

## COLLOQUIUM ARTICLES

# RESHAPING MUNICIPAL AND COUNTY LAWS TO FOSTER GREEN BUILDING, ENERGY EFFICIENCY, AND RENEWABLE ENERGY

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### INTRODUCTION

Al Gore, former Vice President and global warming activist, was blocked from installing solar panels on his home. Local code requirements simply did not permit it. It took months to amend the local code, which was based on considerations unrelated to solar power, so that he could proceed.<sup>1</sup> This example is not an isolated case but rather illustrates the effort necessary to examine and amend local U.S. laws to address current realities. Motivated by concerns about global warming, energy independence, energy reliability, public health, and quality of life issues, communities throughout the country are beginning to develop responses.

ICLEI (formerly the International Council for Local Environmental Initiatives) has proposed an effective framework

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<sup>1</sup> See *infra* note 143 and accompanying text.

for local governmental action. It requires conducting a baseline emissions inventory and forecast, adopting an emissions reduction target, developing a local action plan, implementing policies and measures, and monitoring and verifying results.<sup>2</sup> The principal areas of opportunity for community reductions of greenhouse gases (GHG) generally center on buildings, renewable energy, waste reduction, transportation, infrastructure, purchasing, land use, water conservation, and education and outreach. The field is evolving rapidly and there are literally hundreds of possible solutions that cut across many areas of community activity that can contribute to the effort. There is simply no silver bullet to correct global warming. A variety of online tool boxes are being developed for municipalities to guide them in their efforts and provide concrete examples of what is being done by individual communities.<sup>3</sup>

This paper will argue that local governments can have a positive impact on global warming by utilizing measures to foster green buildings, energy efficiency, and renewable energy use in government operations and by the general population.<sup>4</sup> Section I

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<sup>2</sup> ICLEI US: How it Works, <http://www.iclei.org/index.php?id=1120#milestones> (last visited Nov. 12, 2007).

<sup>3</sup> EPA, Climate Change—State and Local Governments, <http://www.epa.gov/climatechange/wycd/stateandlocalgov/index.html> (last visited Sept. 10, 2007); THE UNITED STATES CONFERENCE OF MAYORS, ENERGY AND ENVIRONMENT BEST PRACTICES GUIDE (2007), available at [http://usmayors.org/uscm/best\\_practices/EandEBP07.pdf](http://usmayors.org/uscm/best_practices/EandEBP07.pdf); ICLEI, U.S. MAYORS' CLIMATE PROTECTION AGREEMENT, CLIMATE ACTION HANDBOOK (2006), available at [http://www.coolmayors.com/photos/news/Climate\\_Action\\_Handbook-0906.pdf](http://www.coolmayors.com/photos/news/Climate_Action_Handbook-0906.pdf); NATURAL CAPITALISM SOLUTIONS, CLIMATE PROTECTION MANUAL FOR CITIES, [http://www.climatemanual.org/Cities/downloads/ClimateProtectionManual\\_Cities.pdf](http://www.climatemanual.org/Cities/downloads/ClimateProtectionManual_Cities.pdf); Database of State Incentives for Renewables and Efficiency, <http://www.dsireusa.org/> (last visited Nov. 12, 2007); Clean Air-Cool Planet, Community Climate Solutions [http://www.cleanaircoolplanet.org/for\\_communities/toolkit\\_home.php](http://www.cleanaircoolplanet.org/for_communities/toolkit_home.php) (last visited Aug. 31, 2007). A myriad of other resources are available on the web. As many local governments have limited staff resources to hunt through the many websites and sources, efforts are continuing to develop a single easy-to-access website, a one stop shop, where municipalities can readily access all of the information they need to take action. A more recent website is being developed which may serve to fulfill that need. See Cool Mayors for Climate Protection, <http://www.coolmayors.org/> (last visited Nov. 12, 2007).

<sup>4</sup> There are a host of federal, state, and local monetary incentives, both tax incentives and direct subsidies, and technical assistance and educational programs, which, while critical to progress in this area, are beyond the scope of this article. In addition, local governments can ensure significant GHG reductions through such crucial measures as land use planning that supports

will explain why action at the local level is necessary. Section II will provide a general overview of the organizational structures that have been developed to assist local governments in this effort. Section III will review illustrative measures that have been taken at the local level to promote green building. Section IV will focus on measures to increase energy efficiency. Section V will describe mechanisms employed to foster development of renewable energy. Section VI will address planning for adaptation. Section VII will present the opportunity afforded by comprehensive plans. Section VIII will describe some tools that have been developed to fund local efforts in this arena.

### I. MUNICIPAL ACTION IS ESSENTIAL

“Think globally, act locally” may be a hackneyed phrase but it still resonates as a truth. Actions taken by local governments can provide an important step towards conquering global warming and provide a necessary supplement to any federal or state measures. Municipalities can have a substantial impact just by changing their own operations. They own and control thousands and thousands of buildings, vehicle fleets, and energy intensive infrastructure facilities. They are in the best position to educate and inspire local providers of services that impact GHG emissions and to influence the institutions and people in their community. Many states are home rule states, which give almost complete control over land use, including zoning and building permits, to their local governments. Municipalities and local governments are central to the effort to reduce global warming as they can require the reduction of vehicle miles traveled, encourage better site design, and commission more efficient buildings. Municipalities, acting as a group, are an influential lobbying voice, and can be instrumental in garnering support for needed legislation at the federal and state level. Finally, it is unclear when federal legislation on GHG will

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transit oriented development, storm water retention, and open space preservation (often referred to as “smart growth”), as well as through waste reduction measures like pay-as-you-throw programs and improved recycling programs, transportation purchasing decisions that favor such lower emission products as hybrid vehicles and biofuels, mandates that reduce automobile trips like limitations on parking spaces or requisite trip reduction amenities in new developments, and gray water systems and low impact development requirements to reduce water usage. These are very important areas but to treat them adequately would require extensive discussion and so are also beyond the scope of this article.

be passed or how it will be framed, making progress by local governments all the more important. Time is short to curb GHG emissions and the more responsive and speedy action available at the local governmental level can serve to fill the gap in the federal and state response.

The importance of municipal action is apparent as one examines where opportunities for reducing emissions lie. In a very well received paper, Professors Pacala and Socolow presented the concept of “stabilization wedges.”<sup>5</sup> The paper recognizes that there is no single solution to reverse or arrest global warming but that by utilizing a portfolio of currently known technologies, emissions can be reduced and the concentration level of atmospheric CO<sub>2</sub> stabilized. Fifteen wedges, each representing a strategy in the action portfolio, are identified. Pacala and Socolow argue that successfully implementing just seven of the wedges would be sufficient for stabilization under a business as usual scenario. Several of the wedges identified are areas in which municipalities can have a substantial impact. These wedges include energy efficient buildings, wind power and solar power, reduced use of vehicles, efficient vehicles, and use of biofuels. Indeed, the paper identifies improvements in efficiency and conservation as offering the “greatest potential to provide wedges.”<sup>6</sup>

In 2007, the American Solar Energy Society conducted a study to explore how the wedges could be filled, and concluded that “[e]nergy efficiency and renewable energy technologies have the potential to provide most, if not all, of the U.S. carbon emissions reductions that will be needed to help limit the atmospheric concentration of carbon dioxide to 450 to 500 ppm.”<sup>7</sup> Local governments, acting to promote these wedges, can make a significant contribution to meeting this carbon dioxide concentration goal which the scientists have advised must be met

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<sup>5</sup> Stephen Pacala & Robert Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCI. 968, 968 (2004).

<sup>6</sup> *Id.*

<sup>7</sup> AMERICAN SOLAR ENERGY SOCIETY, TACKLING CLIMATE CHANGE IN THE U.S. (2007), available at [http://www.ases.org/climatechange/climate\\_change.pdf](http://www.ases.org/climatechange/climate_change.pdf); see also WORLDWATCH INSTITUTE & CENTER FOR AMERICAN PROGRESS, AMERICAN ENERGY: THE RENEWABLE PATH TO ENERGY SECURITY 19-21(2006), available at <http://images1.americanprogress.org/il80web20037/americanenergynow/AmericanEnergy.pdf>.

by 2050 in order to avoid the worst case scenarios of climate change impacts.<sup>8</sup>

As concern about cost is always an important consideration for new governmental policies, the economics of addressing global warming must be considered. In a seminal work, Sir Nicholas Stern concluded that if one factored in all of the policies and programs necessary to curb emissions, the world's economic growth rate would be reduced by about 1% point a year but that a failure to take action could cut GDP growth rates by at least 5% and as much as 20% a year.<sup>9</sup> This global analysis certainly suggests that immediate and widespread action should be taken. A similar analysis at the local level is even more compelling as many local action steps have no cost, serve to enable others to expend sums voluntarily on environmentally preferable behavior, or quickly pay for themselves. Moreover, measures taken to address global warming galvanize local economic development as new businesses take shape and energy dollars stay in the community.<sup>10</sup> It is government's responsibility to ensure that policies are adopted now to assure a healthy, safe, and sustainable future for generations to come, a responsibility that requires government to take a long term view of all aspects of the issue including the economics.

## II. LOCAL GOVERNMENTS ORGANIZE TO MAKE COMMITMENTS AND DEVELOP TOOLS

Faced with the failure of the federal government to ratify the Kyoto Protocol, local governmental entities in the U.S. became a vigorous force in moving the country towards compliance with the Protocol's requirements. Action has taken various forms including joining the U.S. Mayors' Climate Protection Agreement (Mayors' Agreement), which was launched by Mayor Nickels of Seattle,

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<sup>8</sup> R.K. Pachauri, Chairman, Intergovernmental Panel on Climate Change, Presentation at the United Nations of the IPCC Fourth Assessment Working Group Reports: Key Findings (Sept. 24, 2007), available at [http://www.ipcc.ch/UN\\_NYC\\_24thSep2007.ppt](http://www.ipcc.ch/UN_NYC_24thSep2007.ppt).

<sup>9</sup> SIR NICHOLAS STERN, STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE vi (2007), available at [http://www.hm-treasury.gov.uk/media/3/2/Summary\\_of\\_Conclusions.pdf](http://www.hm-treasury.gov.uk/media/3/2/Summary_of_Conclusions.pdf).

<sup>10</sup> Byron Kennard & Scott Hauge, *Global Warming on Main Street*, BUSINESS WEEK ONLINE, June 27, 2006, [http://www.businessweek.com/smallbiz/content/jun2006/sb20060626\\_603752.htm](http://www.businessweek.com/smallbiz/content/jun2006/sb20060626_603752.htm).

Washington the day the Kyoto Protocol went into effect. The goal was to have mayors sign on and commit to meet or beat in their own communities the Kyoto Protocol targets.<sup>11</sup> As of October 2007, over 650 U.S. mayors representing over 74 million people from every state in the union and governed by leaders from every political party have joined the Mayors' Agreement, and membership is expanding at an accelerating pace.<sup>12</sup>

The initiative was endorsed in 2005 by the U.S. Conference of Mayors (the Mayors' Conference), the official nonpartisan organization of over 1,000 cities with populations of over 30,000. All members were urged to sign on.<sup>13</sup> The Mayors' Conference formed a Mayors Climate Protection Center with the goal of providing mayors the knowledge and tools they need to carry out their mission.<sup>14</sup>

Counties have also begun to act. The National Association of Counties (NACo) is a national organization that represents county governments in the United States.<sup>15</sup> Over 2,000 counties belong to NACo, comprising more than 80% of the U.S. population.<sup>16</sup> In March of 2007, the NACo Board of Directors adopted a resolution to "provide leadership in the education, discussion, evaluation, and decision making processes regarding issues of global climate change affecting counties."<sup>17</sup> NACo established a County Climate Protection Program to support work in this area by providing

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<sup>11</sup> Seattle Mayor Nickels, Office of the Mayor, U.S. Mayors Climate Protection Agreement, <http://www.seattle.gov/mayor/climate/> (last visited Nov. 12, 2007); Letter from Greg Nickels, Mayor of Seattle et al., to various US Mayors (Mar. 30, 2005), *available at* [http://www.seattle.gov/mayor/climate/PDF/USCM\\_6-page\\_Climate\\_Mailing\\_ALL.pdf](http://www.seattle.gov/mayor/climate/PDF/USCM_6-page_Climate_Mailing_ALL.pdf).

<sup>12</sup> Mayors Climate Protection Center, Participating Cities, <http://usmayors.org/climateprotection/listofcities.asp> (last visited Nov. 12, 2007).

<sup>13</sup> U.S. Conf. of Mayors, 2005 Adopted Resolutions: Environment, Endorsing the U.S. Mayors Climate Protection Agreement, *available at* [http://usmayors.org/uscm/resolutions/73rd\\_conference/en\\_01.asp](http://usmayors.org/uscm/resolutions/73rd_conference/en_01.asp).

<sup>14</sup> Mayors Climate Protection Center: About the Center, <http://usmayors.org/climateprotection/about.htm> (last visited Nov. 12, 2007).

<sup>15</sup> National Association of Counties, About NACo, [http://www.naco.org/Template.cfm?Section=About\\_NACo](http://www.naco.org/Template.cfm?Section=About_NACo) (last visited Nov. 12, 2007).

<sup>16</sup> *Id.*

<sup>17</sup> Press Release, National Association of Counties, NACo Adopts Global Warming Policy at Conference, (Mar. 5 2007), *available at* [http://www.naco.org/Template.cfm?Section=Media\\_Center&template=/ContentManagement/ContentDisplay.cfm&ContentID=22852](http://www.naco.org/Template.cfm?Section=Media_Center&template=/ContentManagement/ContentDisplay.cfm&ContentID=22852).

counties with best practices, tools and resources.<sup>18</sup>

Joining in another important program, hundreds of local governments in the U.S., both counties and municipalities, collaborate with ICLEI in its Cities for Climate Protection program.<sup>19</sup> As the international sustainable development and environmental agency for local governments, ICLEI provides information, delivers training, organizes conferences, facilitates networking and city-to-city exchanges, carries out research and pilot projects, and offers technical services and consultancy.<sup>20</sup> The Mayors' Conference is partnering with ICLEI to reduce GHG emissions.<sup>21</sup>

Substantial progress has already been made by municipalities that have embarked on this effort. 134 participating cities responded to a survey conducted by the Mayors' Conference.<sup>22</sup> The survey revealed, in response to questions as to what they had already implemented or were planning to implement in the following year, that (i) 72% use vehicles that run on alternative fuels or hybrid/electric technology, (ii) more than 80% use renewable energy, (iii) 97% use more efficient lighting, (iv) nearly 90% require, or anticipate requiring in the next year, that new city buildings be energy efficient and sustainable, (v) more than 75% are undertaking measures to encourage the private sector to construct energy efficient sustainable buildings, (vi) 66% are changing their building codes to assure such construction, and (vii) 66% have individuals on staff responsible for climate protection activities.<sup>23</sup> Significantly, the public welcomed the cities' efforts with 83% of the cities reporting that their public was favorable to

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<sup>18</sup> Kelly Zonderwyk, NACo Launches County Climate Protection Program, <http://www.naco.org/Template.cfm?Section=Publications&template=/ContentManagement/ContentDisplay.cfm&ContentID=24200> (last visited Nov. 12, 2007).

<sup>19</sup> ICLEI U.S.: Cities for Climate Protection FAQs, <http://www.iclei.org/index.php?id=405#4> (last visited Nov. 12, 2007).

<sup>20</sup> ICLEI Global Services, <http://www.iclei.org/index.php?id=global-services> (last visited Nov. 12, 2007).

<sup>21</sup> Brett Rosenberg, *Mayors Implement Local Solutions to Global Climate Change*, U.S. MAYOR'S ARTICLES, May 22, 2006, [http://www.usmayors.org/uscm/us\\_mayor\\_newspaper/documents/05\\_22\\_06/energyImplement.asp](http://www.usmayors.org/uscm/us_mayor_newspaper/documents/05_22_06/energyImplement.asp).

<sup>22</sup> MAYORS CLIMATE PROTECTION CENTER, SURVEY ON MAYORAL LEADERSHIP ON CLIMATE PROTECTION 4 (2007), <http://usmayors.org/climateprotection/climatesurvey07.pdf>.

<sup>23</sup> *Id.*

their participation in the climate protection agreement.<sup>24</sup>

However, it is important to note that this is essentially a solo effort by the cities. The survey revealed that only 6% found that support from federal leaders or agencies was very helpful and only 16% said that support from state leaders or agencies was very helpful.<sup>25</sup> While federal and state assistance in the form of legislation, programs, and funding is of the utmost importance, there is a great deal local governments can accomplish without federal or state assistance. Global warming requires action at all levels of society. Whether sufficient progress will be made will depend in part on the commitment local governments devote to the effort and the support they are receive from their constituents.

### III. PROMOTING GREEN BUILDINGS

Green buildings, as they are commonly known, are high performance buildings that (1) use energy, water, and materials more efficiently and (2) use measures related to siting, design, construction, operation, maintenance, and removal to reduce the building's impacts on human health and the environment. The large use of energy and other resources by buildings demonstrates the compelling need to use green building practices to foster sustainability. Currently, traditional buildings:

- Use about 40% of all the energy consumed<sup>26</sup> and 72% of all the electricity used in the country;<sup>27</sup>
- Are responsible for about 40% of the country's carbon dioxide emissions;<sup>28</sup>
- Account for 52% of sulfur dioxide emissions, 19% of nitrous oxide emissions, and 12% of particulate emissions, all of which degrade air quality;<sup>29</sup>
- Produce 136 million tons of construction and demolition waste annually;<sup>30</sup> and

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<sup>24</sup> *Id.* at 9.

<sup>25</sup> *Id.*

<sup>26</sup> U.S. DEP'T OF ENERGY, BUILDINGS ENERGY DATA BOOK § 1.1.3 (2006), available at [http://buildingsdatabook.eere.energy.gov/?id=view\\_book](http://buildingsdatabook.eere.energy.gov/?id=view_book).

<sup>27</sup> *Id.* § 1.1.6.

<sup>28</sup> *Id.* § 3.1.1.

<sup>29</sup> *Id.* § 3.3.1.

<sup>30</sup> *Id.* § 3.4.3.



- Represent 40% of the raw materials consumed in the United States.<sup>31</sup>

Green building can greatly contribute to easy and cost-effective climate change mitigation. There are more than 82 million residential buildings<sup>32</sup> and about 75 billion square feet of commercial floor space in buildings in the United States.<sup>33</sup> Cost-effective energy efficiency retrofits to this existing building stock can result in major energy savings. By the year 2015 the nation is projected to add over 15 million households<sup>34</sup> and 11 billion square feet of commercial space.<sup>35</sup> Green construction of these buildings could make a large impact.

The Architecture 2030 Challenge established a goal of making buildings dramatically more energy efficient today and carbon neutral by 2030.<sup>36</sup> This initiative is gaining acceptance and was recently adopted as a goal by the Mayors' Conference, NACo, and The American Institute of Architects, as well as a host of other key market participants and municipalities.<sup>37</sup> Of course, if the goal of reaching carbon neutral buildings is achieved, the consequent 40% reduction in GHG emissions would be of enormous import. Cost should not be an inhibiting factor in reaching the goal. Studies have shown that green buildings are only marginally more expensive up front and that the payback on the original investment is quite short due to the energy cost savings.<sup>38</sup> If one also considers and monetizes the ancillary benefits to people, such as improved productivity and reduced absenteeism of those who use

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<sup>31</sup> Nat'l Res. Def. Council, Affordable Green Housing, <http://www.nrdc.org/cities/building/fhousing.asp> (last visited Nov. 12, 2007).

<sup>32</sup> U.S. DEP'T OF ENERGY, *supra* note 26, § 2.1.1.

<sup>33</sup> *Id.* § 2.2.1.

<sup>34</sup> *Id.* § 2.1.1.

<sup>35</sup> *Id.* § 2.2.1.

<sup>36</sup> Architecture 2030, Climate Change, Global Warming, and the Built Environment—The 2030 Challenge, [http://www.architecture2030.org/2030\\_challenge/index.html](http://www.architecture2030.org/2030_challenge/index.html) (last visited Nov. 12, 2007).

<sup>37</sup> Press Release, U.S. Green Building Council, The 2010 Imperative Global Emergency Teach-in (Jan. 29, 2007), *available at* <http://www.usgbc.org/News/PressReleaseDetails.aspx?ID=2893>.

<sup>38</sup> For a discussion of the studies done on the costs and benefits of green buildings, see Edna Sussman, *Building Stock Offers Opportunities to Foster Sustainability and Provides Tools for Climate Change Mitigation and Adaptation*, 7 SUSTAINABLE DEV. L. & POL'Y J. 17, 19 (Spring 2007).

the buildings, the value proposition is compelling.<sup>39</sup>

There are many avenues that can be pursued to promote green building. The following sections will describe the Leadership in Energy and Environmental Design (LEED) rating system, mandatory use of green building standards, revised energy and building codes, requiring specific design elements, and non-monetary incentives.

#### A. *The United States Green Building Council and LEED*

The United States Green Building Council (USGBC) has emerged as the leader and has been central to the progress of the green building movement in the United States.<sup>40</sup> Using a membership consensus process, the USGBC developed a green rating system for new commercial construction and major renovations that is increasingly utilized as the national standard for green buildings.

The LEED Green Building Rating System ranks buildings as Certified, Silver, Gold, or Platinum depending on the level of sustainability achieved by construction and renovation projects.<sup>41</sup> This system serves the critical purposes of promoting sustainable design features and creating a standard that can be applied universally and credibly. The system has gained wide acceptance.

It is considerably easier for a community to adopt an established green building rating system than to develop its own and to provide its own mechanisms and staff to certify compliance. Thus LEED is a remarkably useful tool to assure that the building is truly sustainable and not just the product of a “greenwashed” sales exercise. At the same time, LEED obviates the need for additional staff for review. However, concerns have been expressed by some that the LEED certification drives up the price of construction and several communities have opted to develop their own system of green building credits or to simply require that the buildings be LEED certifiable without actually requiring LEED

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<sup>39</sup> *Id.*

<sup>40</sup> U.S. Green Building Council Homepage, <http://www.usgbc.org> (last visited Nov. 12, 2007).

<sup>41</sup> U.S. GREEN BUILDING COUNCIL, LEED, RATING SYSTEM: 2.0 vi (2001), available at <https://www.usgbc.org/Docs/LEEDdocs/3.4xLEEDRatingSystemJune01.pdf>. (This source also covers other project types.)

certification.<sup>42</sup>

### B. *Mandating Green Building*

Recognizing the many benefits that can be afforded by green building, communities all over the country have focused on how they could capitalize on this opportunity. Numerous communities have now bound themselves to building new construction and major renovations to LEED standards. Many have also included in this requirement construction that obtains public funding. The individual mandates vary as to the minimum size of the building as to which a commitment is made and what level of LEED must be achieved. Typically a minimum of 5,000 square feet is specified and LEED Silver is the certification level to be achieved. Since LEED is a framework for all aspects of sustainability and its credits are not restricted to energy concerns, to assure that adequate energy improvements are included, some communities have specified that a certain number of LEED credits be earned from the energy credit category.<sup>43</sup>

In a growing trend, communities have begun to mandate green building for larger projects in the private sector as well. The City of Boston, Massachusetts enacted regulations requiring buildings of over 50,000 square feet to be LEED certifiable.<sup>44</sup> The City of Washington, D.C., enacted a Green Building Act that requires a non-residential privately owned project of over 50,000 square feet to be verified as having fulfilled LEED standard certification requirements starting in 2012.<sup>45</sup> Some communities are beginning to require LEED or LEED equivalency even for smaller scale projects. The Town of Babylon, New York requires all new construction of commercial, office, industrial or multi-family residences of over 4,000 square feet to complete a LEED checklist or comparable mechanism acceptable to the building inspector and no building permit is issued unless the proposed

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<sup>42</sup> See U.S. Green Building Council, LEED Initiatives in Governments and Schools, <https://www.usgbc.org/ShowFile.aspx?DocumentID=691> (last visited Nov. 12, 2007) (providing a compilation of local mandates to build LEED or green buildings).

<sup>43</sup> *Id.* LEED now has an energy point requirement.

<sup>44</sup> Zoning Comm'n of the City of Boston, Text Amendment No. 331 (2007), available at <http://www.cityofboston.gov/bra/gbtf/documents/Boston%20Zoning%20Code%20Green%20Bldg%20Amendments.pdf>.

<sup>45</sup> D.C. CODE § 6-1451.03 (2007).

building will be able to attain LEED certified status.<sup>46</sup> A certificate of occupancy is not issued unless proof is produced that the standard has been met.<sup>47</sup>

To move towards more energy efficient home construction several communities turned to the Energy Star Homes program, EPA's national program offering assessment tools and certifiers.<sup>48</sup> To earn the Energy Star label, a home must meet guidelines for energy efficiency set by EPA. These homes are at least 15% more energy efficient than homes built to the 2004 International Residential Code, and include additional energy-saving features that typically make them 20-30% more efficient than standard homes.<sup>49</sup> The Green Building program in Frisco, Texas prescribes the EPA's "Energy Star" program requirements as the minimum building standard for new homes.<sup>50</sup> Brookhaven, New York, requires that any new single or multi-family residence of four or fewer units and of not more than three stories be built to comply with the New York Energy Star labeled home program, and that a home energy rating be submitted.<sup>51</sup>

While not actually requiring the private sector to build green, Arlington, Virginia mandates that all site plan applications include a LEED score card and have a LEED accredited professional associated with the project whether or not the builder plans to obtain a LEED certification.<sup>52</sup> Undoubtedly such a requirement will cause the accredited professional to inform the developer about the actual costs and benefits of green buildings and will

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<sup>46</sup> TOWN OF BABYLON, N.Y., MUN. CODE §§ 89-83 to 89-87 (2006), available at <http://www.usgbc.org/ShowFile.aspx?DocumentID=2164>.

<sup>47</sup> *Id.* § 89-87.

<sup>48</sup> The USGBC did not issue a LEED rating system for homes until 2005.

<sup>49</sup> Energy Star EPA, Features of ENERGY STAR Qualified New Homes, [http://www.energystar.gov/index.cfm?c=new\\_homes.nh\\_features](http://www.energystar.gov/index.cfm?c=new_homes.nh_features) (last visited Nov. 12, 2007).

<sup>50</sup> City of Frisco, Texas, Residential Green Building, [http://www.friscotexas.gov/Projects\\_Programs/Green\\_Building/?id=155](http://www.friscotexas.gov/Projects_Programs/Green_Building/?id=155) (last visited Nov. 12, 2007). For another example, see GREENBURGH, N.Y., MUN. CODE § 100-15 (2002), available at [http://www.e-codes.generalcode.com/codebook\\_frameset.asp?t=tc&p=0237%5Fatp%2Ehtm&cn=1&n=\[1\]](http://www.e-codes.generalcode.com/codebook_frameset.asp?t=tc&p=0237%5Fatp%2Ehtm&cn=1&n=[1]).

<sup>51</sup> BROOKHAVEN, N.Y., MUN. CODE § 16-4.1 (2006), available at [http://www.e-codes.generalcode.com/codebook\\_frameset.asp?t=tc&p=0012%2D016%2Ehtm&cn=243&n=\[1\]\[2\]](http://www.e-codes.generalcode.com/codebook_frameset.asp?t=tc&p=0012%2D016%2Ehtm&cn=243&n=[1][2]).

<sup>52</sup> Arlington Virginia, Green Building Incentive Program, <http://www.arlingtonva.us/departments/EnvironmentalServices/epo/EnvironmentalServicesEpoIncentiveProgram.aspx> (last visited Oct. 24, 2007).

motivate more builders to build to LEED standards.

### C. *Energy and Building Codes*

The most direct and comprehensive way to drive greener building is through changing energy and building codes. These can serve to promote or impede green building development.<sup>53</sup> The development and enforcement of energy codes is a shared responsibility of state and local government. Prior to 1992, states enacted energy codes on a voluntary basis but the U.S. Department of Energy (DOE) required all states to adopt commercial energy codes at least as stringent as a specified ASHRAE/IES standard by 2004, and most states have complied.<sup>54</sup> The actual standards adopted vary from state to state.<sup>55</sup> As new technologies are always emerging, frequent code upgrades are necessary and the DOE continues to work on developing more stringent model codes.<sup>56</sup> Federal legislation strengthening the development of and adherence to a national energy code is being considered in the 110th Congress as part of the energy agenda.<sup>57</sup>

The authority of municipalities to adopt their own code requirements varies from state to state. Many states permit more stringent code provisions at the local level, although this is generally subject to some form of reporting to or approval by the state.<sup>58</sup>

Some communities at liberty to enact more stringent code

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<sup>53</sup> See generally DAVID EISENBURG ET AL., *BREAKING DOWN THE BARRIERS: CHALLENGES AND SOLUTIONS TO CODE APPROVAL OF GREEN BUILDING* (2002), available at [http://www.dcat.net/about\\_dcat/current/Breaking\\_Down\\_Barriers.pdf](http://www.dcat.net/about_dcat/current/Breaking_Down_Barriers.pdf) (giving an overview of how building codes impede green development).

<sup>54</sup> See generally U.S. Dep't of Energy, Building Energy Codes Program, Status of State Codes, [http://www.energycodes.gov/implement/state\\_codes/state\\_status\\_full.php](http://www.energycodes.gov/implement/state_codes/state_status_full.php) (last visited Oct. 3, 2007).

<sup>55</sup> See generally U.S. Dep't of Energy, Building Energy Codes Program, Status of State Energy Codes, [http://www.energycodes.gov/implement/state\\_codes/index.stm](http://www.energycodes.gov/implement/state_codes/index.stm) (last visited Nov. 12, 2007) (giving overview of state energy codes).

<sup>56</sup> See U.S. Dep't of Energy, Building Energy Codes Program, About the Program, <http://www.energycodes.gov/whatwedo/> (last visited Nov. 12, 2007).

<sup>57</sup> S. 1419, H.R. 3221, 110th Cong. (1st Sess. 2007).

<sup>58</sup> See U.S. Dep't of Energy, Building Energy Codes Program, Status of State Energy Codes, [http://www.energycodes.gov/implement/state\\_codes/index.stm](http://www.energycodes.gov/implement/state_codes/index.stm) (last visited Nov. 12, 2007).

provisions have done so.<sup>59</sup> For example, Marin County's Single Family Dwelling Energy Efficiency Ordinance requires that new homes larger than 3,500 square feet must meet the California Building Energy Efficiency Standards for a 3,500-square-foot house in the same location.<sup>60</sup> The ordinance lists several ways to reduce the energy needed to operate the larger homes.<sup>61</sup> Homes can be designed with energy efficiency measures and/or may supplement energy use with renewable energy.<sup>62</sup>

Where authority exists, enhancing local code affords the most direct and assured avenue for driving energy efficiency. In July 2007, New York City joined Dallas, Detroit, Honolulu, Houston, Miami, Philadelphia, Phoenix, Washington, D.C., and other major metropolitan areas that have adopted the International Building Code and related codes developed by the International Code Council.<sup>63</sup> However, developing supplemental code provisions requires municipal leaders to work with trained professionals to analyze what is feasible and appropriate, and requires training of municipal staff so that lack of enforcement does not defeat the objective. New York's adoption of its new code took four years of work by four hundred volunteers.<sup>64</sup> Developing a more stringent code at the local level also presents concerns that some developers will choose not to build in a community with more stringent, and therefore perhaps more expensive, requirements, when nearby communities have not enacted similar provisions. While these are all factors to be considered, the net benefits of enacting code changes can make the effort supremely worthwhile.

#### *D. Examples of High Yield Specific Design Requirements*

If a general overhaul of the local building or energy code is

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<sup>59</sup> See, e.g., DSIRE, Town of Epping—Energy Efficiency and Sustainable Design Requirement, <http://www.dsireusa.org/library/includes/tabsrch.cfm?state=NH&type=Building&back=regeetab&Sector=L&CurrentPageID=7&EE=1&RE=1>; Official Website of Eagle County Colorado, EcoBuild, <http://www.eaglecounty.us/commDev/ecobuild.cfm> (last visited Nov. 12, 2007).

<sup>60</sup> MARIN COUNTY, CAL., CODE § 19.04.100 (2005), available at <http://www.dsireusa.org/documents/Incentives/CA40R.pdf>.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> Press Release, International Code Council, New York City Adopts International Codes to Save Lives and Protect Property (July 12, 2007), available at <http://www.iccsafe.org/news/nr/2007/0712NYC.html>.

<sup>64</sup> *Id.*

not desirable, then local governments can effectively create considerable energy savings by requiring specific design elements.<sup>65</sup> Such measures may be viewed as more palatable politically than a general building efficiency requirement as many can be installed at no additional cost to the builder. Such requirements have been enacted in jurisdictions both in the United States and around the world. As technologies develop, many specific cost effective design elements will present opportunities for targeted mandates.

A salient example of such a specific planning tool is a vegetation requirement. Vegetation can both act as a powerful “sink” for the absorption of carbon dioxide and reduce the “heat island effect,” which are the warmer temperatures caused by the reradiation of the solar heat absorbed by impervious built surfaces such as roads and buildings.<sup>66</sup> Higher temperatures increase electricity demand as they cause summer air conditioning demand to rise.<sup>67</sup> Street trees and vegetated roofs on top of buildings known as “green roofs” can significantly reduce the heat island effect.<sup>68</sup>

Seizing the opportunity afforded by this tool, Seattle enacted its Green Factor ordinance in early 2007. It requires all commercial structures of over 4,000 square feet, all residential structures of more than four units, and all parking lots with more than 20 parking spaces to achieve a specified “green factor” and lists green landscaping elements including green roofs, vegetated walls, and drought tolerant plantings that can be utilized to satisfy the requirement.<sup>69</sup> Chicago embarked on a concerted effort to

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<sup>65</sup> EPA provides a succinct explanation of the energy benefits that can be achieved with building code revisions. See EPA, CLEAN ENERGY—ENVIRONMENT GUIDE TO ACTION § 4.3 (2006), available at [http://www.epa.gov/solar/pdf/gta/guide\\_action\\_full.pdf](http://www.epa.gov/solar/pdf/gta/guide_action_full.pdf).

<sup>66</sup> See EPA, Heat Island Effect Basic Information, <http://www.epa.gov/heatisld/about/index.html> (last visited Nov. 12, 2007).

<sup>67</sup> *Id.*

<sup>68</sup> For an analysis of the heat island effect and mitigation strategies, see CYNTHIA ROSENWEIG ET AL., MITIGATING NEW YORK CITY’S HEAT ISLAND WITH URBAN FORESTRY, LIVING ROOFS, AND LIGHT SURFACES 6–11 (2006), available at [http://www.nyserda.org/programs/Environment/EMEP/project/6681\\_25/06-06%20Complete%20report-web.pdf](http://www.nyserda.org/programs/Environment/EMEP/project/6681_25/06-06%20Complete%20report-web.pdf); see also EPA: Heat Island—What Can be Done, <http://www.epa.gov/heatisld/strategies/greenroofs.html> (last visited Nov. 12, 2007).

<sup>69</sup> SEATTLE, WASH., MUN. CODE § 23.47A-016 (2006), available at <http://clerk.ci.seattle.wa.us/~public/toc/23-47A.htm> (follow “23.47A.016”

promote the use of vegetation, in keeping with its “City in a Garden” motto. It awards grants for various vegetative features including a highly successful program to encourage green roofs and landscaping.<sup>70</sup> Green roof mandates in the United States may be the next step. Green roofs have been required in Germany and parts of Switzerland for years and have served not only to reduce the electrical load but also afford the side benefit of significant on-site storm water retention.<sup>71</sup> A second and perhaps easier step to address the heat island effect is to require light colored reflective roofs, often white or metallic, which are also very effective in reducing the heat absorption factor.<sup>72</sup> For example, Chicago amended its energy code to require roofs on low sloped air conditioned buildings to meet a specified initial solar reflectance.<sup>73</sup>

In suburban settings, energy smart landscaping such as planting deciduous trees to the south and east to provide summer shading for cooling and winter sun for heating and evergreens to the north and west to provide a winter wind screen and block late afternoon sun in summer can reduce energy demand and costs by as much as 30%.<sup>74</sup> To capture this opportunity, Union City, California requires all projects with a landscaping component to incorporate green landscaping measures.<sup>75</sup> Tree shading ordinances requiring a certain percentage of parking lots’ surface to be shaded have been enacted in several communities.<sup>76</sup>

Another tool with tremendous potential is the installation of

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hyperlink).

<sup>70</sup> CITY OF CHICAGO DEP’T OF ENVTL. PROT., MAYOR DALEY’S LANDSCAPE AWARDS PROGRAM (2007), available at [http://egov.cityofchicago.org/webportal/COCWebPortal/COC\\_EDITORIAL/2007MLAapplication.pdf](http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/2007MLAapplication.pdf).

<sup>71</sup> Dusty Gedge, *Life at the Top*, 16 OUR PLANET 28, 28–29 (2005), available at [http://www.ourplanet.com/imgversn/161/images/Our\\_Planet\\_16.1\\_english.pdf](http://www.ourplanet.com/imgversn/161/images/Our_Planet_16.1_english.pdf).

<sup>72</sup> EPA, Heat Island Effect—Cool Roofs, <http://www.epa.gov/heatisld/strategies/coolroofs.html> (last visited Nov. 12, 2007).

<sup>73</sup> CHICAGO, ILL., MUN. CODE § 18-13-303.1 (2003), available at [http://egov.cityofchicago.org/webportal/COCWebPortal/COC\\_EDITORIAL/Energy\\_Conservation\\_Code.pdf](http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/Energy_Conservation_Code.pdf).

<sup>74</sup> U.S. Dep’t of Energy, Consumer’s Guide to Landscape Shading, [http://eere.energy.gov/consumer/your\\_home/landscaping/index.cfm/mytopic=11940](http://eere.energy.gov/consumer/your_home/landscaping/index.cfm/mytopic=11940) (last visited Nov. 12, 2007).

<sup>75</sup> UNION CITY, CAL., MUN. CODE ch. 15.76 (2006), available at [http://qcode.us/codes/unioncity/view.php?topic=15-15\\_76&frames=on](http://qcode.us/codes/unioncity/view.php?topic=15-15_76&frames=on).

<sup>76</sup> EPA, Heat Island Effect—Community Actions, <http://www.epa.gov/heatisld/strategies/community.html> (last visited Nov. 12, 2007).



solar hot water heaters.<sup>77</sup> Heating hot water can constitute 15-25% of the energy use in a home.<sup>78</sup> A solar hot water heater can reduce annual operating costs for heating water by 50-80%.<sup>79</sup> The federal government offers a tax credit for solar hot water installations<sup>80</sup> and several communities in the United States offer incentives for the installation of hot water heaters.<sup>81</sup> Again mandates for hot water heaters may be the next step. In 2000, Barcelona implemented such a requirement which is being followed by cities all over Spain with great success.<sup>82</sup>

### *E. Incentives for Green Buildings*

Incentives for green buildings that have a minimal price tag for the local government are being developed.<sup>83</sup> A growing number of communities are granting density bonuses for buildings that achieve a LEED rating. In Arlington, Virginia private developers may apply for additional density ranging from a minimum of 0.15 Floor Area Ratio (FAR) for a project certified at the basic LEED level to a maximum of 0.35 FAR for a Platinum

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<sup>77</sup> U.S. Dep't of Energy, Consumer's Guide to Solar Water Heaters, [http://www.eere.energy.gov/consumer/your\\_home/water\\_heating/index.cfm/mytopic=12850](http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850) (last visited Nov. 12, 2007).

<sup>78</sup> EPA, IMPROVE ENERGY EFFICIENCY WITH SOLAR WATER HEATING (2001), [http://www.energystar.gov/ia/new\\_homes/features/ESSolarWaterHeating.pdf](http://www.energystar.gov/ia/new_homes/features/ESSolarWaterHeating.pdf).

<sup>79</sup> *Id.*

<sup>80</sup> 26 U.S.C.S § 25D (LexisNexis 2007).

<sup>81</sup> *See, e.g.*, DSIRE, Washington Incentives for Renewables and Efficiency, <http://www.dsireusa.org/library/includes/map2.cfm?State=WA&CurrentPageId=1&EE=1&RE=1> (last visited Sept. 5, 2007) (providing a list of links for financial incentives and rebate programs).

<sup>82</sup> European Solar Thermal Industry, Solar Thermal Regulations, <http://www.estif.org/262.0.html> (last visited Nov. 12, 2007).

<sup>83</sup> As noted *supra* note 4, tax incentives, direct subsidies, and technical support are beyond the scope of this article. It should be noted that all of these other tools are being employed. The federal government has countless voluntary programs, subsidies, and incentives. Direct subsidies are also being offered by many state agencies and municipal governments. For example, New York led with the first green building tax credit. New York State Dep't of Env'tl. Conservation, New York State Green Building Tax Credit Legislation Overview, <http://www.dec.ny.gov/energy/1540.html> (last visited Nov. 12, 2007). Many communities have developed strong informational websites. *See, e.g.*, Santa Monica Green Building Program, <http://www.greenbuildings.santamonica.org/mainpages/whatsnew.htm> (last visited Aug. 29, 2007); King County Solid Waste Division, Green Tools, <http://www.metrokc.gov/dnrp/swd/greenbuilding/index.asp> (last visited Nov. 12, 2007). All of these measures are crucial.

project.<sup>84</sup> The program applies to all types of building projects, including office, high rise, and residential.<sup>85</sup> In order to ensure that the builder complies with the LEED standards in exchange for the increased density, the certificate of occupancy is not issued until LEED certification is obtained.<sup>86</sup> Seattle, Washington enacted new zoning regulations for its downtown area and provided for greater height and/or floor area for LEED Silver buildings that include affordable housing and public amenities.<sup>87</sup>

Offering expedited permitting has also proven to be an effective tool and a growing number of communities have made that available. Chicago states that permitting can be accomplished in as little as fifteen days in some cases.<sup>88</sup> San Francisco offers priority permitting for all new or renovated buildings that achieve Gold LEED status or its equivalent.<sup>89</sup> Such treatment can be a powerful incentive for a builder and marks significant progress from the lag in approval of green features previously encountered, and often still encountered, as municipal staff learn about the new technologies and become comfortable with approving them.

Other tools are being utilized to incentivize green building. Sarasota County, Florida provides a 50% reduction in permitting fees.<sup>90</sup> Recognition programs are essentially cost free and can be very effective in inspiring action. Gainesville, Florida provides signage, inclusion on the government's website, press releases, and logos.<sup>91</sup> New York City awards a highly publicized green building

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<sup>84</sup> Dep't of Env'tl. Servs., Arlington, Va., Green Building Incentive Program, <http://www.arlingtonva.us/Departments/EnvironmentalServices/epo/EnvironmentalServicesEpoIncentiveProgram.aspx> (last visited Nov. 12, 2007).

<sup>85</sup> *Id.*

<sup>86</sup> *Id.*

<sup>87</sup> DEP'T OF PLANNING AND DEV., CITY OF SEATTLE, 2006 BONUS DENSITY INCENTIVE 1 (2006), *available at* [http://www.seattle.gov/dpd/stellent/groups/pan/@pan/@sustainablebldg/documents/web\\_informational/dpdp\\_018423.pdf](http://www.seattle.gov/dpd/stellent/groups/pan/@pan/@sustainablebldg/documents/web_informational/dpdp_018423.pdf).

<sup>88</sup> CHICAGO DEP'T OF CONSTR. & PERMITS, GREEN PERMIT PROGRAM 3, *available at* [http://www.aia.org/static/state\\_local\\_resources/adv\\_sustainability/Permitting%20and%20codes/GreenPermitBrochure.pdf](http://www.aia.org/static/state_local_resources/adv_sustainability/Permitting%20and%20codes/GreenPermitBrochure.pdf).

<sup>89</sup> Press Release, SFEnvironment, Mayor Newsom Announces Expedited Permit Processing for Green Building (Sept. 28, 2006), *available at* [http://www.sfenvironment.org/our\\_sfenvironment/press\\_releases.html?topic=details&ni=15](http://www.sfenvironment.org/our_sfenvironment/press_releases.html?topic=details&ni=15).

<sup>90</sup> Robin Sutin, *What Works at Sarasota County*, BUILDINGS, Oct. 2005, <http://www.buildings.com/articles/detail.aspx?contentID=2743>.

<sup>91</sup> GAINESVILLE, FLA., MUN. CODE art. 1.5, § 6-12 (2007), *available at* <http://www.usgbc.org/ShowFile.aspx?DocumentID=1979>.

award annually and sponsors a major event to give the award.<sup>92</sup> Lower property tax assessments or some exemption from property tax increases for green building are being adopted in some locales and can be a most compelling incentive.<sup>93</sup>

#### IV. INCREASING ENERGY EFFICIENCY

Energy efficiency provides a huge opportunity for the most cost-effective GHG reductions. The American Solar Energy Society analysis concluded that “[a]ssuming no change in the carbon intensity of energy supply, the total achievable potential for cost-effective carbon emissions reduction from energy efficiency in 2030 . . . is enough to essentially offset carbon emissions growth.”<sup>94</sup> Such measures not only reduce GHGs but result in net savings for consumers. A 30% improvement in U.S. building energy efficiency has been projected to reduce consumer costs by \$38 billion within fifteen years.<sup>95</sup> Many of the municipal initiatives to reduce GHGs are directed at this low hanging fruit both in public facilities and in the private sector.

##### A. *Fostering Energy Efficiency Improvements in Public Facilities*

As a first step municipalities generally examine the energy efficiency of their own operations. Many steps are obvious and are explored in detail in the many resources available to municipalities.<sup>96</sup> Changing lighting systems and traffic signals are common first steps as the payback period is generally very short.<sup>97</sup> Behavioral changes such as changing thermostat settings, adjusting

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<sup>92</sup> See Press Release, EPA, EPA and New York City Show Off Greener Big Apple; Announce Winners of Second Green Building Competition (June 20, 2006), available at <http://yosemite.epa.gov/opa/admpress.nsf/7144dd430c47561885257018004c77a3/1a095e313ba7ec9b8525719300623596!OpenDocument>.

<sup>93</sup> For a compilation of incentives in locales throughout the United States, see U.S. Green Building Council, Summary of Government LEED Incentives, <https://www.usgbc.org/ShowFile.aspx?DocumentID=2021> (last visited Nov. 12, 2007).

<sup>94</sup> AMERICAN SOLAR ENERGY SOCIETY, *supra* note 7, at 40.

<sup>95</sup> U.S. DEP’T OF ENERGY, COOPERATIVE EFFORTS RAISE BUILDING ENERGY CODES AND APPLIANCE STANDARDS (1999), available at <http://www.nrel.gov/docs/fy99osti/25394.pdf>.

<sup>96</sup> For a list of such resources, see *supra* note 3.

<sup>97</sup> THE UNITED STATES CONFERENCE OF MAYORS, *supra* note 3, at 6, 16.

computers to energy saving modes, turning off unnecessary energy drains are all obvious and easy places to start.<sup>98</sup> However, for a more sophisticated and comprehensive review of the possibilities for energy savings, an energy audit by professionals is generally undertaken.<sup>99</sup> These can lead to recommendations for a myriad of measures such as upgrading heating and cooling systems, installing or improving building management systems, or improving insulation.<sup>100</sup> It is often useful to analyze which buildings have the highest energy bill (a fact often not known by municipal staff) in selecting the order in which the various government buildings' energy performance will be analyzed.<sup>101</sup>

Many municipalities employ the services of an Energy Service Company, better known as an ESCO. ESCOs generally develop, design, and finance energy efficiency projects, install and maintain the energy efficient equipment involved, measure, monitor, and verify the project's energy savings, and assume the risk that the project will save the amount of energy guaranteed.<sup>102</sup> There is no upfront cost to the municipality, as the services are bundled into the project's cost and are paid over time out of the energy cost savings.<sup>103</sup>

Virtually every state has enacted enabling legislation to set the ground rules for municipal use of ESCOs.<sup>104</sup> The states' provisions cover such issues as the bidding process required, the permissible length of the contract, the requirement of a performance bond, the requirement of a guarantee from the ESCO that savings will match or exceed costs, or a requirement that the energy savings be shared.<sup>105</sup> Each municipality must check the

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<sup>98</sup> *Id.* at 16, 49; NATURAL CAPITALISM SOLUTIONS, *supra* note 3, at 33; Clean Air Cool Planet, *supra* note 3.

<sup>99</sup> THE UNITED STATES CONFERENCE OF MAYORS, *supra* note 3, at 20; NATURAL CAPITALISM SOLUTIONS, *supra* note 3, at 97, 105–07.

<sup>100</sup> *Id.* at 105–07.

<sup>101</sup> THE UNITED STATES CONFERENCE OF MAYORS, *supra* note 3, at 42.

<sup>102</sup> National Association of Energy Service Companies, What is an ESCO?, <http://www.naesco.org/about/esco.htm> (last visited Nov. 12, 2007).

<sup>103</sup> EPA provides an excellent web based program for assessing building energy efficiency and tracking progress. See EPA, Energy Star Portfolio Manager, [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) (last visited Nov. 12, 2007).

<sup>104</sup> For a compilation of state statutes governing municipal use of ESCOs, see Oak Ridge National Laboratory, Status of ESCO Enabling Legislation in the States, <http://www.ornl.gov/info/esco/legislation/> (last visited Nov. 12, 2007).

<sup>105</sup> See, e.g., ALA. CODE §§ 41-16-140 to 41-16-144 (2007).

governing legislation in its state to determine how to proceed. In addition, an analysis must be conducted to determine whether the ESCO contract is in fact the best mechanism for funding. While using an ESCO has considerable surface appeal as there is no cash outlay by the municipality, the ESCO proposal must be analyzed against the cost of other contractors, and the ESCO cost must be compared against the cost of issuing a bond or paying for the improvement out of capital. Whether the amount owed to the ESCO must be recorded as debt by the governmental unit must also be considered. As attractive as it may seem at first blush, using an ESCO may often, but not always, be the most fiscally sound means of financing an efficiency upgrade.

*B. Fostering Energy Efficiency Improvements  
in Private Existing Buildings*

Municipalities appropriately devote considerable attention to public education and outreach, as these are critical to persuading people that energy efficiency can pay for itself while providing other benefits. But garnering voluntary action is a slow process and municipalities may wish to consider opportunities to mandate energy efficiency upgrades or to force a review of a building's energy efficiency. Such mandates can be required upon the sale and transfer of real estate involving residential and commercial uses. This presents a unique and attractive opportunity for enhancing energy efficiency.

The City of San Francisco has had a residential energy conservation ordinance since 1982 that requires an energy inspection and compliance with a detailed list of energy and water efficiency measures at the time of sale.<sup>106</sup> An owner may appeal if the application of an energy ordinance measure is not cost effective.<sup>107</sup> City officials have found an average energy savings of 15% per household since passage of the ordinance. The City of Berkeley not only followed San Francisco's lead but expanded the requirement to apply to the sale or major renovation of commercial

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<sup>106</sup> SAN FRANCISCO, CAL., HOUSING CODE Ch. 12 (2001).

<sup>107</sup> *Id.* § 1213. Costs are capped at \$1,300 for a single or two-family home. For a summary of the San Francisco ordinance, see S.F. DEP'T OF BLDG. INSPECTION, WHAT YOU SHOULD KNOW ABOUT THE RESIDENTIAL ENERGY CONSERVATION ORDINANCE (2006), [http://www.sfgov.org/site/uploadedfiles/dbi/Key\\_Information/ResidEnergyConsOrd1006.pdf](http://www.sfgov.org/site/uploadedfiles/dbi/Key_Information/ResidEnergyConsOrd1006.pdf).

buildings.<sup>108</sup> Tailoring its approach to address the problem that a building owner who does not pay the utility bills lacks motivation to invest in energy efficiency, Burlington, Vermont limits its ordinance requiring compliance with certain energy efficiency standards upon sale of a building to multi-family residences where the tenant pays the monthly utility bills.<sup>109</sup>

In addition to requiring energy efficiency improvements, consideration can be given to requiring an energy audit and disclosure of the results upon a sale of property. A simple disclosure of possible energy efficiency upgrades and a payback analysis may persuade people to implement the audit recommendations. The State of Kansas has implemented such a measure and requires homebuilders or realtors to disclose information about the energy efficiency of new homes to potential home buyers prior to purchase, whenever the house is shown, and at any other time upon request.<sup>110</sup> The information required is quite specific and includes a report on whether the building has a Home Energy Rating of 80 or more, was built to meet a specified energy code, or has other energy efficient elements. A list of such elements, specifying insulation values, thermal properties of windows, heating and air conditioning, and water heating efficiency levels is also required.<sup>111</sup> Municipalities can consider expanding such requirements to cover older homes and buildings being sold. The European Union issued a directive in 2002 that applies not only to new construction but also to the sale or rental of existing buildings.<sup>112</sup> Requirements upon sale, tailored to the community and updated to meet current standards, can be a very

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<sup>108</sup> BERKELEY, CA, MUN. CODE § 19.72.030 (2007), available at <http://www.ci.berkeley.ca.us/bmc/BMC-Part1-Aug07.pdf> (includes exemptions if hardship or lack of cost-effectiveness is shown). For a summary of the Berkeley provisions, see Large Cities Climate Summit, Eco-Building—Berkeley, [http://www.nyclimatesummit.com/casestudies/building/bldg\\_berkeley.html](http://www.nyclimatesummit.com/casestudies/building/bldg_berkeley.html) (last visited Nov. 10, 2007). The maximum expenditure is 0.75% of the sale price or \$750 for each \$100,000 of sale price. *Id.*

<sup>109</sup> See Burlington Electric Department, Minimum Rental Housing Energy Efficiency Standards Ordinance, <http://burlingtonelectric.com/energyefficiency/tos2.htm> (last visited Nov. 10, 2007). The maximum expenditure is limited to 3% of the sale price or \$1,300 per rental unit, whichever is less. *Id.*

<sup>110</sup> KAN. STAT. ANN. § 66-1228 (2006).

<sup>111</sup> *Id.*; see also Kansas Energy Efficiency Disclosure Form, available at <http://www.engext.ksu.edu/codes/disclosure.pdf>.

<sup>112</sup> European Parliament and Council Directive 2002/91/EC, Official Journal of the European Communities, L1/65-L1/71 (Jan. 4, 2003).

effective tool to promote energy efficiency in the private sector.

#### V. PROMOTING RENEWABLE ENERGY RESOURCE DEVELOPMENT

The development of renewable resources such as solar, wind, geothermal, hydro-power, biofuels, and biomass has been growing exponentially over the past few years, a growth that is projected to continue and increase, driven in part by federal and state regulation. Federal production tax credits are driving significant investment into renewable energy.<sup>113</sup> The Energy Policy Act of 2005 set a renewable fuels standard (RFS) for ethanol and biodiesel.<sup>114</sup> A national renewable portfolio standard requiring utilities to provide a certain percentage of their electricity from renewable sources is being seriously considered in the 110th Congress.<sup>115</sup> Over twenty states have already enacted renewable portfolio standards for their electricity companies.<sup>116</sup>

This is an area in which there is enormous opportunity for proactive action by local government. Action by local government can be determinative of whether a renewable energy resource is actually developed, since the local government generally controls the siting of the facilities. Municipalities can put in place provisions now that will set the stage for the development of on site renewable generation and remove obstacles. While the scope of local authority will have to be reviewed in each locale, communities can and should now review such areas as are relevant including their zoning, codes, and architectural review guidelines. It is especially important to address the issues now before they are presented as a neighbor-against-neighbor battle, a situation always much more difficult for the local decision makers and expensive for the municipality in terms of staff time and litigation costs. Moreover, in the context of a dispute, the viewpoint of the party with more money to mount court battles or greater local political influence may prevail over sound policy.

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<sup>113</sup> See, e.g., Union of Concerned Scientists, Production Tax Credit for Renewable Energy, [http://www.ucsusa.org/clean\\_energy/clean\\_energy\\_policies/production-tax-credit-for-renewable-energy.html](http://www.ucsusa.org/clean_energy/clean_energy_policies/production-tax-credit-for-renewable-energy.html) (last visited Nov. 10, 2007).

<sup>114</sup> 42 U.S.C.S. § 7545(o)(2) (LexisNexis Supp. 2007).

<sup>115</sup> H.R. 3221, 110th Cong. (1st Sess. 2007).

<sup>116</sup> A list of states with renewable portfolio standards and details of those provisions can be found at U.S. Dep't of Energy, States with Renewable Portfolio Standards, [http://www.eere.energy.gov/states/maps/renewable\\_portfolio\\_states.cfm](http://www.eere.energy.gov/states/maps/renewable_portfolio_states.cfm) (last visited Nov. 10, 2007).

This section will discuss purchases of renewable energy by local government, requirements for installation of renewable energy systems in private construction, the development of local wind ordinances, the review of local ordinances for their impact on solar development, issues raised by documents governing planned developments, availability of solar access, and municipal planning to facilitate the development of renewable energy.

#### A. *Increasing Renewable Energy Capacity*

Many local governments across the country have committed to purchasing a certain percentage of their power needs from renewable energy.<sup>117</sup> These purchases of renewable energy serve both to support further renewable energy development and to provide an important model for such purchases by other members of the community. In some states that have “low bid” laws requiring municipalities to make their purchases from the lowest bidder, questions have been raised as to whether such purchases of renewable power at a higher price than fossil fuel generated power are in violation of law or whether they can be viewed as a different product making the low bid law inapplicable.<sup>118</sup> Legislative solutions to this issue have been introduced allowing payment of a premium for renewable energy.<sup>119</sup>

Several communities with municipal utilities have enacted their own renewable portfolio standards, requiring that a certain percentage of the electricity generation be from renewable sources.<sup>120</sup> Since many municipalities own their utilities, this

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<sup>117</sup> See, e.g., Jacob Fenton, *Town's Renewable Energy Campaign Features Cows*, BUCKS COUNTY COURIER TIMES, July 1, 2007, available at <http://www.phillyburbs.com/pb-dyn/news/111-07012007-1371567.html>; Press Release, Community Energy, Largest Wind Purchase for a Municipality in New York State (Feb. 12, 2003), available at [http://www.communityenergy.biz/pr/cei\\_pr\\_croton.html](http://www.communityenergy.biz/pr/cei_pr_croton.html); City of Columbia, Missouri, Electric Supply Information, <http://www.gocolumbiamo.com/WaterandLight/Electric/ElectricSupplyInformation.php> (last visited Nov. 10, 2007). Santa Monica California is buying 100% of its power from renewable energy resources. CITY OF SANTA MONICA, SUSTAINABLE CITY PROGRESS REPORT (2006), [http://www.smgov.net/epd/scpr/ResourceConservation/RC4\\_RenewableEnergy.htm](http://www.smgov.net/epd/scpr/ResourceConservation/RC4_RenewableEnergy.htm).

<sup>118</sup> See, e.g., A.R. AE2162 (N.Y. 2007), available at <http://assembply.state.nyu.us/leg/?bn=A02162>.

<sup>119</sup> *Id.*

<sup>120</sup> See, e.g., City of Roseville, Cal., Renewable Portfolio Standard, [http://www.roseville.ca.us/electric/rates\\_reliability\\_n\\_billing/renewable\\_portfolio\\_standard.asp](http://www.roseville.ca.us/electric/rates_reliability_n_billing/renewable_portfolio_standard.asp) (last visited Nov. 10, 2007); DSIRE, Columbia, Mo., Incentives



represents a significant opportunity for increasing the deployment of renewable energy. Seattle, with the advantage of having 90% of its municipal utility's power generated by hydropower, has committed to make its utility carbon neutral through a combination of renewable energy production, conservation, and the purchase of offsets.<sup>121</sup> A challenge to the purchase by the utility of carbon offsets was successful, with the Washington State Supreme Court finding that the cost should have been borne by the taxpayers rather than the rate payers.<sup>122</sup> Legislation was quickly enacted in Washington that expressly declared the state's intent to reverse the court's decision, stating that GHG mitigation efforts are a "recognized utility purpose that confers a direct benefit on the utility's ratepayers," and that utilities may mitigate GHG impacts through mechanisms which include GHG offset and credit purchases.<sup>123</sup>

Municipalities are also installing on-site renewable energy for their own operations, often with the assistance of a grant or other funding source, and beginning to develop mandates for the installation of a renewable source for energy-intensive private construction. For example, Aspen, Colorado requires that builders of new residential construction of over 5,000 square feet install a renewable energy system or pay a fee.<sup>124</sup> Del Mar, California requires a solar heating system in all new structures and that solar heating be the only heating source for swimming pools.<sup>125</sup>

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for Renewable Energy, [http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive\\_Code=MO04R&state=MO&CurrentPageID=1&RE=1&EE=0](http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=MO04R&state=MO&CurrentPageID=1&RE=1&EE=0) (last visited Nov. 10, 2007).

<sup>121</sup> Press Release, Seattle City Light, Sale of Centralia Coal-Fired Power Plant Means Commitment to Cleaner Energy (May 4, 2000), *available at* <http://www.seattle.gov/light/news/newsreleases/release.asp?RN=30>. A carbon offset purchase is the purchase of the emissions reduction attribute of a project which reduces GHG emissions. Typical offset projects include reforestation, methane capture and renewable energy development.

<sup>122</sup> *Okeson v. City of Seattle*, 159 P.3d 556 (Wash. 2007).

<sup>123</sup> H.R. 1929, 60th Leg., (Wash. 2007), *available at* <http://www.leg.wa.gov/pub/billinfo/2007-08/Pdf/Bills/House%20Bills/1929.pdf>.

<sup>124</sup> CITY OF ASPEN & PITKIN COUNTY, ENERGY CONSERVATION CODE § 311.3 (2003), *available at* <http://www.aspenpitkin.com/pdfs/depts/7/Chapter3.pdf>.

<sup>125</sup> DEL MAR, CAL., MUN. CODE §§ 23.20.10 to 23.20.60 (1997), *available at* [http://www.delmar.ca.us/NR/rdonlyres/0502D996-EE76-43D0-838F-FB5CE1FCCEC3/0/chapter\\_2320.pdf](http://www.delmar.ca.us/NR/rdonlyres/0502D996-EE76-43D0-838F-FB5CE1FCCEC3/0/chapter_2320.pdf).

B. *Removing Obstacles to Renewable Energy Development—Wind*

Installation of wind generation, both on a commercial scale and on a small single turbine on-site scale, has become a divisive issue in many communities. The battle over the Cape Cod offshore wind project proposal has been the most publicized and has generated media attention, lawsuits, and action by various legislative bodies, including the U.S. Congress.<sup>126</sup> Land-based commercial scale wind projects have also generated vigorous opposition in other locales.<sup>127</sup> In addition, there have been numerous instances of communities embroiled in disputes between neighbors over small wind installations. Opposition by neighbors has even led to a town's reversing its own approval of a small 35-foot wind turbine installation after it was installed.<sup>128</sup> While this could be NIMBYism,<sup>129</sup> it could also be viewed as giving voice to concerns often expressed in opposition to wind which center on the visual impact of turbines on the landscape.

Many municipalities lack extensive planning staff and have had little or no exposure to wind technology, making the review of any wind proposal a challenging and protracted experience. In the absence of clearly established local guidance, local governments are more likely to be caught in the middle of an expensive and time-consuming review and even a court process.<sup>130</sup> An early

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<sup>126</sup> See Pam Belluck, *Plan for Wind Farm Off Massachusetts Clears State Hurdle*, N.Y. TIMES, Mar. 31, 2007, at A9. For a review of disputes in Massachusetts and a discussion of how to succeed in installing a land based wind farm in Massachusetts, see Mike Koehler, Note, *Developing Wind Power Projects in Massachusetts: Anticipating and Avoiding Litigation in the Quest to Harness the Wind*, 12 SUFFOLK J. TRIAL & APP. ADVOC. 69, 70 n.5 (2007).

<sup>127</sup> See generally Brian Dietz, *Turbines vs. Tallgrass: Law, Policy, and a New Solution to Conflict Over Wind Farms in the Kansas Flint Hills*, 54 U. KAN. L. REV. 1131 (2006) (discussing the controversies over wind facilities in Kansas).

<sup>128</sup> See, e.g., Alternative Energy Retailer, *A NIMBY Tale of Wind Power*, July 12, 2007, [http://www.aer-online.com/e107\\_plugins/content/content.php?content.666](http://www.aer-online.com/e107_plugins/content/content.php?content.666). For a collection of articles about disputes over wind installations and other wind developments, see Industrial Wind Action Group Homepage, <http://www.windaction.org/> (last visited Nov. 10, 2007).

<sup>129</sup> NIMBY is a commonly used acronym for "not in my backyard."

<sup>130</sup> See generally Mark Dausch, *Analyzing a Municipality's Authority to Enact the Model Ordinance for Wind Energy Facilities in Pennsylvania*, 45 DUQ. L. REV. 47 (2006) (providing examples of such controversies and an analysis of what local government can do to protect itself from such disputes in Pennsylvania through zoning ordinances, subdivision or land use ordinances or general police powers).

development of wind ordinances and zoning provisions by municipalities across the country would facilitate and streamline these installations as all participants would know the parameters for approval and understand the process to follow.<sup>131</sup> Clear rules would also discourage litigation and the courts, reviewing specific local provisions, would be less likely to reverse the government's decision.

Model wind ordinance provisions and recommendations for wind zoning overlays have been developed by several states.<sup>132</sup> These model rules generally cover height specifications, setbacks, noise levels, compliance with all codes, safety, and Federal Aviation Administration requirements for all wind installations. For larger systems, a provision for a wind assessment and a discussion of the visual, environmental, avian, wildlife, and shadow flicker impacts are also always included.<sup>133</sup> The typical requirements for small wind installations are a limit of 65 feet in height, a setback one and a half times the height of the tower including the top of the blade in the vertical position, and a noise level of 55 dB(A).<sup>134</sup> As these models contemplate, commercial wind generation facilities should have a comprehensive review,

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<sup>131</sup> For a review of the options available to local governments to create a meaningful review process for wind facilities, see KATHERINE DANIELS, N.Y. STATE ENERGY RESEARCH AND DEV. AUTH., *THE ROLE OF GOVERNMENT AGENCIES IN THE APPROVAL PROCESS 4* (2005), [http://www.powernaturally.org/Programs/Wind/toolkit/16\\_rolegovernmentagencies.pdf](http://www.powernaturally.org/Programs/Wind/toolkit/16_rolegovernmentagencies.pdf). The National Renewable Energy Laboratory produced state-by-state Small Wind Electric Systems Consumer's Guides to help homeowners, ranchers, and small businesses decide if wind energy will work for them. See U.S. Dep't of Energy, Small Wind for Homeowners, Rangers, and Small Business, [http://www.eere.energy.gov/windandhydro/windpoweringamerica/small\\_wind.asp](http://www.eere.energy.gov/windandhydro/windpoweringamerica/small_wind.asp) (last visited Nov. 10, 2007).

<sup>132</sup> See, e.g., KATHERINE DANIELS, N.Y. STATE ENERGY RESEARCH AND DEV. AUTH., *WIND ENERGY MODEL ORDINANCE OPTIONS* (2005), [http://www.powernaturally.org/Programs/Wind/toolkit/2\\_windenergymodel.pdf](http://www.powernaturally.org/Programs/Wind/toolkit/2_windenergymodel.pdf); MASS. DIV. OF ENERGY RES., *MODEL AMENDMENT TO A ZONING ORDINANCE OR BY-LAW: ALLOWING WIND FACILITIES BY SPECIAL PERMIT*, available at <http://www.mass.gov/Eoca/docs/doer/renew/model-allow-wind-by-permit.pdf>; Press Release, Dep't of Env'tl. Prot., Pa., Governor Rendell Unveils Model Ordinance to Help Local Gov'ts, Wind Energy Developers (Apr. 24, 2006), available at <http://www.ahs.dep.state.pa.us/newsreleases/default.asp?ID=3914>.

<sup>133</sup> See, e.g., STATE OF MICH. DEP'T OF LABOR & ECON. GROWTH, *MICHIGAN SITING GUIDELINES FOR WIND ENERGY SYSTEMS 3-9* (2007), available at [http://www.michigan.gov/documents/Wind\\_and\\_Solar\\_Siting\\_Guidlines\\_Draft\\_5\\_96872\\_7.pdf](http://www.michigan.gov/documents/Wind_and_Solar_Siting_Guidlines_Draft_5_96872_7.pdf).

<sup>134</sup> *Id.* at 3.

but small wind projects can be often be done with a simpler and more abbreviated process in communities that have developed and passed wind regulations with as-of-right permitting, special use permitting, or accessory use permitting.

The development of small on-site wind systems has been encouraged in many parts of the country. California, in enacting Assembly Bill 1207, sought to promote the use of small wind systems by minimizing obstacles to their use.<sup>135</sup> The statute authorized and encouraged local governments to adopt ordinances that facilitate the siting of small wind turbines and established limited approval criteria for these sites.<sup>136</sup> Local governments that failed to enact their own wind-friendly ordinances by July 1, 2002, were required to review applications under default provisions, contained in the new law, which provided for expedited approval and minimal siting requirements.<sup>137</sup> While the statute and the default ordinance it established sunset by its terms on July 1, 2005, the statute motivated communities in California to enact their own ordinances, creating a transparent roadmap for local small wind development in many communities which can be adopted in other municipalities.<sup>138</sup>

### C. *Removing Obstacles to Renewable Energy Development—Solar*

Large-scale solar thermal technology is used to deliver utility electricity.<sup>139</sup> There is an increasing deployment of this technology but there are few installations to date. Whether large-scale solar will draw the kind of opposition that wind has generated remains to be seen, although the technology does not appear to have the same kind of visual or wildlife impacts that trouble the wind industry. On-site smaller installation of solar

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<sup>135</sup> A.B. 1027, 2001-2002 Sess. (Cal. 2001).

<sup>136</sup> *Id.*

<sup>137</sup> *Id.*

<sup>138</sup> For a discussion of the California law and actions taken by local government following its enactment, see CAL. ENERGY COMM'N, PERMITTING SMALL WIND TURBINES: A HANDBOOK, LEARNING FROM THE CALIFORNIA EXPERIENCE 21-22 (2003), available at <http://www.awea.org/smallwind/documents/permitting.pdf>.

<sup>139</sup> For a description of concentrating solar power systems, see U.S. Dept. of Energy, Solar Energy Technologies Program, Concentrating Solar Power, <http://www1.eere.energy.gov/solar/csp.html> (last visited Nov. 10, 2007).

generators, on the other hand, have encountered significant issues. Whether intentionally or unintentionally, there are many provisions developed by government or developers of planned communities that inhibit solar development. As in the wind power context, these barriers need to be addressed now. Clear rules provide objective criteria and transparency and reduce conflict. It has been estimated that solar photovoltaic rooftop panels can supply 10% of grid electricity without creating grid management problems.<sup>140</sup> This is a major opportunity that can be captured.<sup>141</sup> If the goal of zero energy homes—homes that produce as much energy as they require—is to be met, on-site solar generation is essential.<sup>142</sup>

### 1. *Local Ordinances*

As Al Gore discovered, siting and installing renewable energy facilities can often be difficult in many municipalities around the country. Upon purchasing his home in Belle Meade, Tennessee, Mr. Gore embarked upon an ambitious renovation which included plans for solar panels on his roof, but ran into problems when his contractor applied for an installation permit.<sup>143</sup> The town zoning required all power generating equipment to be installed at ground level, a provision that had been enacted because

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<sup>140</sup> AMERICAN SOLAR ENERGY SOCIETY, *supra* note 7, at 21; *see also* WORLDWATCH INSTITUTE, *supra* note 7, at 20.

<sup>141</sup> For a discussion of the potential for solar in New York City, see WILSON RICKERSON ET AL., THE CTR. FOR SUSTAINABLE ENERGY AT BRONX CMTY. COLL., NEW YORK CITY'S SOLAR ENERGY FUTURE PART I: THE MARKET FOR PHOTOVOLTAIC SYSTEMS IN NEW YORK CITY (2006), *available at* <http://www.bcc.cuny.edu/InstitutionalDevelopment/CSE/Documents/CUNY%20MSR%20-%20Market%20for%20PV%20in%20NYC.pdf>. For a comprehensive illustrative discussion of the obstacles and solutions to solar in New York City, see WILSON RICKERSON ET AL., THE CTR. FOR SUSTAINABLE ENERGY AT BRONX CMTY. COLL., NEW YORK CITY'S SOLAR ENERGY FUTURE PART II: SOLAR ENERGY POLICIES AND BARRIERS IN NEW YORK CITY (2007), *available at* [http://www.bcc.cuny.edu/institutionalDevelopment/cse/CUNYPV\\_%20PolicyAndBarriersStudy.pdf](http://www.bcc.cuny.edu/institutionalDevelopment/cse/CUNYPV_%20PolicyAndBarriersStudy.pdf).

<sup>142</sup> For examples of zero energy homes, see FLA. SOLAR ENERGY CTR., ON THE PATH TO ZERO ENERGY HOMES (2001), *available at* [http://www.eere.energy.gov/buildings/building\\_america/pdfs/29915\\_zeb\\_path.pdf](http://www.eere.energy.gov/buildings/building_america/pdfs/29915_zeb_path.pdf); *see also* Andrew Murr, *No More Electric Bills*, NEWSWEEK, Aug. 15, 2005, at 43.

<sup>143</sup> *Gore's Solar Plans Thwarted by Upscale Neighborhood's Rules*, USA TODAY ONLINE, Mar. 20, 2007, [http://www.usatoday.com/weather/climate/globalwarming/2007-03-20-gore-solar\\_N.htm](http://www.usatoday.com/weather/climate/globalwarming/2007-03-20-gore-solar_N.htm).

many people had back-up personal generators, which were generally diesel operated, large, and noisy.<sup>144</sup> It took close to a year to amend the town's zoning provision, which now permits rooftop solar but only "so long as they are not visible from the street or from any adjoining property."<sup>145</sup>

Al Gore's experience highlights both kinds of obstacles that local ordinances can present. Local ordinances, as in Mr. Gore's case, may have been drafted to address a different concern and inadvertently conflict with solar energy installations. Or local ordinances may render it difficult if not impossible in many settings to proceed with a solar system because of limitations founded on aesthetic considerations. The limitation ultimately enacted in Belle Meade, Tennessee, which only permits solar installations that are not visible to others, exemplifies the tension between on-site solar systems and traditional views of aesthetics and can be found in the ordinances or architectural review guidelines of many communities. Many of these provisions were developed decades ago when solar collectors were large and obtrusive, unlike the more visually pleasing solar technologies available today. Communities should revisit their laws and guidelines, reconsider their priorities in light of current technology and environmental realities, and make the changes necessary to streamline the installation of on-site renewable energy.

Some states have expressly legislated limits on municipal powers relating to solar. Following the oil embargo in the 1970s, there was a flurry of activity and legislation passed in various states addressing solar energy. California, which has been in the forefront in legislating to protect and enable solar installations since the enactment of the Solar Rights Act in 1978, limits local autonomy by barring local agencies from "creating unreasonable barriers to the installation of solar energy systems," expressly barring "design review for aesthetic purposes," and limiting local review of solar installations to whether they meet "health and safety requirements."<sup>146</sup> New Mexico recently amended its Solar Rights Act to provide that municipalities could not restrict the installation of a solar collector except in a historic district.<sup>147</sup>

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<sup>144</sup> *Id.*

<sup>145</sup> *Id.*

<sup>146</sup> CAL. GOV'T CODE § 65850.5 (West 2007).

<sup>147</sup> N.M. STAT. § 3-18-32 (West 2007).

Indiana allows “reasonable” restrictions, but limits them to those that do not significantly increase cost or decrease efficiency or allow for an alternative system of comparable cost and efficiency.<sup>148</sup> Other state statutes that use a reasonableness standard do not define what is reasonable and leave open the issue of whether aesthetic considerations can be deemed reasonable.<sup>149</sup> Most states have no such legislation and it is incumbent upon the municipalities to take the steps necessary to adopt any local changes necessary to facilitate renewable energy development.

## 2. *Planned Developments*

Privately developed rules that govern homes in planned developments can also often create issues similar to those raised by local law. Developers of planned communities generally place uniform architectural controls in the declaration of covenants, conditions, and restrictions (CC&Rs) to ensure a uniform appearance and preserve “curb appeal.” These often limit the ability of homeowners to install solar panels. The form of the restrictions vary and may appear as a restriction on the placement of and type of solar power generation allowed, a requirement for approval by an architectural review board, height restrictions, setback requirements, screening requirements, specifications of roofing materials, architectural style requirements, or as a restriction on secondary structures.<sup>150</sup> There are over 200,000 planned communities in the United States and over half of new developments will be built in a planned community.<sup>151</sup> As the CC&R documentation for new projects is often copied from existing ones, care must be taken to identify these issues and change the documentation forms to reflect current needs for energy.

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<sup>148</sup> IND. CODE. § 36-7-2-8 (West 1981).

<sup>149</sup> FLA. STAT. § 163.04 (West 2006); WIS. STAT. § 236.292 (West 2004); MASS. GEN. LAWS ch. 40A, § 3 (West 2004); N.H. REV. STAT. ANN. § 672:1 (LexisNexis 2007) (restricting unreasonable restrictions on solar and wind installations).

<sup>150</sup> For a comprehensive discussion of issues relating to solar energy in planned communities, see THOMAS STARRS, LES NELSON & FRED ZALCMAN, BRINGING SOLAR ENERGY TO THE PLANNED COMMUNITY: A HANDBOOK ON ROOFTOP SOLAR SYSTEMS AND PRIVATE LAND USE RESTRICTIONS 13, 16–17 (2000), available at [http://www.consumerenergycenter.org/erprebate/documents/CC+Rs\\_and\\_solar\\_rights.pdf](http://www.consumerenergycenter.org/erprebate/documents/CC+Rs_and_solar_rights.pdf).

<sup>151</sup> *Id.* at 7.

Again, some states have legislated, like California, that any covenant, restriction or deed in connection with the transfer of real property that “effectively prohibits or restricts the installation or use of a solar energy system is void and unenforceable.”<sup>152</sup> New Mexico’s recent amendment has the same effect.<sup>153</sup> Colorado’s statute allows for some deference to aesthetic considerations in providing that the statute barring such restrictions does “not apply to aesthetic provisions which impose reasonable restrictions on solar energy devices and which do not significantly increase the cost of the device.”<sup>154</sup> Florida bars deed restrictions, covenants, or similar binding agreements that run with the land but permits the determination of where the solar collector is to be placed as long as it does not impair the effective operation of the collector.<sup>155</sup> Most states however have no such provisions and it is again necessary for the municipalities to assure that planned communities which they approve have no unacceptable restrictions on renewable energy development.

### 3. *Solar Access*

A solar collector is rendered useless if there is no continuing access to sunlight. A neighbor’s new structure or growing tree may cast shadows and significantly reduce the amount of solar energy that can be captured. Protecting solar access is not a new concept. The Doctrine of Ancient Lights protected landowners’ rights to light in Britain for centuries. The rejection of this doctrine by the courts in the United States in the earlier days of the country’s development, when the unrestricted development of land was the goal, created the need for government to step in and create such protections or for parties to negotiate private easements.<sup>156</sup>

California land owners wishing to utilize solar power benefit from the Solar Shade Control Act. The law prohibits a property

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<sup>152</sup> CAL. CIV. CODE § 714 (West 2007); *see also* SCOTT ANDERS, KEVIN GRIGSBY & CAROLYN ADI KUDAK, ENERGY POLICY INITIATIVE CTR., CALIFORNIA’S SOLAR RIGHTS ACT: A REVIEW OF THE STATUTES AND RELEVANT CASES 6 (2007), *available at* [http://www.sandiego.edu/epic/publications/documents/070123\\_RightsActPaperFINAL.pdf](http://www.sandiego.edu/epic/publications/documents/070123_RightsActPaperFINAL.pdf).

<sup>153</sup> N.M. STAT. § 3-18-32 (2007).

<sup>154</sup> COLO. REV. STAT. § 38-30-168 (2006).

<sup>155</sup> FLA. STAT. § 163.04 (West 2006); *see also* WIS. STAT. § 236.292 (2004).

<sup>156</sup> *See* *Mohr v. Midas Realty Corp.*, 431 N.W.2d 380, 382 (Iowa 1988); *Sher v. Leiderman*, 181 Cal. App. 3d 867, 876 (Cal. Ct. App. 1986).



owner from allowing a tree or shrub to grow on his property which casts a shadow on greater than 10% of the absorption area of a previously installed solar collector.<sup>157</sup> Santa Cruz County has supplemented this protection by also limiting obstructions created by new construction.<sup>158</sup> If an owner of a “solar energy system” registers the system with the county, any obstruction to the system must be mitigated to “the maximum extent feasible.”<sup>159</sup>

Twenty states have taken the step of enacting legislation recognizing the creation of solar easements which assure that an adjoining property has unfettered access to sunlight where the property owners make such a private agreement.<sup>160</sup> Easement rights, however, are generally the product of a voluntary negotiation, require legal guidance, and may require the payment of some sum to obtain the easement. Communities that are serious about promoting solar energy may consider taking a more proactive step to assure that rights equivalent to an easement are obtained where the neighboring property owner refuses to grant the right. Portland provides for the issuance of a solar access permit if the applicant is unable to reach an agreement with their neighbor.<sup>161</sup> The provision exempts from the restriction imposed on the neighboring property any existing vegetation at the time of the application and all trees that meet the City’s approved list of solar friendly trees, which do not significantly block solar radiation in the winter months.<sup>162</sup> Del Mar, California provides that if adjacent landscaping deprives a site of reasonable solar access or shades an existing device, the owner of the solar device can petition the city council for abatement of the foliage as a public nuisance.<sup>163</sup>

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<sup>157</sup> CAL. PUB. RES. CODE § 25982 (West 2007).

<sup>158</sup> SANTA CRUZ COUNTY CODE § 12.28.040 (2007), available at [http://ordlink.com/codes/santacruzco/\\_DATA/TITLE12/Chapter\\_12\\_28\\_SOLAR\\_ACCESS\\_PROTECT/12\\_28\\_040\\_Protection\\_of\\_solar\\_.html](http://ordlink.com/codes/santacruzco/_DATA/TITLE12/Chapter_12_28_SOLAR_ACCESS_PROTECT/12_28_040_Protection_of_solar_.html).

<sup>159</sup> *Id.*

<sup>160</sup> For a summary of these states provisions, see Erik J.A. Swensen, *State and Local Policies Affecting the Advancement of Renewable Energy Sources*, ABA ENERGY COMMS. NEWSL., Jan. 2007, at 10, available at <http://www.abanet.org/enviro/committees/energy/newsletter/jan07/energy0107.pdf>.

<sup>161</sup> PORTLAND CITY CODE & CHARTER § 3.111.080 (2007), available at <http://www.portlandonline.com/Auditor/index.cfm?c=28472>.

<sup>162</sup> *Id.*

<sup>163</sup> DEL MAR, CAL., MUN. CODE § 23.20.100 (1997), available at <http://www.delmar.ca.us/NR/rdonlyres/0502D996-EE76-43D0->

#### 4. *Planning for Solar*

Communities around the country have employed direct measures to create a planning environment that promotes solar energy development. While on-site solar installations are somewhat expensive today and have a relatively long payback, planning now for a solar future when, as predicted, the price for solar panels falls dramatically, is important to consider. If buildings are sited now to maximize solar absorption it will be relatively easy to add on solar devices. Absent proper building orientation, that transition will be difficult, if not impossible, in the future. Comprehensive plans, zoning, and building requirements can be crafted now to create a solar strategy for orienting the building toward the sun to increase winter heating potential and reduce summer overheating. For new construction, facing a building within 30 degrees of true south (or true north in the Southern Hemisphere) costs nothing, yet maximizes solar potential. Some communities suggest orientations as much as 45 degrees east of south, since morning sunlight from the east offers many benefits with only minor increases in summer heating. Establishing appropriate street patterns can create solar friendly orientations by default as buildings generally face the street.

In the City of San Jose, California, planners developed guidelines to encourage solar orientation in new construction. These Solar Site Design Guidelines, developed by the Environmental Services Department, specify that the long axis of new dwellings should face within 30 degrees west and 45 degrees east of true south.<sup>164</sup> San Jose also specified the amount of shade on the dwelling unit to protect solar access. The City of Boulder has developed detailed guidelines to protect solar access.<sup>165</sup> Homes in two of the three sections of the city known as “solar access areas” are protected by “solar fences” of either 12 or 25 feet.<sup>166</sup> Compliance with the guidelines can be determined by

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838FFB5CE1FCCEC3/0/chapter\_2320.pdf.

<sup>164</sup> DSIRE: Incentives by State: Incentives in California, <http://www.dsireusa.org/> (click checkbox for “Renewable Energy” and click on California, then follow hyperlink for “San Jose—Solar Access Design Guidelines”).

<sup>165</sup> CITY OF BOULDER, SOLAR ACCESS GUIDE, OR SOLAR SHADOW ANALYSIS I (2006), available at <http://www.bouldercolorado.gov/files/PDS/codes/solrshad.pdf>.

<sup>166</sup> *Id.*

measuring the shadow cast by a proposed structure and using a conversion table to determine whether the shadow encroaches into the solar fence.<sup>167</sup> Those requiring additional protection, either because they do not live in a Solar Access Area protected by solar fences or because they require a larger solar fence, may apply for a “solar access permit.”<sup>168</sup> Issuance of the permit will protect an existing or proposed solar energy device from future obstruction, whether caused by vegetation or construction.<sup>169</sup>

## VI. PLANNING FOR ADAPTATION

Any local effort to address global warming should analyze adaptation measures. “Adaptation” refers to the measures required to adapt to the impacts of changes caused by global warming, while “mitigation” refers to the measures necessary to reduce GHG emissions and minimize the changes caused by climate change. Adaptation has been part of the global effort on climate change since the original issuance of the United Nations Framework Convention on Climate Change in 1992, which provided for the development of measures to reduce emissions, and “measures to facilitate adequate adaptation to climate change.”<sup>170</sup>

Most efforts to date have focused on mitigation, perhaps because there was a need to look to reducing emissions first and because there was concern that looking to adaptation would cause the momentum for mitigation efforts to falter. Recent reports from the Intergovernmental Panel on Climate Change have helped bring adaptation to the forefront as a necessary element in global warming oriented planning.<sup>171</sup> Action step recommendations for adaptation are being developed in the United States. A guidebook has been prepared by Kings County, Washington, in partnership with ICLEI, to inform communities about what they can do to adapt to climate change.<sup>172</sup> ICLEI has formed a Climate Resilient

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<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *See id.*

<sup>170</sup> United Nations Framework Convention on Climate Change art. 4, § 1(b), May 9, 1992, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

<sup>171</sup> *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY (2007), available at <http://www.ipcc.ch/SPM13apr07.pdf>.

<sup>172</sup> *See* Dan Miller, *Climate Resilient Communities Campaign Helps Counties*

Communities program to concentrate on adaptation measures and to help local governments develop tools to assess their vulnerabilities and prepare their communities for the impacts and costs associated with predicted global climate change.<sup>173</sup> Communities are joining the program, and local comprehensive plans and capital plans are beginning to include planning for adaptation.

Energy planning is an important element of addressing adaptation. The more frequent and more severe weather events and flooding that may accompany climate change threaten to damage electricity infrastructure. The higher temperatures predicted would bring with them increased demand for air conditioning and so increase summer time electricity load. Warmer weather also threatens to reduce the capacity of hydropower. All of these conditions could create additional pressure on water supply and water treatment facilities; these facilities are energy intensive and greater demands on them increase electricity demand. The steps taken to promote green building, increase energy efficiency, and use renewable energy are important; they serve a dual purpose as they “mitigate” by reducing the use of fossil fuels and “adapt” by helping to create more reliable electricity supply to meet demand increased by climate change consequences.<sup>174</sup>

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*Adapt in Face of Global Warming*, COUNTY NEWS ONLINE, July 2, 2007, <http://www.naco.org/CountyNewsTemplate.cfm?template=/ContentManagement/ContentDisplay.cfm&ContentID=24175>; King County, Wash., Guidebook Will Help Communities Prepare for Climate Change Impacts (April 20, 2007), <http://www.metrokc.gov/exec/news/2007/0420guidebook.aspx>.

<sup>173</sup> ICLEI, Climate Resilient Communities, <http://www.iclei.org/index.php?id=6687> (last visited Nov. 10, 2007).

<sup>174</sup> Again, the many steps that must be taken to adapt to climate change are beyond the scope of this article which is limited to green building, energy efficiency, and renewable energy issues. Adaptation planning efforts focus on a myriad of impacts on the social, natural, and built environments. Adaptation steps that can be considered include (i) careful planning for water supply, sewer/wastewater treatment and storm water with infrastructure built to withstand storm events, store more storm water on-site and create flood pathways to address more frequent and more severe storm events; (ii) zoning that avoids development in areas likely to flood; (iii) water conservation measures to confront diminished water quantity; (iv) building standards for construction that can withstand flooding and be suitable for warmer weather; (v) planning for electricity infrastructure with attention to increased demand, reduced hydropower capacity and burying electrical lines to avoid storm damage; (vi) review of municipal coastal plans for risks and consequences of flooding and attention to

## VII. THE COMPREHENSIVE PLAN OPPORTUNITY

Comprehensive plans, which are used by planners to identify goals and policies that incorporate a community's vision of the future, provide an excellent opportunity to plan for the changes necessary to counter climate change. The comprehensive plan provides the policy basis for subsequent implementation programs, guidelines, and regulations. Historically comprehensive plans have generally focused on how to establish land use and transportation patterns that are most desirable for the community based on projected growth. Looking forward now and planning for a future through the additional lens of climate change, the comprehensive plan can be a vehicle for formulating guidelines for the full breadth of measures required for GHG reduction, mitigation, and adaptation. Giving consideration in the planning process to such additional concerns should not only serve to ensure that these concerns are addressed but also afford a flexible framework that will enable the utilization of new solutions and technologies as they emerge.<sup>175</sup>

A failure to take such action in comprehensive plans (and project reviews) can expose local governments to litigation. Although the plan included measures to promote public transit and foster local jobs to decrease automobile trips, the Attorney General of the State of California filed a lawsuit in the spring of 2007 against San Bernardino County for failing to address global warming in the Final Environmental Impact Statement associated with its growth plan, in violation of the California Environmental Quality Act and Assembly Bill 32.<sup>176</sup> AB 32, the California Global Warming Solutions Act of 2006, mandated a reduction of

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protecting public access to changing shoreline; (viii) reviewing economic issues and fostering the development of new jobs and businesses suitable for a changed climate; (viii) emergency preparedness planning and protecting communication channels for emergencies; (ix) developing biotic corridors to enable wildlife to migrate to suitable climates; (x) introducing crops that can thrive in changed climate.

<sup>175</sup> See EPA, Community Actions—Heat Island Effect, <http://www.epa.gov/heatisland/strategies/community.html> (last visited Nov. 10, 2007) (reporting that San Diego, CA, Highland, UT, and Gilbert, AZ have included energy related issues in their comprehensive plans).

<sup>176</sup> Rob Luke, LegalNewsLine | Inland Empire County Hopes to Settle Brown's Green Suit v. Plan, <http://www.legalnewsline.com/news/195667-inland-empire-county-hopes-to-settle-browns-green-suit-v.-plan> (last visited Nov. 10, 2007).

GHG to 1990 levels by 2020, a cap equal to a 25% reduction from current levels.<sup>177</sup> The California Attorney General has sent at least fifteen letters to local governments with respect to their comprehensive plans or project reviews.<sup>178</sup> The letters suggest that not only must cumulative GHG emission be evaluated and broadly stated, and mitigation related to land use, transportation, and green building be included in the plans, but specific projects and funding for implementation also must be identified.

A settlement of this lawsuit, approved on August 21, 2007, requires the County to amend its plan to add a policy on GHG reduction, adopt a Greenhouse Gas Emissions Reduction Plan, inventory sources of GHGs, and create targets for reduction of sources of emissions reasonably attributable to the County's discretionary land use decisions.<sup>179</sup>

The National Environmental Policy Act requires the preparation of an environmental impact statement for "major Federal actions significantly affecting the quality of the human environment."<sup>180</sup> Many states have enacted what are known as "little NEPA's," which establish similar requirements under state law for local projects.<sup>181</sup> Many states have also set GHG reduction goals.<sup>182</sup> Thus not only does the comprehensive plan offer a tremendously useful tool for local governments to engage in proactive planning on global warming, but local governments in many states may be required to include issues related to global

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<sup>177</sup> A.B. 32, 2005-2006 Sess. (Cal. 2006).

<sup>178</sup> Mike Lee & Michael Gardner, *Brown's Plans for Emissions Disputed, Lack of Legal Basis for Actions Fuels Gripes*, SAN DIEGO UNION-TRIB., Aug. 4, 2007, at A1. For a discussion of climate change, AB 32, and the California Environmental Quality Act, see Hannah Bentley & Eddy Beltran, *AB 32 and CEQA: What Must Local Agencies Do?*, 5 CAL. ENVTL. L. REP. 163 (2007).

<sup>179</sup> See Press Release, Cal. Dep't of Justice, Office of the Attorney Gen., Brown Announces Landmark Global Warming Settlement (Aug. 21, 2007), available at <http://ag.ca.gov/newsalerts/release.php?id=1453&year=2007&month=8>; Press Release, County of San Bernardino, Settlement Positions County as a Leader on Climate Issues (Aug. 21, 2007), available at <http://www.sbcounty.gov/pressreleases/docs/1877AGlawsuitsettlementrelease8-21-07.pdf>.

<sup>180</sup> 42 U.S.C. § 4332(C) (2000).

<sup>181</sup> For a discussion of the import of climate change on "little NEPA" reviews, see Michael Gerrard, *Climate Change and Impact Statements*, N.Y.L.J., May 25, 2007, at 3.

<sup>182</sup> For a summary of states' emission target goals, see Pew Center, *What's Being Done in the States*, [http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_states](http://www.pewclimate.org/what_s_being_done/in_the_states) (last visited Nov. 10, 2007).

warming in preparing comprehensive plans and considering environmental reviews.

### VIII. FUNDING LOCAL GOVERNMENT INITIATIVES

Funding the many initiatives that need support at the local level is a challenge. Recognizing that while substantial progress can be made, resource limitations would constrain municipal action, the Mayors' Conference's ten-point plan for federal legislative priorities for 2007 made enactment of a new Energy and Environment Block Grant, modeled on the successful Community Development Block Grant program, its top legislative priority.<sup>183</sup> The funds would be used for education and incentives for such measures as green building, energy efficiency, and waste reduction that would reduce GHGs, and to promote renewable energy and alternative sources.<sup>184</sup> The Block Grant program sought was included in the energy bills that passed in the Senate and in the House and awaits reconciliation.<sup>185</sup>

In the meantime local communities are taking action to find their own sources of funding. Boulder, Colorado moved in an innovative direction with the first U.S. carbon tax in November of 2006.<sup>186</sup> Boulder does not have a municipal utility or a statewide system benefit charge to provide funding for the implementation of its Climate Action Plan.<sup>187</sup> Recognizing the need to take action on climate change and to identify a source of funding for the effort, the Boulder City Council directed an analysis of possible funding sources which would generate one to three million dollars annually for at least six years and have a logical relationship to the work being funded.<sup>188</sup> Following extensive analysis of various options,

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<sup>183</sup> THE U.S. CONFERENCE OF MAYORS, MAYORS' 2007 10-POINT PLAN (2007), available at [http://usmayors.org/uscm/news/press\\_releases/documents/10-PointPlan.pdf](http://usmayors.org/uscm/news/press_releases/documents/10-PointPlan.pdf). For text of the proposed Energy and Environment Block Grant, see H.R. 2447, 110th Cong. (2007).

<sup>184</sup> *Id.*

<sup>185</sup> S. 1419, H.R. 3221, 110th Cong. (1st Sess. 2007).

<sup>186</sup> Press Release, City of Boulder, Colorado, Boulder Voters Pass First Energy Tax in the Nation (Nov. 8, 2006), available at [http://www.ci.boulder.co.us/index.php?option=com\\_content&task=view&id=6136&Itemid=169](http://www.ci.boulder.co.us/index.php?option=com_content&task=view&id=6136&Itemid=169).

<sup>187</sup> CITY OF BOULDER, CO, CLIMATE ACTION PLAN 7 (2006), [http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/cap\\_final\\_25Sept06.pdf](http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/cap_final_25Sept06.pdf).

<sup>188</sup> CAROLYN BROUILLARD & SARAH C. VAN PELT, A COMMUNITY TAKES

including a building square footage fee to be collected on water bills and a trash tax increase, the City Council opted for the carbon tax. Such a tax did not present any legal difficulties and required voter approval, which was desired both by the Council and the utility that had agreed to collect the tax based on the amount of electricity used, as both wanted clear public support.<sup>189</sup> It is anticipated that the measure will lead to a collection of about one million dollars annually.<sup>190</sup> The estimated savings from implementing the Climate Action Plan are estimated at sixty-three million dollars over the long term.<sup>191</sup>

Aspen, Colorado has adopted another approach which serves both to raise funds and to promote the installation of renewable energy. In 2000, Aspen and Pitkin County launched the Renewable Energy Mitigation Program, providing a new building code which increased energy efficiency and required homes to meet a strict energy budget.<sup>192</sup> Under this code, new homes or substantial renovations or additions must include the installation of a two kilowatt solar photovoltaic system or equivalent renewable energy system or pay a fee of \$5,000 for a home of over 5,000 square feet and \$10,000 for a home of over 10,000 square feet.<sup>193</sup> Homeowners who consume energy beyond the budget from energy intensive activities such as snowmelt, outdoor pools, or spas have the option of installing a renewable energy system or paying a renewable energy mitigation fee, which can be as high as \$100,000.<sup>194</sup> The funds collected are utilized to promote green buildings, energy efficiency, and renewable energy.<sup>195</sup> The program has raised seven million dollars for these purposes and has revolutionized the way residential homes are designed and

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CHARGE: BOULDER'S CARBON TAX 4 (2007), [http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/boulders\\_carbon\\_tax.pdf](http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/boulders_carbon_tax.pdf).

<sup>189</sup> *Id.* at 7.

<sup>190</sup> *Id.* at 10.

<sup>191</sup> Press Release, City of Boulder, *supra* note 186.

<sup>192</sup> Community Office of Resource Efficiency, The Renewable Energy Mitigation Program, <http://www.aspencore.org/sitepages/pid31.php> (last visited Nov. 10, 2007).

<sup>193</sup> CITY OF ASPEN & PITKIN COUNTY, ENERGY CONSERVATION CODE § 311.3 (2003), available at <http://www.aspenpitkin.com/pdfs/depts/7/Chapter3.pdf>.

<sup>194</sup> *Id.* § 311.1.

<sup>195</sup> New Rules Project, Democratic Energy, <http://www.newrules.org/environment/climateaspen.html> (last visited Sept. 19, 2007).



built, with architects adding features such as solar hot water, solar photovoltaic, and geothermal systems to commercial and non-commercial buildings.<sup>196</sup> The funds have been used for energy efficient appliances and efficiency upgrades in residences and commercial buildings.<sup>197</sup> The initiative has avoided over 50,000 tons of CO<sub>2</sub> emissions since the program's inception and will continue to avoid three to four times that amount over the lifetime of all the systems installed.<sup>198</sup>

In 2001, San Francisco voters passed two propositions supporting renewable energy.<sup>199</sup> The legislation allowed the City to sell \$100 million in revenue bonds to fund solar and wind projects that would supply electricity to city agencies, and authorized the City to raise additional funds for renewable projects without voter approval.<sup>200</sup> Under the measure, bonds could be issued only to pay for facilities whose electricity would not cost more than the expected cost of electricity from existing energy sources.<sup>201</sup> As the City expected to repay the principal and interest on the bonds from the revenue generated and saved by the proposed facilities, no higher taxes would result.<sup>202</sup>

Another method that may be employed to fund the installation in municipal facilities of some of the currently more expensive technologies with a longer payback period, like solar power, is through a bundling of facilities energy upgrade measures. The energy cost savings achieved by measures with high short-term cost-effectiveness is used to pay for the more expensive technologies. This kind of bundling is essential to prevent the development of situations in which only the "low hanging fruit," with short-term returns, is implemented and the savings achieved are deflected to other unrelated purposes, leaving no funds available for other more expensive and yet very important energy

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<sup>196</sup> Interview with Gary Goodson, Community Office for Resource Efficiency (July 18, 2007) (on file with author).

<sup>197</sup> *Id.*

<sup>198</sup> *Id.*

<sup>199</sup> Vote Solar, The San Francisco Story, <http://votesolar.org/sf.html> (last visited Sept. 18, 2007); DSIRE, San Francisco – Renewable Energy Purchasing, [http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive\\_Code=C A43R&search=Implementing&implementingsector=L&currentpageid=2&EE=0 &RE=1](http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=C A43R&search=Implementing&implementingsector=L&currentpageid=2&EE=0 &RE=1) (last visited Nov. 10, 2007).

<sup>200</sup> *Id.*

<sup>201</sup> *Id.*

<sup>202</sup> *Id.*

improvements.

Communities across the country are exploring these and other measures to raise funds to support their climate change plans. Arlington has established a green building fund and all projects must contribute \$0.03 per square foot, a cost which approximates the cost of complying with the LEED verification procedures.<sup>203</sup> The fund is used for education and outreach for the development community on green building issues.<sup>204</sup> If the developer achieves a LEED rating, the contribution is refunded.<sup>205</sup> Similar fees and funds are also emerging in other jurisdictions, where the proceeds are used for technical assistance, education, training, and incentive funding.<sup>206</sup>

### CONCLUSION

Justice Brandeis's observation in his dissent in *New State Ice Co. v. Liebmann* reflects the power inherent in local government to lead in achieving necessary change:

[i]t is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.<sup>207</sup>

Local governments at the county and municipal level, like states, can move forward proactively in developing new solutions to the compelling environmental, social, and economic problems posed by climate change. Indeed, local government can play a very significant role since much of the work that must be done on climate change can only be done at the local level.

Thus it is incumbent upon local governments to review promptly the tools available to them to eliminate obstacles to the development of green building, renewable energy, and energy efficiency, to create a legal environment receptive to these developments, and to enact mandates that help accomplish these

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<sup>203</sup> Arlington, Virginia, Green Building—Environmental Services, <http://www.arlingtonva.us/DEPARTMENTS/EnvironmentalServices/epo/EnvironmentalServicesEpoGreenBuildings.aspx> (last visited Nov. 10, 2007).

<sup>204</sup> *Id.*

<sup>205</sup> *Id.* This charge should serve not only to raise funds but also to obviate any reluctance on the part of builders to spend the extra sum incurred in complying with LEED reporting and other requirements.

<sup>206</sup> See, e.g., D.C. CODE § 6-1451.03 (2007).

<sup>207</sup> 285 U.S. 262, 311 (1932).

goals. There are a great many available tools, and more are being developed every day. Each community will have to consider which tools best suit its populace. Since local governmental authority varies from state to state, in each case any local government considering any particular measure must first review the scope of its authority to act and what mechanism can be employed for implementation.