



National Energy Center for Sustainable Communities

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The National Energy Center for Sustainable Communities (“NECSC”) appreciates the opportunity to comment on “Energy and Land Use Issues and Opportunities” in connection with the Commission’s 2009 IEPR proceedings. In the NECSC’s view, the Commission’s efforts to integrate land-use, energy and climate change policies across agency domains are vital in addressing the multiple challenges of climate change, sustainable economic growth, and energy security. Equally important are the steps that the CEC is taking to provide assistance to local governments to become more energy and resource efficient through better land-use planning. Moreover, the NECSC strongly agrees with the Commission that, by tying local and regional land-use planning and strategic growth management to energy and climate change goals, the State can significantly increase the efficiency, dependability and sustainability of energy use in California and create more cost-effective opportunities for achieving greenhouse gas emission (“GHG”) reductions under AB 32.

Set forth below are the NECSC’s comments on these matters. These comments are further elaborated upon in the accompanying paper entitled, “Sustainable Community Energy Planning in California: New Challenges & Roles for Government Agencies, Utilities & the Development Industry,” that focuses on the importance of “sustainable energy planning”¹ and “energy and resource efficient community development”² to achieving California’s climate and energy goals. Overall, the NECSC supports the recommendations that the Land Use Subgroup of the Climate Action Team made to CARB in connection with the development of its Scoping Plan. In particular, the Center believes that the GHG and energy impacts of land use decisions need to be addressed in a manner that: (1) Supports and furthers the State’s land-use, economic development, transportation, housing, resources and other planning goals; (2) Aligns federal, state, regional and local growth management planning processes, methods and tools; and (3) Preserves the authority of local governments to make land use and local infrastructure decisions, as well as promotes partnerships with major stakeholders. In addition, the Center agrees that integrated planning should build upon and strengthen existing planning models for regional development and extend the “Regional Blueprint Planning Program.” However, as outlined in

¹ Sustainable energy planning integrates energy and environmental planning into land-use, transportation, resources and economic development planning to support community sustainability. Through these linkages, sustainable energy planning seeks to promote the efficient production, delivery and use of energy resources in the development of economically, socially and environmentally healthy communities. See accompanying paper for a more detailed definition.

² Energy and resource efficient community development, hereinafter “EECD,” refers to the development of residential, commercial, institutional and mixed-use complexes and supporting infrastructure that combine renewable and advanced end-use technologies with performance-enhancing urban design and development practices to substantially reduce energy consumption and GHG emissions, while also furthering water, air and other resource objectives.



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the attached paper, the NECSC also maintains that “sustainable energy planning” and “energy and resource efficient community development” (“EECD”) need to be explicitly folded into the envisioned integrated land use planning and strategic growth management processes to complement and enhance smart growth development. Finally, the NECSC offers suggestions relating to coordinating mechanisms, a central repository for information, and technical and financial assistance that the State could provide to help enable local governments to undertake more climate-friendly and resource efficient land-use planning, design and development.

The NECSC is a nonprofit organization that is dedicated to advancing the development of economically and environmentally healthy communities that are energy and resource efficient. The Center undertakes this mission through collaborative initiatives among government agencies, businesses, and civil society to integrate clean energy systems and energy-smart planning and design into development and re-development projects. These initiatives are intended to: (1) Accelerate the use of energy efficiency, demand response, renewable resources and distributed energy systems through research, training, demonstration and capacity-building; and (2) Result in development patterns and practices that reduce energy consumption, greenhouse gas emissions, storm water runoff, urban heat island effect, as well as further other resource planning goals. Recently, the NECSC completed modeling of two greenfield sites in Chula Vista, California that demonstrated the potential efficiencies and GHG emissions reductions that could be captured by combining onsite renewable generation and other distributed energy resource applications with smart growth design at the community/site development level.

The NECSC strongly believes that integrating energy, transportation, land-use, economic development and resources planning to build more energy and resource efficient communities within California and to reduce GHG emissions is crucial to achieving cost-effectively California’s climate and energy goals. In this regard, the Center offers the following policy recommendations on ways in which the State can foster the necessary coordination between its relevant agencies and local and regional government authorities. The NECSC also offers suggestions on ways that State agencies can provide the needed financial and technical assistance to assure that local and regional government agencies and the California planning community have the requisite tools, resources and capabilities to implement new climate-friendly and energy and resource efficiency policies that the State issues:

- **Integrated, state-wide land-use policies, designed to achieve California energy and GHG policy goals, need to explicitly address sustainable energy planning and energy and resource efficient community development (“EECD”).**

The NECSC endorses the LUSCAT’s recommendations and principles for incorporating GHG emission reduction strategies into statewide long-term land-use planning and strategic growth management processes in a manner that also will produce co-benefits relating to the State’s land-use, economic development, transportation, housing, energy infrastructure and other resource planning goals. Land-use decisions can have large and long-term consequences on energy consumption and GHG emissions levels. As a result, the direct and embedded energy consumption and emissions impacts of land use decisions and urban design need to be addressed in order to maximize GHG reductions and identify cost-effective opportunities for EECD.

The LUSCAT primarily focused upon reducing GHG emissions from the transportation sector through smart growth and the development of transportation demand management and alternative



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mobility options. However, the LUSCAT developed a comprehensive set of principles for taking energy and GHG emissions into account in land-use development and strategic growth management. The NECSC, therefore, recommends that “sustainable energy planning” and “energy and resource efficient community development (“EECD”) be built into that framework and linked to all land-use development and growth management planning processes. To achieve California’s climate and energy goals cost-effectively, this linkage is necessary because sustainable energy planning and EECD affect all sectors that use energy and seek to shape fundamentally urban growth and development.

Sustainable energy planning and EECD need to be included as a vital component of integrated, state-wide land-use planning strategies to assure that the full range of energy considerations is taken into account, in addition to efficiencies resulting from smart growth development. Combining energy-smart development with smart growth design techniques will assure the incorporation of more strategically aligned energy and environmental goals and performance objectives in urban planning and economic development.

Integrating energy-smart planning and EECD into land-use, growth management, transportation, economic development and resources planning will enable local governments to plan, build and optimize, in an orderly and capital efficient manner, energy infrastructure that can deliver high quality, cost-competitive and reliable, and environmentally responsible energy services for all users.

Sustainable energy planning and EECD strategies will heighten the capability of local governments to: (1) Understand the environmental, economic and equity impacts of embedded energy costs and operational energy needs of urban infrastructure and urbanization; (2) Identify the local environmental, economic and equity benefits of such planning and development efforts, especially with respect to the private sector; (3) Develop information and materials that lead to a better understanding of planning options and the costs and benefits of alternative technologies, practices and development scenarios; and (4) Develop effective decision support tools and methods and performance metrics for community energy systems development.

With such increased capabilities, local governments will be able to take an energy and environmental “systems” approach to: (1) Reducing energy consumption and GHG emissions in and incorporating renewable energy into public facilities and operations; (2) Promoting efficient energy use and alternative resources in the private sector through judicious use of incentives, regulations, standards and demonstrations; (3) Shaping local land use and development patterns and urban design to reduce per capita energy use and improve environmental quality.

Because of these potential benefits, the Strategic Growth Council (“SGC”) needs to promote sustainable energy planning and EECD in its efforts to coordinate and support sustainable infrastructure and development planning. In addition, the Office of Planning and Research (“OPR”) needs to stress in its guidelines the benefits of such planning and development in holistically addressing cross-sectoral GHG impacts of land use development. These agencies also should promote the inclusion of sustainable energy planning and development as a necessary component in General Plans and elaborate upon the energy content needed in CEQA evaluations, Regional Housing Needs Plans, Urban Management Plans, Regional Transportation Plans and the like. Such leadership will, in turn, help to catalyze, discipline and broaden private investment in sustainable energy development.



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Energy-smart development can leverage and amplify the effects of smart growth strategies, resulting in: Expanded transportation choices; conservation of green spaces and natural systems; Improved air quality; increased efficiency of water and wastewater management; development of urban systems solutions that combine a mix of local renewable energy sources with energy efficiency, smart grid integration, energy storage, combined cooling, heating and power, district energy or demand response capabilities to improve overall performance, while lowering costs and environmental impacts; and energy-efficient community and housing designs that advance transit-oriented development, encourage infill and mixed-use development, and reduce energy and integrate renewable energy into commercial, institutional and residential buildings.

Inclusion of sustainable energy planning and EECD also would provide the bridge necessary to connect community and regional infrastructure development with efficient electric utility resource planning.

- **In developing integrated, state-wide energy-efficient and GHG-reducing land-use policies, the Strategic Growth Council should seek to align federal, state, regional and local growth management planning processes, methods and tools, based on a shared vision with regional and local authorities.**

The State Government should provide overall direction and guidance to local and regional government agencies by adopting energy-efficient and GHG-reducing land-use policies; but, should undertake such actions in a collaborative manner that preserves the authority of local governments to make the land-use and local infrastructure decisions and promotes partnerships with major stakeholders.

The NECSC agrees with the LUSCAT that policies and programs that the State adopts should reflect the responsibility that all governments share for improving land-use decision-making and a commitment to collaborate at all levels.

The SGC and State agencies should design policies and programs that provide legal and technical assistance to guide decision-making and build capacity at all levels of government, while allowing for local implementation flexibility.

To further California's climate and energy goals, alignment is necessary with respect to federal, state, regional and local growth management and long-term land-use planning. If planning is coordinated in this way, then energy costs, emissions and alternative scenario information can become a meaningful part of regional and local economic, energy and environmental policy.

California State agencies should incorporate GHG emissions reductions and energy and resource efficient development as a fundamental element of planning, designing, siting, developing and operating state-owned or leased facilities. Similarly, State agencies need to incorporate these considerations into state-assisted infrastructure, land-use planning and development to assure that these matters are taken into account in appropriate fiscal, technical and regulatory land-use programs, guidelines, standards and criteria.

Through the SGC, State agencies should coordinate and rationalize financial assistance for and develop financing mechanisms to support energy and resource efficient planning, design and development. As LUSCAT pointed out, coordinated statewide policies need to address public



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financial and fiscal barriers to GHG-related and energy-efficient local and regional planning, embrace life cycle costs and life cycle assessment in planning evaluations and explore links with federal transportation and other funding.

A State liaison entity should be designated and an agency cross-cutting advisory body established to provide a means for representatives of local and regional authorities, relevant local institutions and advocacy organizations and businesses to provide input to the SGC and State agencies with respect to improving land-use decision-making; identifying barriers to energy and resource efficient land-use development; prioritizing key policies and strategies; and crafting proposals to the Governor and Legislature. The NECSC suggests that the OPR be continued and its responsibilities expanded to serve as the liaison to local and regional government agencies and to assist the SGC in coordinating the delivery of various and interrelated planning services and financial assistance to municipalities and regional authorities. The NECSC also recommends that the CEC and CPUC be represented on the Strategic Growth Council.

In particular, the State needs to standardize methodologies for measuring and estimating future GHG emissions within municipalities and regional areas, as well as to undertake the development of standardized metrics and methodologies for assessing and certifying public benefits generated by energy and resource efficient development.

The Strategic Growth Council and State agencies should engage local and regional authorities and the private sector in setting up a centralized information database of case studies and best practices with respect to EECD, as well as information on land-use planning and development incentives.

- **Integrated state-wide land-use policies should build upon and strengthen existing frameworks for regional development and extend the Regional Blueprint Planning Program.**

The NECSC agrees with the LUSCAT that the State should invest in the “Regional Blueprint Planning Program” to serve as the analytical regional and local government backbone for the State’s efforts to affect sustainable energy use and GHG emissions reductions across multiple sectors. General Plans, Regional Comprehensive Plans, Regional Climate Plans and other energy-related planning can be developed in concert with long-term growth planning by using the available Blueprint database and planning outcomes as the baseline and future growth quantification. The Blueprint Planning Program provides a means for coordinating multiple planning activities for more efficient and effective results.

The SGC and State agencies should draw upon the expertise of Councils of Governments such as the San Diego Association of Governments to develop model plans and replicable strategies that can be transferred to other regional and local bodies.

Blueprint Planning processes need to be extended to go beyond a focus upon transportation and housing. Also, current limitations that restrict funding based on Blueprint Plans to transportation-related activities need to be lifted.

The Regional Blueprint Planning Program should be linked to the State liaison entity and advisory body, all of which should assist the SGC in guiding and building upon the SB 375 Strategic Communities Strategies and Alternative Communities Strategies in advancing more



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comprehensive energy and resource efficient development and in coordinating the delivery of technical and financial assistance and other services to local and regional authorities.

- **Integrated state-wide land-use policies need to foster critical partnerships, especially between municipalities and utilities and developers and to better align sustainable community energy planning and land-use development with utility integrated resources planning.**

In developing state-wide land-use policies and advancing EECD, the SGC and State agencies need to re-examine the traditional roles that public and private stakeholders have played in the past and engage new market players such as utilities, developers, universities and financiers.

The CEC and CPUC should continue to promote partnerships between regional and local authorities and electric utilities and energy service providers to increase their respective understanding of the planning contexts for municipalities and electricity planners, improve decision support tools, and link the use of such tools to both utility and community needs.

Sustainable community energy planning, land-use development and growth management need to be better aligned with electric utility resource planning processes that are undertaken under the auspices of the CPUC and guided by the CEC's Integrated Energy Policy Reports.

Partnerships between electric utilities, regional and local authorities and energy service providers could develop effective tools and methods for incorporating energy supply and demand and infrastructure analyses into existing regional housing, land-use, water supply and wastewater, transportation and other planning processes. These tools and methods are needed to integrate energy analyses of emerging alternative sustainability and resource planning efforts into existing regional growth and land-use planning frameworks and processes.

Utilities and regional agencies also could partner on designing and funding regional community energy smart grants to support energy and resource efficient planning, design and development.

- **State initiatives should actively engage local governments in the development of model ordinances, standards and regulations, protocols for measuring GHG emissions and accounting for reductions and energy savings, modeling and decision support tools and methods, and carbon benchmarking and design standards for site development and redevelopment.**

State agencies should partner with the U.S. Department of Energy, the U.S. Environmental Protection Agency and other federal agencies to showcase climate and sustainable energy communities and leverage economic stimulus funding to maximize results.

State agencies such as the CEC, need to assist municipalities in establishing practical frameworks in which public and private stakeholders can collaborate to optimize a community's future energy infrastructure and built environment, according to energy and resource efficient planning and design principles. Such efforts should be directed at clarifying barriers to EECD and building public-private partnerships to address such impediments through more integrated technical, market and policy solutions.



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The Strategic Growth Council and State agencies should assist local governments in developing more effective funding and organizational structures for undertaking EECD, as well as minimizing and removing public financial and fiscal barriers impeding such planning and development.

- **Integrated state-wide land-use policies should place a premium upon research, demonstration, training and capacity-building.**

Integrated state-wide land-use policies should stress the importance of research and pilot demonstrations in addressing technical gaps and broadening the knowledge base. State initiatives should assist local and regional authorities in conducting needed pilot demonstrations that can increase their capabilities to undertake iterative and holistic sustainable energy planning and EECD strategies.

Pilot demonstrations can educate local and regional government agencies about integrated energy solutions and asset development management strategies. Demonstrations also can show tangibly the costs and benefits of alternative scenario planning, as well as different options for deploying technology systems and performance-enhancing community design techniques.

State agencies need to provide assistance to local authorities for training and workforce development.

Concluding Remarks:

The NECSC believes that, through coordinated state policy development and state financial and technical assistance to local governments, the potential benefits of integrating energy and GHG emissions considerations into land-use planning and strategic growth management processes can be realized. In the Center's view, including sustainable energy planning and EECD into land-use planning, design and development and strategic growth management is essential to furthering California's efforts to transform the market to bring about "zero net energy" results, while also advancing other resource planning objectives.

The NECSC hopes that its comments will be helpful to the Commission in setting policy direction in the 2009 IEPR. The Center also wishes to commend the CEC on organizing and conducting a very informative workshop on "Energy and Local Assistance."

Thank you for the opportunity to comment.

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Sustainable Community Energy Planning in California: New Challenges & Roles for Government Agencies, Utilities & the Development Industry



Prepared by the National Energy Center
for Sustainable Communities



Sponsored by the City of Chula Vista, California
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Introduction

A Climate for Change

After decades of debate, a consensus now exists among the majority of scientific organizations and most national governments that global warming is occurring and that human consumption of energy resources is to blame.

Moving beyond the debate and into action, the State of California has enacted the most comprehensive set of state policies—and soon regulations—to curb energy-related greenhouse gas emissions. The *California Energy Action Plan, the Integrated Energy Policy Report of 2007, the Global Warming Solutions Act of 2006, Executive Order S-3-05* and *California's Strategic Plan for Energy Efficiency* all contain goals and strategies to reduce emissions from the key industrial and transportation sectors and from individual buildings. However, if the ambitious goals contained in these documents are to be realized, State, regional, and local government agencies must partner with utilities and the private development industry to optimize energy-efficiency at the community scale.

This document, intended for government agency development professionals and utility program managers, summarizes the State's climate and clean development challenge and suggests that community-scale energy efficiency may be the most effective means of addressing it. Additionally, the document presents the development industry's perceived barriers to this form of development and a set of solutions that they believe would accelerate its adoption. This is followed by a description of a new set of roles that State, regional and local government agencies and utilities can play to aid in this effort, and a set of complimentary recommendations they might consider in the process. The document concludes with select examples of current government and utility incentives for green development, several profiles of successful energy-efficient development projects in California and a list of publications, papers and links to organizations that will aid agencies and utilities as they develop new initiatives to reduce greenhouse gas (GHG) emissions through energy-efficient community development.¹

¹ *Energy-efficient Community Development* (EECD) refers to the development of residential, commercial, institutional and mixed-use complexes and supporting infrastructure that combine renewable and advanced end-use and smart grid enabling



1. California's Climate & Clean Development Challenge

Recently, California authorities in Sacramento have issued an array of legislation, regulations and directives for reducing greenhouse gas emissions and increasing energy savings and reliability. Most notably, the landmark California Global Warming Solutions Act of 2006 ("AB 32") establishes a first-in-the-world comprehensive program of regulatory and market mechanisms to reduce California's GHG emissions to 1990 levels by 2020 (a 25% reduction).² Mandatory caps will begin in 2012 for significant stationary and mobile sources and ratchet down to meet the 2020 goals. In addition to the passage of AB 32, Governor Schwarzenegger issued a 2005 Executive Order that set an even more ambitious climate change response program to reduce GHG emissions by 80% by 2050 (which will require a 90% GHG reduction per capita).³

These challenging climate targets have galvanized both new thinking as well as the recognition that existing agency-based program "silos," focused upon technology, sector or facility/building-specific solutions, will not be adequate to meet these goals. Moreover, the State's objectives have prompted considerable re-examination of the traditional roles of private business, non-profit organizations, academia,

technologies with performance-enhancing urban design and development practices to substantially reduce energy consumption and GHG emissions, while also furthering water, air and other resource objectives.

² California Assembly Bill No. 32, "Global Warming Solutions Act of 2006," (Nunez, Chapter 488, Statutes of 2006).

³ Governor's Executive Order S-3-05 (June, 2005) ("Governor's 2005 Executive Order").

and state, regional and local governments. These policy priorities and regulatory targets clearly place a premium upon interdisciplinary, systemic approaches to inform the development of mutually reinforcing strategies that can achieve multiple objectives; a new interactive dynamic between state, regional and local government authorities; and creative public-private partnerships.

2. Revisioning & Rethinking Policies & Programs

California has long distinguished itself as a leader in addressing climate change, clean energy and sustainable development through launching a range of significant initiatives targeting stationary and mobile sources. For example, in addition to AB 32 and the Governor's 2005 Executive Order, the State has issued a Renewable Portfolio Standard ("RPS"), California Solar Initiative, Low Carbon Fuel Standard, Bio-energy Action Plan, Long-Term Energy Efficiency Strategic Plan, and a Self-Generation Incentive Program.⁴ Yet, the comprehensive and far-reaching nature of California's recent climate challenge and goals is fundamentally reshaping the State's regulatory and

policy landscape. The new mandates not only establish minimum initial greenhouse gas emissions reduction (GHG) requirements, but also set the stage for sequential tightening of requirements overtime, pointing towards carbon neutrality and "zero net energy."⁵ Without question, the measures are necessitating parallel and coordinated environmental and energy solutions at all governmental levels. But more fundamentally, these climate goals are driving both a "re-visioning" of the potential for energy efficiency and renewable energy across the range of California's environmental and energy policies and programs and a "re-thinking" about programmatic design and delivery.

This "revisioning" tracks California's "Loading Order" which gives priority within its hierarchy first to energy efficiency and demand response and then to renewable energy and distributed generation in meeting the State's energy needs.⁶ In particular, energy efficiency will play a central role in reconciling current climate and energy security challenges that pose significant economic and social risks. As the least-cost, most reliable and most environmentally-sensitive resource, energy efficiency can cost-effectively minimize contributions to climate change, enhance electricity system reliability, defer

⁴California Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002) established a RPS program whose target has since been accelerated; Senate Bill 107 (Simitian, Chapter 464, Statutes of 2006) obligates investor-owned utilities to increase the share of renewable energy to 20 percent of electricity sales by 2010; and Assembly Bill 1585 (Blakeslee, Chapter 579, Statutes of 2005) established a 33 percent by 2020; California Senate Bill 1 (Murray, Chapter 12, Statutes of 2006) launched the "California Solar Initiative" which has a target of 3,000 MW of new solar generating systems by 2017; California Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) directs the CEC and CARB to develop and adopt a plan to increase the use of alternative fuels in the transportation sector; Governor's Executive Order S-1-07 (2007) called for CARB to design a Low Carbon Fuel Standard to increase the use of transportation fuels that emit lower quantities of greenhouse gases on a life-cycle basis; Governor's Executive Order S-06-06 (April, 2006) calls for California to produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050, sets a RPS biomass target, and also establishes a Bioenergy Action Plan to develop an integrated and comprehensive state policy on biomass; California Public Utilities Commission, "California Long Term Energy Efficiency Strategic Plan (September, 2008) ("CPUC 2008 EE Strategic Plan"); California Assembly Bill 970 (Ducheny, Chapter 329, Statutes of 2000) directed the CPUC to adopt initiatives to reduce electricity demand, including incentives for distributed generation; CPUC D.01-03-073 created the Self-Generation Incentive Program to promote DG technologies under 5 megawatts (MW).

⁵Zero net energy refers to a building or development with a net energy consumption of zero over a typical year. To cope with fluctuations in demand, zero energy buildings or developments are typically envisioned as connected to the grid, exporting electricity to the grid when there is a surplus, and drawing electricity when not enough electricity is being produced. The amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building or development. A ZNE building or development may also consider embodied energy – the quantity of energy required to manufacture and supply to the point of use the materials utilized for its building. The CPUC has defined "Zero Net Energy" at the level of a single "project" seeking development entitlements and building code permits in order to enable a wider range of technologies to be considered and deployed, including district heating and cooling systems, small scale renewable energy projects, clean distributed generation, etc., that serve more than one home or business. California Public Utilities Commission, "California Long Term Energy Efficiency Strategic Plan," (2008) at 13.

⁶ California Energy Commission, California Public Utilities Commission and Consumer Power and Conservation Financing Authority, "Energy Action Plan I," (2003) and "Energy Action Plan II" at 2; Public Utilities Code 454.5(b)(9)(C) states that utilities are required to first meet their "unmet resource needs through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible."

energy supply investment, increase utilization of existing energy delivery capacity and increase business productivity and competitiveness.⁷ This emissions free and low-cost energy resource alternative also can tangibly reduce the pressure on energy demand arising from increasing population growth within California. To meet this accelerating energy demand in an environmentally sound manner, California is scaling up its efforts to increase significantly the efficiency with which energy is generated, delivered and used in the State. Towards this end, the State has begun to promote the development of technically integrated and cost-optimum strategies that combine energy efficiency with demand reduction, energy storage, smart grid enabling technologies, and renewable and clean distributed generation in a community energy system context.

California is a national leader in the development of renewable resources. In addition, the State's energy policies are shifting how the State will meet energy demand in the future, so that consumers and businesses can benefit from greater choice and lower costs. This has led to new strategies for increasing renewable energy market penetration. As a means for enhancing the uptake of renewable energy, California has made the development of clean distributed generation and distributed energy resources an explicit policy goal in its Integrated Energy Policy Reports.⁸ While this push is intended to increase the effectiveness and economic viability of renewable energy deployment, it would also yield numerous co-benefits that include: reliability considerations, peak demand reduction, transmission congestion relief, reduction of transmission losses, higher fuel-to-energy conversion efficiencies resulting from partnering renewable energy technology with combined heat and power systems.⁹

⁷ California Energy Commission and California Public Utilities Commission, "Energy Action Plan II," (2005) declared that, "Cost-effective energy efficiency is the resource of first choice for meeting California's energy needs. Energy efficiency is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change."

⁸ California Energy Commission, "2007 Integrated Energy Policy Report," Document No. CEC-100-2007-008-CMF (2007) at 201 ("2007 IEPR").

⁹ Id.

3. New State Focus Areas

In seeking to advance California's new climate agenda through enhanced energy efficiency and renewable energy efforts, policy makers at the State's governmental agencies have been increasingly focusing on three areas:

- (1) A pro-active role to be taken by local and regional governmental authorities;
- (2) Community-scale energy efficiency and renewable energy; and
- (3) Land-use planning, design and development.

The unparalleled stringency of the new climate targets and timeframes is driving a fundamental re-thinking about energy and environmental program design and delivery. Policy makers are re-focusing their programmatic approaches to incorporate these three cross-cutting elements in a manner that can contribute to advancing the following policy strategies: (1) Developing all feasible, cost-effective, and reliable energy efficiency, demand reduction and renewable energy resources locally and regionally in a way that works in harmony with larger power and fuel systems, while reducing fossil fuel use and climate change impacts; (2) Increasing the efficiency of electricity and natural gas use and on-site renewable distribution systems; (3) Aligning and coordinating regulations, incentive programs and financing mechanisms in order to support the increased adoption of such energy efficiency, demand response and onsite generation opportunities; and (4) Integrating and optimizing these strategies with the achievement of air quality, water conservation, waste reduction and reuse, and transport and mobility objectives.¹⁰

The following discusses more specifically how California authorities are addressing these three new focus areas to "re-vision" energy efficiency and renewable energy resource development and "re-think" program design and delivery. The examples also indicate how policy makers are beginning to embrace the need for sustainable urban energy systems planning as essential to their efforts to

¹⁰ See, for example, CPUC 2008 Energy Efficiency Strategic Plan.

transform the market towards technologies and practices that can bring about “zero net energy” results.

Pro-active Role for Local and Regional Governments:

Applying the principle of subsidiarity is fast becoming integral to California’s efforts to achieve its aggressive climate and energy goals. In the interest of accelerating market transformation, the State already is devolving increasing responsibility to those in the best position to act. In this regard, local and regional authorities are in a unique position to design and implement innovative, long-term, cross-cutting programs promoting energy efficiency, sustainability and reduced carbon emissions. Vested with a broad array of energy-related authorities and responsible for providing a diversity of municipal services, local governments can directly influence energy demand and use through their planning and development policies and activities, not just in terms of addressing individual sources, sectors or technologies, but in terms of addressing the welfare and progress of the community in its entirety.

California is, therefore, seeking to fully engage its local governments in using energy efficiency and renewable energy to reduce demand and greenhouse gas emissions both in their own facilities and throughout their communities.¹¹ In particular, the State is looking to municipalities and cities to tap their broad authority over planning and development to maximize energy savings and emissions reductions both in public facilities and infrastructure and in privately owned new construction and existing buildings. Local governments are being encouraged to “lead by example” and to showcase, with their own facilities and operations, cost-effective strategies for improving energy efficiency and reducing CO₂ emissions, as well as to display promising energy efficiency, demand side management and renewable technologies and practices. Moreover, the State will be engaging the ability of municipalities to interact, through public-private partnerships, with businesses and residents to work towards integrated sustainable communities that support California’s challenging

climate and energy goals and help make “zero net energy” a reality.¹²

This agenda is especially evident in the CPUC’s “Energy Efficiency Strategic Plan.” This long-term plan provides a roadmap for achieving maximum energy savings in California between 2009 and 2020 and beyond. It is intended to advance the CPUC’s “Big Bold Energy Efficiency Strategies” to reach zero net energy in residential construction by 2020 and in commercial construction by 2030.¹³ Within this framework, local governments are expected to play a pivotal role in leading their communities with innovative programs for energy efficiency, sustainability and climate change. In particular, the CPUC is calling upon municipalities to help transform the marketplace by adopting and implementing, whether on a mandatory or voluntary basis, “reach” codes and standards which exceed the minimum requirements established in Title 24.¹⁴ In this regard, local governments are encouraged to expand the purview of current codes and standards to include development projects in addition to buildings and products. Local governments can use their long-term development authority to identify opportunities for more energy and environmentally integrated development and infrastructure and to incorporate best practices into their land use planning and General Plans.¹⁵

¹² Id.

¹³ CPUC 2008 EE Strategic Plan at 6. The “Big Bold Energy Efficiency Strategies” were established by the CPUC in D.07-10-032 and D.07-12-051. These strategies also include transforming Heating, Ventilation and Air Conditioning to ensure that its energy performance is optimal for California’s climate; and providing all eligible low-income customers the opportunity to participate in the low income energy efficiency program by 2020.

¹⁴ Title 24, Cal. Code Regs. Part 6. Title 24 establishes minimum building energy efficiency standards. The Plan envisions that Title 24 will be progressively updated, tightened and extended on a triennial basis based on two tiers of voluntary, beyond-code standards derived from standards developed by local governments or the private sector. Ultimately, the Plan seeks to expand Titles 20 (appliances) and 24 to address all significant energy end uses.

¹⁵ The CPUC 2008 EE Strategic Plan “seeks to move utilities, the CPUC and other stakeholders beyond a focus on short-term energy efficiency activities into a more sustained long-term, market transformation strategic focus” at 4. The Plan requires “coordination of local government building codes and development policies to facilitate common approaches to the adoption and rapid evolution of highly energy efficient technologies and techniques in new construction” at 15. In the case of commercial development, the Plan promotes integrated

¹¹ CPUC 2008 EE Strategic Plan, Section 12, “Local Governments,” at 90-98.

Community-Scale Energy Efficiency and Renewable Energy:

Recent policy pronouncements, such as the California Energy Commission's (CEC) 2007 "Integrated Energy Policy Report," the California Public Utility Commission's (CPUC) 2008 Energy Efficiency Plan and the California Air Resources Board's (CARB) Scoping Plan, recognize the importance of community-scale energy resource development to the achievement of California's climate and energy goals.¹⁶ For this reason, they are promoting the near term integration of energy efficiency and renewable energy products and services in the energy infrastructure of California communities. This new focus on community-scale efforts, in addition to ongoing utility and building scale activities, is supported by a number of trends.¹⁷ Renewable energy and advanced end-use technologies are now mature and cost-competitive due to available incentives, with a growing global market. Energy prices have spiked periodically. There is a developing market for the environmental attributes of clean energy and renewable energy and energy efficient technologies and they can be economically configured, demonstrated and deployed in sizes that fit the demand profile of communities. Community-scale economics opens up opportunities for innovative technical integration solutions.

As a result of these trends, localities and regional areas are seeking to find ways to capitalize on the proliferation of new energy supply and end use technology options in order to stabilize their energy costs, increase electricity reliability, create local jobs, reduce environmental impacts, and tap locally

design solutions that "go beyond individual buildings and consider community-level energy and carbon impacts" at 33. In particular, the Plan aims for the development of standards that better integrate onsite clean distributed generation.

¹⁶2007 IEPR at 207, 212; CPUC 2008 EE Strategic Plan at 33, 36, 96; California Air Resources Board, "Climate Change Proposed Scoping Plan: A Framework for Change" (2008) ("CARB Proposed Scoping Plan") at 43; CEC, "2008 Integrate Energy Policy Report Update," Doc. No. CEC-100-2008-008-CTD (September, 2008) at 2, 12, 22-27. ("2008 IEPR Update")

¹⁷ CEC Public Interest Energy Research Program (PIER) Solicitation PON-08-004, "Renewable-Based Energy Secure Communities," Research, Development and Demonstration, PIER Renewables Program, (December 8, 2008), Attachment A, RESCO Technical Integration at A-1. ("RESCO Solicitation")

available renewable energy sources. However, historically, U.S. communities have not, as a general matter, planned and managed their own energy supply.

Recently, the California Energy Commission's Public Interest Energy Research ("PIER") program issued a solicitation to help communities develop, pilot and implement transitioning plans for building their economies on the foundation of stable energy costs and environmental stewardship.¹⁸ These plans would focus upon developing and demonstrating new methods, tools, practices, programs and enabling technologies needed for accelerating cost-beneficial deployment of renewable energy (RE) and energy efficiency (EE) options in a community energy system context. The PIER program seeks to assist communities that wish to become "Renewable-Based Energy Secure Communities" (RESCOs). Specifically, the PIER program will help communities to identify and achieve the best economic solutions by developing a mix of renewable energy resources and combining technologies in an integrated and cost-optimum way, based on complementary attributes.¹⁹

The RESCO RD&D strategy embodied in the solicitation is intended to promote orderly and capital efficient development of community-based renewable resources, using PIER funding to anticipate and address the technical issues that arise when energy imports are sought to be reduced at the community level.²⁰ The solicitation emphasized that these technical challenges do not relate primarily to the cost

¹⁸ RESCO Solicitation, Attachment A at A-1.

¹⁹ RESCOs are communities that secure their energy supply (electricity and fuel) through primary (up to 100%) reliance on indigenous renewable energy resources and are, therefore, less vulnerable to interruptions and emergencies affecting the supply of imported energy. Integration solutions promoted by the solicitation include the following: Integrated RE resources mix; Integration of RE electricity with efficiency measures and demand response; Integration of RE resources and energy storage; Integrated inter-sectoral applications (e.g., transportation and electricity); Integration of biopower resources and combined cooling, heating and power (CCHP); Integration of local RE resources and imported RE energy; Integration of RE heating and cooling with energy efficiency, demand response and on-site electricity generation.

²⁰ RESCO Solicitation, Application Package at 6.

and performance of individual technologies, but instead, to the technologies, tools and strategies that can enable their integrated and symbiotic use.²¹ Furthermore, the RESCO PIER initiative urges holistic planning within communities to determine economically and environmentally preferred technical integration solutions that can: (1) enable multiple individual RE technologies to serve a community's energy needs more cost-effectively than would be possible using a single technology and (2) take advantage of competitive energy markets.²²

Most importantly, the request for proposals (RFP) recognizes that RESCO development will involve sequential and iterative planning, piloting and implementing of capabilities and solutions that: (1) fit the local resource base; (2) offer promise for future integration and expansion toward the goal of eventually achieving full reliance on RE; and (3) undergo continuous adjustment based on experience and adaptation to particular circumstances and changing market conditions.²³ Notably, the RFP emphasizes the need for a framework in which community leaders, RE developers, planners, utilities and other major market players can collaborate and optimize a community's future energy infrastructure.²⁴ This framework would enable the stakeholders to evaluate and determine ways in which to accelerate the adoption of viable and proven technical integration solutions that can maximize economic value and minimize costs and environmental impacts, while capitalizing on advancements in RE, EE and demand response, energy storage, smart grid integration, combined cooling, heating and power, the co-production of transportation fuels, etc.

Land-Use Planning, Design & Development:

Recent California initiatives recognize that there is a fundamental linkage between energy and community form. The value proposition for integrating energy planning into urban land-use and design and for taking a systems approach to community development lies in the fact that 70% of a community's energy consumption can be influenced by land use allocations, site design, development practices and transportation and utility infrastructure.²⁵ Indeed, realizing the fuller potential of energy efficiency and renewable energy is dependent to a large extent on the form and parameters of a community's infrastructure and built environment. Notably, the urban sprawl, which has been perpetuated by America's development practices since the 1950's, has contributed to our country's having the highest per capita energy consumption in the world. Therefore, to maximize GHG emissions reductions and energy savings, the indirect effects of land use decisions need to be addressed and mitigated.

Yet, the opportunity to influence significantly local energy end-use through "how and where" construction and renovation takes place is, nonetheless, quite promising. In fact, in the next 20 to 25 years more than half of all structures in the U.S. will be designed, constructed and remodeled. The number is staggering—equal to 213 billion square feet of built space. And more than half of this work will be in new homes yet to be planned, designed and constructed. This growth presents an unprecedented opportunity to design and build homes and offices, public facilities and whole communities to a new level of energy and resource efficiency.

Recognizing this potential, California has explicitly linked climate and land-use planning and development through a number of policy and regulatory actions. Underlying these actions is an understanding that the State's market transformation and integrated design strategies will not be achievable without a new focus upon the context in which California is imposing its requirements and negotiating voluntary commitments with respect to stationary and mobile sources.

²¹ Id.

²² Id.

²³ Id. at 8.

²⁴ Id. at 6.

²⁵ "Model for Sustainable Urban Design," Sustainable Energy Planning Office, Gas Technology Institute (2004) at 1. ("GTI Model Design")

Recent California legislation has increased the role of local and regional governmental authorities in facilitating efficiency investments and ensuring sustainable planning and development. Senate Bill 375 posits climate considerations within the context of strategic growth management.²⁶ SB 375 requires metropolitan planning organizations (“MPOs”) to include in their regional transportation plans “Sustainable Communities Strategies” that will meet the region’s target for reducing GHG emissions.²⁷ These strategies are required to balance transportation and regional housing needs and create incentives by tying Federal transportation funds to projects achieving emissions reductions.

Also, in furthering the Governor’s Strategic Growth Plan (“SGP”), Senate Bill 732 establishes the Strategic Growth Council to help state agencies allocate SGP funding in ways that best promote efficiency and sustainability, as well as support the Governor’s economic and environmental goals.²⁸ The Council will coordinate with its member agencies, as they undertake infrastructure and development projects, to encourage sustainable land use, improve air and water quality, protect natural resources, increase the availability of affordable housing, improve transportation, and meet the goals of AB 32. The Council also can support, through grants and loans, the planning and development of

sustainable communities, including preparing, adopting and implementing general plans, general plan elements, regional plans and other planning instruments. While the State has little direct say in local land-use planning, the Council will provide leadership and support for local governments.²⁹

Moreover, the CEC chairs the Land Use Subgroup of California’s “Climate Action Team” (LUSCAT) and is working to advance the recommendations that were made by this group to CARB in connection with the development of its Scoping Plan.³⁰ In particular, LUSCAT developed a report with recommendations on expanding State technical and financial assistance to local and regional agencies to facilitate climate-friendly and energy-efficient planning and development.³¹ CARB’s Scoping Plan encourages local governments to develop climate action plans and calls for carbon fees that could be provided to local governments based on GHG savings projected to result from improved land use planning. CARB also recommends a 15% GHG emissions reduction target for local government municipal and community-wide emissions from current levels by 2020 to parallel the State’s target.³²

With funding by the CEC, the San Diego Association of Governments (SANDAG) is developing a “how-

²⁶ California Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008) (“SB 375”).

²⁷ SB 375 requires MPOs to prepare a communities strategy to reach the regional target provided by CARB. MPOs will use the sustainable communities strategy for the land use pattern underlying the region’s transportation plan. If the strategy does not meet the target, the MPO must document the impediments and show how the target could be met with an alternative planning strategy. Integration of the sustainable communities strategies or alternative planning strategies with local general plans will be vital to achieving the goals.

²⁸ In January 2006, the Governor launched the Strategic Growth Plan (SGP), a proposed set of new policies to leverage partnerships with the private sector, increase synergy between public agencies, and educate thousands of new engineers to build the California of tomorrow. CEC “2008 Integrated Energy Policy Report Update,” Doc. No. CEC-100-2008-008-CMF (Adopted November 20, 2008) at 118, (“Adopted 2008 IEPR Update”); California Senate Bill 732 (Steinberg, Chapter 729, Statutes of 2008). Chaired by the Director, Office of Planning and Research, the Council consists of the Secretaries from the Resources Agency, CalEPA, the California Business, Transportation and Housing Agency, and the California Department of Food and Agriculture.

²⁹ Adopted 2008 IEPR Update at 118. The Council will recommend policies that encourage sustainable development and will collect and provide data to local governments to help them develop and plan sustainable communities.

³⁰ The Governor’s 2005 Executive Order directed the California Environmental Protection Agency to lead a multi-agency Climate Action Team to conduct an analysis of the impacts of climate change on California and to develop strategies to achieve the targets and mitigation and adaptation plans for the State.

³¹ Draft “LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use and Transportation,” Land Use Subcommittee of Climate Action Team (May 5, 2008). (“LUSCAT Submission”)

³² CARB has adopted a “Local Government Operations Protocol” to provide local governments guidance on how to inventory and report greenhouse gas emissions from government buildings, facilities, vehicles, wastewater and potable water treatment facilities, landfill and composting facilities, and other government operations. See CARB Draft Scoping Plan. CARB also is developing an additional protocol for community-wide emissions. Also, see Adopted IEPR Update at 118. In its Draft Scoping Plan, CARB indicated its intention to pursue strategies to provide stable funding for sustainable local planning and zoning updates.

to” guide on preparing an energy element in General Plans for use by other regional and local governments.³³ A State Advisory Task Force is guiding this project. The CEC is also updating its “Energy-Aware Planning Guide” and assisting municipal utilities in partnering with local governments to incentivize smart growth in their service territories.³⁴

AB 811 (Levine, 2008) authorizes cities to provide low-interest loans to property owners with long-term repayments added to their annual property tax bills to help finance energy efficiency improvements and distributed generation installations.³⁵

Also, the State Attorney General’s Office has called upon local governments to use their California Environmental Quality Act (“CEQA”) compliance responsibilities to address greenhouse gas impacts and mitigation strategies of local development policies.³⁶ Energy efficiency and renewable energy policies and initiatives are among the options available to communities.

³³ Adopted IEPR Update. The State Advisory Task Force includes representatives from metropolitan planning organizations, councils of government, and state agencies.

³⁴ Also see, California Public Utilities Commission Decision 99-08-021, Ordering Para. 11; and D.01-01-060 directing the utilities to increase partnerships with local governments to achieve energy efficiency at the local level. See also, Adopted IEPR Update. The CEC guide will explain the effects of energy policy on GHG emissions, prescribe more effective relationships between local and regional planning agencies, and describe recent best practices.

³⁵ California Assembly Bill 811 (Levine, 2008) Streets and Highway Code, Sections 5898 et seq (“SB 811”).

³⁶ California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq. (“CEQA”) PRC 21083.05, added to CEQA by Senate Bill 97 (Dutton, Chapter 185, Statutes of 2007), directs the Governor’s Office of Planning and Research (OPR) to develop draft CEQA Guidelines “for the mitigation of GHG emissions or the effects of GHG emissions” and transmit those guidelines to the Resources Agency on or before July 1, 2009.

4. Emergence of Sustainable Community Energy Planning

While the State has taken unprecedented steps in linking climate to land-use and growth management planning processes, especially transportation planning, the State needs to explicitly promote community energy planning and management within these planning processes. Linking energy planning to growth management planning would encourage communities to explore cost-effective opportunities for distributed energy resource development created by smart growth spatial patterns.³⁷

As evidenced by the examples discussed in the previous section, California decision-makers clearly appreciate that the State’s climate and energy goals stand to benefit from deploying integrated energy solutions at the community-scale, facilitated and guided by regional and local jurisdictions, their public agencies and other local institutions. There is also a clear recognition of the large and long-term consequences that land use planning decisions have on energy consumption and GHG emission levels. But California officials are only beginning to grapple with the need to integrate energy systems planning into local land use planning, design and development processes that have been structured to address other matters such as growth management, public infrastructure development (transportation, water supply and wastewater and solid waste treatment), availability of affordable housing, etc. Linking energy planning to growth management and land use planning would enable local and regional authorities to address distributed generation and other energy infrastructure needs earlier and to maximize efficiencies within community transport, water, waste and energy systems.

The undertaking of sustainable community energy planning by local and regional governments in partnership with major stakeholders and the integration of this planning into land use development is crucial to the successful application of California’s new policy strategies on-the-ground. Among other things, this integrated planning can help to assure that

³⁷ Distributed energy resources are small-scale power generation technologies (typically in the range of 3 to 10,000 kW) located close to where electricity is used (e.g., a home or business) to provide an alternative to or an enhancement of the traditional electric power system.

efforts are carried out with a better understanding about:

- (1) the impacts of the embedded energy costs and operational energy needs of urban infrastructure and urbanization;
- (2) the local economic, environmental and equity benefits to be derived from such planning processes, especially with respect to the private sector; and
- (3) the costs and benefits of alternative planning options, technologies and practices, and development scenarios.³⁸

In other words, the integration of energy planning into land-use planning processes is essential for municipalities to pursue high performance, low-impact development under a unifying vision of sustainable community design.

However, there are significant barriers to advancing the State's GHG emission reduction goals and energy-efficient growth through the integration of energy planning into land use development. Primary among these are significant financial constraints, competing priorities, lack of knowledge and technical expertise, little incentive to undertake energy-related activities outside of managing a municipality's own consumption; lack of control of the resources required to engage in comprehensive energy sustainability planning and regulatory obstacles.³⁹

The next section of this guide outlines these barriers and some potential public and private sector solutions for overcoming them. However the majority of the solutions will require the State of California to provide not only leadership and oversight, but also, significant financial and technical assistance to develop new energy planning capabilities at the local and regional governmental levels. But, as discussed, strong market, technology and policy drivers are at play which can, in combination, work to overcome these barriers. This includes the urgency that California attaches to the achievement of its own climate objectives.

³⁸ CEC, "Sustainable Urban Energy Planning: A Roadmap for Research and Funding," Doc. No. CEC-500-2005-102 (June, 2005) at 2-3. ("CEC Roadmap")

³⁹ CEC at 24-26.

Defining Sustainable Community Energy Planning:

Sustainable community energy planning integrates sustainable energy,⁴⁰ clean energy technologies⁴¹ and responsible resources management strategies for the development of economically, socially and environmentally healthy communities. The ultimate aim is to bring about a paradigm shift with respect to energy and resource use within all of the functions of a community and to change infrastructure parameters and development patterns by affecting "how and where we build" and "how we generate, deliver and use energy." Sustainable energy planning seeks to strike a better balance between energy and resource supply and demand, by fusing energy and resource efficiency with "smart growth," "smart grid," intelligent transportation system management" and similar urban strategies; and by pursuing the following community planning and design principles:⁴²

Sustainable Use of Energy Resources: Planning and design should maximize the efficient use of energy resources across all end uses, while minimizing direct and indirect adverse impacts on the environment.

Ecological Community Form and Function: Planning and design should emulate nature to maximize the benefit of natural systems and preserve and restore the natural environment. Urban functions should be managed to reinforce natural flows and characteristics, creating a balance and mutually supportive cycle of interaction between built and natural environments.

⁴⁰ "Sustainable energy" is energy saved through efficient end-use practices or derived from non-depleting, "renewable" energy resources such as solar, wind, biomass, geothermal and low-impact hydroelectricity.

⁴¹ "Clean energy technologies" refers to those energy supply or end-use technologies that, compared with conventional technologies currently in commercial use, emit substantially lower levels of GHG and air criteria pollutants over their life cycle and generate substantially smaller or less-toxic volumes of solid, liquid or gaseous wastes. Clean energy technologies include those that allow the production, transport, storage and use of fossil energy resources with relatively high efficiency and relatively low impact on the environment.

⁴² "Planning & Design Guidelines for Energy-Efficient Community Development," D. Newman, Gas Technology Institute (2004) at 4-5; GTI Model Design at 15-16.

Environmentally Sound and Energy Efficient Land Use Optimization: Planning and design should seek to minimize the consumption of energy, material and natural resources by restructuring and more efficiently utilizing the existing urban footprint. In addition, compact, mixed-use development and co-location of compatible uses can enable cost-effective applications of distributed energy resources, district energy systems and urban mass transit systems.

Energy and Environmental Technology Integration: Planning and design should integrate cleaner energy systems into development projects, using “whole building” and “community-scale” approaches to maximize energy performance and economic value, while minimizing adverse environmental impacts. Efforts should capitalize upon technology advancements, but advance integrated technical systems needed to expand the use of local renewable and recyclable energy resources, build sustainable local and regional energy networks, secure underground distribution systems for critical urban facilities, develop supply and demand network control systems, and establish more technology-ready infrastructure.

Community Resources Management: Wherever possible, planning and design should engage community residents in the efficient use of energy and material resources by decentralizing resource management systems to the neighborhood level. Neighborhood-based systems should be designed to provide ongoing systemic management of community resources and promote shared energy resources and material and process efficiencies, based on town energy management plans.

Social Equity and Economic Vitality: Energy-efficient planning and design should increase access to affordable housing, public services and employment for lower-income populations and stimulate local economic opportunities.

Sustainable community energy planning seeks to reconcile energy and resource use with exponential urban growth by taking a “total energy and environmental systems” approach to land-use development and urban design. This approach integrates planning for traditionally disparate sectors such as transport, waste, water and energy in order to characterize future energy demand and influence

supply strategies. This systems method also complements individual technology, facility and sector approaches.⁴³

Achieving California’s energy and climate objectives through market transformation and integrated design will require the capability to better understand, characterize and shape energy demand and use within our built environments. In this regard, local and regional authorities need support to build their capacity to: (1) Understand the environmental, economic and equity impacts of the embedded energy costs and operational energy needs of urban infrastructure systems and urbanization; (2) Identify the local environmental, economic and equity benefits of sustainable community energy planning, especially with respect to the private sector; (3) Develop information and materials that lead to a better understanding of planning options and the costs and benefits of alternative technologies, practices and development scenarios; and (4) Develop effective decision support tools and methods for community-based energy systems planning.⁴⁴

There are compelling reasons for local governments to become involved in sustainable community energy planning. Smarter energy use can reduce energy costs, improve public health and safety, enhance economic development and environmental quality, increase social equity and environmental justice, and raise living standards and the overall quality of life.⁴⁵ With the increasing availability of energy supply and end-use technologies, local governments also are seeking to achieve a higher level of control and self-sufficiency with respect to their access to energy resources.

⁴³ GTI Model Design at 10, 17-24. The CPUC 2008 EE Strategic Plan recognizes the importance of evolving a “total systems” approach. The Plan emphasizes that “it is critical to develop a shared vision and process for regulatory coordination in California to support the energy savings benefits of demand-side management integration [across resources] and to ensure consistent and mutually supportive energy, water, air, and GHG policy and regulations” at 72. Sustainable energy planning would enhance the prospects for achieving DSM integration solutions that support energy and carbon goals in the present, and further water and other resource conservation goals in the future.

⁴⁴ CEC, “Sustainable Urban Energy Planning: A Roadmap for Research and Funding,” Doc. No. CEC-500-2005-102 (June, 2005) at 2-3. (“CEC Roadmap”)

⁴⁵ CEC Roadmap at 20-24.

To date, local governments have engaged in sustainable community energy planning in three principal ways: (1) Reducing energy consumption within their own facilities and operations; (2) Promoting efficient energy use and alternative resources in the private sector through judicious use of incentives, regulations and demonstration projects; and (3) Shaping local land use and development patterns to reduce per capita energy use and improve environmental quality.⁴⁶ Such efforts have largely been undertaken separately rather than in an interrelated and systemic manner. Furthermore, the efforts have been predominantly project-oriented and aimed at addressing the environmental impacts of energy use, increasing efficiencies within buildings, installing alternative energy in facilities and fleets, and promoting mass transit and alternative mobility strategies.

To accommodate future population growth and urban sustainability, local and regional governmental officials must better understand: (1) How different development patterns, building and infrastructure design and materials, and clean energy technologies can increase energy and resource efficiency without compromising the quality of life; (2) How decisions regarding private development projects affect long-term energy demand; and (3) How energy smart planning carried out as part of land use development and growth management processes can bring into better balance energy supply with demand by facilitating the orderly, capital efficient and environmentally sound application of distributed energy resources.



⁴⁶ Id. at 27.

5. Modeling the Potential of Energy-Efficient Community Development

From 2007-2008, the U.S. Department of Energy and the California Energy Commission funded a research initiative at San Diego State University to determine which energy technologies and strategies could be combined with advanced community design features to increase the energy efficiency and air quality of California's communities.

The initiative, known as the Chula Vista Research Project (CVRP), modeled the use of a number of building energy technologies and community design features on two large-scale development sites on the eastern side of Chula Vista, California. One site was planned as a predominantly commercial mixed-use development on 206 acres of land. The other was planned as a predominantly residential mixed-use development on 418 acres of land.

The technologies were bundled into three development options and modeled for 20 distinct building types planned for the two sites.

They included:

- The EE option: advanced, highly efficient building envelope features, appliances and space conditioning equipment
- The EE-PV option: the EE option with the addition of solar photovoltaic panels
- The EE-DG option: the EE option with the addition of distributed generation technologies

Five alternative community design features were also modeled and included:

- Moderate-density, mixed-use, smart-growth development
- Storm water runoff mitigation measures
- Carbon storage and sequestration measures
- Urban heat island mitigation measures
- Passive solar building orientation

The CVRP modeling findings indicated that use of EECDF features in a large-scale development project can reduce *aggregate* electric energy consumption (kWh) by approximately 43 percent; peak demand (kW) by 45 percent; and CO₂ emissions by 35 percent, compared to a project designed for minimum compliance with California's Title-24, 2005 energy

efficiency standard (the applicable standard at the time of the study).

The CEC publication entitled: *A Building and Site Design Reference Guide for Energy-Efficient Community Development in California* presents the entire set of detailed findings from the engineering and planning analysis conducted under the initiative.

6. Market Barriers & Potential Solutions

Concurrently with the engineering modeling, the CVRP researchers conducted a series of workshops, surveys and interviews to examine the market, policy and procedural barriers preventing adoption of EECD in California and to generate potential solutions to resolve them. Participants in the examination included developers, builders, capital market investors, municipal development officials, utility planners, real estate market experts and members of both environmental and community advocacy organizations.

The researcher's central conclusion was that the building industry is unlikely to voluntarily integrate EECD features into large-scale projects until there is a fundamental market transformation that allows them to do so profitably. In reaching this conclusion, the researchers adopted the California Public Utilities Commission's definition of market transformation. Specifically:

Long-lasting sustainable changes in the structure or functioning of a market achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly-funded intervention is no longer appropriate in that specific market.

The CVRP analyses suggest that two fundamental changes are necessary in the structure of the market:

- That the value of energy-efficient building technologies and community design features is recognized by all entities in the real estate development transaction chain (lenders, investors, developers, builders, design professionals, appraisers and brokers); and
- That this recognition results in market transactions that enable developers to capture capital investments in energy-efficient design

features through real estate sale prices that are acceptable to consumers.

The results further suggest that there are six significant economic, policy and procedural barriers that must be addressed in order for these market changes to occur. These include the:

1. Split Incentive Dilemma: a misalignment between investment costs and benefits;
2. Lack of consumer willingness to pay for the value of energy efficient features;
3. Capital market investment risks that inhibit financing for EECD projects;
4. Lack of financial incentives for developers and builders;
5. Lack of municipal investments in enabling green infrastructure;
6. Inconsistent municipal policies, procedures and incentives for EECD projects

Each of these barriers is discussed in greater detail below, along with potential solutions to move beyond them.



Economic Barriers & Potential Solutions:

The Split Incentive Dilemma

The so-called Split Incentive Dilemma exists when the party investing in energy-efficient building and development project design features (energy-efficient building materials, technologies and infrastructure

systems) does not directly benefit from the investment. The dilemma is well known in the commercial and residential real estate markets where building owners have little incentive to invest in energy-efficient features that produce benefits/savings for tenants who are unwilling to pay premiums to receive them. On the other side of the dilemma, tenants have little incentive to improve a leased space unless they intend to occupy the space for a period of time sufficient to obtain a return on the investment through energy savings. To do otherwise would only produce a benefit for the building owner or future tenant.

The corollary dilemma for the large-scale community developer is a reluctance to invest in energy-efficient building features when the benefits of those features are realized by the eventual homeowner over a long period of time, well beyond the timeframe of the developer's involvement with the project. The dilemma is further complicated by the fact that the development industry sees insufficient demand for these features in the market at the present time, and believes that builders are forced to eliminate conventional amenities - such as upgraded kitchen features and granite countertops, to accommodate these features.

To resolve this barrier the California real estate market must be transformed into one in which:

- True Cost pricing of real estate products (homes, commercial structures and planned communities) reflects the externalities associated with their direct and embedded energy consumption;
- Real estate appraisers, brokers and buyers are aware of and are willing to pay for the Total Value of energy-efficient and environmentally compatible real estate commodities;
- Developers/builders integrate energy-efficient and renewable technologies into their projects and are recognized and monetarily rewarded for the energy and emissions savings that they produce;
- Residential, commercial, institutional and municipal consumers are aware of and responsible for the energy and water consumption and air emissions associated with their structures and communities.

True cost pricing will require additional engineering and economic research to determine the direct and embedded energy consumption and emissions impacts of alternative building and site design features and their costs and benefits relative to the use of conventional features. In addition to material and installation costs associated with these features, there must be a thorough analysis of any additional planning, design and entitlement processing costs required to accommodate those features.

To produce consumer willingness to pay for the "Total Value" of energy-efficient and environmentally compatible real estate commodities, consumers must have some sense of what total value means in relation to their buying decisions. Presently, consumers receive little information related to the energy-efficiency of a new home or commercial structure. Outside of efficiency ratings on HVAC and refrigeration equipment, the consumer doesn't have an opportunity to judge the overall efficiency, much less the emission impacts of a structure for sale, making comparisons to other real estate products on the market impossible. This is further aggravated by the fact that, outside of the voluntary LEED certification, industry-wide adoption of uniform product labeling for energy-efficient structures is not in place to aid consumers in making informed decisions.

Whether through a voluntary industry initiative or State and/or local government regulations, uniform adoption of energy-efficiency and emissions performance rating and labeling for all structures and communities must be put into place if consumers are expected to understand and be willing to pay for the "True Value" of energy-efficient and environmentally compatible real estate commodities.

To produce a willingness among developers and builders to integrate energy-efficient and renewable technologies into their projects, the stakeholders suggested that there must be a new model or paradigm for project accounting and/or appropriate financial mechanisms put into place to produce a direct return on investment. The new model or paradigm would be one in which a return on investment equals both an internal and an external rate of return, taking into account all related externalities.

With regard to financial mechanisms, this could include incentives, rebates, tax credits or mortgage arrangements that would result in the consumer's willingness to pay premiums for the energy-efficient features at the point of purchase. Alternately or in addition, this could include 3rd party economic incentives for developers that offset the incremental first-cost of including these features in their products prior to marketing. In addition to these mechanisms, the stakeholders also suggested that development and construction practitioners will need to have information resources that outline related best practices and guidance on the assessment and use of these technologies in large-sale development projects. This might entail development of an industry and/or municipal information clearinghouse accessible on the Internet. They also suggested that municipal officials must address outdated and conflicting development and building ordinances and train personnel to be able to assess energy-efficient development proposals submitted by developers.

To produce consumer awareness and responsibility for energy and resource consumption, there must be advances in research, development and demonstration of whole home/structure resource monitoring so that occupants can observe resource consumption in real-time and modify that consumption in response to the information. This will entail advances in building systems metering devices, whole-house/building electrical and water monitoring systems and display technologies that convert resource use into household/building economic and emissions impacts.

With regard to leadership and resources to support this initiative, the stakeholders suggested that such a fundamental transformation of the marketplace will require State government leadership and suggested that a California Executive Order would be necessary to realize the full strategy. Additionally, they suggested that some portion of the public goods funds should be used to plan and execute contributing initiatives and that the investor-owned utilities (IOUs), join with the California Public Utilities Commission (CPUC), the Energy Commission, the Department of Finance and the Treasurer's office to further develop this strategy in the future.



Consumers' Willingness to Pay

As stated above, *most* consumers are uninformed about the value of energy-efficient and sustainable design features in their homes, businesses and communities and as a consequence, are unwilling to pay a premium for them. At this early stage in the evolution of this movement, this is not a surprising finding. However, it is clear that action needs to be taken as soon as possible to address this barrier, as it ultimately underpins the other economic barriers discussed here.

A willingness to pay among consumers can be considered the first clear signal that the required market transformation is beginning to take effect, although it may appear before the need for government and utility intervention is no longer necessary. Ideally, this transformed market will be one in which energy-efficiency and responsible resources management is the norm among consumers, rather than the exception, and where enabling technologies are incorporated into the construction of all homes, offices and institutional buildings to aid consumers in this practice. The transformed market must also be one in which increased market volume for energy-efficient features results in only a negligible incremental cost to the developer and builder for including them.

To achieve this ideal state, it will be necessary to pursue a combination of the *market-push* and *market-pull* initiatives. These include.

- Additional Research – on the energy-efficiency and carbon emission reduction potential of alternative building materials,

equipment, technologies and energy-smart site design features and infrastructure.

- Rating and Labeling – that informs consumers about the energy efficiency and emissions reduction performance of both buildings and whole development sites.
- Performance Monitoring Technologies – that enable residential and commercial property owners to assess and modify their energy and resource consumption practices.⁴⁷
- A New Model of Business Accounting – that accounts for all environmental externalities of site, building and infrastructure development.
- Consumer Financing Mechanisms and Developer Incentives – that enable consumers to afford energy-efficient properties and developers to build them profitably.⁴⁸
- Accessible Information Resources – that results in the sharing of best practices among development practitioners in both the public and private sectors.
- Revised Municipal Development Ordinances – that reflect the value of energy-efficient

development alternatives and facilitates their use in large-scale development projects.

- Municipal and Utility Incentives/Disincentives – that promote building industry pursuit of this form of development and that discourage inefficient consumer practices.

In addition to these measures, it will be necessary to launch a substantial public information campaign through a concerted effort among state, regional and local government agencies; investor- and municipally-owned utilities, development industry trade organizations and municipal and consumer advocacy organizations.

With regard to leadership and collaborators best suited to mount this effort, the surveyed stakeholders believe that State and local government agencies must take the lead, but that the real estate finance and development entities must become active and fully invested collaborators. In addition, given that this strategy is founded on additional research and consumer education, the California universities should play a significant role in the collaboration as well.

⁴⁷ On July 8, 2008, the Centex Corporation announced its Centex Energy Advantage, a collection energy-efficient features that will be standard in all of the company's new homes by January of 2009. A key feature is an in-home energy monitor that provides homeowners real-time information about electricity usage and expenses and enables them to reduce their electricity consumption by as much as 15%. For more information visit: <http://www.prnewswire.com/mnr/centex/33930/>

⁴⁸ FHA's Energy Efficient Mortgage program (EEM) helps homebuyers or homeowners save money on utility bills by enabling them to finance the cost of adding energy efficiency features to new or existing housing as part of their FHA insured home purchase or refinancing mortgage. For more information visit: www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm

Location-Efficient Mortgages (LEM) enable residents to buy homes more easily in location-efficient communities, those that enable walking and have accessible public transit, which reduces household transportation costs. To learn more about LEMs visit: <http://www.locationefficiency.com/>



Capital Investment Market Risks

To determine the investment barriers and risks that inhibit capital market entities from financing energy-efficient development projects, the researchers conducted an online survey of those entities. In early June 2008, email survey invitations were sent to randomly selected members of the National Association of Industrial and Office Properties (NAIOP) and the Pension Real Estate Association (PREA).

In total, 120 questionnaires were completed and collected between June 15 and June 30, 2008. Respondents of the survey represented three occupational subgroups - lenders (34%), equity investors (49%) and developers (17%). Over 65% of the participants had been involved with LEED-certified projects or *EnergyStar* designated buildings.

The results of the survey indicate the following:

- The vast majority of lenders, investors and developers believe that energy-efficient building projects are more expensive to build (5-10% or more), but are also more valuable to own than comparable conventional buildings. The latter perception is due primarily to the assumption of lower owner operating costs. However a minority also believe that there may be lower rates of tenant turn-over and the possibility of higher rents. Additionally most, but not all respondents believe these benefits offset the additional costs;

- Input received on the additional cost of building one large master planned community development project (e.g.: 8,000+ acres), incorporating a community solar electricity system, sustainable site development features, advanced building envelope and equipment enhancements, and construction site mitigation measures, was estimated to be 25%-35% more than the cost of conventional site development, depending on available incentives;
- With regard to the most significant barriers to investment, equity investors believe that the lack of consumer awareness of the benefits of energy-efficient buildings is the top barrier followed by the lack of private (utility and financial institution) incentives. Lenders and particularly developers on the other hand, believe the top two barriers are the lack of public (government) financial incentives and again lack of consumer awareness.
- In regard to the most significant risks, all three occupational subgroups believe that the top risk is that tenants will not be willing to pay higher rents for energy-efficient space, followed by a concern that the value of this space may not be recognized by lenders and appraisers.⁴⁹

⁴⁹ Although the CVRP survey respondents hold this belief, other studies conducted recently suggest that some consumers are willing to pay a premium for energy-efficient properties. Interested readers should see the following articles:

It's True: Green Buildings do Boost Sales, Rental and Occupancy Rates - Posted by: Adam Aston on April 03, 2008
http://www.businessweek.com/investing/green_business/archives/2008/04/its_true_green.html The NBI study was funded by USGBC with support from the U.S. Environmental Protection Agency and can be accessed here:
<https://www.usgbc.org/ShowFile.aspx?DocumentID=3930>
 View more information on the CoStar Group study:
<http://www.costar.com/News/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679>

New Evidence on the Green Building Rent and Price Premium
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1372440

Green Buildings in US Attract Higher Rents and Sell for More
<http://www.propertywire.com/news/north-america/green-buildings-us-200904012873.html>

The Business Case for Going Green

The capital market survey and industry interviews generated a number of potential solutions to these investment barriers and risks. Taken together, they suggest a strategy designed to target additional economic incentives to developers and consumers to address the added costs of producing and acquiring energy-efficient projects and properties and to reduce the impact of the split incentive dilemma. Additionally, this input suggests an implied strategy that connects the State's carbon reduction goals with the federal government's promotion of consumer energy-efficiency and the objective of writing down the costs of energy-efficient development projects. Specific components of such a strategy might include:

- State and local carbon credits for EECD development projects;
- Low-interest financing for EECD/or sustainable construction projects;
- Tax credits for homeowners in energy-efficient developments;
- Federal and state income tax reductions for developers and builders of EECD projects;
- Energy-efficient mortgage instruments;
- Cash rebates for consumers buying properties in energy-efficient developments;
- Discounted insurance rates for energy-efficient construction;
- Utility and/or municipal subsidies to developers for EECD design consultant costs;
- Deferral of increased property tax until close of escrow;
- Deferral of special assessments until close of escrow; and

- Research to generate means of aligning EECD investments costs with long-term benefits.

The strategy should also include the deployment of informational resources necessary to build and promote a defensible *business case* for energy-efficient community development and associated training and municipal procedures. Specific components might include:

- Demonstration projects to document the value of EECD for the development industry;
- Development industry case studies and examples of successful EECD projects;
- Consumer, lender and appraisal industry education and training initiatives;
- *Best Practices* information for public, private and utility planning practitioners;
- Centralized source of information on EECD (information and incentives clearinghouse);
- Professional training resources for public, private and utility development practitioners;
- Model design and development guidelines and standards for EECD.

Survey respondents strongly believe that federal, State and local government agencies must again take the lead on the majority of these solutions to encourage industry investment in the solutions on which they are best suited to lead (i.e. low-interest loans, mortgage instruments, and industry education and training initiatives).

Global giants, from Wal-Mart to HP, see cost savings, other benefits

URL: <http://www.msnbc.msn.com/id/17969124/>



Development Industry Incentives

The lack of financial incentives for developers/builders is considered the single greatest barrier to the adoption of energy-efficient building community development by the California building industry. It became the top barrier during October of 2008 when the impact of the sub-prime mortgage crisis resulted in the collapse of several major banking and insurance institutions. This event triggered a set of follow-on interviews with senior officials of the CBIA, and executives from some of the top production homebuilding companies in the State. In light of the crisis, those interviewed were asked what was the most important message their industry could send State and local government officials relative to the prospects for energy-efficient community development in the California. The response was unanimous - *Substantial Financial Support*. One senior company executive captured the consensus of those interviewed when he stated:

“For the foreseeable future, our emphasis is on least cost construction. We have had the worst numbers since records have been kept. If we invest in clean technologies on a community-scale, we will need offsets and incentives to make those investments.”

The prospect for a substantial improvement in the market remains unlikely in the near future according to the President of the CBIA, however he believes his industry will eventually embrace the movement toward more sustainable construction practices. He stated that:

“We see no near-term relief in sight. Land has a negative value in many areas across the state, and improved lots are selling

for far less than their value... [However,]...once we get home values stabilized we can begin working earnestly on more sustainable construction techniques. We want to do it, but it will not happen in the near future without financial incentives.”

As the priority interest of the development/building industry centers on financial incentives, rather than procedural incentives, the leaders believe that fee deferrals, fee waivers and other financial incentives are the top benefits that need to be incorporated into future discussions about energy-efficient community-scale development projects.

Industry leaders also suggested that attention needs to be given to carefully structuring new State and local government and utility financial incentives for this type of construction, and applicable codes and standards. As one builder put it:

“Developers are trying to bridge the gap between higher construction costs for greener construction and what it costs to simply meet code - and regardless of the state of the economy, incentives are needed to help bridge this gap.”

Industry leaders also suggested that State and local government agencies and utilities need to work together to centralize information about available financial incentives and technical assistance for the development industry and to establish a uniform set of rules governing how they are to be sought and administered.

With these perspectives establishing the industry outlook for the near-term development market in California, the leaders interviewed were asked to identify the most important incentives that could stimulate industry investment in energy-efficient community development projects. Collectively, they suggest an economic stimulus strategy consisting of State and local government and utility incentives that reduce developer/builder costs and increase the prospects for increased profits for those that design and build energy-efficient development projects. The suggested incentive components include:

Potential Support from California’s Green Wave Environmental Investment Initiative – Several of the industry practitioners interviewed suggested that one potential source of State financial support could be the State Treasurer’s Green Wave Environmental

Investment Initiative. Under this initiative, the state's two public pension funds invest in the stocks of emerging clean energy and environmental technology companies and place funds in venture capital firms that invest in them with the objective of building the state's clean tech economy. The pensions have also invested in significant energy conservation programs for their considerable real estate holdings in the state and could potentially invest in large-scale energy-efficient community development projects as well. The creative leveraging of this fund should be investigated by the State Treasurer's Office in consort with the California Department of Housing and Community Development.

State - Sustainable Buildings Tax Credit - The State of New Mexico enacted a Sustainable Buildings Tax Credit in 2007, which one CBIA Board member suggested could be passed in California in the future.

SB 463, enacted in April 2007, established both a personal and a corporate tax credit for sustainable buildings in New Mexico, known as the Sustainable Buildings Tax Credit (SBTC). Commercial buildings that have been registered and certified by the US Green Building Council at LEED Silver or higher for new construction (NC), existing buildings (EB), core and shell (CS), or commercial interiors (CI) are eligible for a tax credit.⁵⁰

The amount of the credit varies according to the square footage of the building and the level of certification achieved. Residential buildings certified as sustainable homes can also qualify for the tax credit. Eligible residential buildings include single-family homes and multi-family homes which are certified as either Build Green NM Gold or LEED-H Silver or higher, and *Energy Star* certified manufactured homes. The amount of the credit also varies according to the square footage of the building and the level of certification achieved.

To receive the tax credit the building owner must obtain a certificate of eligibility from the Energy, Minerals and Natural Resources Department after the building has been completed. The Department will only grant certificates in any given calendar year until the equivalent of \$5,000,000 worth of certificates for commercial buildings and \$5,000,000 worth of

certificates for residential buildings have been awarded in that calendar year. Further, no more than \$1,250,000 of the annual amount for residential buildings can be applied to manufactured housing. The taxpayer must then present their certificate of eligibility to the Taxation and Revenue Department to receive a document granting the Sustainable Building Tax Credit.

If the total amount of a Sustainable Building Tax Credit is less than \$25,000, the entire amount of the credit can be applied to the taxpayer's income tax in that year. If the credit is more than \$25,000 the credit will be applied in increments of 25% over the next 4 years. If a taxpayer's tax liability is less than the amount of credit due, the excess credit may be carried forward for up to seven years. A solar thermal system or a photovoltaic system may not be used as a component of qualification for this tax credit if a tax credit has already been claimed for it under New Mexico's separate Solar Market Development Tax Credit.⁵¹

Municipal - Development Impact Fees (DIF) Deferral Programs – As referenced above, municipalities commonly require developers to pay their fair share of the costs associated with infrastructure that will serve their development sites, to ensure that those additional costs don't impact existing residents. In some instances communities have elected to permit developers to defer payment of those fees from the time a building permit is issued until the final building inspection in exchange for the developer's agreement to pursue the use of energy-efficient features on their projects. The California Building Industry Association would like to see DIF deferral programs established for industry participants in energy-efficient community development projects in communities across California.

Municipal - Higher Density Allowance / Relaxed Park Fee Incentives - Another option some communities have used to incentivize energy efficiency development is one in which developers are allowed higher densities through the use of a

⁵⁰ Leadership in Energy and Environmental Design (LEED)

⁵¹ For more information about the tax credit, interested parties can contact Susie Marbury, New Mexico Energy, Minerals and Natural Resources Department, Energy Conservation and Management Division, 1220 S. St. Francis Drive, Santa Fe, NM 87505. Phone: (505) 476-3254.

relaxed park fee incentive. For example, in a targeted green development, the density might be approved at 4.6 units per gross acre (including parks). However, the city collects park fees for only three units per thousand population instead of the allowed five units per thousand population, which frees up additional funds for the developer and allows greater net densities (since the park acreage granted by the city is not included in the units allowed in the gross acre calculation). Essentially, developers are allowed the higher number of units (closer to a net of 6.0 units per acre in this example), while paying less to the city in park-related fees.

Municipal - Bond Funds for Developer Loans - Due to the state of California's current financial/budget crisis, several of the interviewed building industry experts thought that local government bond funds would be more important to energy-efficient development projects in the near future. Through this mechanism, the city or county collects the funds through a bond, and then disperses the funds to developers involved in more sustainable construction techniques and practices. The City of Phoenix, Arizona currently uses such a bond instrument, and offers low interest loans to developers to assist them with community-scale, sustainability-related development.

Utility and State - Financial Incentives for Energy-Efficient Community Design - One building industry leader thought that utilities and the State of California were "...missing the boat by not providing design assistance funding to developers up-front in the development process for community-scale projects." He thought that utilities should provide design assistance funding to builders through their traditional energy efficiency programs, or come up with some new programs. In his words,

"If the utilities were allowed to give us \$5,000 or \$10,000...or more...to help us design more sustainable neighborhoods, this would go a long way toward getting us the energy and environmental savings the Governor wants. It takes money to design things right."

Some California utilities are evidently considering providing money to builders for LEED design through their energy efficiency program offerings. This may be an effective way to spur more community-scale green construction.

Utility - Financial Incentives for Green Build Program Participation - There was general consensus from the building industry experts that the two most important green builder programs in California at the present time are the *California Green Builder Program* (CGBP) and the *Build It Green* (BIG) program. Some of the industry leaders suggested that builders who participate in these programs should be provided special financial incentives, especially in the existing (depressed) California housing market. The majority of the industry experts thought that the financial incentives for building to these standards should be significantly higher than the \$250 to \$500 per home offered by utilities for building to *EnergyStar* standards. "The data shows that we spend \$2K-\$3K on energy efficiency upgrades for most of our homes. Utilities need to help us here," commented one CBIA leader.

Insufficient Infrastructure Investments

Stakeholders identified municipal investment in enabling green infrastructure as a necessary pre-requisite to engage the development industries in the effort to design and build energy and resource-efficient community development projects. Specifically, they cited the need for government leadership that results in partnership initiatives with local utilities that capitalize green infrastructure projects and enable the development industry to take advantage of proven distributed energy and renewable energy technologies, alternative vehicles and transit, water reclamation systems and stormwater runoff and urban heat island reduction measures.

The stakeholder discussion suggested that the related factors supporting this barrier include regulatory and utility rules that discourage municipal investment in energy systems, lack of capital for these investments and lack of constituent awareness and apparent interest in the subject.

To address the barrier and these supporting factors, the stakeholders proposed a strategy that entails collaboration between local government advocacy organizations (i.e. Local Government Commission, California League of Cities, etc.), the three major IOUs, Energy Commission, CARB and the CPUC to:

- Examine and modify the existing regulatory and utility rules that impede municipalities

and developers from taking advantage of available energy-efficient and renewable energy technologies and systems. Chief among these are those affecting distributed generation interconnection, sub-metering, standby charges, and inter-lot transfers of energy;

- Provide local governments guidance on the formation of financial mechanisms that can generate the necessary capital for these investments. This could include formation of energy-efficient and renewable energy technology districts (e.g. Berkeley's solar district), utility surcharges to create municipal green technology investment funds whose dividends support revolving loan programs for projects;
- Formulate mechanisms to inform and involve consumers in the responsible use of energy, water and material resources. These will include: public information elements that educate consumers about the direct and indirect environmental impacts and costs associated with individual consumption practices; clear utility price signals and in-home displays that communicate the cost of their consumption in real-time; and economic incentives and disincentives such as a utility or local tax rebate for consumer conservation performance at the end of a calendar year or a carbon-tax/surcharge on excessive consumption.

Again, the development industry stakeholders believe that State and local government and utility leadership on these initiatives will be necessary to lead to private investment. Other entities to enlist in such an effort should include regional transit planning organizations, infrastructure industry trade organizations and financing entities.

Policy & Procedural Barriers & Solutions:

Inconsistent Municipal Policies, Procedures & Incentives

A major barrier that emerged from the surveys and discussions with the development industry is the lack of uniform policies, procedures and related procedural incentives among municipalities in California.

Most large-scale developers and builders pursue projects in several municipalities across the state and often simultaneously. Consequently, they face the challenge of determining for each project, which design features will or will not be permissible and incentivized in each jurisdiction. Meeting this challenge, and the aforementioned challenge of finding available financial incentives outside of the municipality for an energy-efficient project, represents a substantial additional expense to the developer/builder.

Input obtained through stakeholder discussions and industry interviews suggest that there is a need to formulate a voluntary, uniform, energy-efficient site development standard, and a set of policy and procedural guidelines and State, local and utility incentives to guide and incentivize the development industry. The U.S. Green Building Council's LEED standard for Neighborhood Development (LEED-ND) is one voluntary standard that is currently being pilot-tested nationally and in a number of California communities. However, most of California developers interviewed specifically stated that a different standard is needed, one specific to California and aligned with the States climate change goals and objectives. Toward this end, the stakeholders suggested an implementation plan for the strategy that would include:

- Additional research to quantify and benchmark the energy-efficiency and carbon reduction potential of alternative building, infrastructure, transportation and urban design features;
- Translate the research into a set of model EECDD site design standards and guidelines and a practical project evaluation tool for use by local planning officials (populated with

EECD carbon metrics and values for alternative sites design features);

- Provide a model municipal sustainable community development policy that aligns economic and community development priorities with specific energy efficiency and greenhouse gas emissions reduction goals; and
- Provide guidance to local governments on translating the development policy into specific modifications for existing municipal codes and standards.

Should such a standard and set of policy and procedural guidelines be established, development industry representatives believe that the following key components should be included in a companion incentives program.

Flexibility in Zoning Code Requirements - This incentive, now common in many communities across the nation, allows developers/builders more zoning flexibility in return for their commitment to pursue greener, energy-efficient construction. Allowing decreased setbacks and bonuses, and relaxed parking requirements and street standards in return for greener construction should be the rule, rather than the exception, and will only become more important in community-scale projects into the future. The CBIA officials interviewed were especially supportive of relaxed parking requirements.

Cross-Departmental Expedited Plan Review – Expedited plan review is now offered by municipal planning and building departments in many California communities today. However, expedited plan review across all relevant municipal departments is still rare and a significant issue with many of the developers/builders interviewed during the research project. Specifically, builders have learned that unless all of the relevant municipal departments are involved in the expedited review process, plans can and will get stuck in the departments that are not participating in the process. To remedy this problem, some communities have assigned a senior City official the responsibility of engaging all relevant departments in the process and in making sure that developer plans do in fact make it through cross-department review in

a timely fashion.

Gold Star Treatment - Pioneered by the City of Chula Vista Building Official, this easy to implement benefit entails ensuring that a green builder's plans are affixed with a "Gold Star" when they are received at the City, and conducting weekly status reviews to ensure that the plans are moving expeditiously through the review process. This administrative solution carries a surprising amount of weight with builders when the market is busy.

Priority Field Inspections - Like the Gold Star treatment mentioned above this benefit is not as important during a downturn in the economy, since delays are at a minimum due to the lack of construction underway. However, ensuring that greener builders get inspections when they need them is usually a very easy benefit for most communities to provide. This low cost benefit is currently provided by many jurisdictions at the present time.

One-Stop-Shopping, Aggregating Benefits and Sustainability Coordinators - Some of the building industry experts interviewed disagreed on the importance of a single point of contact when negotiating and/or implementing benefits for greener, energy-efficient construction. Some thought it was very important while others believed that they could negotiate issues directly through the city manager and/or council as needed. In some jurisdictions, an experienced building official can offer financial and recognition incentives without council involvement.

One industry leader suggested that a new area for builder benefits will involve city-hired *Sustainability Coordinators*. He said, "Cities may want to appoint a sustainability coordinator whose job it is to aggregate benefits for green developers like me". Sustainability coordinators are now being hired by some cities in the State to help coordinate all green building functions, so this may be emerging as an important trend that would benefit green developers and builders.

Accelerated Processing of Entitlement and Permit Applications - Despite the fact that this incentive is not as important now to builders as are direct financial incentives, most still consider it an important and valuable incentive. Shaving time off of the review processes will always reduce a builder's expenses, especially after the housing market picks

up again and city staffs once again become stretched thin. Some cities are able to reduce the entitlement turnaround process by as much as 25- to 50-percent if new structures perform significantly above minimum compliance with the prevailing building energy efficiency standard. For an energy-efficient community-scale development project, this benefit will be critical, particularly to reverse the generally held perception that greener projects take longer to move through the entitlement process.

Residential Development Allowances in Commercial Zones – This increasingly popular policy was referenced by three CBIA officials as important to industry members. It simply entails allowing a builder to construct mixed-use residential structures in a commercial area in exchange that builder's commitment to design and build an energy-efficient community-scale project. This is an easy-to-implement incentive for most cities and counties to provide.

A Tiered Utility EnergyStar-Plus Incentive – Another significant finding from the research was that many builders find the EnergyStar label less important to them today than it has been over the preceding years. Consequently, some builders have suggested the institution of an "EnergyStar-Plus" category, where according to one builder: "...we are rewarded with more funding for building well beyond EnergyStar levels." The researchers believe that this two-tiered policy is likely to become commonplace in the near future. Many utilities are already offering this two-tier incentive at this time, such as the Public Service Company of New Mexico.

The stakeholders suggested that local government agencies and their utility partners would be best suited to lead this strategy and to formulate these incentive components. County and local government advocacy organizations and universities would be ideal collaborators to assist in the development of a detailed implementation plan for this strategy.

7. Change-Agent Role for Local Governments

As stated earlier, the long-term reach and comprehensive nature of California's climate and energy goals has led to a "re-visioning" of the State's strategies for developing energy efficiency and renewable energy resources. In particular, California is now promoting technically integrated and cost optimum solutions in a community energy system context, as well as supporting "Renewable-Based Energy Secure Community" planning. In this way, the State is tapping into community-scale economics to develop all feasible, cost-effective and reliable energy efficiency, demand reduction and locally available renewable energy resources. In this respect, local communities can be considered essential change agents at the center of the State's strategy to achieve its ultimate climate and energy goals.

Specifically, the State is looking to municipalities to address the GHG impacts of their development policies and to exercise their broad authority over land use planning to maximize energy savings and emissions reductions. This new approach focuses on changing the energy infrastructure and built-environment within communities to increase sustainability. It, therefore, introduces a quite different dynamic for purposes of local government involvement in energy planning than in the case of increasing efficiencies under current energy system and infrastructure parameters.

It is a new course of action that necessitates the undertaking of sustainable community energy planning, as an integral part of land use development processes, in order to capture in an orderly and capital efficient manner the potential economic, environmental and equity benefits of community-based energy efficiency and renewable energy. Attaining low impact, high performance "community" development will not be achievable without integrating community energy systems planning and design into land use development processes.

Holistic, long-term planning will be required to achieve a highly efficient energy supply infrastructure combined with energy-efficient buildings and other distributed energy resource applications. Also, integral to this process is the establishment of a framework within which community leaders, developers, planners, utilities and other major market

players can collaborate. Establishing such a governance mechanism will enable municipalities and their stakeholders to address the risks and barriers impeding efficient and sustainable development through the structuring of innovative public-private partnerships and integrated technical, market and policy solutions that fit the local demand profile and resources.

Without a doubt, California's new strategies raise a range of new choices for localities and regional areas that are seeking to stabilize their energy costs, increase electricity reliability, reduce environmental impacts and tap locally available renewable energy sources. But regardless of the extent to which any particular locality chooses to become involved in community energy planning, these developments are poised not only to affect significantly the role of local governments in energy planning, but also the direct benefits that could accrue to municipalities from such involvement. In particular, California's new focus upon community-scale energy efficiency and renewable energy will spur local governments to shift to more holistic and strategic planning to assure continuous improvement towards the State's zero net energy objectives.

In addition, California's new focus on the effects of land use decisions and development practices on energy consumption and GHG emissions will create unique opportunities for municipalities to use their broad and cross-cutting planning and development authority as a means for facilitating integrated technical, market and policy solutions that can attract investment in clean energy products and services within their communities.

Institutional Prerequisites for a Pro-Active Local Government Role:

Because sustainable energy planning cross-cuts all sectors that use energy, it needs to engage the participation of departments across a municipality's organizational structure. Thus, while planning efforts may be housed within a particular municipal department or agency, there is a need for cooperation and coordination across departments, including economic development, planning and building, engineering and general services, environmental and conservation services, etc.⁵² The Mayor, City

Council and the City Manager should provide leadership on energy planning, especially in connection with determining budget priorities and funding for programs. It also is recommended that a framework be established within which the municipality can collaborate with utilities, developers, non-governmental organizations and institutions, industry and citizens on energy planning. Overall, to achieve effective design and delivery of sustainable energy solutions, an institutional framework needs to include: (1) Clearly delineated, transparent and participatory planning and coordination processes and mechanisms; (2) Well-defined organizational lines and departmental roles; (3) Specified staffing and resource allocation priorities; and (4) Established management and monitoring protocols.

Finally, communities should establish a "vision" of a sustainable future, along with sustainability criteria and specific objectives and tactical approaches for achieving the vision over a reasonable period of time. This vision should reflect a balance between the community's means of continued growth and development and the maintenance of local and global environmental quality. The sustainability criteria will provide the means for assessing progress and for prioritizing and selecting strategies and tactics to pursue.

The development of effective institutional structures within municipalities for sustainable energy planning can significantly contribute to shaping more integrated technical, policy and market solutions for increasing energy efficiency and renewable energy within communities. An institutional framework that involves holistic, iterative and sequential planning, piloting and implementing of capabilities and solutions will generate information and resources that can help to design more effective technology deployment strategies, policy measures and incentives, and market-based delivery mechanisms.

Based on the knowledge base and expertise developed through such an institutional framework, solutions can be crafted that differentiate the barriers and risks associated with different scales of development activity (building, site, district, and community-wide) and with different types of energy-related investments. Upon such an institutional foundation, innovative public-private partnership arrangements can be structured to address market

⁵² GTI Blueprint at 68, 87.

gaps and minimize, allocate and manage risks, based on more accurate assessments of the costs and benefits of alternative options. Very importantly, effective institutional structures can help to develop decision-support tools and valuation methodologies that are needed for designing performance-based and market-oriented policies, standards and incentives.

Institutional platforms also can help to inform the development of creative government procurement, licensing, permitting and contracting practices that can build market demand and foster the provision of new energy services. For example, local support could involve the early engagement between developers and community leaders, under which developers mutually agreeable designs and amenities can result in community support of the development as it travels through the complex road from entitlement to build-out.⁵³

Planning activities can guide local governments on ways to aggregate demand, pool resources and bundle projects with different investment profiles and risks to attract affordable financing for energy efficiency and renewable energy. Mechanisms such as Clean Energy Development companies might provide the means for procuring technologies for new development and redevelopment through third party providers.

Institutional processes for sustainable community energy planning will give impetus to new forms of governmental collaboration, mechanisms to quantify and value multiple resource benefits, and fundamental changes in the business and service delivery practices of utilities, energy service companies and building contractors.⁵⁴ Finally, a solid institutional base will create innovative opportunities for integrating energy and water efficiency into community development activities.⁵⁵

⁵³ Environmental Defense, "Infrastructure and Community," Michael Singer Studio, et al., (2007) at 9.

⁵⁴ CPUC 2008 EE Strategic Plan at 74.

⁵⁵ By example, Chula Vista, through its Climate Change Working Group, generated a "Solar and Energy Efficiency Conversion" initiative that integrated technical, policy and market solutions for facilitating the widespread installation of solar-PV, thermal solar and other renewable energy technologies in combination with energy efficiency and water conservation measures in upgrading commercial, residential and municipal facilities.

The Chula Vista Model:

In California, the City of Chula Vista provides a good illustration of a community that began by addressing the environmental impacts of energy use in the context of its climate change and environmental management strategies, but has evolved to become a model community that is integrating energy resource planning into its land use development and growth management processes. This section of the guide highlights just some of the city's initiatives that other communities may wish to consider as they pursue energy-efficient development within their jurisdictions.



The City of Chula Vista has been a recognized leader in pursuing cost-effective opportunities and creating innovative approaches for improving energy efficiency and increasing the use of renewable energy within its own facilities and throughout its community. Since the early 1990s, the City has undertaken climate, energy and sustainability planning that has shaped its General Plans, development policies and regulatory actions, as well as charted its energy and environmental programs.

The City's efforts have significantly reduced energy consumption and greenhouse gas emissions within its own facilities and operations and those of its contractors. The City also has used strategically incentives, regulations and demonstration projects to promote efficient energy use and alternative resources in the private sector. Its green buildings program has been highly successful and, increasingly, alternative energy technologies are being installed in city facilities and fleets and in commercial and residential buildings. Moreover, through its zoning and development authority, the municipality continues to shape land use and development patterns to reduce per capita energy use and improve environmental quality. And through its public education and outreach efforts, as well as its creative policies and initiatives, the City has raised green awareness in and engaged its citizens and businesses.

Sustainable Community Energy Planning Initiatives

Most recently, the City of Chula Vista has undertaken two planning initiatives that will take these efforts to the next level of energy and environmental management:



The Climate Action Plan:⁵⁶ - To meet the City's 2010 target of reducing greenhouse gas emissions 20% below 1990 levels, the municipality established a Climate Change Working Group, comprising of residential, business and community representatives, to recommend a rigorous agenda. While the City has significantly reduced emissions on a per capita basis and from its own operations by 17% and 18%, respectively, during the period from 1990 to 2005, citywide greenhouse gas emissions have increased by 35% (primarily due to exponential residential growth). On April 1, 2008, the City Council adopted seven measures to reduce the municipality's carbon footprint:

- ***100% Clean Vehicle Replacement Policy for the City Fleet:*** Replace vehicles through the purchase or lease of alternative fuel and hybrid vehicles.

- ***100% Clean Vehicle Replacement Policy for City-Contracted Fleet Services:*** Work with current and future vendors to include a "Clean Vehicle" replacement policy into the bid and contracting process.
- ***Business Energy Assessments:*** Through a new ordinance, encourage businesses to participate in a no cost assessment as part of the business licensing process.
- ***Green Building Standard:*** Through a building code revision, require all new and renovated buildings to increase their energy efficiency and meet statewide green building standards.
- ***Solar and Energy Efficiency Conversion:*** Provide a cost-effective, streamlined mechanism for property owners to implement solar and energy efficiency upgrades and create a municipal code provision requiring pre-wiring for solar electric systems.
- ***Smart Growth Around Mass Transit Stations:*** Implement the smart growth design principles outlined in municipal planning documents.
- ***Outdoor Water Conservation:*** Provide a cost-effective, streamlined mechanism for installing water saving plants at private and public sites and create new municipal landscape regulations.

This Climate Action Plan ("CAP") was guided by the 2005 Greenhouse Gas Emissions Inventory⁵⁷ conducted by the City to evaluate its progress in reaching its emissions goals. Also, the results of these measures will be quantified using the City's emissions inventory protocol. Chula Vista will link emissions reductions from its "reach" codes and other programs to CARB's AB 32 program and to its CEQA responsibilities.

Energy Efficiency Partnership between San Diego Gas & Electric (SDG&E) and the City of Chula Vista (2009-2011):⁵⁸ - The City of Chula Vista and SDG&E have proposed to the CPUC for approval a

⁵⁶ City of Chula Vista, "Climate Change Working Group Measures/Implementation Plans" (Adopted by City Council in July, 2008) at 1-58. ("Chula Vista Climate Action Plan")

⁵⁷ City of Chula Vista, "2005 Greenhouse Gas Emissions Inventory Report," Michael Meacham, et al. (2005).

⁵⁸ City of Chula Vista, "2009-2011 Energy Efficiency Partnership Abstract" (2008) at 1-20. ("Chula Vista/SDG&E Partnership Proposal")

2009-2011 Energy Efficiency Partnership (“SDG&E/Chula Vista Partnership or Partnership”) that will build upon their current partnership to further improve community and municipal energy efficiency, leading to substantial direct and indirect energy savings.

The Partnership consists of four program components addressing municipal facility efficiency improvements, strengthened building energy codes and inspections (Sustainable Communities Program), energy saving development planning and design (Energy Efficient Community Development Initiative), and community-based energy conservation education and facility assessment (EmPower Chula Vista).

Established Energy Planning Frameworks

Both the SDG&E/Chula Vista Partnership proposal and CAP build on well-established city planning frameworks that have shaped the municipality’s General Plans, Municipal Code and local ordinances, and other planning instruments and regulations:

CO₂ Reduction Plan:⁵⁹ Starting in 1996, the City developed a Carbon Dioxide (CO₂) Reduction Plan to reduce the community’s greenhouse gas emissions or “carbon footprint” to 20% below 1990 levels by 2010. The comprehensive plan set out 20 measures focused on energy conservation, transportation and land use policy. Specific projects that have been implemented under this plan include LED traffic signal retrofits, municipal building upgrades, energy-efficient landscaping, municipal life-cycle purchasing standards and green building incentive programs. In February, 1997, the City reinforced their efforts relating to land use by laying the groundwork for a Sustainable Development Program and also specifically promoting environmental resources management and education.

Energy Strategy and Action Plan:⁶⁰ In 2001, the Chula Vista City Council adopted an Energy Strategy and Action Plan. This plan evaluated a range of

options that included pursuing district energy and distributed generation investments, developing an emissions offset program based on mobile sources, becoming a municipal energy “aggregator,” forming a municipal utility, expanding municipal and community energy conservation projects, and instituting seasonal energy saving measures.

Municipal Building Energy Efficiency Policy:⁶¹

In 2005, the City Council approved a Municipal Building Energy Efficiency Policy that established energy conservation and renewable energy guidelines for new City buildings and major facility renovations. This policy encourages incorporation of energy-saving measures into the design, construction and operations of new City structures by striving to achieve passive heating and cooling, energy efficiency at least 20% above Title 24 standards, energy-efficient technology upgrades and ENERGY STAR-rated equipment purchases. The policy also requires on-site renewable energy generation to supply 20% of new building energy requirements and up to 100% renewable energy purchases (if equivalent or lower than local utility rates).

Furthering California’s Climate & Energy Goals

As a result of its planning and ensuing actions overtime and with its recent initiatives, the City of Chula Vista is already well along in advancing California’s climate and energy goals and strategies. In particular, the following discussion highlights the ways in which the City’s recent energy and environmental planning is leveraging its broad array of authorities and expanding the scope of opportunities to maximize energy savings and greenhouse gas (GHG) emissions reductions cost-effectively, not only in the near term, but also, through a sustained and focused effort, over the longer term.

The City’s energy policy and programs are coordinated by the Conservation & Environmental Services Department under the leadership of a Director and Environmental Resource Manager. In addition, support is provided by staff in a variety of City Departments including, Planning & Building,

⁵⁹ City of Chula Vista CO₂ Reduction Plan.

⁶⁰ City of Chula Vista City Council Agenda Statement No. 16, “Report on the City’s Strategic Energy Plan” (May, 2001) at 1-50, including the “Energy Strategy and Action Plan” (Attachment 1). (“Chula Vista Energy Action Plan”)

⁶¹ City of Chula Vista Council Agenda Statement No. 6, “Energy Conservation and Renewable Energy Guidelines for City Buildings and Facilities” (February, 2005) at 1-6; City of Chula Vista Building Energy Efficiency Policy Document (2005).

Engineering & General Services and Public Works Operations, Re-development.

Through its proposed SDG&E/Chula Vista Partnership, CAP and planning frameworks, Chula Vista has been responsive to the key goals and strategies set out in the CPUC's Energy Efficiency Strategic Plan and other State agency agendas.⁶²

Beyond-Code "Reach" Standards

Mandatory Green Building Standard.⁶³ The Chula Vista City Council approved a city-wide, mandatory green building standard for new construction and major renovations that: (1) establishes a minimum energy efficiency (carbon equivalent) requirement of 15% above Title 24 (2005); and (2) mandates the early adoption of the new California Green Building Code for all residential and commercial projects. This standard also will be re-evaluated once revisions to Title-24 become effective.

The standard is intended to complement green building measures at the state and national levels and is the City's initial step towards achieving the State's zero net energy targets for residential and commercial buildings. As part of this initiative, the City also will undertake a Building Carbon Reduction Benchmark Program and a Green Awareness Program for homeowners and building operators to support implementation of its "reach" code.

The Building Carbon Reduction Benchmark Program will establish the goals, objectives and thresholds for carbon reduction from all new construction and major renovations relative to Title-24 requirements. It also will contain an energy savings component to instruct builders on how to accumulate carbon savings through both energy efficiency measures (including onsite renewable energy) and community/site design.

⁶² Chula Vista's programs and activities address all of the goals and strategies that the CPUC 2008 EE Strategic Plan sets out for Local Governments at 90-98: (1) Goals – Adopting and Implementing "Reach" Codes; Strong Support for Energy Code Compliance Enforcement; Lead by Example; Lead Communities with Innovative Programs; Community Leadership; and Energy Efficiency Expertise; and (2) Strategies – Using local government authority to maximize energy efficiency in the private sector; Leading by example; and Community Leadership.

⁶³ Chula Vista Climate Action Plan at 18-26.

In addition, the Chula Vista Carbon Checklist will be revised and supplemented to outline Development Credits for emissions reductions and Energy Efficiency Credits in connection with the issuance of building permits.

The inclusion of the community/site design element in this program will extend the coverage of the City's new "reach" standard beyond qualifying individual buildings to developments to take into account energy savings (and the carbon equivalent) on the community level resulting from integrative urban design and strategic site planning. Among other things, these techniques and practices can optimize the potential for economically viable integration of energy-saving distributed energy resource applications (for example, combinations of such technologies as solar photovoltaic, thermal solar, CCHP and district energy, energy efficiency and demand response, energy storage). These savings will be evaluated and quantified using appropriate CEC certified software tools.

Leading By Example

Through its partnership with SDG&E,⁶⁴ Chula Vista has set a target for reducing further municipal energy use through coordinated facility retrofits and upgrades. The City plans to organize a "Building Operators Certificate" training program on energy management best practices. These efforts will complement the City's ongoing investments in renewable energy generation. New city facilities must include an option for alternative energy.

Retrofitting city facilities with energy efficient lighting, and heating and cooling systems, and installing LED traffic signal lights has already reduced the City's energy costs by \$400,000 annually. The City has installed one of the largest reflective roof systems to reduce the urban heat island effect at its 26-acre Corp Yard facility and the new Police Department. The Police Department building exceeds the Title-24 energy efficiency standards by 21% and the City Hall building exceeds the standard by about 25%.

⁶⁴ Chula Vista/SDG&E Proposed Partnership at 16-17.



Engaging the Community, Advancing the Science

Bundling Solar with Energy and Water Efficiency.⁶⁵

As part of its CAP, the City approved a “Solar and Energy Efficiency Conversion” initiative to facilitate widespread installation of solar photovoltaic (PV) systems, thermal solar (hot water) and other renewable energy technologies in combination with energy efficiency and water conservation measures in upgrading commercial, residential and municipal facilities. By combining energy and water efficiency upgrading options with solar panel (electric) and solar hot water installation, consumers will be able to minimize their total project costs and maximize their monthly savings. Additionally, property owners can structure their payments to have their investment costs offset by the energy and water savings generated by the improvements that they choose. This initiative is designed to provide the average residential and commercial consumer a cost-effective and time-saving means for undertaking an integrated package of retrofits to their homes and businesses, while at the same time creating a sustainable economic stimulus and job growth program for the City.

The program will:

- (1) Identify energy and water upgrades that help reduce ratepayers monthly costs;
- (2) Execute a competitive bidding process that selects qualified contractors and sets

maximum prices and minimum warranty and service standards;

- (3) Aggregate interested participants geographically to harness their collective purchasing power and maximize the potential for installation efficiency and savings;
- (4) Establish voluntary special assessment districts (under the authorization of AB 811) to fund the program through local bonds and allow participants to pay back the costs of these improvements through a voluntary fee assessment that will be added to their property tax bills;
- (5) Link local vocational job training in energy and water efficiency with focused business recruitment; and
- (6) Update municipal codes to encourage renewable energy and energy efficiency product installations and to remove institutional barriers.

Sustainable Development Innovations Center. The City of Chula Vista partnered with the University of California San Diego, San Diego State University and the Gas Technology Institute to establish the National Energy Center for Sustainable Communities. The Center is dedicated to the promotion of healthier and more productive communities by integrating clean energy systems and energy smart planning and design into development projects. To achieve this mission, the Center undertakes collaborative research and capacity-building initiatives to increase our understanding about how alternative energy technologies, infrastructure systems and building materials can be combined with performance-enhancing land-use planning to produce low-impact, resource-efficient community development projects. Pilot projects, undertaken with key stakeholders, have explored technical solutions for integrating and optimizing technologies (i.e., energy efficiency, demand response, distributed generation, energy storage and smart grid technologies) and district energy systems that can accelerate the achievement of California’s energy and climate goals and, eventually, further the achievement of water and other resource conservation objectives.

⁶⁵ Chula Vista Climate Action Plan 27-32.

Sustainable Land-Use Development & Urban Design

Transit-Oriented Development.⁶⁶ The City is undertaking a number of projects to facilitate the “smart growth” envisioned in its General Plan (GP) and Urban Core Specific Plan (UCSP) with respect to certain Transit Focus Areas. The GP and UCSP call for high-intensity, mixed-use and environmentally-sensitive development near transit sites that can substantially reduce carbon emissions through reduction in Vehicle Miles Traveled (VMT). Such compact, efficient and sustainable development will provide a mix of housing, service uses and public facilities close to transit and other modes of alternate transportation, allowing the ability to access uses by walking and/or transit.

Energy-Efficient Community Development.⁶⁷ The proposed SDG&E/Chula Vista Partnership contains an “Energy-Efficient Community Development” component. This initiative will build upon the current collaboration between the City of Chula Vista and SDG&E to demonstrate and develop methodologies for cost-effectively integrating energy-efficient and renewable energy technologies into large-scale development projects to increase energy savings and reduce GHG emissions.

This initiative aims to: (1) Develop and demonstrate new methods, tools, and practices to promote EECD in coordination with SDG&E’s energy efficiency and emerging technologies programs; (2) Conduct pilots and prepare case studies to demonstrate the value of EECD; (3) Increase the capacity of development practitioners in partnership with area universities and trade organizations, organizing “train the trainer” courses; and (4) Establish the “business case” of EECD to existing and new businesses in the City. Based on this research, demonstration and capacity-building, the partners will develop a set of model EECD site design standards and guidelines and practical evaluation tools for local planning officials; a model municipal EECD policy; and recommendations on appropriate modifications to municipal codes and other planning instruments.

⁶⁶ Chula Vista Climate Action Plan at 33-40.

⁶⁷ Chula Vista/SDG&E Proposed Partnership at 14-15.

Chula Vista effectuates initiatives that it adopts through modifications to the City’s building codes, land use policies, zoning ordinances and site design guidelines (for example, Air Quality Improvement Plan guidelines, Growth Management Ordinance, Design Manual and Guidelines, Municipal Code, Zoning Ordinance). Also, adopted programs and modifications are aligned with California Environmental Quality Act (CEQA) review requirements. Moreover, the City has included within its entitlement, permitting, and planning processes incentives for energy-efficient and renewable energy-based development.



Education, Marketing and Outreach⁶⁸

In support of its initiatives, Chula Vista has always strived to raise consumer and business awareness and spur participation through quite varied and creative Marketing, Education and Outreach (ME&O) activities. Its ME&O efforts have employed techniques such as, Integrated Marketing of products and services and Internet-Based Information dissemination, to create effective “demand pull” for its efficiency and renewable energy actions. The EmPower Chula Vista program is designed to complement San Diego’s Gas & Electric’s residential and commercial energy efficiency programs by providing trained City staff to engage and educate Chula Vista businesses, residents and contractors about energy-saving opportunities.

⁶⁸ Chula Vista/SDG&E Proposed Partnership at 10-13.

Chula Vista's staff conducts free energy efficiency and solar energy assessments for City businesses and residents using SDG&E's Energy Waves software and educates them on the utility's incentives for undertaking improvements. The City is broadening this program to help participants reduce energy usage by plug-load devices using a "Kill-A-Watt" device and to allow participants to monitor their energy consumption over a two-week period using a real-time energy monitor. Through the program's peer-to-peer efforts, the City conducts workshops to assist smaller South Bay communities pursue energy efficiency regulation, facility retrofit projects and community outreach campaigns.

8. Supporting Roles for Collaborating State & Regional Agencies



The State of California and the investor- and municipally-owned utilities have begun to play supportive roles to facilitate local communities as change agents in the state's strategy to achieve its climate and energy goals. This section of the guide outlines some of their initiatives and suggests others that they can engage to further advance this strategy.

LUSCAT's Long-Term Vision for Land Use Planning in California:

In its recommendations to CARB, the Land Use Subgroup of California's Climate Action Team (LUSCAT) outlined a vision for State policies on land use planning to advance the State's climate agenda.⁶⁹ The Subgroup advised that California's 2020 and 2050 climate goals will require the incorporation of GHG emission reduction strategies

into statewide long-term land-use planning. It also found that these goals would benefit from an integrated approach to land-use planning that aligns federal, state, regional and local growth management planning processes, methods and tools. LUSCAT recommended that GHG strategies be integrated into land-use planning in a manner that also supports and furthers the State's land-use, economic development, transportation, housing and resource planning goals.⁷⁰ Because it cross-cuts all sectors that use energy and seeks to shape fundamentally urban growth and development, sustainable community energy systems planning needs to be built into this framework and linked to all of these growth management planning processes.

Recognizing the large and long-term consequences that land use decisions can have on energy consumption and GHG emission levels, the Subgroup set out a vision of an integrated and aligned long-term land-use planning process that incorporates the following guiding principles:⁷¹

- **"Reducing GHG Emissions:** The State should strengthen and coordinate existing and potential planning strategies and processes to assist not only in reducing GHG emissions associated with land use decision making, but also in furthering co-benefits such as resource conservation, affordable housing, etc;
- **Comprehensive Yet Flexible Planning:** An integrated and comprehensive land use planning policy should be developed by the State to coordinate the goals and requirements of Federal, State, Regional and Local government agencies and be flexible enough to be responsive to the needs of each;
- **Coordination of Planning Efforts:** A statewide policy will facilitate the coordination of planning efforts at all governmental levels through information exchange, training, education and outreach to promote efficient use of existing planning resources and control costs of infrastructure extension and maintenance;

⁶⁹ LUSCAT Submission at 5.

⁷⁰ LUSCAT Submission at 6.

⁷¹ Id at 6-8.

- **Land Use Planning Incentives:** A coordinated statewide policy will address existing financial disincentives to GHG-related local and regional planning, recommend incentives, embrace life cycle costs and life cycle assessment in planning evaluations, and explore links with federal transportation and other funding;
- **Building Upon Existing Planning Models:** Integrated planning will build upon existing planning models for regional development as outlined in the “Regional Blueprint” project;
- **Inclusion of Utilities in Infrastructure Planning:** Comprehensive planning will address the distribution of water and power, including electricity generation, along with other future infrastructure needs; and
- **Planning Decision Impacts on Population Growth and Distribution:** The impacts of planning decisions on efficiently accommodating population growth and distribution will be addressed, including restrictive land use practices that limit infill and an adequate housing supply.”

These principles already are manifested in SB 375 which directs California communities to account for climate change impacts of development in regional planning efforts. California is the first in the nation to embrace comprehensive efforts to link land use planning, transportation and greenhouse gas emission reductions as a way to reduce Vehicle Miles Traveled (VMT).

While the LUSCAT recommendations to CARB primarily focus upon reducing GHG emissions from the transportation sector through smart growth and the development of transportation demand management and alternative mobility options, the Subgroup’s principles and recommended strategies create a framework in which sustainable community energy systems planning should be integrated to contribute to the State’s climate objectives.

Just as LUSCAT recognized that GHG emissions could be substantially reduced by using alternative energy and on-site generation for water and wastewater treatment,⁷² there is also the need to address the potential efficiencies and GHG emissions

reductions that could be captured by combining onsite-renewable generation and distributed energy resources with smart growth at the community level. Doing so would not only complement, but also enhance the LUSCAT long-term land use planning vision. At the same time, the institutionalization of sustainable community energy planning would be significantly advanced by being explicitly folded into this envisioned integrated land use planning process. Successful institutionalization of energy smart development requires support from both State programs and regional planning capabilities.

State Leadership:

Addressing Energy Planning in State-Wide Land Use Policies to Achieve GHG Emission Reductions:

While the California Constitution gives local governments the authority to make land use decisions within their municipal boundaries, the State’s legislature and Governors can ensure that State-wide policy objectives are also met by vesting various state agencies with influence over certain land use decisions.⁷³ Senate Bill 375 represents such a policy action.

As stated earlier, it aims to address the GHG impacts of land use decisions through a collaborative effort between CARB and regional and local governments, in which CARB sets regional GHG emission reduction targets and the regions develop with local governments “Sustainable Communities Strategies” to achieve the targets.

In addition, the State Attorney General has called upon local governments to use their CEQA compliance requirements to address GHG impacts and mitigation strategies of local development policies. The Governor’s Office of Planning and Research (OPR) already has identified a variety of ways to include energy considerations into overall land development planning in its General Plan

⁷² Id. at 43.

⁷³ Id. at 8. Local governments hold the majority of land use authority in California and express their legally enforceable policies through general plans and zoning codes that are required by the State. General Plans set forth objectives, principles, standards and proposals for development. State law requires these general plans to address land use, circulation, housing, open space, conservation, safety and noise. There is no requirement that a general plan include an energy element and only about 10 percent of California’s general plans include an energy component. See, 2007 IEPR at 268.

Guidelines and is revising State land use policy objectives to include GHG mitigation. In an update of its General Plan Guidelines and CEQA Guidelines, OPR will provide information about how to address climate change issues in general plans and CEQA evaluations through policies, objectives and implementation measures.⁷⁴

These developments open up an opportunity to garner State support for including sustainable community energy planning (and energy-efficient community development) as a vital component of the state-wide integrated land use planning strategies. This inclusion would significantly leverage smart growth to maximize energy savings and GHG emission reductions within communities and regional areas. In this regard, State support is critical for emphasizing the need for sustainable community energy planning in order to accelerate GHG and energy-efficient growth in a manner that furthers the State's land use policy objectives relating to transportation, housing, water conservation, natural resources protection, air quality and energy infrastructure.

Community energy infrastructure planning needs to be addressed as part of land use strategies for the energy sector (which currently focus principally upon utility-scale energy supply) and interrelated with the policy objectives for all of the sectors subject to growth management planning. Doing so would help to advance the distributed energy priorities set out in California's Energy Action Plan and Integrated Energy Policy Reports.

Sustainable community energy planning that guides the use and development of distributed energy resources within local land use processes can assure responsible resources management "that meets present needs without compromising the ability of future generations to meet their needs."⁷⁵ It is especially important that such energy planning be promoted by the Governor's Strategic Growth Council in its efforts to coordinate and support

sustainable infrastructure and development planning. Also, the OPR GHG Guidelines for CEQA, as well as for General Plans, should stress the benefits of sustainable local energy planning to holistically address and mitigate the cross-sectoral GHG impacts of land use development policies.

Promoting sustainable urban energy planning within the context of state-wide integrated land use planning strategies would provide meaningful direction to initiatives such as AB 811 and "Community Choice Aggregation."⁷⁶ In particular, placing the planning and development of community energy infrastructure within this larger context would, in turn, shape the manner in which these types of initiatives are undertaken and their effect on the development of clean and distributed energy resources within communities. Among other things, the inclusion would assure the incorporation of more strategically aligned energy and environmental goals and performance objectives in urban planning and economic development.

The systems approach taken in sustainable community energy planning matches the integrated approach to land use planning that California is seeking to take to mitigate the long-term risks that climate change poses in urban environments. In this regard, sustainable community energy planning would amplify the effects of smart growth strategies with respect to each of the sectors that land use decisions impact the most and in so doing would result in:

- expanding transportation choices;
- conserving green spaces and natural systems;
- improving air quality;

⁷⁴ Adopted 2008 IEPR Update at 119. See also, CEC Roadmap at 54.

⁷⁵ The text references the definition of sustainable development in, "Our Common Future," United Nation's World Commission on Environment and Development (1987). The Commission stated that long-term economic development would require "a change in the content of growth, to make it less material- and energy-intensive and more equitable in its impact."

⁷⁶ California Assembly Bill 117 (Migden, Chapter 838, Statutes of 2002). The purpose of the Community Choice Aggregation ("CCA") is to allow local governments to pool the electricity demand of their residents and businesses in order to lower prices and promote cleaner sources of power. This allows cities to have local control of electricity supply and energy efficiency programs, giving city councils decision-making power over resource planning and rate-setting.

- increasing the efficiency of water and wastewater management;
- furthering urban systems solutions that combine a mix of local renewable energy sources with community-based energy efficiency, smart grid, energy storage, CCHP, district energy or demand response capabilities to improve overall performance and efficiency, while lowering costs and environmental impacts; and
- promoting energy-efficient community and housing designs that advance transit-oriented development, encourage infill and mixed-use development, and reduce energy use and promote renewable energy integration into commercial, institutional and residential buildings.

By combining community energy planning with smart growth as the basis for integrated state-wide land use planning to address GHG emissions, the California State Government could not only provide better guidance on overall growth, but also on transportation and non-transportation infrastructure investments.⁷⁷ Inclusion of such planning within this integrated framework would provide the bridge necessary to connect community infrastructure development with efficient electric utility resource planning, a connection that could not be made with a focus solely upon smart growth development within the boundaries of a municipality or region. As a result, efforts to influence infrastructure and land use planning and development in support of the State's climate policies would not be limited to reducing or limiting the growth in vehicle trips or vehicle miles traveled.

Alignment of State Policies and Criteria Based on a "Shared Vision" with Regional and Local

Authorities: Linking sustainable community energy planning to the State's policy objectives for each of the sectors for which growth management planning is undertaken, would allow the State to create criteria for both energy smart and smart growth development within integrated state-wide land use strategies for attaining GHG emissions reductions. This, in turn, would provide a basis upon which the State could

⁷⁷ Also, the State could build upon the Governor's Strategic Growth Plan by requiring that all state financing for infrastructure incorporate energy use reduction strategies and climate considerations.

provide targeted financial and technical assistance through the direct and indirect ways in which its agencies affect growth and infrastructure development within California, consistent with the principles outlined in the LUSCAT's vision.

In light of California's climate and energy goals, it is important that the State provide overall direction and guidance to regional and local government agencies by adopting policies to address land use decisions directed at reducing GHG emissions. However, the State government should do so in a collaborative manner that preserves the authority of local governments to make the land use and local infrastructure decisions and that promotes partnerships with major stakeholders. In the case of SB 375, CARB is charged with defining regional GHG emission reduction targets for land use and transportation related GHGs, but regional and local authorities are given the flexibility to design sustainable community strategies to meet the targets.

California State agencies are "leading by example" in incorporating GHG emission reduction as a fundamental element of planning, designing, siting, developing and operating state-owned or leased facilities.⁷⁸ This is, for example, reflected in the Governor's Green Building Initiative.⁷⁹ Such leadership also needs to be directed at state-assisted infrastructure, land use planning and development to assure that GHG considerations are taken into account in appropriate fiscal, technical and regulatory land use programs, guidelines, standards and criteria.⁸⁰ As mentioned, these efforts should explicitly encourage energy smart development patterns and practices in combination with smart growth strategies.

⁷⁸ LUSCAT Submission at 55.

⁷⁹ Governor's Green Building Initiative (Executive Order S-20-04) requires that the state implement all cost effective energy conservation measures in its own buildings to reduce energy consumption by 20 percent by 2015. The CEC developed a report, "AB 2160 Green Building Report," setting forth findings and recommendations on financial and other project delivery mechanisms for promoting energy and resource-efficient projects in the state's own buildings. California Assembly Bill 2160 (Lieue, Chapter 742, Statutes of 2006) directed the CEC to submit the report to the Governor's Green Action Team.

⁸⁰ LUSCAT Submission. at 9.

As the LUSCAT recommended and as embodied in SB 375, the State should build upon existing planning models for regional development, such as strengthening and expanding the Regional Blueprint Planning process (discussed below) to improve land use and mobility planning and implementation.⁸¹ In particular, the State should include in this model an emphasis on sustainable community energy system development as an efficient and GHG-reducing way to improve land use and mobility planning and implementation.

As LUSCAT advised, the policies and programs that the State adopts should reflect both the responsibility that all government agencies (from federal to local to special districts) share for improving land use decision-making and a commitment to collaborate at all levels.⁸² This should be re-affirmed through the establishment of a State liaison entity and a cross-cutting advisory structure, in which representatives of local and regional authorities, and relevant local institutions and advocacy organizations, could participate to provide input to State agencies on the development of policies, incentives and market-based mechanisms.

Establishing these structures would enable a partnership process that could, in coordination with the Strategic Growth Council, OPR, the Business, Transportation and Housing Department, CARB and other agencies, examine ways to improve land use planning and growth management and offer recommendations to the Governor and Legislature.⁸³ Such a process could give consideration to requiring an energy element in General Plans, as well as elaborating on the energy content to be included in CEQA evaluations, Regional Housing Needs Plans, Urban Water Management Plans, Regional Transportation Plans and the like. This partnership process also would provide a means through which public and private stakeholders could identify barriers to efficient land use development and prioritize key policies and strategies that need to be addressed to meet regional targets. Furthermore, these mechanisms could provide a means for designing supportive measures for energy-efficient

and renewable-energy based community development, including establishing a municipal sustainable energy infrastructure fund. This mechanism would directly address several of the barriers identified earlier in this reference guide.

LUSCAT emphasized that State authorities need to work in partnership with stakeholders and representatives of regional and local governments in developing clear guidance in the form of guidelines, information, methodologies, and technical resources. It is vital that the necessary financial and technical assistance and training be provided to assure that the California planning community has the requisite tools, resources and capabilities to implement new climate-related land use policies issued by the State. Working closely with local and regional authorities and stakeholders, State agencies should design policies and programs that provide legal and technical assistance to guide decision-making and build capacity at all governmental levels, while again allowing for local implementation flexibility.⁸⁴

In particular, LUSCAT recognized that the State needs to standardize methodologies for measuring and estimating future expected GHG emissions within municipalities and regional areas.⁸⁵ The State should enlist local governments, such as Chula Vista, that have implemented successful climate, clean energy or sustainability plans to assist in the development of protocols for measuring emissions and accounting for reductions, as well as in the development of modeling tools to support emission quantification at the local level. Measurement tools should allow local governments to evaluate and compare the GHG emissions and energy savings of alternative land use planning decisions. It also will be important to establish procedures for certifying software tools to be used in quantifying emissions and energy savings.

Furthermore, LUSCAT urged the State to engage local and regional authorities in setting up a centralized information database of case studies and best practices for reducing GHG emissions, especially measures for reducing emissions from sources that are directly affected by local governments such as municipal operations and

⁸¹ Id. at 7.

⁸² Id. at 9.

⁸³ Id. at 10-11.

⁸⁴ Id. at 9.

⁸⁵ Id. at 10-11.

discretionary land use practices.⁸⁶ Data compilation, such as inventories of GHG emissions of regional areas, also will be necessary to track progress towards goals and to assess the effectiveness of measures implemented.⁸⁷

Expansion of Regional Blueprint Planning:

In developing a statewide land-use planning framework for furthering its climate objectives, California is keying into regional planning efforts throughout the State that have been enabled by a federal mandate for regional transportation planning, state devolution of transportation planning decisions to countywide authorities, and statewide mandates for regional fair-share housing needs allocations.⁸⁸ There is a clear recognition that isolated local smart growth initiatives would be insufficient for affecting sustainable regional form without complementary coordination and investment through regional growth planning. The CEC noted that an array of regional authorities in the most urbanized areas of California have been using these planning frameworks as a means of addressing smart growth and sustainability, spurred by fiscal constraints and the quality of life impacts of sprawling urbanization.⁸⁹

However, “energy” has only recently been addressed in such regional planning efforts as a result of California’s focus upon dealing with the risks of climate change. The San Diego Association of Governments (SANDAG) was the first to develop a “San Diego Regional Comprehensive Plan” (SDRCP) in which SANDAG treated energy as a fundamental component of its infrastructure strategy and set out targets for indigenous regional production, deployment of renewable energy resources, energy efficiency and imported supplies.⁹⁰ These targets were the product of an extensive public input process that resulted in a Regional Energy Strategy, a detailed “Energy Infrastructure Study” and, ultimately, the formation of an Energy Working Group through

SANDAG.⁹¹ Efforts like SANDAG’s and other Councils of Governments need to be drawn upon by State authorities, both with respect to developing integrated state-wide land use policies for addressing GHG emission reductions and expanding regional “Blueprint Planning” processes to go beyond a focus upon transportation and housing to also include community energy infrastructure.

The CEC has funded a partnership with SANDAG to develop model General Plan, Regional Comprehensive Plan and Regional Climate Plan materials, with a focus on transferability to other regional and local bodies. All of these model materials will incorporate energy and GHG emission considerations. Moreover, as LUSCAT pointed out, these plans can be developed in concert with long-term growth planning by using the available Blueprint database and planning outcomes as the baseline and future growth quantification.⁹² As LUSCAT stated, if planning is coordinated in this way, then energy cost, emissions and alternative scenario information will become a meaningful component of regional and local economic and environmental policy.⁹³

Indeed, Regional Blueprint Planning provides a means for coordinating multiple planning activities for more efficient and effective results.⁹⁴ Key goals of the State Blueprint Planning Program are to: (1) Foster a more efficient land use pattern that (a) supports improved mobility and reduced dependency on vehicle travel, (b) accommodates an adequate supply of housing for all incomes, (c) reduces impacts on valuable habitat, productive farmland and air quality, (d) increases resource use efficiency, and (e) results in safe and vibrant neighborhoods; and (2) Provide consumers more housing and transportation choices.⁹⁵

Blueprint plans are the joint product of Metropolitan Planning Organization (“MPO”) and local

⁸⁶ Id. at 54.

⁸⁷ Id. at 11.

⁸⁸ CEC Roadmap. at 56.

⁸⁹ CEC Roadmap. at 55.

⁹⁰ Id. at 56.

⁹¹ Id.

⁹² LUSCAT Submission. at 21.

⁹³ Id.

⁹⁴ Id.. at 23.

⁹⁵ Id. at 30.

government collaboration and feed into Regional Transportation Plans and Regional Housing Needs Plans.⁹⁶ The MPO, whose Board of Directors is comprised of elected officials from cities and counties, provides an ideal forum for consensus-building among regional agencies, local governments, State agencies and stakeholders and for marshalling funding to implement sustainable land use, transportation, housing and energy and resource plans.⁹⁷

LUSCAT recommended that the State invest in the Blueprint Planning program to serve as the analytical regional and local government backbone of the State's efforts to affect sustainable energy use and GHG emissions reductions across multiple sectors.⁹⁸ The Blueprint Planning program needs to be connected to a State liaison entity that could deliver various and interrelated planning services to regional and local governments including:

- mentoring planners, officials and modelers;
- training public and private planning professionals in the use of modeling and analytical tools and methods and land use planning and forecasting software;
- providing grant funding and oversight of the effectiveness of planning efforts;
- establishing on-line access to planning software and training and model Blueprint products;
- assisting regions in developing data collectives using standardized databases and models that allow for comparative analysis and that facilitate collaboration among municipalities within each region;
- establishing a mechanism for identifying appropriate private sector partners; and

- identifying technical and information gap areas for research and development, etc.⁹⁹

However, under current limitations, Blueprint Plans can only direct funding support to transportation-related activities.¹⁰⁰ There is also a lack of funding or alternative financing mechanisms to support the implementation activities of local governments to reduce GHG emissions, particularly related to infrastructure and transit. The State, therefore, should work with regional and local governments to broaden the scope of Blueprint Planning support and to develop funding mechanisms to support planning activities, plan implementation and community design evaluations that are not solely dependent on sales tax revenues, new development or transportation funds.¹⁰¹

Major metropolitan areas in California have been actively pursuing "Blueprint Planning" processes that encourage the type of land use development and transportation infrastructure that will improve air quality, reduce vehicle trips and trip lengths and provide more transportation and housing options.¹⁰² As a result of SB 375, MPOs are now working collaboratively with local governments to create regional visions for sustainable community development and then to map out strategies for attaining regional land use-related GHG targets. State-level policies and reforms need to enhance further these regional actions, both within the near-term as well as over the longer-term, by expressly fostering sustainable energy planning in combination with smart growth strategies as integral to addressing GHG emissions.

Within these new planning frameworks, partnerships need to be promoted between regional and local authorities and electric utilities (investment-owned utilities and municipal-owned utilities) and energy service providers. In particular, these partnerships need to be encouraged at the regional scale to

⁹⁶ Id.

⁹⁷ Id.

⁹⁸ Id.

⁹⁹ Id. at 59. The Blueprint Learning Network currently coordinates with state and regional agencies to share experiences and best practices in making better infrastructure investment decisions.

¹⁰⁰ Id. at 32.

¹⁰¹ LUSCAT Submission at 23.

¹⁰² LUSCAT Submission at 10.

increase understanding about the planning contexts for local municipalities and electricity planners, improve decision support tools, and link the use of these tools to both utility and community needs.¹⁰³ Sustainable community energy planning should be better aligned with long-term electric utility resource planning processes that are undertaken under the auspices of the CPUC and guided by the CEC's Integrated Energy Policy Report proceedings.¹⁰⁴ These Partnerships, which could be formed through Councils of Governments ("COGs"), could help to develop effective tools and methods for incorporating energy supply and demand and infrastructure analysis into existing regional housing, land use, water supply and wastewater, and transportation planning processes. These tools and methodologies are needed to integrate energy analyses of emerging alternative sustainability and resource planning efforts into existing regional growth planning frameworks and processes. Utilities and regional agencies also could partner on designing and funding regional community energy smart planning grants to public and private entities to support the integration of energy efficiency and renewable energy technologies into smart growth development in furtherance of regional planning objectives.

9. Conclusions & Recommendations

From the forgoing research, the authors offer five conclusions (provided in bold italic text below) and a set of recommendations for consideration by State, regional and local government agency development professionals and utility program managers.

California's climate & energy goals necessitate the use of sustainable community energy planning

These goals and strategies cannot be met cost-effectively without developing integrated energy solutions and innovative energy asset development and management strategies for increasing energy efficiency and renewable energy at the community level.

¹⁰³ 2007 IEPR.

¹⁰⁴ This recommendation is consistent with the longer-term objective stated in the CPUC 2008 EE Strategic Plan of investigating "the integration of utility infrastructure planning with potential community-based codes" at 71.

These strategies will require sustainable community energy planning to take into account the direct and embedded energy consumption and emissions impacts of land use and urban design in order to identify cost-effective opportunities for the development of community-based renewable and energy efficiency resources.

Policy, market and technology drivers are causing a "re-visioning" of the potential for energy efficiency and renewable energy across California's environmental and energy policies and programs and a "re-thinking about programmatic design and delivery.

There is a new focus upon local and regional government activism; community-scale energy efficiency and renewable energy; and land use planning, design and development, with the objective of developing all feasible, cost-effective and reliable energy efficiency, demand reduction and renewable energy resources locally and regionally in a way that works in harmony with larger power and fuels systems, while reducing fossil fuel use and climate change impacts.

Sustainable community energy planning is essential to California's efforts to transform the market, through integrated technical, market and policy design to bring about "zero net energy" results, while also furthering other resource planning objectives relating to air quality, water conservation, waste reduction and reuse, and transport and mobility.

Local governments need capacity & partnerships to pursue sustainable community energy planning

Local governments need to integrate sustainable community energy planning into their land use, growth management, transportation and economic development planning in order to identify strategic opportunities for community-based energy resource development and to plan, build and optimize, in an orderly and capital efficient manner, energy infrastructure that can deliver high quality, cost-competitive and reliable, and environmentally responsible energy services for all users.

Sustainable energy planning can provide a strategic vision for energy resource development and management and give holistic direction, guided by the "market pull" of future growth and energy

demand projections, to consensus-based strategies for closing the gap overtime between what exists and what is needed to attain urban sustainability.

Local governments need to establish a framework for energy planning in which community leaders, developers, utilities, and other market players can collaborate to optimize a community's future energy infrastructure and built-environment according to energy and resource efficient planning and design principles.

The establishment of an open and participatory framework for planning and collaboration will enable the evaluation and development of integrated energy solutions that: (1) Fit a local resource base; (2) Maximize economic value and minimize costs and environmental impacts; (3) Capitalize on advancements in renewable energy, energy efficiency and demand response, energy storage, smart grid integration, combined cooling, heating and power, and other technologies; (4) Can take advantage of competitive energy markets; and (5) Promise future integration and expansion towards sustainability.

Community design, land use and zoning planning that promote energy-efficient smart growth and the development of sustainable urban energy systems should be institutionalized in local government general plans and land use development processes.

Sustainable community energy planning needs to engage the participation of departments across a municipality's organizational structure. Effective planning, design and delivery of sustainable energy solutions will require: (1) Clearly delineated, transparent and participatory planning and coordination processes and mechanisms; (2) Well-defined organizational lines and departmental roles; (3) Specified staffing and resource allocation priorities; and (4) Established management and monitoring protocols.

State assistance is needed for developing more effective organizational and funding structures for energy planning activities within municipalities and for minimizing or removing public financial and fiscal barriers that impede effective efforts.

Sustainable energy planning can provide the institutional structure within which market-changing public-private partnerships, policies, and business and

financial models can be designed to overcome economic, market and procedural barriers to energy-efficient and renewable energy-based community development and to mobilize private investment in new and advanced technologies.

Community energy planning must be integrated into & aligned with growth management policies & planning

Sustainable energy planning combined with smart growth needs to be linked to growth management planning processes and incorporated into state-wide integrated land use policies to address and mitigate GHG emissions. State planning, financing, infrastructure and regulatory land use policies and programs should be aligned with the inclusion of sustainable energy planning and smart growth into regional and local growth management planning.

Sustainable energy planning needs to be promoted by the Governor's Strategic Growth Council and OPR needs to stress the benefits of such planning in its GHG Guidelines for CEQA and Guidelines for General Plans.

The State Government should provide overall direction and guidance on energy-efficient and GHG-reducing land use policies, but work in partnership with regional and local government representatives and stakeholders in developing the appropriate guidelines, information, methodologies and technical resources.

State agencies should design policies and programs that provide legal and technical assistance to guide decision-making and build capacity at all governmental levels, while allowing for local implementation flexibility.

The State should develop standardized methods for calculating GHG emissions and accounting for reductions.

General Plans should be required to include an Energy element. The State should expand its efforts to provide technical and financial assistance to regional agencies and local governments to facilitate climate-friendly and energy efficient planning and development.

The State should support financing mechanisms, such as a municipal sustainable energy infrastructure fund,

to advance energy-efficient and renewable energy-based community planning, design and development.

A partnership structure and processes should be established consisting of a State liaison entity and a cross-cutting advisory task force in which local and regional governmental representatives can participate to provide input to State agencies such as, the Strategic Growth Council, CARB, OPR, CEC, CPUC and others, on ways to improve land use planning and growth management and to make recommendations to the Governor and Legislature. This process is needed to identify barriers to efficient land use development and prioritize key policies and strategies needed to meet regional targets.

Regional Growth Management Planning needs to incorporate both GHG emissions and energy considerations. Regional Blueprint Planning should serve as the analytical and local government backbone of the State's efforts to affect sustainable energy use and GHG emissions reductions across multiple sectors. The Blueprint Planning program should be connected to a State liaison entity that delivers various and inter-related planning services to regional and local governments.

The scope of Blueprint Planning support needs to be broadened to encompass non-transportation related activities and funding mechanisms need to be developed to support planning activities, plan implementation and community design evaluations that are not solely dependent on sales tax revenues, new development or transportation funds.

The State needs to promote partnerships with utilities & energy service providers

Sustainable energy planning should be better aligned with long-term electric utility resource planning processes. The State needs to continue to promote partnerships between regional and local authorities and electric utilities and energy service providers. These partnerships are needed to develop effective tools and methods for incorporating energy supply and demand and infrastructure analyses into existing regional housing, land use, water supply and wastewater, and transportation planning processes. The partners can help to support the integration of alternative sustainability and resource planning efforts into existing regional growth planning frameworks.

There's a need for model cities, peer-exchanges & additional research to advance energy-efficient community development in California

The City of Chula Vista has developed transferable resources and replicable models to guide other local governments in undertaking sustainable energy planning with respect to: (1) Reducing energy consumption within their own facilities and operations; (2) Promoting efficient energy use and alternative resources in the private sector through judicious use of incentives, regulations and demonstration projects; and (3) Shaping local land use and development patterns to reduce per capita energy use and improve environmental quality. Cities like it can provide peer-to-peer guidance to others seeking to pursue energy-efficient community development.

Leading cities such as Chula Vista should, and are willing to play an active role in State processes for the development of protocols for measuring GHG emissions and accounting for reductions, and the development of modeling tools to support emissions quantification at the local level. Also, cities should work with the State in setting up a centralized information database of case studies and best practices for reducing GHG emissions.

Pilot demonstrations can demonstrate the tangible benefits of combining clean energy supply and advanced end-use and smart grid-enabling technologies with community design features, including reducing energy consumption, peak demand, and GHG emissions.

Research projects such as the CVRP help to build the capacity of local and regional authorities to: (1) Understand the environmental, economic and equity impacts of embedded energy costs and operational energy needs of urban infrastructure and urbanization; (2) Identify the local environmental, economic and equity benefits of sustainable energy planning, especially with respect to the private sector; (3) Develop information and materials that lead to a better understanding of planning options and the costs and benefits of alternative technologies, practices and development scenarios; and (4) Develop effective decision support tools and methods and performance metrics for community energy systems planning.

10. Practical Resources

California is fortunate to have a wealth of resources on hand to draw on as governments and utilities begin to launch their own programs to advance energy-efficient community development within their jurisdictions and service territories.

The resources compiled here include select examples of current municipal, county and utility incentives for green development at both the building and community scale; select profiles and links for EECD projects in California; and publications, papers, presentations and links to other valuable information.

County, Municipal & Utility Incentives

Chula Vista, California

The City of Chula Vista has established a Sustainability Center that provides users with information on all available green-building program guidelines, incentives and rebates as well updates on the initiatives of the City's Climate Change Working Group. The initiative includes activities designed to reduce the City's carbon footprint through:

- The strategic use of alternative fuels;
- A city-wide green building ordinance;
- Transit-oriented development projects;
- Free business energy efficiency and solar energy assessments;
- A solar energy and energy efficiency assistance program for commercial and residential property owners;
- An outdoor water quality conservation program that assists property owners in replacing turf with drought-resistant plants.

The city has also established policies and guidelines designed to mitigate the urban heat island effect through assistance programs for cool roofs and pavements and shade tree plantings.

For more information, visit their website at: www.chulavistaca.gov/City_Services/Development_Services/Planning_Building/SustainabilityCenter/default.asp

Marin County, California

Marin County has developed a website that provides users a comprehensive overview of all current and planned sustainable development programs in the county. The site lists their goals for greening public facilities and services, and community infrastructure, buildings, housing and transportation. The site also provides a regularly updated indicator of progress against the county's planned goals for each of these areas. As an example of the type of program incentives they provide developers/builders, their Residential Green Building Program offers the following:

- Free technical assistance, design consultation, resources and information;
- Fast-track building permit processing and waiver of the Title-24 energy review fee. This set of incentives is available only for projects that exceed Title-24 requirements by 20 percent OR those that install a solar electric/renewable energy system to meet 75 percent of electricity needs.

For more information, visit their website at:

<http://www.co.marin.ca.us/depts/CD/main/comdev/advance/Sustainability.cfm>

San Diego County, California

The County of San Diego has a Green Building Incentive Program designed to promote the use of resource efficient construction materials, water conservation and energy efficiency in new and remodeled residential and commercial buildings. As part of the program, the County will waive the fee for the building permit and plan check for a photovoltaic system. In addition, for qualifying resource conservation measures, the County will reduce building permit and plan check fees by 7.5 percent and grant expedited plan checks, saving approximately seven to 10 days on the project timeline.

For more information, visit their website at:

www.sdcountry.ca.gov/dplu/greenbuildings.html

Santa Monica, California

The Santa Monica Green Building Program awards grants to promote green building throughout the city. Grants for new private-sector buildings are based on the level of certification attained under the LEED standards and include the following:

LEED Certified - \$20,000

LEED Silver - \$25,000

LEED Gold - \$30,000

LEED Platinum - \$35,000

All commercial, multi-family residential, mixed-use and affordable housing new construction and renovation projects that register for LEED (LEED-NC) certification are eligible to apply.

For more information, visit their website at:
greenbuildings.santa-monica.org/

San Rafael, California

The City of San Rafael offers various incentives for residential projects that achieve at least a LEED “Gold” rating and residential projects that achieve at least 100 Green Points under the Build It Green’s GreenPoint Rating system. These include:

- Expedited building permit plan check (typically a two-week turnaround);
- A bronze plaque for building mounting, identifying the project as meeting the City’s Emerald Green Building level;
- A City Green Building logo for construction signage;
- Listing of the building on the City’s website;
- Reimbursement for the cost of the Green Point Rater services (max. limit of \$1,000).

For more information, visit their website at:
www.cityofsanrafael.org/Government/Community_Development/Planning/Green_Building.htm

Fresno, California

The City of Fresno offers different incentives for certified projects in its voluntary Green Building Program. These include:

- A 25 percent fee reduction of many planning fees;
- A 20 percent minor deviation from development standards, if needed (25 percent if public art is incorporated into the project);
- Expedited processing through the Green Team;
- Eligibility for a Fresno Green award and use of the Fresno Green brand for the project.

Developers have a choice of three different methods for becoming certified as a Fresno Green project:

1. Satisfy the requirements of one of the USGBC’s LEED Programs
2. Qualify for Build-It-Green’s GreenPoint rating system for residential building
3. Follow the Fresno Green checklists

For more information, visit their website at:
fresnogreen.net/pages/incentive.html

San Diego Gas & Electric – Sustainable Communities Program

The utility’s Sustainable Communities program is intended to encourage sustainable development, promote green building design practices and create a variety of demonstration sites to serve as models for similar projects in their service area. The program provides incentives for qualified projects that significantly exceed the Title-24, 2005 California Energy Efficiency Standards, that obtain LEED certification or the equivalent and that evaluate on-site renewable energy systems.

For multi-family residential projects, cash incentives are paid to building owners or to builder/developers. These incentives range from \$165 to \$220 per dwelling unit for residential projects, with a per project maximum of \$50,000. For nonresidential projects incentives range from \$0.10 to \$0.25 per annualized kWh saved and \$0.34 to \$1.00 per annualized therm saved with an additional 20 percent incentive available for projects that exceed Title-24 by 20 percent, achieve LEED rating (or its

equivalent) and complete an on-site renewable energy assessment. The maximum incentive for a nonresidential project is \$150,000. Additional incentives are also available for design teams on nonresidential projects.

For more information, visit their website at:
www.sdge.com/environment/sustainablecommunities/aboutSustainable.shtml

Model Community Development Projects in California

Village Homes

Davis, California

Developers: Michael Corbett and Town Planners

Website: www.villagehomesdavis.org

The earliest example of an energy-efficient community development dates back to 1973 and is known as the Village Homes project in the City of Davis, Calif. A mixed-use residential and commercial development on a 68-acre site, the project consists of 220-detached, single-family homes and 20 apartments; a commercial office complex and a community center all featuring passive solar design and construction, solar hot water heaters and natural cooling systems. The site also includes narrow, tree-lined streets that reduce the urban heat island effect, natural stormwater control features, a communal garden and a plan that promotes walking and biking

The 1,000 residents of Village Homes consume 36 percent less energy for vehicular driving, 47 percent less electricity and 31 percent less natural gas than residents of a conventional housing development and they enjoy ambient air temperatures that are 10 percent cooler than surrounding neighborhoods. Village Homes continues to inspire enlightened sustainable community planning across the country.

Terramor Village at Ladera Ranch

Orange County, California

Developer: Rancho Mission Viejo, LLC

Website: www.laderaranch.com

Located within the 4,000-acre Ladera Ranch in Orange County, Calif., Terramor Village is home to 1,258 residents who reside in single-family homes

and condominiums featuring solar photovoltaics, *EnergyStar* appliances, energy-efficient indoor lighting, low-voltage outdoor lighting, drip irrigation systems, low-flow toilets, formaldehyde-free insulation and low-VOC wall and floor coverings. The site also features drought-resistant plantings and an accessible, pedestrian- and biker-friendly circulation plan that knit together its 12 neighborhoods.

Otay Ranch

Chula Vista, California

Developers: Pacific Coast Communities, Oakwood Development, Rimrock Communities, The Sunrise Company, Kane Development, The Corky McMillin Companies, HomeFed/Otay Land Company, Otay Ranch Company

Website: www.otayranch.com

This 5,300-acre site is located on the eastern half of the City of Chula Vista and just west of the U.S. Olympic Team's warm-weather training facility. The Ranch is designed around most smart growth principles and features a network of pedestrian, bike and hiking trails along with a green *paseo* system that knits together its many planned communities. All of its communities also feature community clubhouses and recreational amenities.

The Ranch will be served by a light-rail transit corridor and will contain a large, transit-oriented mixed-use urban center featuring energy-efficient residential, civic and commercial retail and office buildings. A district cooling system is being considered for the urban center that will be bordered by a shared university campus. Residents will have a choice of a wide variety of energy-efficient housing options all within walking distance of elementary, middle schools and high schools.

Mountain House

Mountain House, California

Developer: Trimark Communities, LLC

Website: www.mountainhouse.net

Mountain House is designed as a self-sufficient master-planned community that will house 43,500 residents upon its completion in 2025. The 4,800-acre community, located in the San Francisco Bay area, features a smart growth development plan consisting of 12 five-acre villages of single-family and multi-

family structures clustered around a mixed-use commercial core. All structures feature energy-efficient appliances and envelope improvements, and all villages are linked together by walking and biking trails.

The development was designed to provide residents access to employment, education, shopping, parks and recreational amenities all within walking distance or a short drive, thereby reducing vehicle miles traveled by approximately 40 percent. The community also features a separate commercial and industrial area to provide nearby employment opportunities.

RiverPark

Oxnard, California
RiverPark Development, LLC
Website: www.riverparklife.com

RiverPark is a 702-acre planned community development that will feature 1,800 single-family detached homes and 1,000 rental townhomes and apartments surrounding a 2.5- million square-foot commercial complex consisting of a convention center, shops, restaurants and an open farmer's market. Home builders are including a variety of energy-efficient building envelope enhancements, domestic hot water systems and advanced space conditioning and lighting controls.

Sonoma Mountain Village

Rohnert Park, California
Developer: Coddington Enterprises
Website: www.sonomamountainvillage.com

The 200-acre Sonoma Mountain Village is designed as a mixed-use sustainable community designed around smart growth, smart code and new urban design principles. It's targeting a platinum certification under the U.S. Green Building Council's LEED-ND pilot program. The Village consists of 1,900 homes in a variety of energy-efficient housing types, surrounding a central urban square containing a community civic center and an assortment of retail, dining and entertainment options.

The Sonoma Mountain Business Cluster will offer employment to 3,000 residents and will consist primarily of sustainable technology start-up firms and a steel-frame company operating on reused materials. The majority of the community's commercial core is

now powered by a \$7.5 million solar energy system that produces 1.14 megawatts of electricity for commercial tenants. The system is comprised of 5,845 photovoltaic panels all mounted on one roof.

Recreational and education amenities will include an international all-weather soccer field, a fitness center, a lifelong learning center, and access to Sonoma State University located within one mile of the community. It is designed so that all residents will be within a five-minute walk of parks and recreational amenities and within walking distance to shopping and transit corridors. Neighborhoods are linked by walking and hiking trails.

Additional profiles for energy-efficient, sustainable community development projects around the nation and the World can be found in the Urban Land Institute's "Development Case Studies" at www.casestudies.uli.org/.

For a listing of California developers, production builders and housing developments featuring solar energy technologies visit Environment California at: www.environmentcalifornia.org/energy/million-solar-roofs/solar-home-developments

Publications, Papers & Presentations

Although energy-efficient community development is only now emerging as a new field of inquiry among California state research and regulatory organizations, a number of related reference publications, papers, presentations and websites are now available that contain valuable resources on the subject. A select number of these are presented below.

Advanced Building & District Energy Technologies

Building Load Profiles and Optimal CHP Systems.

2002. Czachorski, M., W. Ryan, J. Kelly, presented at ASHRAE Summer Meeting, Honolulu, Hawaii,

Commercial Buildings Energy Consumption Survey.

1999. Energy Information Administration.
U.S. Department of Energy

Community - District Energy Systems: Preliminary Planning & Design Standards.

2007. Newman, D., National Energy Center for Sustainable Communities and the International District Energy Association. Available at:

http://www.necsc.us/docs/CommunityDistrictEnergy_Systems.pdf

Comparing Economics of Various Methods of Improving Energy Efficiency of Commercial Buildings.

Czachorski, M., T. Kingston, J. Wurm. Presented at CLIMA 2007 Congress, June 10-14 2007, Helsinki, Finland.

Economics of CHP Systems.

Czachorski, M., Presented at 4th Conference of International Building Performance Simulation Association - Czech Republic, IBPSA-CZ, Praha, Czech Republic November 7, 2006.

Economics of Commercial Building Cogeneration and Desiccant Technology Combinations.

Czachorski, M., J. Wurm. Presented at 14th International Conference VYKUROVANIE Tatranske Matliare, Czech Republic, March 6 - 10, 2006

Economics of Installing Desiccant Dehumidifier in Commercial Buildings Application of Cooling Heating and Power Generation Systems.

2005. Czachorski, M. Presented at ASHRAE Summer Meeting, Denver, Colorado. 2005.

Evaluation of Commercial Markets for Building Cooling Heating and Power Applications in the

U.S. Czachorski M., E. Ryan, J. Wurm. Paper presented at Konferenc Simulace Budov a Techniky Prostredí; II. Národní Konferenc IBPSA-CZ ; Prague, Czech Republic. 2002.

Evaluating Active Desiccant Systems for Ventilating Commercial Buildings.

2000. L. Harriman, M. Witte, M. Czachorski, D. Kosar, Published in ASHRAE Journal.

Improving the Economy of Ventilation in Commercial Buildings.

2004. Czachorski, M., J. Wurm. VVI Magazine, No. 3, Vol. 13, Published (in Czech) by the Society for Environmental Technology, Novotného Lávk 5, 11668 Prague 1, Czech Republic.

Large District Energy Systems.

Contained in Sustainable Urbanism: Urban Design With Nature. Page 199. 2008. Newman, D., R. Thornton, J. Kelly - authors. D Farr – editor. John Wiley & Sons, Inc. Available at:

<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471475815.html>

Simulation and Evaluation of Markets for Building Cooling Heating and Power Applications in the U.S.

Czachorski M., J. Wurm. Paper presented at Eight International IBPSA Conference – Building Simulation 2003 for Better Design; Eindhoven, Netherlands.

Community Planning, Design & Development Policies

A Renewable Energy Community: Key Elements.

2008. N. Carlisle, J. Elling, and T. Penney, National Renewable Energy Laboratory. A reinvented community to meet untapped customer needs for shelter and transportation with minimal environmental impacts, stable energy costs, and a sense of belonging. Available at:

http://www.nrel.gov/applying_technologies/pdfs/42774.pdf

Assessment of Local Models and Tools for Analyzing Smart-Growth Strategies.

2007. Loudon, William et al. Prepared for the State of California Business, Transportation and Housing Agency, and the California Department of Transportation by DKS Associates and the University of California, Irvine

Blueprint for Urban Sustainability: Integrating Sustainable Energy Practices into Metropolitan

- Planning*. Containing the winning entries from the U.S. Competition on Metropolitan Energy Design. 2003. Gas Technology Institute. Available at: http://www.necsc.us/docs/Blueprint_Urban_Sustainability.pdf
- Characterizing the Fabric of the Urban Environment: A Case Study of Greater Houston, Texas*. 2003. Rose, L.S., H. Akbari, and H. Taha. Lawrence Berkeley National Laboratory Report LBNL-51448
- Chicago's Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project*. 1994. McPherson, Gregory, David Nowak and Rowan Rowntree. eds. Gen. Tech. Rep. NE-186. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station.
- City Green: Calculating the Value of Nature: Technical Manual*. 2004. Western Climate Initiative - Western Governors' Association. <http://www.westernclimateinitiative.org/AmericanForests>
- Commuting in Transit Versus Automobile Neighborhoods*. 1997. Cervero, R. and K. Kockelman. Journal of the American Planning Association, Vol. 61, pp. 210-225.
- Cool Roof Design Brief*. Pacific Gas & Electric. www.pge.com/includes/docs/pdfs/shared/saveenergymoney/rebates/remodeling/coolroof/coolroofdesignbrief.pdf
- Costs of Sprawl*. 2002. Burchell, R.W., Lowenstein, G., Dolphin, W.R., Galley, C.C., Downs, A., Seskin, S., Still, K.G., and Moore, T. Transit Cooperative Research Program, Transportation Research Board, National Research Council Report. Washington DC: National Academy Press.
- Directory of Eco-villages in Europe* (Book Review—Reviews the book 'Directory of Eco-villages in Europe'). 1999, Christensen K: Utopian Studies; Vol. 10 Issue 1, p160, 6p.
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Helpful Organizations & Sites

- American Council for an Energy-Efficient Economy
www.aceee.org
- American Planning Association
www.planning.org
- California Center for Sustainable Energy
www.sdreo.org
- California Environmental Protection Agency – Air Resources Board
www.arb.ca.gov/homepage.htm
- California Integrated Waste Management Board Green Building Program
www.ciwmb.ca.gov/GreenBuilding/
- City of Berkeley, Energy and Sustainable Development
www.ci.berkeley.ca.us/SubUnitHome.aspx?id=15404
- City of Chula Vista – Sustainability Center
http://www.chulavistaca.gov/City_Services/Development_Services/Planning_Building/SustainabilityCenter/default.asp
- City of Oakland Environmental Services Division Green Building Resource Center
www.oaklandpw.com/page273.aspx
- City of San Jose, Mayor Reed's Green Vision for San Jose
www.sanjoseca.gov/mayor/goals/environment/GreenVision/GreenVision.asp
- City of San Francisco Green Building Program
www.sfenvironment.org/our_programs/topics.html?ssi=8&ti=19
- City of Santa Monica, Residential Green Building Program
<http://greenbuildings.santamonica.org/mainpages/whatsnew.htm>
- City of Santa Monica Sustainable City Plan
www01.smgov.net/epd/scpl/
- Congress for New Urbanism
www.cnu.org
- County of Marin, Countywide Plan
www.co.marin.ca.us/depts/CD/main/comdev/ADVANCE/cwp/index.cfm
- Global Energy Network for Sustainable Communities
www.globalenergynetwork.org
- National Energy Center for Sustainable Communities
www.necsc.us
- Renewable Energy and Energy Efficiency Partnership
www.reeep.org
- Santa Barbara County, Innovating Building Review Committee
www.sbcountyplanning.org/projects/ibrp/index.cfm
- Smart Communities Network – National Center for Appropriate Technologies
www.smartcommunities.ncat.org
- Smart Code Central
www.smartcodecentral.org

- Urban Land Institute
www.uli.org
- U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy
www.eere.energy.gov
- U.S. Department of Housing and Urban Development – Energy Efficient Mortgage Program
www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm
- U.S. Green Building Council – LEED-ND
www.usgbc.org/DisplayPage.aspx?CMSPageID=148
- U.S. Environmental Protection Agency – Smart Growth Website
www.epa.gov/smartgrowth



Acronym	Definition
BAU	Business-As-Usual, or a conventional approach to development
CBIA	California Building Industry Association
CCHP	Combined Cooling Heat and Power technology
CEC	California Energy Commission
CPUC	California Public Utility Commission
CARB	California Air Resources Board
CO₂	Carbon Dioxide
CVRP	Chula Vista Research Project
DG	Distributed Generation technologies
DR	Demand Response
EE	Energy Efficiency
EECD	Energy-Efficient Community Development
EE-PB	Energy Efficiency and Photovoltaic technology option
EE-DG	Energy Efficiency and Distributed Generation technology option
EEM	Energy-Efficient Mortgage
ET&CD	Energy Technology and Community Design options
GHG	Greenhouse Gas emissions
HVAC	Heating, Ventilation and Air Conditioning equipment
kWh	Kilowatt hours
LEED	Leadership in Energy and Environmental Design
LEM	Location-Efficient Mortgage
ROI	Return-On-Investment
SANDAG	San Diego Association of Governments
SBTC	Sustainable Buildings Tax Credit
SDG&E	San Diego Gas and Electric
SDSU	San Diego State University
T-24	California's Title-24 building energy efficiency standard, 2005
UHI	Urban Heat Island effect
USDOE	US Department of Energy
USEPA	US Environmental Protection Agency
VMT	Vehicle Miles Traveled
ZNE	Zero Net Energy



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