

SAVING THE CALIFORNIA ENVIRONMENT, SAVING THE CALIFORNIA ECONOMY

**Reducing Global Warming, Energy Demand and Water Use
While Creating Jobs and Generating Revenues**

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EXECUTIVE SUMMARY

California is under mandates to reduce greenhouse gas emissions, shift to renewable energy sources and reduce water demand. At the same time, the state economy, especially the construction industry, is in dire condition.

The greatest opportunity to meet those environmental goals, while simultaneously stimulating the state economy, lies in retrofitting existing homes and commercial buildings to use less energy, reduce reliance on carbon-based energy sources and require less water. Such a program, carried out on a large scale and making even the most basic improvements to energy efficiency, could readily reduce greenhouse gas emissions from buildings by 35%, thereby meeting the standards of the California Global Warming Solutions Act. A similar program to cut water waste could readily reduce indoor water use by more than 50%, drastically reducing the need to transport water around the state. Both programs would generate sufficient savings to property owners to pay off the cost of the improvements within just a few years.

Carrying out the policies and programs which can achieve those goals will act concurrently as an enormous generator of employment opportunities, a stimulus to the state economy overall and a source of significant revenues for state and local government. Implemented on a large enough scale, aimed at retrofitting all older homes in the state over a ten-year period, such programs could generate more than twice the number of construction jobs lost in the current recession and an equal number of jobs in the rest of the economy. They also would reduce the demand for certain public services, while generating significant new property, income and sales tax revenues for state and local government. Finally, they would facilitate compliance with environmental standards, by making possible establishment of mitigation banks for new construction.

Many of the proposed actions already are being carried out on a limited scale, and the state government is embarking on a major new program in this area. There also is legislation pending to provide financial support for such actions. To make a significant difference, there needs to be a commitment to implementing those efforts rapidly and comprehensively, through public education, through improved access to financing and through broader incentives to property owners.

1. INTRODUCTION

Energy and water conservation, and the “green” jobs associated with it, are being promoted by many interest groups as being key to both protecting the environment and stimulating the economy. At the same time, some interest groups are expressing concern that emphasis on such policies may undercut other efforts to stimulate the state economy. With the correct focus, we can simultaneously save both the environment and the economy.

The top issue on the environmental front is climate change. Reports from virtually every scientific organization confirm that global warming is worsening, yet efforts to combat climate change are stalled. The recent Copenhagen climate summit produced no international agreement. The U.S. Congress has backed away from efforts to pass even the fairly pallid energy reform and climate change legislation proposed to date. And California’s Global Warming Solutions Act (AB 32), the leading state-level climate change regulation in the country, has come under recent attack and faces an uncertain future.

The other looming environmental challenge concerns water supply. The Sierra Nevada snowpack and rainfall throughout the state have been shrinking steadily and are not adequately replenishing the state’s rivers and reservoirs. Water deliveries from the Sacramento Delta have been slashed under court order for environmental reasons. Access to Colorado River water has been reduced due to claims from other states. The past year’s uptick in rainfall notwithstanding, the outlook is serious. The resulting shortage is blocking new real estate developments, causing agricultural areas to be fallowed and forcing domestic water use reductions.

At the same time, the state economy is struggling -- particularly the construction industry, which has seen a 75% drop in building permits and 400,000 jobs lost since its peak¹. Based on the multiplier effect of development activity, that has translated into a loss of \$55 billion in activity throughout the state economy², and commensurate reductions in state and local revenues.

There is, however, no need for despair. Rather, there is a readily available strategy which simultaneously would go far toward meeting the AB 32 requirements for reduction of greenhouse gas emissions to 1990 levels by 2020, would facilitate a massive reduction in reliance on fossil fuels, would dramatically reduce water consumption, would jumpstart the state economy and would generate new revenues for state and local governments.

¹ “Hard-hit building industry reviving,” *Los Angeles Times*, May 24, 2010, p. A1.

² *The Economic Benefits of Housing in California*, Center for Strategic Economic Research, July 29, 2010, p. 6.

The answer lies in our existing residential and commercial buildings, in particular the ones built before contemporary energy efficiency standards came into effect and before water resources became constrained. California currently has approximately 13.4 million homes and about a half million commercial buildings. About 8 million homes and about 5.25 billion square feet of commercial space predate any meaningful energy efficiency standards³. The large number of older structures represents the “low-hanging fruit” in the dual effort to reduce the environmental impacts of our built environment while simultaneously stimulating the economy. Retrofitting those structures to use less energy and consume less water will enable California to take an enormous step toward reducing greenhouse gas emissions and other environmental impacts, reducing utility costs of property owners and residents, and generating more construction jobs than have been lost in the current recession.

This proposal is not a prediction, but rather a projection of likely outcomes based on analysis of existing data. The actual outcomes will be influenced by such factors as the scale and speed of implementation, general economic conditions and the availability of program incentives. They also will be influenced by other initiatives, such as the new California Green Building Standards Code⁴. In any case, the time to begin implementing the proposals described in this analysis is now.

³ Climate Change Scoping Plan, Appendix C, California Air Resources Board, December 2008, p. C-146.

⁴ California Code of Regulations, Title 24, Part 11.

2. REDUCING ENERGY DEMAND AND CLIMATE CHANGE

Two-thirds of the existing homes and a majority of the existing commercial structures were not subject to any energy efficiency requirements at the time of construction, though some have been upgraded since then. The current energy efficiency standards are based on utilizing improved insulation, roofing, windows and other construction materials. The California Air Resources Board estimates that residential and commercial buildings are responsible for about 22% of greenhouse gas emissions⁵, not counting the emissions associated with water delivery. Nearly all of that is related to older structures, making it far more cost-effective to concentrate on that part of the building stock.

A study prepared for the California Building Industry Association demonstrates that homes built in the last few years use 25% less energy each than ones built as recently as 1990, even though the average square footage has increased by 15%⁶. That, in turn, has allowed a reduction of nearly 25% in greenhouse gas emissions for each of those newer homes⁷. As a result, while new homes built in a typical year comprise about 1% of the total housing stock, residential new construction in accordance with current standards already complies with AB 32's criteria⁸ and contributes only 0.12% of annual greenhouse gas emissions⁹. During periods of economic recession such as the current building downturn, new homes comprise as little as one-third of 1% of total housing stock, with a commensurately lower contribution to greenhouse gas emissions. Simply retrofitting residential structures built before 2006, and especially those built before 1982, to current efficiency standards would similarly slash their share of those emissions, without even taking into account other potential gains, such as from converting to solar and other sustainable energy sources.

For example, retrofitting a typical existing single-family home with new heating and air conditioning systems and improved insulation, at a cost of no more than \$10,000, depending on the age of the structure, would reduce greenhouse gas emissions for that home by about one-third. That cost to the homeowner could be cut in half, depending on the availability of rebates and other incentives from utilities and government agencies. By contrast, achieving a comparable further gain

⁵ Climate Change Scoping Plan, California Air Resources Board, December 2008, p. 13.

⁶ Carbon Footprint of Single-Family Residential New Construction, ConSol, May 27, 2008, p. 3.

⁷ Ibid., p.4.

⁸ Ibid. p. 16.

⁹ Ibid., p. 18.

in a more energy-efficient new home could cost eight times as much per unit of reduced emissions, because of the high level of efficiency already present in those new structures¹⁰.

Similar calculations for retrofitting commercial buildings are more difficult, because of the great variation in the standards to which they have been built and renovated. However, the Air Resources Board calculates that adherence to its energy efficiency targets could result in a 35% reduction in the carbon footprint of all such buildings¹¹.

The proposed retrofitting would produce immediate benefits to property owners and other utility consumers. The average California household consumes about 5,900 kWh per year¹². Reducing the electrical requirements of their homes and workplaces would reduce their electrical bills commensurately and would rapidly pay for the cost of those improvements. Because electrical rates are tiered, with the cost rising as the level of consumption increases, the proposed reductions in demand would have a disproportionate beneficial impact on consumer costs. So, for example, reducing annual electrical consumption by one-third for the household described above would eliminate top-tier pricing altogether and reduce their annual cost for electricity alone by about \$375 (based on San Diego Gas & Electric rates)¹³. Because the rates are substantially higher for increased levels of consumption, a household currently using 10,000 kWh annually would save about \$940 per year from a similar percentage reduction¹⁴.

In some respects, California has an enviable record with regard to electricity demand. California consumes less electricity per capita than any other state, and per capita demand has barely increased over the past 30 years¹⁵. At the same time, electrical generation accounts for 28% of the state's carbon dioxide emissions¹⁶ and 25% of its total greenhouse gas emissions¹⁷.

Reducing electrical consumption has the direct effect of reducing greenhouse gas emissions and their global warming impacts. Reducing consumption of natural gas and other energy sources used for heating has similar benefits. Energy-efficient retrofitting of existing structures will advance both those goals.

At a minimum, retrofitting existing residential structures to the improved energy efficiency standards described above would substantially reduce their demand for electricity and other energy

¹⁰ Meeting AB 32—Cost-Effective Green House Gas Reductions in the Residential Sector, ConSol, August 2008, p. 10.

¹¹ Climate Change Scoping Plan, Appendix C, *supra*, p. C-145.

¹² California Long-Term Energy Efficiency Strategic Plan, California Public Utilities Commission, p. 10.

¹³ San Diego Gas & Electric, rate schedule, website.

¹⁴ *Ibid.*

¹⁵ Integrated Energy Policy Report 2007, California Energy Commission, p. 16.

¹⁶ *Ibid.*, p.2.

¹⁷ *Ibid.*, p. 19.

sources, and therefore their responsibility for greenhouse gas emissions. Beyond that, some or all of the remaining electricity and other power needs of existing structures may be met by converting to photovoltaic, wind-power or other sustainable energy sources, depending on the size of the system installed and the cost which the owner is prepared to invest. Installation of solar hot water systems is similarly beneficial by reducing reliance on natural gas and electricity. Installation of any such systems will be more costly than simple energy efficiency improvements, and are beyond the scope of this analysis. However, they may be considered on a structure-by-structure basis in order to maximize reduction of fossil fuel consumption and greenhouse gas emissions.

3. REDUCING WATER USE

The opportunities are equally great when it comes to reducing water use. A study conducted last year for the California Homebuilding Foundation determined that a typical new single-family home for a family of four consumed about 59,000 gallons of water annually for indoor uses¹⁸. That will go down to about 47,000 gallons under new efficiency standards effective this year¹⁹. A similar home built in 1975, on the other hand, consumes 92,000 gallons a year, or 56% more²⁰. Either home additionally consumes about 115,000 gallons of water a year for landscape irrigation²¹.

Simply retrofitting all of those older homes with water-saving toilets, faucets and showerheads would reduce consumption by 29,000 gallons a year for each home built in the mid-1970's and by 18,000 gallons a year for each one built in the early 1990's²². For the roughly 11 million homes built before the 1992 water efficiency requirements took effect, that saving could total nearly a million acre feet annually (an acre foot being enough to serve at least two households for a year at current use levels). On top of that, an estimated 16,000 gallons per home could be saved annually through more efficient outdoor irrigation, for an annual saving of an additional 650,000 acre feet²³, and far more if water use is further reduced by eliminating overwatering.

The U.S. Green Building Council estimates that water efficiency measures in commercial buildings can reduce water consumption by at least 30%²⁴. For a typical 100,000 square foot office building, that means a saving of at least one million gallons per year²⁵. With over 7 billion square feet of commercial space in California, that amounts to potential annual savings of as much as 70 billion gallons, or 215,000 acre feet.

As a point of reference, all of that conservation, carried out statewide, could amount to almost 80 percent of the total water supply currently imported to Southern California from all sources by the Metropolitan Water District²⁶ – more than enough to offset all the current natural and legal restrictions on supply. Alternatively, as a recent study by the Pacific Institute points out, conserving a million acre feet of water would supply the City of San Francisco for nearly 12 years, would make unnecessary the construction of several new reservoirs currently under consideration,

¹⁸ Water Use in the California Residential Home, ConSol, January 2010, p.8.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid., p. 10.

²² Ibid., p. 11.

²³ Ibid., p. 9.

²⁴ LEED for New Construction Version 2.2, U.S. Green Building Council, October 2007, p. 115.

²⁵ Ibid.

²⁶ Metropolitan Water District of Southern California, website.

or would provide 18 times the supply promised by the massive desalination plant proposed to be built in Carlsbad²⁷.

As with energy efficiency improvements, reducing water consumption will produce immediate benefits to property owners and other utility consumers, though the saving will be less for water. Again, tiered pricing results in outsized savings from the first increment of reduced demand. For example, for the typical single-family home described above, at current water rates in the San Diego region, the anticipated 56% reduction in indoor water demand would result in a saving of about \$170 per year²⁸. However, that saving can be increased significantly by reducing outside use, consisting mainly of landscape irrigation.

²⁷ California's Next Million Acre Feet; Saving Water, Energy, and Money, Pacific Institute, September 2010.

²⁸ City of San Diego, Water Rates, website.

4. CREATING JOBS AND STIMULATING THE ECONOMY

The environmental gains are only half of the picture, however. Equally exciting is the beneficial effect which all of that building retrofitting activity would have on the economy. Currently, there are estimated to be only about 68,000 “green” construction jobs in California²⁹, but that number could increase dramatically. Instituting a long-term program of this kind would provide the certainty needed to support expansion of the manufacturing, service and construction sectors in this field, as well as investment in development of improved technologies for resource conservation and energy generation.

A recent University of California study forecast the creation of about ten full-time direct jobs for every \$1 million invested in energy efficiency upgrades³⁰. An aggressive program aimed at retrofitting all the 9.2 million less efficient residential units over the next ten years, at an average cost of no more than \$10,000 each, could generate a staggering 920,000 construction jobs. Investing another \$1,650 apiece for water efficiency improvements to 7.5 million homes would generate another 124,000 construction jobs. In all, that is nearly three times the number lost in this recession. Upgrading the commercial building stock would add significantly to that job-creation effect.

Construction work has a multiplier effect that creates at least one additional full-time job in the general economy for each new construction job, according to the federal Bureau of Economic Analysis³¹, based on both the wages injected into the economy and the requirement for building materials and other manufactured products used in construction. Consequently, the money spent on the retrofitting itself could generate a total of over two million jobs and a total of about \$210 billion in economic value, thereby radically reducing unemployment and potentially providing enough stimulus to end the current recession in this state. Some economists believe the multiplier effect of construction jobs is higher than this, in which case the economic benefits would be even greater.

²⁹ California’s Green Economy, California Employment Development Department, Table – Industries with the Most Green Jobs, April 21, 2010.

³⁰ “Addressing the Employment Effects of AB 32,” UC Berkeley Center for Labor Research and Education, February 2009, p. 23.

³¹ Ball, Robert, “Employment created by construction expenditures,” Monthly Labor Review, December 1981, p. 38.

5. HELPING PUBLIC AGENCY BUDGETS

The effects of the construction and other economic activity described above will significantly aid state and local governments in California, particularly since this activity can be achieved with minimal use of public funds, as described below.

Retrofitting all older homes and commercial buildings would add substantially to the property tax base (unless such improvements are excluded from assessed valuation). Retrofitting all pre-1983 homes with the minimum energy-efficiency improvements discussed above would increase the residential property tax base by about \$90 billion as properties are reassessed over time, and eventually would generate at least \$900 million annually in additional property taxes to support schools, public safety and other local government services.

Assuming a comprehensive retrofitting program for residential structures alone, carried out over ten years, if even half of the total investment represents the value of the materials and equipment, that will average at least \$9 billion per year. That would generate an average of at least \$787 million per year in additional sales taxes.

Assuming conservatively an average full-time annual income of about \$50,000 per skilled worker in the construction industry³², the potential employment generated by the proposed programs could produce an aggregate increase in income of \$5.2 billion per year over ten years. That would generate an average of as much as \$113.8 million per year in additional state income taxes, based on a single-earner family tax rate³³.

The increase in the property tax base for commercial buildings, as well as the sales and income taxes generated, is more difficult to estimate, due to the variation in improvements anticipated for such structures. Nonetheless, it will produce a substantial additional increment of revenues in all categories.

There will be other significant financial benefits, as well. For example, generating new jobs will reduce demand for unemployment insurance payments and various forms of public assistance for unemployed workers and their families. At the same time, there will be a reduced need for construction of new water storage and transmission facilities and new power generating and distribution facilities.

³² "Industries at a Glance," Bureau of Labor Statistics, U.S. Department of Labor; "General Prevailing Wage Determinations," California Department of Industrial Relations.

³³ California Tax Rates and Exemptions, California Franchise Tax Board.

6. IMPLEMENTATION STRATEGIES

The environmental and economic benefits described above will occur over an extended period of time. The California Public Utilities Commission already has adopted a goal of a 40% reduction in energy consumption in existing homes by 2020³⁴.

An initial level of activity already is occurring, utilizing a combination of incentives and assistance programs, but achieving the full level of potential benefits will require a substantial increase in activity in order to jump launch such an ambitious program on a statewide level. It is proposed that, once begun, the work and the economic benefits will be spread over this decade, consistent with the PUC's goal. During that time, most of the jobs created by retrofitting activity can be expected to be converted into jobs in new construction or other sectors of a rising economy.

Currently, while numerous incentives exist for retrofitting of existing structures, those incentives are scattered, inconsistent and often insufficient. There also is a lack of sufficient information reaching property owners about the availability of those programs.

The State of California is beginning to address these concerns through a new statewide program – Energy Upgrade California – a collaboration of several state agencies, utility companies, local governments and private sector contractors. This program aims to provide or facilitate financing for a broad range of residential and commercial energy and water retrofit programs, including ones already in place through utility companies and local governments. It also would provide the public with a comprehensive information source for such opportunities, assist lenders with information and access to subsidies, standardize qualifications for contractors performing retrofitting work, and establish training programs for workers in this growing industry.

These efforts could be jump-started by commencing a program to retrofit all older government buildings, many of which predate modern energy and water efficiency standards. That would reduce state and local operating costs, while also serving as a model for similar action in the private sector.

Successful implementation of both Energy Upgrade California and other, existing programs will require at least the following elements:

- Certain utility companies, e.g., San Diego Gas & Electric, offer financing for energy-efficiency improvements to commercial buildings, to be repaid over five years, interest-free,

³⁴ California Long-Term Energy Efficiency Strategic Plan, *supra*, p.11.

through the owners' utility bills. Such programs should be offered by all utilities, and expanded to cover residential installations as well.

- Similar financing programs should be implemented by local water agencies, to provide financing for water-efficiency improvements.
- The State Legislature has authorized the Property Assessed Clean Energy (PACE) program, which provides low-interest loans for installation of sustainable energy systems, to be repaid through property assessments. Numerous jurisdictions throughout the state have initiated such programs, for both residential and commercial structures. However, the leading secondary mortgage market institutions (FNMA and FHLMC) currently are resisting purchasing mortgages on properties utilizing this program, and it is critical that this policy be reversed. Once that occurs, even more jurisdictions need to be encouraged to participate in the program. In the meantime, newly introduced legislation (AB 14, Skinner) proposes to make funds originally set aside for PACE available for a new Clean Energy Reserve Program, a loan program for energy and water efficiency retrofitting, to be operated through private lending institutions.
- State law provides for the value of certain kinds of solar energy systems to be excluded from property tax liability. This exclusion should be broadened to apply to all types of energy efficiency improvements, up to some basic level. While that will reduce potential property tax revenues, it will be a major stimulus to installing such improvements.
- The Public Utilities Commission requires regulated utilities to offer rebates for certain kinds and sizes of solar energy installations. The PUC should consider expanding this program to apply to simpler energy efficiency improvements, as well. A limited number of utilities, e.g., San Diego Gas & Electric, already offer rebates for such improvements, but the amounts of the rebates need to be increased in order to act as more effective incentives.
- A few local government jurisdictions, e.g., San Diego County and San Bernardino County, are offering regulatory incentives for energy efficiency upgrades. These include reduction or waiver of permit fees and expedited plan checking. These are simple, attractive incentives, and should be utilized by far more jurisdictions.
- The public consistently expresses support for resource conservation programs and for adapting to sustainable energy systems. State and local governments, along with electrical utilities, water agencies and others should expand their education efforts to raise public awareness of the availability of these programs and the benefits which they provide.

The range and scale of incentives should be increased and made fairly uniform throughout the state, in order to achieve the maximum effects of both public education and the availability of the proposed programs. In a few instances, certain kinds of programs and incentives will be more appropriate in some parts of the state than in others, e.g., an emphasis on more efficient air conditioning in hotter areas and on reducing landscape irrigation in coastal areas. Because the proposed programs consist of incentives rather than mandates, and are largely property-owned funded, there should not be opposition from taxpayer, ratepayer and consumer advocates. Rather, those groups, along with environmental interests, should be supportive of the goals and programs described here.

An additional opportunity exists to generate funding for retrofitting activity through mitigation requirements attached to other environmental programs. For example, new development projects required to comply with the California Environmental Quality Act must reduce or mitigate their greenhouse gas emissions. When it is not economically feasible to do within the project, mitigation may be performed off-site, such as by retrofitting existing structures to make up for the impacts of the new structures. Similar requirements may be imposed regarding reduction of water consumption, where long-term water supplies are uncertain. Mitigation banks could be established, on a local or regional level, enabling developers, utilities and public agencies which are responsible for such mitigation to contribute funds to be applied to large-scale retrofitting programs.

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We have an immediate choice to make about taking the first steps in the proposed direction. Significantly increasing our commitment toward large-scale retrofitting of our built environment will provide a wealth of environmental and economic benefits. Otherwise, years from now, as we continue to despair about our situation, we still may be asking ourselves why we failed to take such simple, feasible actions to save both the environment and the economy of California.

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Cary Lowe is a land use lawyer, with 35 years of experience representing land developers, builders, public agencies, Indian tribes and non-profit organizations, in connection with a broad range of land use and environmental issues. Mr. Lowe holds a Ph.D. in urban planning, has been admitted to the American Institute of Certified Planners, and is accredited by the Congress for New Urbanism. He has taught courses in law and urban planning at the University of Southern California and UCLA, and he writes and lectures regularly on land use issues, including environmental and water issues. In addition to his legal and consulting practice, he is a credentialed mediator affiliated with the National Conflict Resolution Center. Mr. Lowe has served in several appointed government positions at the state and local levels. Currently a sole practitioner, Mr. Lowe previously was a shareholder in a national law firm, and has served as in-house counsel for two real estate development companies.

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