of developing the code are unknown by the state as the time and costs were incorporated by the state agencies as part of their code development program. However, according to officials at the California Building Standards Commission, the costs associated with implementing the code were minimal, largely as the code was developed as part of the State's cyclic 18 month renewal program. In addition, as the USGBC's LEED rating program was used as the basis of the code, the research and development effort required to implement the code was minimized, although in areas the code covers elements not within LEED. No additional members of staff were required during the development period; instead, code development was incorporated into the duties of existing staff; none of whom worked on the project on a full time basis.

Where local jurisdictions within the State make compliance with the code mandatory, additional enforcement costs (in addition to the costs of integrating local codes with the State's Green Building Code) are likely to be incurred in enforcing the code due to the additional elements that will have to be reviewed as part of the enforcement process. As no individual jurisdictions have yet made compliance with the code mandatory, exact figures for implementation costs are unknown, though it is expected that local staff would need additional training on code enforcement, compliance and policy administration.

### **3.2. Cost to the Developer**

Extensive life cycle cost analysis was not undertaken during the writing of the California Green Building Code as compliance with the code is only voluntary. The same rigor was, therefore, not applied to assess its cost effectiveness as would have been required for a mandatory code. It is expected that as the code is reviewed, updated and developed further, particularly towards the 2010 version of the code, more thorough life cycle costing and cost effectiveness analysis will take place. Funding is expected to be acquired to allow this to take place.

According to representatives of California Building Standards Commission compliance with all measures within the code is likely to be comparable to achieving LEED Silver certification, which carries with it an estimated cost of compliance likely in the order of 2 to 3% of total construction costs.

## **4. ADMINISTRATIVE FEASIBILITY**

### **4.1. Administering Agency**

The code will be administered by the California Green Building Standards Commission in conjunction with the California Department of Housing and Community Development and the California Energy Commission. Enforcement of the code will be overseen by local building departments.

### **4.2. Ease of Initiation**

The program did not require significant policy research and development or stakeholder impact (in part, as compliance with the code is currently voluntary) prior to its implementation. The state deliberately used the US Green Building Council's LEED green building rating system as the basis for the code, as the requirements of the LEED program had already been validated in the public domain. According to state officials, if ASHRAE Standard 189.1 had already been adopted prior to the writing of the code, Standard 189.1 would have been frequently referenced. With further developments of the code, this is expected to be the case. In total, approximately 30 members of state agency staff were involved in the development of the code; however none of these were dedicated to the project full time.

The ease of initiation on local jurisdictions that make compliance with the act mandatory is largely dependent on the existing local building code requirements and enforcement practices. By implementing the code at State level

(albeit in voluntary form) however, the requirements of implementing the code at a local are significantly lessened as local codes will ultimately refer back to State level policies which are already in line with the code requirements.

### **4.3. Educational Outreach Requirements**

Where individual jurisdictions make compliance with the code mandatory, it is expected that they would implement an education and outreach program for stakeholders and interest groups. It is expected that an education program may be created in association with CALBO (California Building Officials) which have previously provided much of the State's training on new building standards.

## **5. STAKEHOLDER IMPACTS**

### **5.1. Acceptability to the Construction Industry**

California Building Standards Commission officials found that, while developers were generally supportive of the development of the code, the code would not be released if the requirements on developers and builders were too radical. Including developers in the policy development process allowed them to exert some influence over the policy design, according to the Standards Commission. This was corroborated by Rob Hammon of Consol Energy Consultants, who was involved in the development of the code as a representative of the California Building Industry Association. Hammon also noted that the industry was generally interested in green building and that the development of the green building code was generally well accepted. Developers have raised concerns however, that a possible increase in construction costs to comply with the code would create a disparity between the cost of new and existing buildings. This would affect leasing and sales prices, which could compromise the marketability of new buildings versus existing buildings.

Although the stakeholder consultation process was not as rigorous as is the case for many mandatory building codes, feedback from developers, builders, and other parts of the building construction industry was sought during the development process. Opposition from stakeholders was experienced over several areas of the code, which ultimately resulted in the removal of some standards from the draft that was eventually adopted by the State. In particular, requirements relating to land use planning were removed late in the process, as developers objected to land use decisions being mandated in a building code. In addition, requirements relating to the urban heat island effect were removed due to opposition over concerns of the technical and economic feasibility of meeting heat island requirements in all buildings. If and when compliance with all or parts of the code becomes mandatory, it is expected that the code would be updated with significantly more stakeholder participation in the process.

It was considered important that the opinions of as many interested parties as possible were obtained in developing the code. However, state officials noted that it was often difficult to predict last minute opposition from stakeholder groups who had previously been thought to be in agreement with policies within the code. With further revisions, officials hope to better prepare for the unexpected, ensuring that potential controversial issues are identified and addressed as early in the process as possible.

## **6. REFERENCES**

Martha Brook, California Energy Commission

Jane Taylor, California Building Standards Commission

Rob Hammon, Consol Energy Consultants