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TOWN OF GREAT BARRINGTON MASSACHUSETTS

OFFICE OF THE TOWN MANAGER

AGENDA

JOINT MEETING

of the

BOARD OF SELECTMEN, PLANNING BOARD, AGRICULTURAL
COMMISSION and ENERGY COMMITTEE

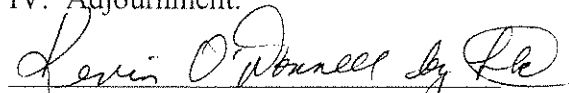
GREAT BARRINGTON FIRE STATION, 37 STATE ROAD

GREAT BARRINGTON, MA 01230

WEDNESDAY, JANUARY 30, 2013

7:00 PM

- I. Call to Order.
- II. Introductions.
- III. General Discussion Regarding Sustainability for the Town of Great Barrington.
- IV. Adjournment.


Kevin O'Donnell, Town Manager

PURSUANT TO MGL. CHAPTER 30A, SECTION 20 (e) (f), MEETINGS OF THE TOWN OF GREAT BARRINGTON SELECTMEN ARE REGULARLY RECORDED AND VIDEOTAPED. ANY MEMBER OF THE PUBLIC WISHING TO SPEAK AT THE MEETING MUST RECEIVE PERMISSION OF THE CHAIR.

THE LISTING OF AGENDA ITEMS ARE THOSE REASONABLY ANTICIPATED BY THE CHAIR WHICH MAY BE DISCUSSED AT THE MEETING. NOT ALL ITEMS LISTED MAY IN FACT BE DISCUSSED AND OTHER ITEMS NOT LISTED MAY ALSO BE BROUGHT UP FOR DISCUSSION TO THE EXTENT PERMITTED BY LAW.

DRAFT CONCEPTS FROM THE DECEMBER 19, 2012 SELCTBOARD MEETING REGARDING SUSTAINABILITY FOR THE TOWN OF GREAT BARRINGTON

Abstract

- Encourage energy self-sufficiency
- Encourage alternative energy sources
- Encourage alternative transportation, particularly for bicycles and feet
- Encourage new employment in town
- Encourage new growth that is sensitive to the landscape and environment
- Encourage existing businesses and land uses to act sensitively toward the environment
- Encourage conscientiousness as to the cost of living in town (i.e. the tax rate) going beyond the earning capacities of those living here
- Encourage home-grown food production and marketing
- Encourage activities that promote good health
- Encourage reuse of municipal waste, perhaps as an energy source
- Encourage new endeavors by taking a leadership role
- Encourage new endeavors by developing sensitive and practical regulations

Concrete

- The town could own its own means of generating electric power.
- The town could develop a reasonable route to the regulation of solar and wind installations
- The town could ban single-use plastic retail bags
- The town could develop sidewalks, trails, bike paths, etc., so more people will be physically active, and at the same time reduce use of automobiles
- The town could offer tax breaks or subsidies for alternate energy endeavors

SEAN A. STANTON
CHAIRMAN

DEBORAH PHILLIPS
ALANA CHERNILA
STEPHEN C. BANNON
ANDREW D. BLECHMAN



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TOWN OF GREAT BARRINGTON MASSACHUSETTS

BOARD OF SELECTMEN

December 6, 2012

Jonathan Hankin, Chairman
Planning Board

Luke Pryjma, Chairman
Agricultural Commission

Christopher Vlcek, Chairman
Energy Committee

Andrew Mankin, Chairman
Conservation Commission

RE: Discussion Regarding Sustainability for the Town of Great Barrington

Dear Sirs:

The Selectboard would like to hold a joint meeting with the Planning Board, Agricultural Commission, Energy Committee and Conservation Commission as a follow up to our first visioning meeting last Spring. Our hope is to discuss the goals of the various boards with regards to sustainability so that we may reflect these goals in our policy. For this meeting, it would be helpful if you could come prepared to discuss the following questions:


1. When it comes to sustainability, are there initiatives you would like to see in the community over the next 5 years? 20 years? Are there measurable goals of these initiatives? And if so, where would you envision the community in 5 years? 20 years?
2. How do you see your board/committee/commission contributing to these initiatives?
3. What (if any) specific concerns, plans, or goals do you have regarding solar development in the community? Would you like to see work continue on a solar bylaw? And, if so, do you have any specific concerns, plans, or goals you think should be addressed directly in the bylaw?

December 6, 2012
Page 2.

The meeting will be on **January 30 at 7:00 pm at the GB Fire Station, 37 State Road.** Thank you for your work on this important issue. Please feel free to contact me or the Town Manager's office if you have any questions.

Sincerely,

The Great Barrington Board of Selectmen



Sean Stanton
Chairman

ST/hk

**DRAFT POSITION STATEMENT OF TOWN OF GREAT BARRINGTON
PERTAINING TO THE ISSUE OF SUSTAINABILITY**

JULY 2012

With resources being stretched, it is imperative as the town government, the Town of Great Barrington undertakes steps to incorporate the best practices of a long term sustainability program into its ongoing practices. Critical areas that should be ever present in the decision making process is the impact the Town government actions will have upon the environment, the infrastructure, promoting healthy and active lifestyles, citizen engagement and a positive stewardship of the natural resources.

To that end, the Town of Great Barrington should continue to explore all forms of alternative energy that show it to be financially prudent within the resources of town government. The Town of Great Barrington is awaiting formal confirmation by the State as a "Green Community". This designation will enable the Town of Great Barrington to apply and qualify for special earmarked State funding avenues to help promote alternate energy use/consumption by the entire community. Sustainability best practices should be consistently incorporated into the services offered by the Town of Great Barrington. A range of 10-15% of the "Green Community" grant funding should be earmarked for facilitating private homeowners in reducing energy consumption. The Town of Great Barrington, as it undertakes the necessary infrastructure upgrades within its jurisdiction, shall routinely incorporate sustainable best practices into those improvements.

The Town of Great Barrington has been contacted by several energy providers recently that include the purchase of solar power and alternative purchasing of electric power. It has become active in a regional approach with the Hampshire Council of Governments pertaining to municipal aggregation. While these options are being newly developed, the Town Manager shall actively continue moving ahead with these energy saving options and report within 60 days as to the status of these activities.

The Town of Great Barrington Master Plan is currently being updated and will contain specific references to a host of alternative energy resource strategies. It will also address walk-ability, quality of life, and economic development. These strategies would form the foundation for future development/redevelopment criteria. The Town of Great Barrington zoning regulations shall be reviewed and revised as necessary to eliminate impediments to the installation of alternative energy sources. As part of the Town of Great Barrington "Green Community" energy reduction plan a 20% savings is targeted within 5 years for town government operations. For the FY15 budget consideration of an additional appropriation equal to 5 cents of the tax rate (\$70,000 estimate) for sustainability program enhancements as recommended by the Energy Committee.

The State limits the local government ability to regulate solar power development. However, within the limitations, the Town of Great Barrington should create a solar power by-law that would include the following:

- allow up to 250 kilowatts by right in residential zones
- allow up to 2 megawatts by right on working farms and in business zones
- allow up to 5 megawatts by right in industrial zones
- allow larger systems than those referenced above by special permit in any district
- require site plan approval of installations larger than 250 kilowatts
- require removal of the solar panels within 180 days of decommissioning the use
- for systems of 2 megawatts or larger enable Great Barrington residents, businesses or industrial users to have the right of first refusal on any surplus power generated.

For further reference to sustainability concepts see attachments.



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Features

The Moral Imperative of Sustainability

by Randall Reid



In February 2008, several dozen ICMA members, staff, and academics joined together in Phoenix, Arizona, to discuss the need for ICMA's membership to embrace the concept of sustainability. It was a rewarding weekend of examining survey data from members, hearing about environmental problems, and exploring community needs around the world. Most meaningful perhaps were the shared stories of the critical importance that local communities have played in our lives.

Our discussion recognized the need to develop a broader understanding of sustainability and how ICMA members can assist their communities to become more sustainable. We noted that the revolution of sustainability would be serious work, requiring both a renewal of the profession's civic reform idealism and an individual commitment from each member to embrace sustainability as a professional management practice.

A commitment pledge for ICMA members modeled after the final lines of the Athenian Oath to "transmit this city greater than it was transmitted to us" was developed for members to sign at the 2007 conference in Pittsburgh, Pennsylvania. (ICMA members can download the pledge at www.icma.org/forms/sustainabilitycommitment.)

Committee members began to encourage state associations to include sustainability sessions at their conferences. We also circulated a series of sustainability articles similar to the *Federalist Papers*, reflecting the basic concepts and core practices of sustainable communities.

The purpose of these efforts is to create a dialogue in the profession on "the issue of the age." This first

ICMA's Sustainable Communities Initiative

The Federalist Papers are a seminal reference on the founding of the United States. Originally published in 1787-1788 to convince New York State citizens to ratify the newly crafted Constitution, the Federalist Papers have since that time provided insights into the philosophy and motivation of the Founders when they created the Constitution of the United States. Today, local government managers have identified the creation of more sustainable communities as a fundamental challenge for the

PM article examines the roots of sustainable communities in the American cultural experience, as well as the spiritual and ethical foundations for sustainable governance.

long-term future, one comparable with the need for more ethical local governance first confronted by ICMA members early in the past century.

A SUSTAINABLE "CITY ON A HILL"

The precepts of sustainability that link people, place, and prosperity are not foreign to America's national DNA. Across America's vast landscapes, indigenous Indian tribes, like the Five Nations of the Iroquois Confederacy, were well versed in sustainable practices and governance, living close to the land and exercising participatory democracy. The Confederacy's Great Law contained the seventh generation sustainable ethic, "In every deliberation, we must consider the impact on the seventh generation."

With this article, ICMA begins a series of periodic leadership and management papers on sustainable communities. Future issues of *PM* will include ICMA members sharing their visions, thoughts, perspectives, and case examples on this issue of our age.

In 1630 on a ship off Massachusetts, John Winthrop established a vision of an America as a "City on a Hill" to be built as a shining example to the world. Recognizing the challenges of the land to be settled, Winthrop sought a divine "blessing in the land" and declared "therefore let us choose life that we and our seed may live." Thus, prior to political formation of local government, a sustainable vision uniting people, place, and prosperity was rooted in American soil.

The Founding Fathers were familiar with both the Judeo-Christian and Greco-Roman philosophers. They knew the Old Testament warning in the book of Proverbs that "without vision the people perish" and Aristotle's observation that people come "to the city to enjoy the good life."

Such historical documents of the republic as Thomas Jefferson's "Declaration of Independence," Abraham Lincoln's "Gettysburg Address," Martin Luther King's "I Have a Dream," speech, and John Kennedy's inauguration speech are a living stream of civic and spiritual expressions. They each represent a collective desire for sustainable and just governance, a focus on higher national purpose, and a call to sacrifice for the future.

Transcendentalist philosophers like Ralph Waldo Emerson and Henry Thoreau; conservationists like Theodore Roosevelt, John Muir, Rachel Carson, and Aldo Leopold; and writers like Wallace Stegner, John McPhee, Wendell Berry, Robert Frost, and Garrison Keillor have contributed to what has been an American dialogue on our sense of place and community. Our various regional cultures are reflected in music, architecture, and literature that arose in local communities.

Historically, wise local government managers are quick to learn the uniqueness of their community's local histories and cultures when new to town. We must now also understand the unique complexities of the bioregion and ecological environments in which our communities exist.

The Preamble to the Constitution called for "We the people" to unite and establish a democratic society. Yet government was not alone responsible for this effort then or now. As de Tocqueville pointed out so vividly, the early civic associations of the United States—the original nonprofit sector—developed independent of governments.

Citizens have collaborated to better the human condition in American communities since our earliest days. Today's sustainable communities will require new and increased levels of civic engagement and participation of citizens as joint partners with our local governments.

Today, citizens must be coaxed off the sidelines and encouraged to be more than customers. We must recognize that "community" begins in conversations between strangers. As managers, we can convene and facilitate such conversations on creating alternative futures for our communities.

ICMA members from other cultures and countries have a similarly rich foundational heritage and traditional stories from their own indigenous peoples that promote the notion of a concern for the environment, healthy economy, and social justice as being necessary for a prosperous human experience. Just as we share many of the same beliefs about sustainability, it is clear that our shared economic, social, and environmental futures are more interdependent than ever before in our history.

SECURE AND RESILIENT COMMUNITIES

It is no longer reasonable to deny that climate change is affecting our natural systems, weather, and migration patterns around the world. Resource depletion, such as potable fresh water, is increasingly documented as population and urbanization increase.

The past year has seen natural gas distribution disrupted in Europe due to regional politics; water shortages in Atlanta, Georgia, that led to Supreme Court litigation from Florida and Alabama; and fluctuating fuel prices and a collapse of our global financial system. Commercially-grown tomatoes, lettuce, and peanut butter have been withdrawn from markets because of fears of contamination, resulting—at least in my jurisdiction—a renewed interest in community gardening and local organic food supplies.

The Golden Rule: A Relevant Foundation for Sustainable Communities.

Hinduism <i>Never do to others what would pain you.</i> Panchatantra 3.104	Baha'I <i>Desire not for anyone the things you would not desire for yourself.</i> Baha'Ullah 66
Buddhism <i>Hurt not others with that which hurts yourself.</i> Udana 5.18	Judaism <i>What is hateful to you do not do to your neighbor.</i> Talmud, Shabbat, 31a
Zoroastrianism <i>Do not to others what is not well for oneself.</i> Shayast-na-shayast 13.29	Christianity <i>Do unto others as you would have them do unto you.</i> Matthew 7.12
Jainism <i>One who neglects existence disregards their</i>	Islam <i>Do unto all</i>

Globalization of our economy does not change the fact that we conduct trade at a local level and must ultimately provide our communities with a sustainable supply of food, energy, and water. The localities where we live actually become more important in periods of economic collapse, spiking energy prices or food and fuel supply disruption. ICMA's membership cannot plan to control world events, but its members can and should plan to be more sustainable and resilient to external threats.

own existence.
Mahavira
Confucianism
Do not impose on others what you do not yourself desire.
Analects 12.2
Taoism
Regard your neighbor's loss or gain as your own loss or gain.
Tai Shang Kan
Ying Pien
people as you would they should do to you.
Mishkat-el-Masabih
Sikhism
Treat others as you would be treated yourself.
Adi Granth
Source: "The Need to Be the Change,"
<http://wecan.be>.

Sustainable communities require the practice of sustainable governance. Sustainability is foremost an ethical framework for daily decisions to be aligned with a shared long-term community vision for stability. These are communities whose consumption of resources and production of wastes are sustainable over time and don't diminish the prospects of future generations.

Sustainable governance is a process in which all community sectors and individuals willingly collaborate to create respect for people and place. It is more organic, conversational, collaborative, appropriately scaled, and decentralized than existing practices. Hopefully, it will be more compassionate as well.

Sustainable solutions do not have to be of a particular political ideology but do require funding and resources. Alachua County, Florida, recently installed a solar collector system that assists in providing electrical power for the county's solid waste resource recovery station.

Our newest solar array of panels could be viewed by some in the community as an environmental project, while others would see it from the perspective of energy independence and national security. They are both correct: future sustainable communities will politically slant neither left nor right. To paraphrase the old management saying, "There is not a Republican or Democratic way of installing solar panels."

Sustainable governance and solutions will require managers to focus more on ecological principles and system theory to achieve more synergistic solutions for the complex problems we face. A neighborhood program to promote energy conservation and reduce utility bills for low-income homeowners, for example, meets multiple sustainable goals.

The program reduces carbon emissions and our community's carbon footprint. It increases energy efficiency and reduces poverty and health issues among homeowners struggling to afford food, healthcare, and rising energy costs. Volunteers, disadvantaged citizens, at-risk youths, and civic organizations can be trained to weatherize homes, thus providing jobs and volunteer opportunities that strengthen civic involvement. Sustainability

requires these kinds of synergistic solutions, and in the end, both the environment and the citizens benefit.

Sustainable communities need the performance management skills of ICMA members to focus on the metrics of changing community conditions. Three decades ago, in 1979, Laurence Rutter stated in ICMA's "New Worlds of Service" report that "demography is destiny." These demographic trends are already impacting natural resources, housing, health care, education, criminal activities, urbanization, and immigration. Sustainable communities driven by demographic changes will require locally distinctive approaches to problem solving.

Local natural resources and fiscal and social capital varies between communities, as do locally appropriate solutions and technologies. Alternative energy sources, for example, may include solar or wind farms in wide-open expanses and nuclear, hydroelectric, and geothermal elsewhere. Community visioning, data-driven strategic planning, smarter land use patterns, expanded civic engagement techniques, collaborative decision-making processes, and performance monitoring of key community indicators must be employed by our members to implement more sustainable alternative futures.

Finally, managers must recognize that regionalism may be the governance process and form of structure of the future. The region and not the local government may become increasingly more important in dealing with issues of sustainability that take place within bioregional systems.

This may continue to require new forms of regional governance, forums, and collaboration as natural systems disregard political geography. Bioregional scale inter-local agreements will be needed to protect resources and reduce the pending potential of legal or political conflicts over resource competition.

For American managers, many who have spent decades valuing the principle of home rule and local self-government; this may be a bitter pill to swallow. Florida has faced this issue over the future of the Everglades restoration, where engineered structures are being removed, communities may be eliminated, and major industries acquired to re-establish water flows required by the ecological systems.

MORAL IMPERATIVE OF SUSTAINABILITY

Managers and residents may tend to mistakenly label sustainability as being just about concern for the environment. Environmental concerns are indeed of paramount importance because history shows us that civilizations that abuse their environments do not prosper in the long term. But sustainable communities place a major priority on creating sustainable economies, poverty reduction, and involvement of all segments of our communities.

The rise of new industrial power centers in countries like Brazil, India, and China has intensified competition for resources as these countries and others seek American-style consumption levels. The interdependence of a global economy means this will inevitably impact your community.

We have often been shielded from the impact of resource distribution and are blessed by better governance and resources than many areas of the world. Will that always be the case if we continue to ignore the moral imperative of creating more sustainable communities? Are we willing to take that chance as a profession?

Above all else, one cannot understand the practice of sustainable management or sustainable communities if one does not see our discussion of sustainability as an ethical statement on civic virtue, healthy living, and social justice. Sustainability is about the responsibilities we have to each other as humans and the places we hold dear. How we use natural resources and the levels of our consumption will affect our future security as a local and global community.

SUSTAINABILITY AS THE "GOLDEN RULE" APPLIED

Millard Fuller, founder of Habitat for Humanity, sought to create a more sustainable community by housing the poor through the "Theology of the Hammer." This theory embraced wholeheartedly the idea that the love of God and the love of man can be blended and integrated in the humble act of constructing a house.

The practice of sustainability among ICMA members can be a holistic ethical lens focused on our collective behaviors; similar to the ICMA Code of Ethics that governs our professional behaviors. Any religious or spiritual component of our lives is usually separated from our professional conversations.

If we could admit professionally, however, that love of people and place are both a human and a professional response and solution to community ills, it might mean everything in terms of embracing sustainability. Many managers possess a strong spiritual sense that our profession of managing communities and organizations can be best understood in the concept of stewardship.

As Cincinnati, Ohio, community consultant Peter Block says, this brings an uplifting moral and life-affirming "gift" and "commitment" that we bring to our communities through our acts of public service. In this sense, we do righteous work.

The spiritual aspect of this sustainable stewardship is important because unbridled greed and competition for depleted resources has historically lead to conflict or violence. In 1993, the Parliament of the World's Religions convened in Chicago. Some 8,000 people from all over the world came together to see if they could find a common ethic in their religious traditions with which to address the issue of violence in their communities.

After much dialogue, they came up with the Golden Rule: Do unto others as you would have them do unto you. As the chart (sidebar) indicates, it is a common ethic among ICMA members of faith worldwide.

As Australian author David Andrews relates in his book, *Plan Be*, "The great value of the Golden Rule is that it is acceptable not only to the religious but also to secular people. General reciprocity seems to be

"common to ethical systems everywhere."

The principle strength of the Golden Rule is that everybody might agree that it is a great place to start with understanding the fundamentals of sustainability. . . "to do unto future generations as you would have them do unto you." Under the concept of applied sustainable ethics, it is no more right for me to use the resources of future generations or another region, for example, than it would be for them to take mine from me by political or military force.

Simply because a resource like water is available in greater quantities or more cheaply outside my own region would not make it ethically right to acquire such resources without consent or fair payment. Self-discipline and community restraint of sprawl and resource use are regional and environmental virtues.

Applying the reciprocity of the Golden Rule to our fellow citizens, we would seek to give others economic opportunity, education, and health care that we have enjoyed because we would want such advantages for our own families and ourselves. This principle of reciprocity is fundamental to the concept of sustainable ethics, and clearly scalable and transferable from personal to local to national and international context.

In the context of sustainable management, a chief executive's role is to create a positive and healthy work environment where employees can grow, develop, and excel. Employees as people cannot be viewed as an expendable commodity and resource.

In these times of cutbacks, it is important that we seek sustainable solutions to sizing our organizations in alignment with our diminishing fiscal resources and our organizational values. An example would be such human resource policies as furloughs, job sharing, and reduced workweeks to avoid the number of lay-offs.

Our own local government organizations can be considered as communities where employees spend the bulk of their lives and waking hours. Sustainable governance of local organizations will enhance the dignity of employees, seek to encourage collaboration and teamwork, share information, promote transparency, conserve natural resources, and reduce or reuse waste materials.

CONCLUSION

A sustainable community is all about enhancing the "Three Es" of economy, environment, and social equity within the community to improve peoples lives. This requires a visionary eye, with the present and future well being of the whole community as its goal. The success of our daily actions, however mundane or heroic, can be judged by the sustainability of the communities and organizations we design and

Older Neighborhoods: 21st-Century Solution?

Global warming, high oil prices when the economy is strong, and epidemic obesity. They're acknowledged to be three of the nation's most serious challenges. But for years we've had a little-used weapon against all three: the compact, walkable older parts of communities—our country's

manage for the benefit of current citizens and future generations.

As Martin Luther King reminded people, the daily struggles of the Montgomery bus boycotts themselves were not the end being sought: "the end is reconciliation; the end is redemption; the end is creation of the beloved community."

Educating residents about sustainability is important. When speaking to them, it may be good to refer to sustainability as being about local people, local places, and local prosperity. To bankers, speak about living off the interest not the principle. To farmers, speak about not eating your seed corn. To the elderly, speak about their grandchildren. To veterans, speak about our nation's security. To scout groups, speak about leaving your campsite better than you found it. As ICMA managers, I urge you to simply speak out.

Perhaps we make sustainability too hard a concept or principle to grasp. What if sustainability were as simple as the Golden Rule! Imagine treating people and your neighboring jurisdictions as you would want to be treated.

Randall Reid is county manager,
Alachua County, Florida
(rhr@alachuacounty.us).

cities, towns, and counties—that facilitate active living and energy conservation.

Hybrid Neighborhoods, a mini-book readable in about an hour, shows the home buyer long-forgotten advantages of in-town living over the sedentary, car-dependent lifestyle of the new subdivision. This book counters popular misconceptions with research findings and anecdotes. One study found residents of walkable mixed-use areas up to 35 percent less likely to be obese. And another found that kids inside a school bus actually breathed dirtier air than kids walking to school. Local government managers who want to help revive sound but out-of-favor older neighborhoods by winning over middle-class families will find evidence here that will bolster their case.

For 50 years, older neighborhoods have lost out because the newest developments have been marketed better, author John Gann notes. Although Gann states that 21st-century challenges now make moving back into urban environments a problem solver for both society and families, he concedes this is not yet appreciated by the public. Perhaps managers can help change that.

Source: John L. Gann, Jr., *Hybrid Neighborhoods* (Glen Ellyn, IL: Carpe Horam, 2007). John L. Gann, Jr., is president, Gann Associates;
citykid@uwalumni.com.

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ICMA is the leading organization for information on professional local government management. Its membership includes city managers, county managers, and other chief appointed officials and assistants in local governments throughout the world. ICMA's mission is to create excellence in local government by developing and fostering professional local government management worldwide.




By Tom Bakaly, ICMA-CM

IMPLEMENTING SUSTAINABILITY

**Chances Are,
You're *Already*
Doing It**

And all with the right dimensions



Despite vivid memories of my mother depositing me into the back of a wood-paneled station wagon, sick from inhaling smog during swim lessons in 1960s Los Angeles, I have not had the passion for environmental issues that I saw in others.

So, a few years ago when the new mayor of my community wanted the city to get more involved in environmental initiatives, I dropped into the bureaucratic fetal position. I claimed we lacked financial resources and city council direction to pursue these new initiatives, which almost felt like a social service program.

I have since wondered if it is still micromanagement if I agree with the elected officials. This is, however, a topic for another day.

The mayor persisted and took me with him to a mayors' climate change conference at the Sundance Resort. When other mayors gave him grief and asked why he had brought the city manager, he simply replied, "He is the one who is going to implement this stuff."

A Matter of Definition

I think when most people hear the word "sustainability" they immediately think of environmental issues

and climate change. Many of them shut down at that point, as I did.

Sustainability is much broader than that. It is a mind-set regarding community, environmental, and economic initiatives that ensure the future viability of your local government. Before sustainability can be implemented, however, it must be defined and shaped into what is unique and best for your own community. One size does not fit all.

Before I explain Park City's recent experience with implementing sustainability, I must ask you to suspend disbelief. Many will say that a resort town that depends on visitors and \$5-million second and third homes is an oxymoron when it comes to sustainability. Maybe, but we should acknowledge and move past that.

I think resort towns are somewhat rare, and they may be further along the sustainability curve than other local governments at this point because resort towns' economies are based on competition and environment. That was the hook for me—the economic connection to our environment and community.

When people ask how we are going to fare financially for the upcoming fiscal year, I reply, "As long as we get early snow, we ought to be okay." As a resort town, we will

TAKEAWAYS

- › Think about sustainability as a mindset instead of a program or initiative.
- › Help define a sustainability role that works best for your community.
- › Integrate the sustainability function into your organization.
- › Implement environmental sustainability ideas that are relatively simple and cost effective.



never be perfectly sustainable, but that does not mean we are failing and should stop trying.

We began our implementation somewhat warily and methodically. We deliberately used words like “facilitate” and “assist” instead of words like “coordinate” or “manage” to literally set the tone for the city’s role. Five years ago, the city broke the cardinal rule and built the environmental staff position around an existing employee rather than develop the scope of the position and then select the candidate.

I’d like to say that the position was located in the city manager’s office to signify the organization’s commitment to the environmental sustainability function. In truth, it was more about control

vent environmental damage, and ensure that taxpayer dollars are not wasted.

After they became comfortable with Park City’s evolving role in sustainability, elected officials and management staff began to understand that sustainability meant more than just environmental issues. There already was a manager who focused on such community issues as affordable housing, public relations, and long-term planning as well as a manager who worked on such economic development issues as events, capital facilities, and redevelopment.

So it was decided to functionally align the three areas of economy, community, and environment in order to meet the council’s sustainability goals. We did this by creating an ongoing self-directed work team of the three

interact with this team. They are not just checking a box, showing they talked to the environmental person, but staff members are actually weaving environmental, community, and economy principles as one concept into their operations. It is becoming a mind-set.

Okay, at this point some readers may have what I call the “Merlin” look on their faces. Merlin is my black lab, my canine friend who tilts his head to the side and points his ears up when he does not understand what I am saying. Here is an example. Seventy percent of Park City’s revenue is based on visitors choosing to visit Park City instead of competing resort towns, cruise lines, or Las Vegas.

Their decision will be based on several factors. One factor will be the treatment they receive from the service community. If members of that service community (the police officer, bus driver, and waiter) live affordably in the community, are thus invested in the community’s success (as ambassadors), and are not thinking about how to easily get home to their

Once comfortable with Park City’s evolving role in sustainability, elected officials and management staff began to understand that sustainability meant more than just environmental issues.

and building my trust that we should be in this business. Being right for the wrong reason still counts.

Park City’s Status

We started with getting some help to identify places in Park City where improvements in energy efficiency could be made. I was skeptical of how committed at a policy level councilmembers were to spending public funds for environmental projects. All councilmembers agreed that energy decisions should be based on return on investment and economy.

Thus far, we have implemented or planned internal energy- and water-saving measures with the potential to save more than \$250,000 per year. The council has also funded a \$100,000 internal revolving loan fund to finance energy- and fuel-saving activities that have a demonstrated financial payback. These measures conserve resources, pre-

managers who were responsible for the function areas.

These managers serve as resources for each other, participate in 360-degree performance reviews, and are essentially self-managed. See Figure 1 for the team’s organization chart.

I challenge managers to look at Figure 1 to find the similarities, not the differences, with services, programs, and projects being done in your organization. My guess is that, with some exceptions, at least 75 percent of these things are being done already.

This structure has allowed us to integrate sustainability into who we are. It is not some program, individual, or new idea the local government manager had after a conference. It is a core function for managers, just like public safety and recreation.

It has been interesting to see how the transit and water system departments

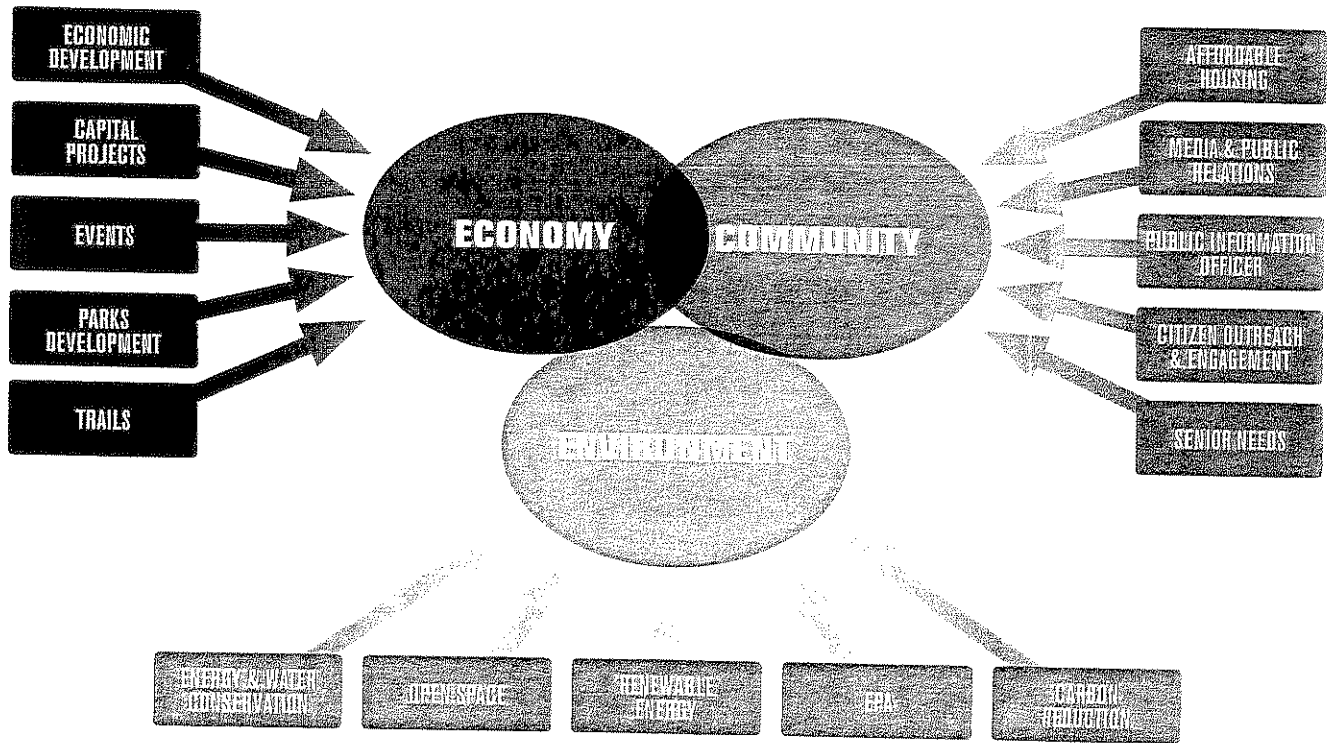
children if needed, their service provision is going to be better than if they lived 30 miles away.

One thing the city staff hear over and over and have documented in surveys is that people in Park City are engaged and extremely nice. Better customer service = return visitors = more revenue = more sustainability. Thus, providing affordable housing is not just a community program; it is the right thing to do. It directly contributes to the city’s economy, not to mention that it reduces traffic, which enhances the visitor and resident experience.

Community Health Ratings

The other thing we have often done is measure the city’s status and how customers rate our city’s performance. I know personally that I tend to be healthier if I get on the scale frequently, and I think it is important to check out

FIGURE 1. Organizational Chart for Park City, Utah's Sustainability Team.



the city's health, too. Employee engagement surveys have been conducted for more than five years, and Park City recently joined the National Citizen Survey to help assess community health.

Park City's scores are high (good). We also calculated the community's carbon footprint, which scored high (bad). Again, we have developed a mind-set that we are willing to honestly look at ourselves, take risks with public opinion, improve, and be sustainable.

Here are some practical environmental sustainability programs that have been implemented and that also built community and helped our economy:

ParkCityGreen.org Website. I was born in the final year of the baby boom generation, so I struggle with the indirect communication of social media that has become the norm today. I know that if I want to have a relationship with my son, nieces, and nephews, I must text.

Similarly, if we want to engage our citizens, we must create convenient opportunities for them to plug into the governance engine and take responsibility themselves. One tool we have used

effectively is a community outreach website called ParkCityGreen.org.

ParkCityGreen.org was launched in September 2009 and is used to connect with residents on environmental issues and encourage sustainable living. The website was created as a hyperlocal resource that includes such tools as a carbon footprint calculator, local events calendar, repository for local environmental reports, and a "Ways to Save" section to guide efficient decision making for households and businesses.

The website experienced tremendous success, with more than 25,000 total visits from roughly 12,000 unique visitors in its first 24 months after launch. The website continues to evolve and is home to an ever-growing portfolio of city environmental programs and projects.

Save Our Snow. In the spirit of facilitating and not solely owning initiatives, we partnered with a community foundation, business leaders, and media representatives to help people understand what snow levels might look like in 20 years and how that will impact our economy.

This was an idea we borrowed from one of our friends and competitors, the city of Aspen, Colorado. I don't want to stick my hand in the climate change badger cage, but scientists agree that glaciers are receding at an accelerating rate. Therefore, the snowpack will likely retreat to a location that's higher on the mountain.

We asked scientists and experts to calculate where snow levels would be in the future. We then enlisted the community to go on the mountain and form a human line that showed the future snow level. A video was created of this, using a helicopter and personal interviews, and then several community meetings and dialogues were held and attended by 1,500 people (20 percent of our permanent population). We won't change the world with this type of activity, but we are going to engage our community and alter mind-sets.

Low Carbon Diet. Park City recently leveraged the success of ParkCityGreen.org to initiate a new outreach program entitled the Low Carbon Diet. This community-based program engages

As I watch every layer of government from federal to local and associations, from mayors to planners claim to be at the forefront of environmental sustainability initiatives, I wonder who is actually going to do the work that is necessary to help communities become wholly sustainable.

households at the grass roots and encourages them to reduce their carbon footprint by 5,000 to 10,000 pounds of carbon dioxide per year.

Emission reductions are achieved by an assortment of strategies, including behavioral changes, energy efficiency upgrades, reduced water consumption, waste and recycling improvements, transportation changes, and dietary choices. Participating households have

each been able to reduce their footprint by an average of 9,557 pounds of carbon dioxide, the equivalent of removing an entire vehicle from the road, while typically accruing net financial savings in the process.

Program information and an online reporting form for participants are available at ParkCityGreen.org.

The sustainability measure of success for each local government will

be whether that community is a place children will want to visit and be able to live in. If you are like me, I got into this business to be where the rubber hits the road. I want to help shape and mold my community.

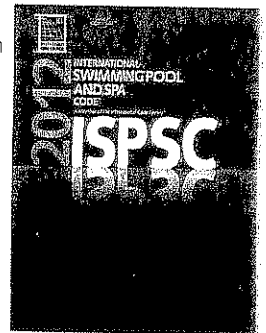
As I watch every layer of government, from federal to local and associations, from mayors to planners, claim to be at the forefront of environmental sustainability initiatives, I wonder who is actually going to do the work that is necessary to help communities become wholly sustainable.

I am obviously biased, but I think it is up to us as city and county managers. We should base our sustainability decisions today on one simple test: Will the manager 20 years from now be happy to see me when I come to visit? **PM**



TOM BAKALY, ICMA-CM, is city manager, Park City, Utah (tom@parkcity.org).

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BY TAD MCGALLIARD

REFRAMING THE SUSTAINABILITY CONVERSATION FROM *WHAT TO HOW*

In an early 1980s music video, the still popular U2 rock group from Dublin, Ireland, prefaced the live version of an early megahit with singer Bono saying, "There has been a lot of talk about this next song, maybe too much talk." The same can be said about the national discourse and the water-cooler conversations on the meaning of sustainability.

Thoughts and Expectations

Some of today's critics present sustainability as a dangerous philosophy that promotes a not-too-distant future in which freedom, liberty, and the timeless aspirations of leaving a better life for our kids are trampled by a new world order outlined in a United Nations document known as Agenda 21. Yet others suggest that sustainability is the green pathway to our harmoniously converged future, where the lion lies down with the lamb.

Neither extreme seems to frame the issue of sustainability accurately.

So what is sustainability? Simply put, sustainability is the ability of communities to consistently thrive over time as they make decisions to improve the community today without sacrificing the future.

Although the term sustainability is often associated with the environment, this is only one aspect of building a sustainable community. In fact, we've been asked more than once why we didn't align this issue of *Public Management (PM)* magazine with World Water Day (March) or Earth Day (April). Doing so would have suggested that sustain-

ability was exclusively an environmental or "green" issue.

Communities need clean air and water, jobs that pay living wages, and a social compact within which people of all religions, political persuasions, races, and age groups live and work together safely.

SUSTAINABILITY IS THE ABILITY OF COMMUNITIES TO CONSISTENTLY THRIVE OVER TIME AS THEY MAKE DECISIONS TO IMPROVE THE COMMUNITY TODAY WITHOUT SACRIFICING THE FUTURE.

Viewed comprehensively, sustainability can provide an organizing framework for building better and stronger communities. Building sustainable communities is at the core of the leadership responsibilities of local government leaders. In the words of the *ICMA Strategic Plan*, "now more than ever, local government managers must provide sound, professional, and ethical leadership to their communities as well as guidance and support to their elected officials; they must bring innovation and efficiency to the task of building sustainable communities."

In This Issue

In this special issue of *PM* and in other communications too, we present a number of articles that are intended to recapture some of the high ground around sustainability by reframing the debate from "what is sustainability and what does it mean" toward "how do we create a better community in which to live, work, and play?"

The articles you can read here are the vanguard of a continuing body of knowledge and resources available for you. Additional case studies and thought pieces are presented in the on-line version of *PM* magazine (online at icma.org/pm beginning May 27, 2012), along with the sustainability topic page

of the Knowledge Network (www.icma.org/kn), and delivered through other ICMA channels to managers in the profession.

"There's some hard times in the neighborhood," goes the refrain from Darrell Scott's song, "It's a Great Day to Be Alive" (also made popular in a remake by singer Travis Tritt), an apt metaphor for our local governments in the wake of the

Great Recession. But all of you in the local government management profession are working hard to create better communities, as you always have and always will, through the good times and the bad.

I hope the articles and knowledge resources made available in this issue and elsewhere provide a tailwind for your efforts. **PM**



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PUBLIC MANAGEMENT

Public Management (PM) aims to inspire innovation, inform decision making, connect leading-edge thinking to everyday challenges, and serve ICMA members and local governments worldwide in the pursuit of excellence in local governance.

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BY MARTHA PEREIRA

SUSTAINABILITY: IT'S A RIGHT VERSUS-RIGHT ISSUE

Is there a way to define sustainability success?

Local government leaders have defined sustainability as the predominant issue of the age. That said, there is considerable debate about what sustainability really means. Is sustainability a good management practice or a leadership imperative?

Is it defined by the triple bottom line of environment, economy, and equity? Or should there be another metric of success?

There may not be at this stage a clear, universally accepted definition of what sustainability means. And lacking that, we may not be in agreement about the way forward. But one thing that we should agree on is that the underlying principles were embraced by the local government profession from the very beginning. And they remain core to the profession to this very day.

When those pioneer city managers drafted the first Code of Ethics in 1924 to define the values for a new profession, they thought about the future of the communities they led.

Back in the Day

"A City Manager will be known by his

works, many of which may outlast him, and regardless of personal popularity or unpopularity, he should not curry favor or temporize but should in a far-sighted way aim to benefit the community of today and of posterity."

This 1924 statement from the Code could have been interpreted more to emphasize the responsibility of individuals to set aside their egos in the pursuit of professional accomplishments than to build for the future. Societal changes brought new obligations and challenges that perhaps helped the profession better define its values.

In 1938, the ICMA Code of Ethics dropped the tenet above but added this one: "The city manager has a firm belief in the dignity and worth of the services rendered by government and a deep sense of his own social responsibility as a trusted public servant."

The reference to social responsibility makes the ethical commitment of the profession and the professional clear. As individuals, we have an ethical obligation to act so that the community and society at large benefit.

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Success isn't just meeting the needs of one segment of the community at the expense of others. Nor is success found in short-term gains made at the expense of long-term accomplishments. Building communities that would last and meet the needs of future generations required a commitment to social responsibility.

Fine-tuned over time, Tenet 2 of the ICMA Code of Ethics calls all professionals to "Affirm the dignity and worth of the services rendered by government and maintain a constructive, creative, and practical attitude toward local government affairs and a deep sense of social responsibility as a trusted public servant."

Philosophy

With our guiding principles in hand, how do we move forward? Begin by recognizing that, for the most part, issues around sustainability are right-

versus-right dilemmas. The values on both sides of the equation are legitimate and good.

These are not the typical ethical issues of good versus evil or right versus wrong. The decisions local government managers make in the sustainability arena are hard because the underlying values involved in any of the options are sound.

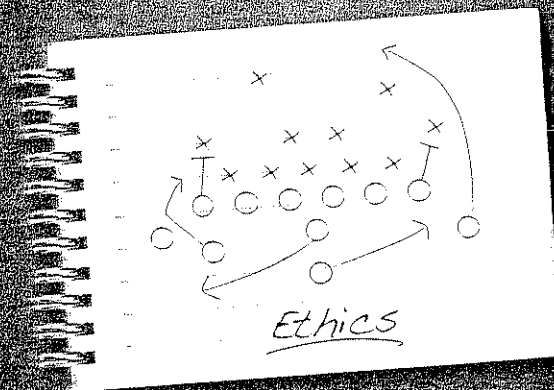
The Greeks gave us the Athenian Code that prompts us to leave our communities in better shape than we found them. That requires us to think beyond tomorrow and not to worry about who gets the credit.

As the Greek proverb reminds us: "A society grows great when old men plant trees in whose shade they know they shall never sit." **PM**



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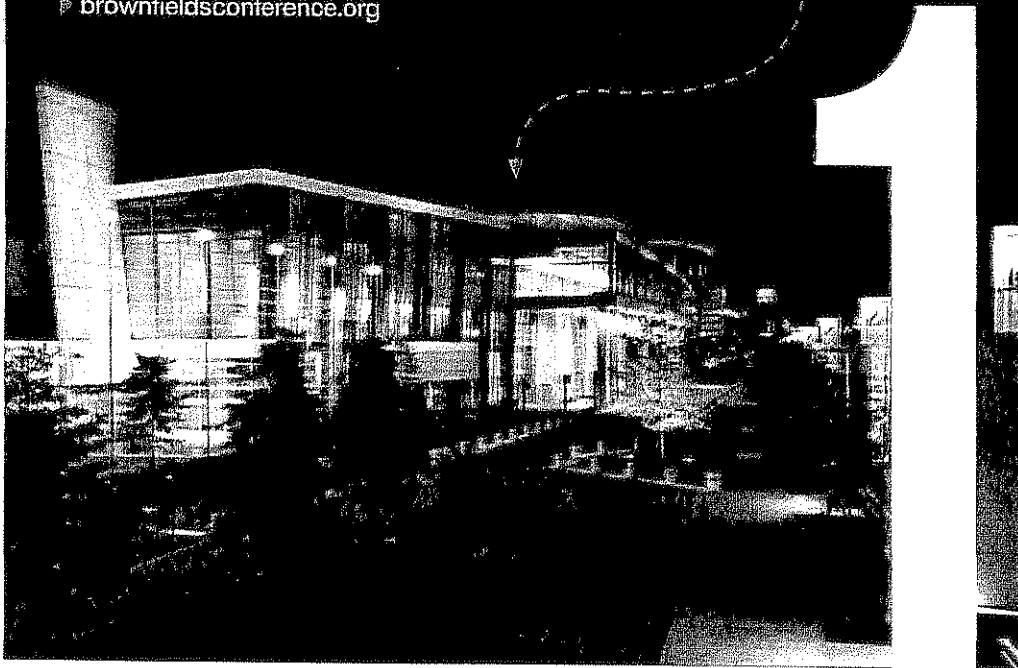
ICMA Leaders at the Core of Better Communities

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GEORGIA ON MY MIND— BROWNFIELDS 2013

ICMA will again manage the communication, outreach, and educational program for the National Brownfields Conference. With more than 5,000 attendees, 200 exhibitors, and 100-plus educational sessions, the conference is the largest of its kind. The next conference is May 15–17, 2013, at the Georgia World Congress Center in Atlanta.

▶ brownfieldsconference.org



KNOWLEDGE NETWORK

TOP 10

SUSTAINABILITY TOPIC PAGES

Here is a list of the top 10 Knowledge Network topic pages related to sustainability. Some 200 more topic pages also provide sustainability information, resources, and networking opportunities.

- Active Living
- Brownfields
- Citizen Engagement
- Energy Efficiency
- Environmental Management Systems
- Food Security
- Smart Growth
- Shared Services
- Solar Energy
- Sustainability

▶ www.icma.org/kn

2 SMART GROWTH IN RURAL PLACES



Some 18 months after its publication, *Putting Smart Growth to Work in Rural Communities* remains one of ICMA's most popular downloads. It provides rural decisionmakers with a resource

for balancing competing goals while creating more vibrant and sustainable communities.

▶ icma.org/ruralsmartgrowth

3 BUILDING KNOWLEDGE THROUGH CITYLINKS



To support its USAID-funded CityLinks program, ICMA has launched a new website that

provides a focal point for knowledge sharing on three urgent challenges in today's rapidly urbanizing world: climate change, food security, and water and sanitation.

▶ icma.org/citylinks

By Michael Willis, ICMA-CM

SUSTAINABILITY: THE LEADERSHIP DIFFERENCE

We Must

PROVIDE

LOOK AT IT AS
THE ISSUE OF OUR AGE

The future will always belong to those who are prepared to face it. It always has, it always will.

In the same vein, former British prime minister Tony Blair has challenged the notion of Western politics being based on divisions of the left and the right. For him, the distinction was more accurately between those who are prepared to embrace reform and the challenge of change and those who are not.

» *Continued on page 10*

At its essence, sustainability is all about facing the future—of devising ways and means to meet the environmental, social, and economic challenges the future presents. Although one may learn from the past, that alone cannot provide the answers for tomorrow anymore than one can drive a car by staring into the rearview mirror.

In that spirit, in February 2007, the ICMA Executive Board decided to make sustainability a priority issue. It directed staff to launch efforts to position ICMA as a leader on the issue. Five years on, a lot has happened. Is it still the issue of our age, or has life passed it by? What needs to be done to ensure that it remains at the forefront of what we do as professional local government managers?

Events that Produced Change

It's important to reflect on how sustainability achieved such prominence. It grew out of the environmental movement in the latter part of the last century as well as the embrace of individual and community values on preserving and protecting our natural assets.

Sustainability, however, goes far beyond the preservation of places of great beauty. It encompasses the impact that our daily lives have on the quality of our local environment.

But sustainability wasn't just about the emergence of an enhanced value set. It was also fostered by an emerging body of evidence that pointed to the environmental calamity that was coming into view as a consequence of climate change.

To these two streams may be added a third: events.

Harold Macmillan, British prime minister of the 1950s and 1960s, was once asked what was likely to blow a government off course. He replied "Events, dear boy, events."

There were some pivotal events that spurred the sustainability movement, including the development of Agenda 21 from the United Nations Conference on Environment and Development in Rio de

Janeiro in 1992 (and the establishment of its companion volume, LA Agenda 21), the work of the Intergovernmental Panel of Climate Change, and of course Al Gore's film, *An Inconvenient Truth*.

Such events as these reshaped our civic consciousness, building on a growing understanding of environmental values and their connection to the importance of place.

Sadly perhaps, the rising tide of sustainability also created a wave of expectation and belief that could not be politically delivered. The 2009 UN Climate Change Conference held in Copenhagen was to form a global political commitment to the agenda developed in Rio de Janeiro in 1992.

If Rio represented a brave new sustainable world, Copenhagen was to sadly show that the commitment to it from world leaders was a mile wide but only an inch deep.

Such fragility increased as a result of the Great Recession of 2008, when the philosophy of sustainability took on a new and sometimes overwhelming emphasis: financial sustainability. How would our cities and communities survive against the financial disaster that had befallen many of them?

Has this aspect of sustainability had a corrosive effect on the heart of sustainability and led us to even pose the question of refreshing it as a concept? That has not been helped—in the United States, at least—by a rising distrust of the willingness or capacity of federal, national, and state governments to provide effective leadership on the environmental threats that have confronted us.

Future Vision

But take heart! Just as every dog has its day and every villain their moment in the spotlight, history does have a habit of being shaped by those who are prepared to face the future.

And there has been a sea change in attitudes to sustainability. On rereading the article, "The Issue of Our Age," published in the August 2006 issue of *PM*,

I was struck by the amount of effort that was put into defining and explaining the concept of sustainability.

If nothing else has been achieved by ICMA in its leadership of that philosophy, it is that we have moved far beyond defining and explaining. ICMA's leadership has ensured that sustainability will be an everyday constant of our profession, which has in turn responded positively and enthusiastically to the challenge. And as we have led, others have followed.

As it was put to me recently: "By embracing sustainability, local governments have brought to the mainstream population the thinking that we must consider environmental, social, and economic impacts of our policies, programs, and practices both for today and for future generations. Local governments have become leaders in implementing changes themselves and prompting change through updates to laws and policies."¹

The January/February 2012 online issue of *PM* included an electronic poll with the question, "What will the profession look like in 2020?" Of the five options offered, stronger commitment to sustainability came out on top (32 percent).

Research as well as anecdotal evidence confirms our leadership. The IBM Center for the Business of Government set out the findings of an ICMA survey on prioritizing environmental and energy programs in local government.² The report found that of the 2,000 localities that responded (8,000 local governments were approached), more than 80 percent reported initiatives on recycling, transportation, and building use. But not as many achievements were reported on alternative energy and workplace initiatives.

The report concludes:

"Sustainability may be 'the issue of our age,' but most local governments are still at a relatively early stage of addressing it. Most countries are taking some action, but the number remains limited. Based on past experience with the spread of other local government innovations, most cities and centers will significantly increase sustainable activity in the future."³

This provides a pointer to the future of sustainability: the challenge of integrating it into the management of our cities and communities. A 2012 Organization for Economic and Development (OECD) report on climate change, employment, and local development in Sydney, Australia, described this graphically in relation to the creation of low-carbon economies.

WE MUST REMAIN TRUE TO THE ENVIRONMENTAL HEART OF SUSTAINABILITY. THAT IS WHAT HAS PROVIDED THE SOUL, THE ENERGY, AND THE SENSE OF URGENCY THAT IS AT THE CORE OF ITS SUCCESS.

“Action is required at the local and metropolitan level. Cities consume more than two-thirds of the world’s energy and account for 70 percent of greenhouse gas emissions. Well-designed regulations and programmes are required to accelerate the transition to a low carbon economy. This requires a commitment to innovation, research, investment in green infrastructure and skills, and strong partnerships that expand opportunities for green growth.”⁴

So while we may fret at the lack of consistency of policy making on sustainability at the state and national levels, and obviously they have a powerful role to play, it is at the local level where committed and inspired leadership can make the difference that counts: in our local governments.

Events Will Be Shape Shifters

Critical to that leadership will be two key elements. First, we must remain true to the environmental heart of sustainability. That is what has provided the soul, the

energy, and the sense of urgency that is at the core of its success.

Second, and paradoxically, we must continue to stretch the boundaries of what it means to be sustainable and to see it as the “the essential vehicle by which we must operate in the future.”⁵ By expanding its applicability, we strengthen it as a core concept of our managerial leadership.

Events will continue to shape that response and that leadership.

The UN-sponsored Durban climate summit late in 2011 did provide a result somewhere between the scenarios of “progress” and “breakthrough,”⁶ with its agreement to negotiate a single, legally binding agreement by 2015 that will cover all major carbon pollution emitters. It also moved forward the establishment of the Green Climate Fund of

\$100 billion a year to help the world’s poorest nations combat climate change; and the commitment must come from all countries to increase the level of ambition of national efforts to reduce pollution.

This month, June 2012, there will be a bookend to Rio de Janeiro 1992, with the meeting of the UN Conference on Sustainable Development. It will be called RIO + 20, and it will be an opportunity for an evaluation of Agenda 21 and, in particular, for promotion of local government advocacy and action to deliver local sustainability.

Looking into the future, we can find cause for both optimism and concern. United Nations statistics predict that the world’s population will peak at 9 billion in 2070. On one level, that’s good news; on another it is not.

The reason for the population slow-down and decline may be the result of the rise in developing economies of Western-style, small-family, high-relative-affluence, and resource-hungry lifestyles that have,

until comparatively recently, been the preserve of the developed economies. The pressures on our environment will not fade; they will increase. Therefore, to pursue the cause of sustainability is to be on the right side of history.

We managers often see ourselves as being in the legacy business—of leaving our places, our communities, and our local economies in better shape than we found them. We work with civic leaders and with staff members to help achieve those aspirations by bringing our professional skills and knowledge to the table.

Our role in creating a sustainable future, however, must go far beyond professional competency. It must draw in the people we both advise and lead toward a better future that is in keeping with environmental constraints. But we must do more than simply show the way to that better future.

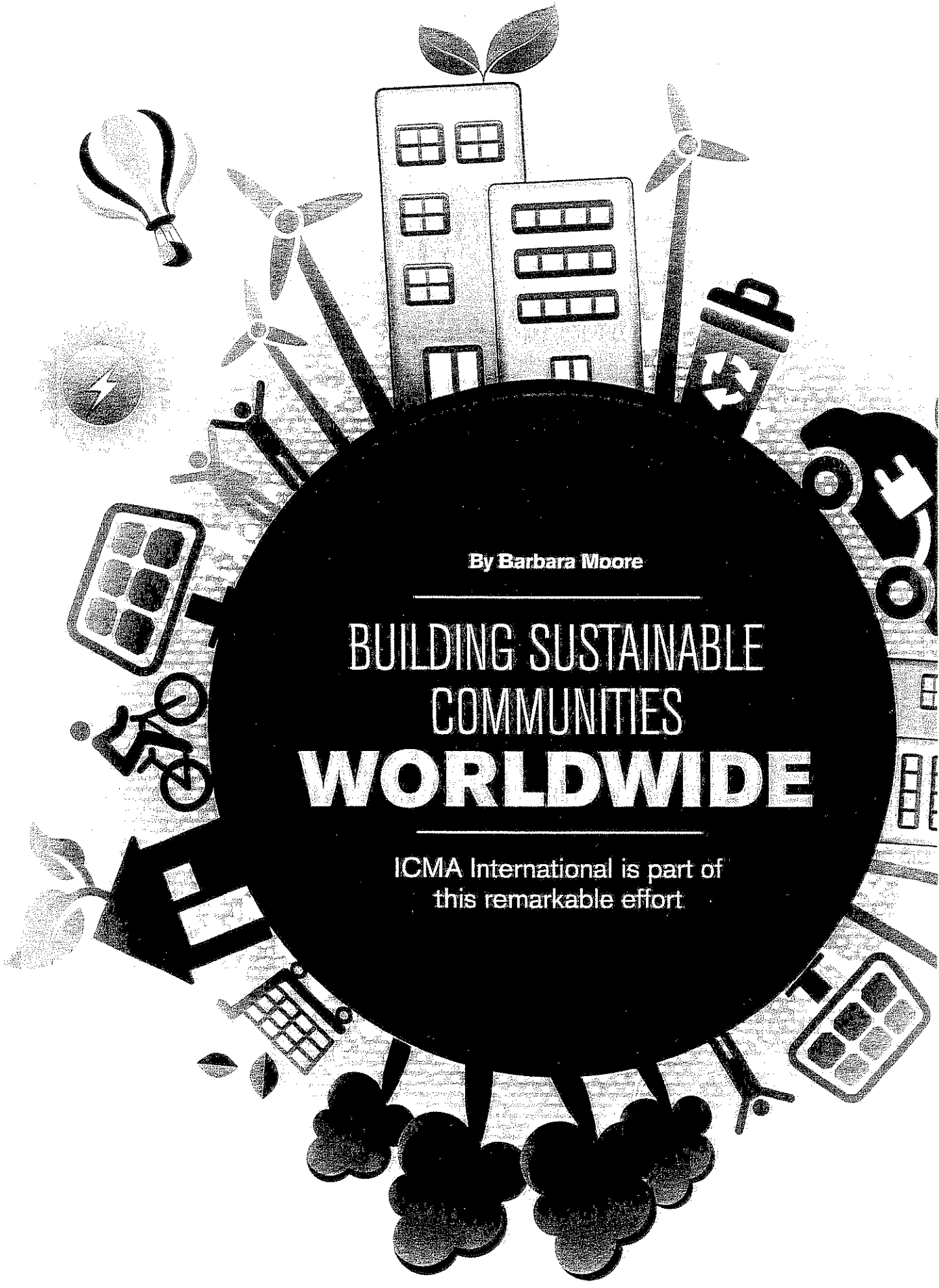
We must through our passion, our energy, and our commitment inspire others to take that path so that they share our belief that it is the right thing to do. That is the leadership difference we must provide, and that is how our profession must face the future. **PM**

ENDNOTES

- 1 Wally Bobkiewicz (city manager, Evanston, Illinois) and Catherine Hurley, (director of sustainability, Evanston, Illinois) in personal communication with the author.
- 2 James H. Svara, Anna Read, and Evelina Moulder, *Breaking New Ground: Promoting Environmental and Energy Programs in Local Government* (Washington, D.C.: IBM Center for the Business of Government, 2011).
- 3 *Ibid.*, p. 3.
- 4 G. Miranda et al., *Climate Change, Employment and Local Development, Sydney, Australia* (Paris: OECD, 2011), p. 14.
- 5 Wally Bobkiewicz (city manager, Evanston, Illinois) and Catherine Hurley, (director of sustainability, Evanston, Illinois) in personal communication with the author.
- 6 *The Durban Climate Summit, Implications for Australia* (Sydney: Climate Institute, December 2011).



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By Barbara Moore

BUILDING SUSTAINABLE COMMUNITIES WORLDWIDE

ICMA International is part of
this remarkable effort.

Environmental sustainability: And in achieving these objectives, a local government must safeguard its water supply, open space, and other physical assets by preparing for and mitigating natural disasters and by employing environmentally responsible methods for energy generation, waste reduction and disposal, and other services.

ICMA International fosters sustainable communities worldwide by introducing sound management practices that enable local governments to work toward these objectives. Together with diverse stakeholders—localities, nongovernmental organizations, civil society, national ministries—ICMA spearheads the design and implementation of locally viable approaches that improve the quality of government services and the quality of life for citizens. They are approaches that can be sustained long after ICMA's involvement ends.

Unless otherwise noted, the projects described here have been funded by the U.S. Agency for International Development (USAID), and many use ICMA's CityLinks model, in which professionals from a U.S. local government are partnered with their counterparts in another country.

Economic Sustainability

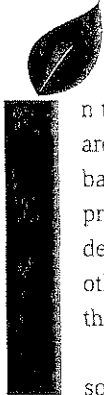
To be economically sustainable, a community needs to ensure that people have a means to support themselves and their families and that the economic base is diverse enough to weather ups and downs in the larger economy. A significant key to economic sustainability is competitiveness, and providing an environment in which private sector jobs can be created or maintained at the local and regional levels is critical.

Virtually all of ICMA's international projects help cities strengthen professional management, improve service delivery, and take other steps that can provide an attractive environment for private-sector investment.

Here are specific examples of programs in which ICMA has fostered economic sustainability.

Economic Development in Bulgaria. ICMA supported the creation of more than 4,000 jobs in Bulgaria through a comprehensive local economic development (LED) program that helped municipalities establish new economic development offices, train new LED professional staff, create business visitation and expansion programs and effective marketing strategies, establish business incubators and industrial parks, and develop an LED certification process.

This CityLinks program was carried out with participation from the Foundation for Local Government



n the broadest sense, sustainable communities are those that maintain a reliable economic base, practice sound financial management, provide a stable environment for their residents, and act as stewards of their land and other environmental resources. Here is how these actions are defined:

Economic sustainability: To maintain a sound economic base, a local government must provide reliable public services, create an environment conducive to businesses, and take other steps to become and remain competitive in the global marketplace.

Financial sustainability: To remain financially viable, it must establish and maintain professionally recognized, transparent budgeting and financial management practices and systems.

Social sustainability: To provide a stable environment for citizens, it must ensure public safety, offer an environment that encourages job creation, engage the community in local decision making, and provide amenities that enhance the quality of life.



TAKEAWAYS

- › Sustainability encompasses much more than environmental practices; it has economic, financial, and social aspects as well.
- › Through its international programs, ICMA seeks to foster lasting improvements in local government management and service delivery to build more sustainable communities worldwide.
- › Professionals from U.S. cities and counties are sharing approaches to sustainability with their counterparts in developing and decentralizing countries.

Reform in Bulgaria and nine U.S. partners: the village of Johnstown, Ohio; the San Bernardino County (California) Economic Development Agency; and seven U.S. cities: Charlottesville, Virginia; Auburn, Alabama; Winchester, Virginia; Kettering, Ohio; West Carrollton, Ohio; Golden, Colorado; and West Bend, Wisconsin.

With their assistance, Bulgarian partner cities established a consortium to lead joint marketing efforts, including a website (www.invest.bg) that still serves as a source of information and a point of contact for prospective investors. ICMA also worked with each member city in the consortium to promote the city's strengths and business opportunities.

Economic Development in the Russian Far East. Faced with a declining fishing industry and a corresponding loss of population, the port city of Nevelsk, in the Russian Far East, sought to capitalize on tourism to diversify its economy. Another city, Bolshoy Kamen, wanted to increase the number of small local businesses, create markets for their products, and expand the tax base.

Nevelsk and Bolshoy Kamen were two of eight municipalities in the region that faced similar conditions: a harsh climate, neglected infrastructure, high energy and transportation costs, and a tradition of centralized planning and development. Because the area is rich in natural resources, that sector had been developed at the expense of a more diversified economy.

The eight cities were matched with CityLinks partners in Alaska, which were relatively close geographically and which shared some of the same climatic and geographic challenges: the cities of Wasilla, Anchorage, Kenai, Skagway, and Juneau, as well as the Juneau Economic Development Council, the Skagway Development Corporation, and the Kenai Peninsula Economic Development District.

In the course of the program, Nevelsk began marketing its unique natural, historical, and recreational resources, and the result was an increased number of visitors to the city. Bolshoy Kamen created a business incubator that helped

the city become self-sustaining to prepare for the day when it ceases to have the federal subsidies that come with its "closed city" status.

Financial Viability

Sound financial management and budgeting are also fundamental to a municipality's long-term sustainability and success. ICMA International has worked to foster changes in financial policies and improvements in financial management practices.

Improved Budgeting in Indonesia. In Indonesia, ICMA helped local governments in nine provinces develop performance-based budgets reflective of community priorities, create timely and accurate financial and performance reporting systems, improve the stewardship of public assets, and transparently and responsibly meet financial obligations.

ICMA also helped build sustainable revenue streams, develop internal controls and financial audits, evaluate the implementation of performance-based budgeting in relation to the annual strategic plan, and improve oversight of the budget and the performance of local agencies.

As a result, more than 40 local governments began implementing performance-based budgets and holding regular public hearings to engage residents in their budget processes. And all nine provinces achieved across-the-board improvements in average outcome measures as assessed before and after the program: planning and budgeting, accounting and reporting, and asset management.

Improved Creditworthiness in Latin America. In Mexico, Costa Rica, and Argentina, ICMA Latinoamérica helped local and state-level jurisdictions and authorities take steps to increase their ability to borrow at reasonable interest rates.

The Regional Credit Rating Improvement Program paired eight Latin American jurisdictions with municipal finance experts from Phoenix, Arizona; El Paso, Texas; Burlingame, California; Santa Fe County, New Mexico; and the

Genesee County Road Commission, Flint, Michigan.

The U.S. partners helped their counterparts review the factors that affect their creditworthiness and design plans for improvement. This program was made possible by a grant from the World Bank through the Public-Private Infrastructure Advisory Facility.

Two of the Mexican jurisdictions were able to obtain credit for infrastructure projects based on their sound financial conditions in a year when many Mexican entities had their credit ratings lowered. Several others were on the verge of issuing bonds at the program's end.

A Practitioner's Guide to Improve Local Authority Creditworthiness, in both Spanish and English, will help ensure that improvements can be sustained.

Social Sustainability

Social sustainability rests on many factors: a stable political environment, public involvement in local decisions that affect people's lives, the availability of jobs, an environment where people feel safe, and public services that provide for quality of life.

Stability in Conflict and Postconflict Areas. Social sustainability is particularly critical in conflict and postconflict countries, and ICMA has worked in Iraq and Afghanistan to provide a foundation for stability. In Iraq, ICMA provided facilitation training to local trainers, who in turn helped municipal council members and community action groups develop the skills they needed to obtain resident input, prioritize municipal projects and activities, and advocate successfully for funding from the national government.

In Afghanistan, ICMA has worked "under the radar" through local municipal offices, putting in place small steps that will increase residents' participation in their local governments and enable Afghan municipal officials to provide reliable services and gain the confidence of residents:

- Sports events, internship opportunities, and other activities encouraged young people to stay in their home communities, resist recruitment by radical forces, and eventually come to view public service as a potential career.
- Children in Khost were able to return to school when water service was restored to the city.
- ICMA built a park that provided children in Kabul with a safe place to learn about traffic from a driver's point of view, using pedal-powered "cars."
- Students, professors, and community members came together as volunteers to clean up the campus of Nangarhar University in Jalalabad—the first cleanup of the campus in three decades.

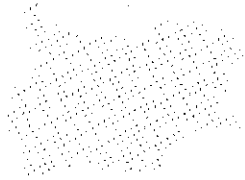
Violence Prevention. Starting in 2009, ICMA has applied and adapted U.S.-based expertise in community-based public safety to the needs of five cities in Panama and El Salvador—two Central American countries that have experienced significant crime and violence.

The program has engaged multiple stakeholders there—national and local government agencies, nongovernmental organizations, police, and representatives of the private sector and religious and youth groups—and partnered them with professionals from the sheriff's department in Pinellas County, Florida, and police departments in Arlington, Texas, and Santa Ana, California. These U.S. departments all have exemplary community-oriented policing programs.

In another program, *Alcance Positivo*, ICMA is providing assistance to the Child and Adolescent Unit of the national police in Panama as they develop community- and school-oriented initiatives for youth at risk. The Central American partners in both programs have begun to adopt practices that bring police together with other community members, based on models they learned about during exchange visits.

Environmental Sustainability

Environmental sustainability is at the core of concerns about climate change,



ICMA SUPPORTED THE CREATION OF MORE THAN 4,000 JOBS IN BULGARIA THROUGH A COMPREHENSIVE LOCAL ECONOMIC DEVELOPMENT PROGRAM.

industrial pollution, water supply protection, and management of natural resources. Local governments around the world are realizing the need to address systemic, and often severe, urban environmental problems if cities are to continue contributing to sustained economic development in the 21st century.

ICMA has shared the expertise of U.S.-based professionals with cities around the world that face challenges involving water, wastewater, solid waste management, and pollution control:

Climate Mitigation and Adaptation. On behalf of the U.S. Department of State, ICMA arranged exchange visits that provided an opportunity for local government professionals from China, Indonesia, Australia, New Zealand, and the United States to learn how other cities are implementing climate mitigation and other programs that promote sustainability.

Methane Gas Recovery. Through a public-private methane-to-markets partnership supported by the U.S. Environmental Protection Agency, ICMA facilitated the exchange of best practices in recovery of landfill gas for use as a clean energy source in Changsha, China. The

program, which included a workshop, landfill tour, and peer assistance, was designed to share practices developed in the United States. It delivered resources about landfill gas capture systems, management issues and techniques, and financing methods.

Hazardous Waste Management. In Jordan, ICMA partnered a Jordanian university with one in the United States to develop medical waste management practices that could be sustained locally and replicated throughout the country. ICMA received additional funding to help Jordan's government limit the environmental and public health risks posed by waste from households and businesses as well as hospitals.

Flood Mitigation. The United States Southern Command (SOUTHCOM) selected ICMA to assist flood-prone communities in Guatemala by assessing their disaster readiness and developing a training and exercise program. ICMA conducted focus groups with key stakeholders to identify gaps in information and knowledge, prepared an assessment, and developed a training guide in English and Spanish.

Solid Waste Management. Through a CityLinks partnership, Catawba County, North Carolina, worked with the city of Tirana, Albania, to improve the operations and maintenance of the local landfill, contract with private companies for waste collection, improve waste containers to reduce spillover, and develop a recycling program. The physical changes were complemented by a public awareness campaign to gain support from citizens and contractors, with a kickoff cleanup day.

These are just a few of ICMA's international programs that have contributed to the development of sustainable communities around the world. For full program descriptions and additional examples, visit icma.org/inter. **PM**



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BY LINDSEY MAHONEY

LEADING BY EXAMPLE: START WITH YOUR INTERNAL SUSTAINABILITY

Make sustainability part of your organizational culture

When addressing sustainability, a local government may look first to its internal operations.

Are we, as members of a task force examining the internal sustainability of its operations, acting as a role model for sustainable practices ourselves? What more can be done?

In 2007, Sedgwick County, located in south-central Kansas, began exploring these issues, which resulted in the

align sustainability with other values that were already used in county decision-making processes.

Make sustainability a part of the organizational culture. Changing existing practices can be a daunting task. In Sedgwick County, the task force chose to focus on incorporating sustainability into current practices for making important decisions. Incorporating sustainability into the management model—the county's

including tips in the weekly newsletter or management message, so employees can begin to understand the positive impact of sustainability efforts.

Along with weekly tips, employees can be provided with resources to encourage further growth. For two years in a row, Sedgwick County hosted a sustainability fair for employees as part of employee in-service activities on Columbus Day. This, along with a

LIKE MAKING ANY OTHER CULTURE CHANGE, IMPLEMENTING SUSTAINABILITY INTO AN ORGANIZATION'S PROCESSES CAN TAKE TIME AND REQUIRES CAREFUL EXAMINATION OF CURRENT PRACTICES. BY IDENTIFYING CHAMPIONS WITHIN EACH PROGRAM AREA AND HELPING TO ENCOURAGE AND REWARD CREATIVITY, CHANGE CAN HAPPEN STEP-BY-STEP.

creation of the county's sustainability task force. During the past four years, the task force has worked to improve the county's organizational sustainability. Here is a discussion of the measures that can be taken to promote sustainability within internal operations.

Define sustainability so that it is understandable to employees. It's hard for employees to support a concept they don't understand. Some employees will have had little to no exposure to sustainability. Start simple.

Sedgwick County started by first defining what sustainability meant for the county and next how to consider sustainability in decision making.

The county chose an approach that considers four factors: environmental protection, economic development, social equity, and institutional and financial viability. This method helped

plan for how to strategically manage and supervise—was a first step.

Sustainability was also incorporated into the budget process so that departments considered the sustainability impact of a project when submitting budget or capital improvement program requests.

Educating new employees was another challenge, so sustainability was added to the curriculum for the new-employee orientation. Now, along with hearing about benefits and policies, new employees learn the meaning of sustainability and participate in an interactive activity that explores the four factors.

Choose a multifaceted approach to education. Creating culture change requires employees to build new habits and change existing practices to be more in alignment with the values of sustainability. Some changes start small by

Sustainability 101 training course and a sustainability resource site on its internal website, helped create additional opportunities for employees seeking to expand their knowledge.

Establish a baseline. Identifying areas for improvement and assessing progress are ongoing processes. Since 2007, the sustainability task force has conducted annual surveys of employees in order to assess growth and identify areas for improvements.

Survey data has also been used to assess the effectiveness of current initiatives and if initiatives are being sufficiently promoted. Data was used, for example, to analyze what percent of employees carpooled to meetings in the past year (30 percent), what percent were aware of paper reduction initia-

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Leading by Example, continued from page 22

tives (97 percent) and what percent reduced paper usage in the past year (88 percent).

We also learned that some initiatives needed more marketing and publicity to ensure all employees were aware of them.

In 2011, the county found that 83 percent of employees indicated an understanding of the concept of sustainability (up from 38 percent in 2007), and 80 percent reported factoring sustainability into their workplace decision making (up from 57 percent in 2007).

Remember sustainability is more than just being green. Especially in challenging financial times, it can be important to remember that sustainability is about making good decisions, both now and for future generations. Focusing on the financial, social, and economic impact of a project can help to create buy-in from those who may not be sold on a project from just its environmental benefit.

In 2011, for example, Sedgwick County chose to undergo an energy audit and a \$1.3 million contract for energy conservation improvements to county-owned facilities. Although the environmental benefit of this project was clearly valuable, it was the financial savings of a guaranteed payback by reduced energy use within six years or less and ongoing savings thereafter that helped the project move forward during tight financial times.

Challenge employees to make positive change. Employees become excited when their ideas are recognized and rewarded. The county's sustainability task force, for example, learned that some good ideas were not being implemented or were being postponed because of budget constraints.

As a result, the task force recommended development of a "Sustainability Challenge" that was open to all employees. Through this challenge,

employees and departments could submit applications for innovative projects that would improve organizational sustainability.

Selected projects are awarded funding through a sustainability contingency fund, similar to a grant program, which helps departments implement new sustainability initiatives. The challenge also recognizes winners, helping projects to become examples for others.

To date, the challenge has awarded funding to eight projects and is entering its third year. Selected projects have included the purchase of diagnostic tools to help the facilities department identify leaks and energy loss, scanning of personnel files to convert to an electronic records management system that reduces paper and storage space, and an e-learning training system that complements the existing training curriculum by adding opportunities for round-the-clock training, thus benefiting all shifts and reducing mileage and travel expenditures.

Be patient. Remember that change does not happen overnight. Like making any other culture change, implementing sustainability into an organization's processes can take time and requires careful examination of current practices. By identifying champions within each program area and helping to encourage and reward creativity, change can happen step-by-step.

Whether those changes are reducing energy use or creating time and labor efficiencies, each improvement helps keep us moving on the continuum of becoming a better model and leader for sustainability. **PM**



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Finally, do not assume these efforts must start and end with your staff members. Partnerships and meaningful community engagement are critical to all of these activities. **PM**



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BY SUSAN CONBERE

GETTING TO SMART GROWTH: TOOLS FOR MANAGERS

Better results lead to a better quality of life

Local government officials in the United States who are interested in environmentally and economically sound growth attended the New Partners for Smart Growth Conference in San Diego, California, during February 2012. Officials at the conference attested that creating a development plan that a community can support, finding the funding, and then implementing the plan are formidable challenges, but the results are worth the effort.

Growth that makes the most of a town's special assets and reflects the desires of the people who live and work there strengthens the economy and the sense of community and leads to a better quality of life.

Here are some of the lessons shared by public officials from communities big and small:

Involve your community from the get-go. Getting public input on community plans helps build public support, which can be important when projects are competing against other budget priorities. Visioning sessions using maps, building blocks, computerized images, and real-life props to show residents how their streets and neighborhoods can look help make the possibilities concrete.

One community blocked off a real street; used tape to mark off new street lines, potted plants to illustrate trees, and a stop sign to show changes in traffic patterns; then invited the community in to comment.

Involve all the community, not just the usual players. Business, youth, elderly, minorities, and disabled all need a voice at the table. Try holding listening sessions in the evening or on weekends at community centers, schools, assisted living facilities, and places of worship.

Share information at community fairs, farmers markets, and other local events. A "pizza, beer, and transit" meeting was a big hit in one town.

Reach out in traditional ways, but extend your efforts using social media, including Facebook, Twitter, and blogs. Translate materials for residents who don't speak English. Include translators and interpreters for the deaf.

Success breeds success. If funding is limited, start with one high-visibility project that starts the ball rolling. The small town of Lake Village, Arkansas, restored its historic town hall. The restored building brought all of the town's agencies under one roof, cutting the cost of renting and equipping multiple offices, and the new town hall became a center for community activity. The building was such a success, it attracted significant private sector investment to renovate other buildings nearby.

Create new partnerships. One initiative that can help is the Partnership for Sustainable Communities. A collaboration of Environmental Protection Agency, Department of Housing and Urban Development, and Department of Transportation, the partnership coordinates federal investments in infrastructure, facilities, and technical assistance to help communities get better results from their investments in growth and development. Visit www.sustainablecommunities.gov to quickly access grant and technical assistance opportunities and other resources from the three agencies.

Beyond federal, state, and local governments, look for help from foundations (particularly local foundations), community groups, businesses, and such associations as the National Association of Development Organizations.

Take advantage of tools and technical assistance. Every community wants funding, but in these challenging times, many grant programs have been cut back or eliminated. Don't overlook other forms of assistance that can help your community find its path to a more sustainable future.

Here are ideas from EPA's Office of Sustainable Communities, online at www.epa.gov/smartgrowth:

Building Blocks for Sustainable Communities. EPA and private sector experts provide targeted technical assistance to help communities implement such smart growth tools as walkability assessments and parking audits.

Smart Growth Implementation Assistance. National experts provide technical assistance for policy analysis (for example, reviewing state and local codes and transportation policies) or public participatory processes (for example, visioning and design workshops).

Greening America's Capitals. A design team produces schematic designs for revitalizing a neighborhood in a capital city.

Governors' Institute on Community Design. National experts provide technical assistance on a growth and development issue to a governor and the governor's policy advisers.

Smart Growth Tools. Many tools are available, including a water quality scorecard, a mixed-use trip generation model, and dozens of publications with case studies, best practices, and lessons learned. **PM**



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BY LAURA GODDEERIS

CULTIVATING THRIVING COMMUNITIES THROUGH FOOD SYSTEMS

Motivations and opportunities for local governments

As part of their sustainability efforts, local governments are increasingly looking to programs and policies that support local and regional food systems. Although the term “food system”—referring to the stakeholders, processes, and linkages necessary to take food from the farm to your plate—may not yet resonate with you, it is likely that activities involved in developing a more locally integrated system align with such familiar community priorities as resiliency, entrepreneurship, or place making.

Resiliency. In the face of climate change, which is currently coupled with economic anxiety, people in communities and regions of the country have begun to ask where exactly their food comes from. Could we produce and purchase more of it closer to home, at a reduced cost to the environment, and keep more dollars in the region?

If you factor in additional concerns over inequitable access to healthy food in both urban and rural areas, shrinking household budgets, and high incidence of diet-related disease, the security of all community residents comes into question. Universities, regional planning authorities, and other community-based organizations are keen to partner with local governments on food system assessments to explore these questions and potential interventions.

For examples of comprehensive food systems assessment and planning efforts, check these websites: Delaware Valley, Pennsylvania (Philadelphia region; www.dvrpc.org/food); Erie County, New York (<http://intersight.ap.buffalo.edu/?p=865>); and Oakland, California (www.oaklandfood.org/home/resources).

Entrepreneurship. In response to an aging farmer population, increased demand for local food, and barriers to entry for prospective new farmers, North Carolina local governments were recently invited to apply for a new statewide program.

Through the Center for Environmental Farming Systems’ Incubator Farm Project, www.cefs.ncsu.edu/whatwedo/foodsystems/incubatorfarmproject.html, public land will be developed into five to six production sites that could be said to be cultivating—in addition to fresh, local produce—new farm entrepreneurs.

Instead of traditional lease agreements, the new farmers will compensate for the land access through donations from their harvests or other forms of community service.

Related examples of culinary or kitchen incubators to support small-scale food processing entrepreneurs can be found across the country. The Agricultural Marketing Resource Center at Iowa State University (www.agmrc.org/markets__industries/food/kitchen_incubators.cfm) provides links to a sampling of resources.

Place making. Food-oriented sites can serve as vibrant nexuses of community activity, whether they take the form of community gardens, weekly farmers markets, or permanent market districts. These sites can transform brownfields or other vacant parcels into thriving, safe places for residents to gather and access fresh, local foods.

Local governments encourage these sites through tailored zoning ordinances or permitting processes, land or water access, or direct investments in the form of, for example, Community Development Block Grant dollars through statewide or local programs.

Communities undertaking comprehensive planning, sustainability planning, or other types of major planning processes may also want to incorporate their local food resources and priorities into these visions.

See the recent policy brief “Planning to Eat: Innovative Local Government Plans and Policies to Build Healthy Food Systems in the United States” (www.farmlandinfo.org/farmland_preservation_laws/index.cfm?function=article_view&articleID=39040) for numerous examples of the above strategies.

Getting Started. Local governments beginning to consider opportunities for food system development in support of sustainability or other goals should think creatively and comprehensively about how food systems intersect with existing programs, policies, funding sources, and stakeholder relationships.

It may be helpful to review a comprehensive resolution, including the 2008 Seattle City Council resolution (31019) (www.seattle.gov/council/conlin/food_initiative) or the 2009 San Francisco executive directive (www.sfgov3.org/ftp/uploadedfiles/sffood/policy_reports/MayorNewsomExecutiveDirectiveonHealthySustainableFood.pdf), for examples of how traditional departments could be encouraged to incorporate food into their goals.

At the federal level, a growing range of agencies is interested in aspects of food system development. The Department of Agriculture is a traditional resource, but programs administered through Housing and Urban Development, Health and Human Services, the Treasury, the

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BY KAYLA PLATT AND CAROLINE JUDY

REGIONAL RENEWABLE ENERGY PROCUREMENT

Power through partnerships

Many of us in local government have been talking about regional partnerships as a way of reducing the cost of services, but are we really willing to “walk the talk”? Cities and counties that try to collaborate often run into challenges with governance or legal requirements. Or the agencies simply run out of energy and enthusiasm before results can be delivered.

Yet quietly and often successfully, there is one area of local government where collaboration is working: procurement. While many communities partner to piggyback off of each other’s procurement contracts for goods and services, Alameda County, California, is using a model of collaborative procurement to help other public agencies develop renewable energy projects on public facilities.

Under the Regional Renewable Energy Procurement Project (R-REP), the county is leading the procurement process for 20 to 30 participating Bay Area agencies in Alameda, Contra Costa, San Mateo, and Santa Clara counties. The R-REP is projected to include more than 190 sites for a total of up to 50 megawatts of power. A technical adviser will then group these sites into bid bundles based upon type of technology, size, location, and site characteristics.

In addition to lowering energy costs for participating agencies and reducing greenhouse gas emissions, the regional economy will also get a boost, as renewable energy projects are initiated simultaneously. The R-REP is projected to generate more than 600 jobs and \$200 million in economic activity.

Alameda County is directing the procurement in partnership with two regional public/private entities. To date, the group has focused on outreach and

education to encourage participation. The next step for participating agencies is to complete professional site assessments to determine the feasibility of each project. Issuance of a request for proposal is planned for fall 2012.

This project is an expansion of the Silicon Valley Collaborative Renewable Energy Procurement Project (SV-REP), under which nine Bay Area public agencies in two counties developed solar projects at 70 sites. Through collaboration, these agencies were able to:

- Conserve funds and staff time (saved 75 to 90 percent in administrative costs and time).
- Achieve volume discounts and receive competitive bids (prices were 10 to 15 percent lower than going it alone).
- Benefit from standardized procurement documents and process.
- Receive competitive bids for individual sites that might otherwise not have been attractive to vendors.
- Accelerate deployment of projects.
- Use experiences within the collaboration through the procurement process.

Keys to Success: Commitment and Guidance

Following a best practice model developed by key SV-REP stakeholders has contributed to the success of the R-REP. This step-by-step model for collaborative procurement is defined in *Purchasing Power: Best Practices Guide to Collaborative Solar Procurement* (www.jointventure.org/purchasingpower), which was published after the conclusion of the SV-REP. This publication provides valuable guidance to any agency interested in collaborative procurement.

Marketing the initiative and attracting interest among agencies was made easier by pointing to the success of this

model in saving the SV-REP participants time and money. More than 95 percent of the SV-REP projects have been completed to date, and the remaining projects are in progress.

There is also continuity between the R-REP and the SV-REP. Joint Venture Silicon Valley Network, a nonprofit organization based in San Jose, functioned as the convener in the SV-REP and is performing the same function in the larger, regional project.

A regional collaboration requires many champions. A partnership was originally formed between Alameda County, as lead agency, and Joint Venture Silicon Valley Network, as project convener. To expand the project to a regional effort, the Contra Costa Economic Partnership was engaged as a second convener. These two trusted, nonprofit organizations lend credibility to the project and play an important role in performing outreach to agencies in their respective geographic areas.

The commitment of senior-level staff at the lead agency and adequate time devoted to the project by other lead agency staff is critical. A champion at each participating agency is necessary too. For these individuals, the benefits of collaboration extend beyond saving time and money. They receive support from the lead agency, conveners, and technical advisers to navigate the complexities of renewable energy procurement and to assist with obtaining buy-in from key decision-makers within their own organizations.

Another recommended best practice for a collaboration of this size is to form a leadership team with representatives from outside agencies and individuals with

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Leading by Example, continued from page 22

tives (97 percent) and what percent reduced paper usage in the past year (88 percent).

We also learned that some initiatives needed more marketing and publicity to ensure all employees were aware of them.

In 2011, the county found that 83 percent of employees indicated an understanding of the concept of sustainability (up from 38 percent in 2007), and 80 percent reported factoring sustainability into their workplace decision making (up from 57 percent in 2007).

Remember sustainability is more than just being green. Especially in challenging financial times, it can be important to remember that sustainability is about making good decisions, both now and for future generations. Focusing on the financial, social, and economic impact of a project can help to create buy-in from those who may not be sold on a project from just its environmental benefit.

In 2011, for example, Sedgwick County chose to undergo an energy audit and a \$1.3 million contract for energy conservation improvements to county-owned facilities. Although the environmental benefit of this project was clearly valuable, it was the financial savings of a guaranteed payback by reduced energy use within six years or less and ongoing savings thereafter that helped the project move forward during tight financial times.

Challenge employees to make positive change. Employees become excited when their ideas are recognized and rewarded. The county's sustainability task force, for example, learned that some good ideas were not being implemented or were being postponed because of budget constraints.

As a result, the task force recommended development of a "Sustainability Challenge" that was open to all employees. Through this challenge,

employees and departments could submit applications for innovative projects that would improve organizational sustainability.

Selected projects are awarded funding through a sustainability contingency fund, similar to a grant program, which helps departments implement new sustainability initiatives. The challenge also recognizes winners, helping projects to become examples for others.

To date, the challenge has awarded funding to eight projects and is entering its third year. Selected projects have included the purchase of diagnostic tools to help the facilities department identify leaks and energy loss, scanning of personnel files to convert to an electronic records management system that reduces paper and storage space, and an e-learning training system that complements the existing training curriculum by adding opportunities for round-the-clock training, thus benefiting all shifts and reducing mileage and travel expenditures.

Be patient. Remember that change does not happen overnight. Like making any other culture change, implementing sustainability into an organization's processes can take time and requires careful examination of current practices. By identifying champions within each program area and helping to encourage and reward creativity, change can happen step-by-step.

Whether those changes are reducing energy use or creating time and labor efficiencies, each improvement helps keep us moving on the continuum of becoming a better model and leader for sustainability. **PM**



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Food Systems, continued from page 24

Environmental Protection Agency, and the Centers for Disease Control and Prevention (to name only a few) are currently funding food-related activities.

Finally, do not assume these efforts must start and end with your staff members. Partnerships and meaningful community engagement are critical to all of these activities. **PM**



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Regional Energy, continued from page 25

deep knowledge of the technical aspects of renewable energy projects. Convening such a group once a month has contributed immensely to the success of the R-REP.

Easily Replicated

The collaborative model for renewable energy procurement can easily be replicated by other regions. Its success has been proven not only by the SV-REP, but also by several other jurisdictions around the country that are using the model.

To start a collaborative, it takes only a motivated organization ready to engage others. In turn, participants will save time and money in the procurement process, and reduce both their operating costs and greenhouse gas emissions as a result of project development. The lead agency that makes the resource investment in the procurement process benefits from the collaborative as well.

Collaborative procurement is one way that local governments are changing the way we do the business of government. **PM**



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BY ANNA READ

SOLAR PERMITTING: REGIONAL COLLABORATION ADDRESSES COST

Local government legislation is being adopted

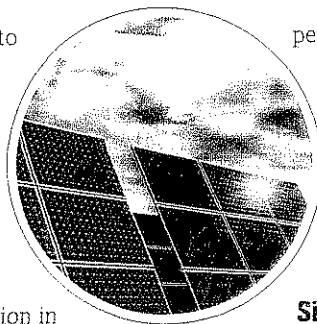
What if you want to install a solar system on your roof? You are likely to find the permitting process to be time-consuming and costly.

In fact, permitting costs, which include a wide variation in local permitting processes, permitting fees, and manual submittal of permitting documents, can add more than \$2,500 in cost to a standard residential solar installation. And, while permitting processes for solar installations add costs to the projects, they do not improve safety.¹

Reducing Costs

The U.S. Department of Energy has made addressing costs related to permitting one of the focus areas of its SunShot Initiative. Through the initiative, which is a collaborative national effort to reduce the cost of solar energy by about 75 percent before the end of the decade in order to make solar cost competitive with traditional energy sources, DOE is investing in research and development and is addressing nonhardware balance-of-system costs such as permitting.

Streamlining solar permitting within a jurisdiction and across a region can reduce the costs associated with permitting and help spur an increase in local solar installations—particularly residential and small-scale commercial rooftop photovoltaic installations. To streamline solar permitting processes, communities can simplify permit application forms and review processes, allow over-the-counter



permitting for standard residential and small-scale commercial systems, and make information on permitting costs and processes available online.

Simplifying the Process

Communities that want to take another step toward simplifying the solar permitting process can switch from a flat-fee structure to a valuation-based fee structure that factors in the system size.²

Communities can also work with neighboring jurisdictions to standardize forms and fees, thus providing more clarity for solar installers, which, in turn, will allow them to produce more accurate estimates. In 2009, the Nassau and Suffolk County, New York, planning commissions and Long Island Power Authority (LIPA) launched the Long Island Unified Solar Permitting Initiative (LIUSPI). The goal of LIUSPI, which is the product of a collaborative process between stakeholders and municipal officials, is to “develop a model process that could be used by all municipalities throughout Long Island to effectively and uniformly handle the application for and approval of residential solar electric and solar hot water systems in each respective jurisdiction.”³

The new, unified permitting process under LIUSPI will apply to 80 percent of residential solar installations. As part of LIUSPI, jurisdictions will require waived or minimal application fees, expedited permits (within 14 days of submittal),

and a new “Solar Energy Fast Track Permit Application” in place of existing permit forms.

Communities will create a registry of local solar installations and implement a new requirement of warning labels on the utility meter and AC disconnect switch.⁴

In September 2011, LIPA announced that it would provide implementation assistance to create incentives for townships and villages to adopt authorizing legislation on LIUSPI by the end of 2011. Townships received \$15,000, and each of the first 10 villages to adopt ordinances in Nassau County and in Suffolk County received \$5,000.

Local governments began adopting authorizing legislation in the fall of 2011. The town of Brookhaven approved the measure in mid-October and was followed by a number of other communities including Southampton, Riverhead, Shelter Island, and Port Jefferson Village.

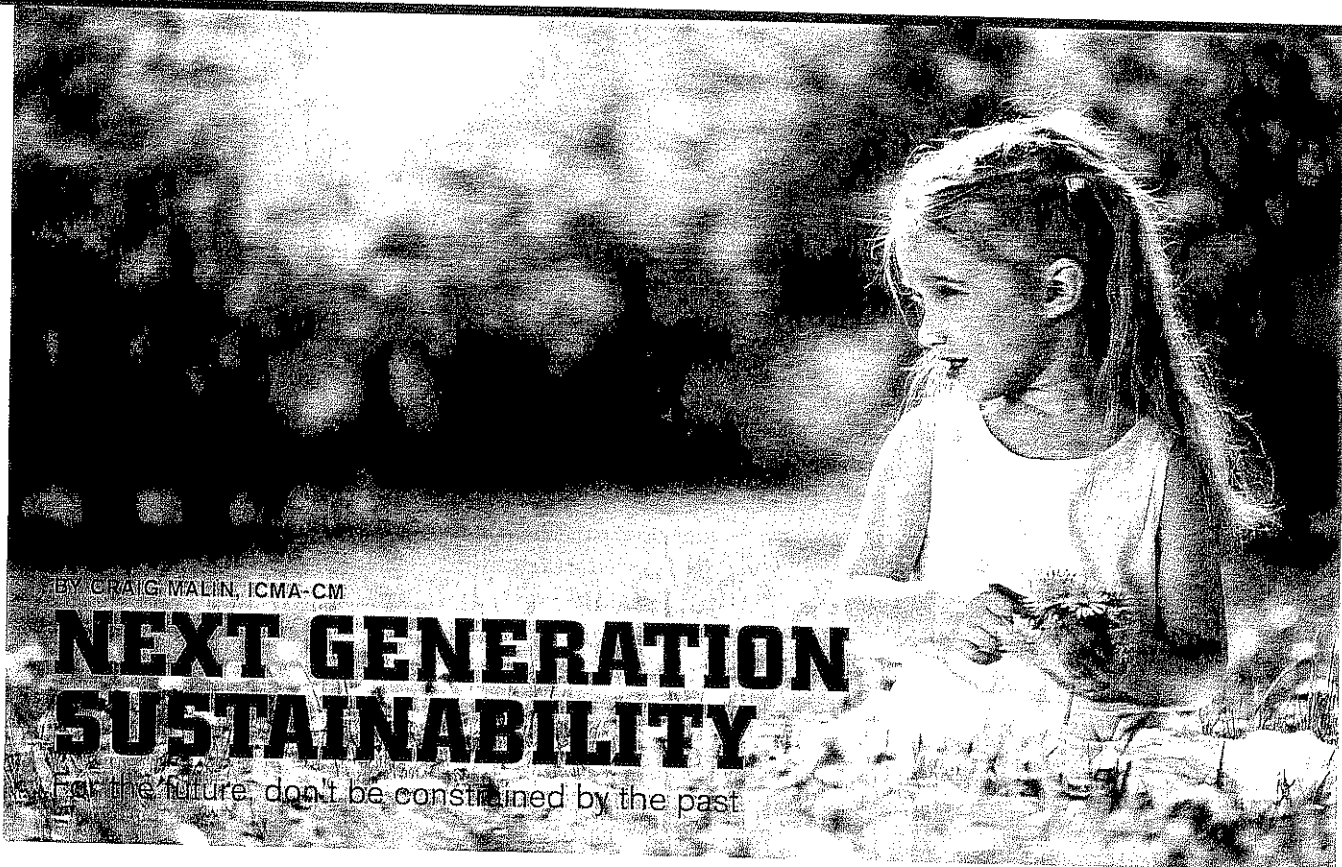
To learn more about what communities across the country are doing related to solar, be sure to listen to the ICMA Center for Sustainable Communities podcasts, available in the documents library at icma.org/solarpodcasts. **PM**

ENDNOTES

- 1 SunRun, *The Impact of Local Permitting on the Cost of Solar Power: How a Federal Effort to Simplify Processes Can Make Solar Affordable for 50% of American Homes*, January 2011, www.sunrunhome.com/permitting.
- 2 U.S. Department of Energy, *Solar Powering Your Community: A Guide for Local Governments*, 2nd ed. (Washington, D.C.: DOE, January 2011), www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments.
- 3 “Nassau County and Suffolk County Planning Commissions and LIPA Launch New Unified Solar permit initiative,” press release, September 23, 2011, www.lipower.org/newscenter/pr/2011/092311-solar.html.
- 4 For more information on the specifics of the LIUSPI, see the Long Island Unified Solar Permitting initiative document (LI Unified Solar Permit Initiative) available on the Long Island Solar Energy Industries Association (LISEIA) website: www.liseia.org/#!/recent-news/4527335090.



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BY CRAIG MAJIN, ICMA-CM

NEXT GENERATION SUSTAINABILITY

For the future, don't be constrained by the past

In a 2007 resolution, ICMA members affirmed their commitment to building sustainable communities, referencing the ancient Athenian Oath to “transmit this city, not only not less, but greater and more beautiful, than it was transmitted to us.” Five years have passed, and the evidence strongly suggests we have not been successful, particularly with passing on what was provided to us, in some measure greater than we received it.

To whom, exactly, are we—local government managers—supposed to transmit the communities where we occupy leadership positions? Developers? Bankers? Property owners? The citizens who elect our bosses? The next city manager or county administrator who replaces us?

This is the rather mundane reality that too many in the profession accept. Although this approach may pay the bills, it is not the stuff of legend, worthy of an ancient oath that inspires a noble profession.

Our profession is more than that. Our profession comes with an obligation to truly, transformatively transmit the communities of which we are the stewards to

a higher purpose. For clarity about why we are obliged to transmit our community, my suggestion is to visit a park, a school, or a juvenile detention center.

We work for kids.

While we respect and honor the past, we work for the future. Managers work for the next generation. We work to pass on our community’s collective social capital, in ever-increasing increments, to those who haven’t yet thought about voting or paying taxes.

We work for those who see the world as it can and should be, rather than how it is or was. We work for kids. When we do our jobs well, kids have more social capital and more opportunities for brighter, greater, and more beautiful futures. Plus, our communities prosper with personal, intergenerational sustainability.

Supposed to Be, But Isn’t

That is how it is supposed to work, but it hasn’t of late. The latest U.S. census data indicate 21.6 percent of American children live in poverty. America has more impoverished children today, 16.4 million,

than it has ever had, and the number continues to rise in the postrecession era.

Of the 3,142 counties in the nation, 653 counties saw significant increases in poverty for children ages 5 to 17 from 2007 to 2010. Only eight counties saw a decrease. Childhood poverty, hunger, poor health, and social disconnection have lifelong consequences, constrain individual potential, and limit the success of nations and the communities within them.

Public education, that time-tested path from poverty, has been similarly hard-pressed. In 1970, America led the world in high school and college graduation. Today, we are 21st in high school completion and 15th in college completion. Every day, more than 7,200 high school students drop out.

For the class that entered high school in 2007, the national graduation rate stands at 68.8 percent. The typical high school dropout loses \$260,000 in reduced earnings over a lifetime. Dropouts’ aggregate, cumulative costs to communities and the nation in reduced earnings and in increased public expenses is crippling, with every four-year cohort of

IN THE DAILY EFFORT TO LEAD LOCAL GOVERNMENTS, DON'T BE WHOLLY CONSUMED BY THE MINUTIAE OF THE PRESENT. BY ALL MEANS, DON'T BE CONSTRAINED BY THE PAST. FOCUS ON THE FUTURE.

high school dropouts costing taxpayers a trillion dollars over their lifetimes.

If you think that poverty is the purview of priests and that education is the province of principals, you're wrong. Unmet social needs that compromise your community's future are your problem. They demand the community's full attention, and they require sustainable solutions founded on inclusive engagement and earnest, ethical, nonpartisan problem solving that is our profession's stock in trade.

All the green roofs, all the LED streetlights, and all the metallic flavors of LEED-certified buildings absolutely pale in comparison to a committed focus on building social capital for the next generation. That is sustainability.

Committed and involved

Local government leaders need to break out of narrow, tradition-bound lanes, for the status quo of slow decline is, assuredly, not sustainable. We need to challenge mediocrity, confront inaction, and call out phrases like "the new normal" for what they are: weak-willed excuses of the comfortably lethargic.

We need to support partners wherever they may be found in pursuit of improving the lives of children as a fundamental, measurable community goal. We need to personally commit and be personally involved, both to have a tangibly informed perspective and to be credible in our unabashed expectation that everyone has a role to play in our community's brighter future.

We need to listen to children and empower them with our time and willing spirit. Children should be an integral part of community planning efforts. They should play a role on boards and commissions. They should review

our operations, suggest changes, and expect that those suggestions be taken seriously. They should be encouraged to challenge us with their dreams as they inspire us with their pluck.

You should expect raised eyebrows from the cynical. You should expect push-back and even some sharp elbows from those who want you back in your narrow lane. But you should also expect success, as innovative ideas spring forth and transformative relationships are forged.

The fact is that community involvement works. Linking local and social services to schools works. Building collaboration among teachers, parents, and community members works. Making schools the center of a community's energy and progress works.

Involvement at the personal level also works. Mentors can cut illegal drug use and school truancy and dropout rates in half (Big Brothers Big Sisters, http://www.bbbs.org/site/c.9iIL3NGKhK6F/b.7721455/k.6CBF/Our_impact_on_education.htm) and reduce pregnancy rates for at-risk teens (Claire Brindis and Laura Davis, Linking Pregnancy Prevention to Youth Development, <http://www.advocatesforyouth.org/storage/advfy/documents/communitiesresponding5.pdf>). Taking responsibility for connecting kids to a brighter future works.

In the daily effort to lead local governments, don't be wholly consumed by the minutiae of the present. By all means, don't be constrained by the past. Focus on the future. The essence of sustainability is our children, well prepared to shape our future. **PM**



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ICMA

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BY MIKE CONDUFF, ICMA-CM

GOOD GOVERNANCE CAN BE SUSTAINABLE

10 ways to achieve sustainability in governance



TO SUPPORT SUSTAINABLE GOVERNANCE

Conversations with managers all over the country have led to a top-10 list in support of sustainable governance:

1. Create, with your current council if possible, a council process manual that includes values, behaviors, and expectations for elected officials; consider this manual the council's job description.
2. Keep your council educated; send members to conferences and state league and regional meetings—and go with them.
3. Conduct a council retreat at least annually, with succession planning as a topic.
4. Offer a citizen academy; teach the segment on the chief management official or chief administrative officer yourself.
5. Hold a council candidate orientation as soon as filing is over; provide a staff contact list for campaigning check-ins.
6. Hold a councilmember orientation for new members as soon as possible after elections; provide and review with them the council process manual.
7. Meet with each new member personally; give them tours of facilities and projects and orientations on key issues.
8. Meet with each member of the governing body regularly and in person; go to breakfast or lunch and personally pay for the meal if necessary.
9. Be visible in the community, and promote the image of the professional staff.
10. Stay current on leading practices; attend ICMA meetings as well as state and regional meetings for managers.

In the three years since ICMA past president Michael Willis wrote the foreword for the book that author Jim Hunt, a 26-year elected official, and I wrote on the subject of sustainability—he termed it the “issue of our age”—much has changed.

In those days, we had to search pretty hard for actual working examples of what communities were doing to go green and save money, which was part of our criteria. Now it is much more the norm for local governments to have a “green committee” and to be pursuing all kinds of sustainable practices. Click on almost any local government website and you are likely to see a prominent link to sustainable leading practices.

Elsewhere in this month’s special issue, authors comment on how competing departmental interests, reduced or disappearing grants, and even waning

community interest in the face of difficult financial times have impacted the ability of local governments to invest in sustainable practices—even when the practices save money.

Encouragement Needed

Although all of this is true, the green issue is only one more in a long list of casualties caused by the proclivity of elected bodies to deal in the near time (what coauthor Jim Hunt calls the “not in my election year syndrome”) and to listen to the vocal few rather than the more numerous people who are reluctant to engage.

As professional managers, we make our paramount interest the cities and counties we serve. For staff members, green was easy to embrace because it made financial and sustainable sense. If a community could invest—espe-

cially using other people's money—in energy-efficient lighting, equipment, operations, and practices and then pay that investment back through savings over time, it became a straightforward management exercise.

Unfortunately, the political arena often viewed this leading practice as a constituent issue. Elected officials often say, "My folks are more worried about getting lights on the soccer field than switching to LEDs." Or, "In this economy, my people just don't want to add more debt, even though the savings more than pay the debt service." These types of comments make advocating for sustainability a real challenge.

Also, Sustainable Governance

So if green is only another issue in a competing short-term view list, how can we encourage sustainable governance so that our view frame lengthens? At least part of the answer is summed up in Jim Collins's

advice to think in terms of succession planning, not internally but politically.

This is essentially the equivalent of ICMA Senior Advisor Frank Benest's NextGen perspective for elected officials: Who are the community's next elected officials, and the next, and the next? Is there a training program for them?

Chambers of commerce do this. Almost every chamber has a leadership program; examples include Leadership Denton and Leadership Cincinnati. Do you have a citizen academy or local government 101 program to educate residents on the complexity of the local government, one of the largest economic engines in the community?

Is there an alumni program to provide support for subsequent groups of leaders and to keep potential council candidates engaged and knowledgeable? Are the current elected officials grooming their replacements and keeping them engaged?

If your community has term limits, it is often clear when turnover will occur. A year or two or even three is not too much time for elected officials to be out recruiting their potential successors.

Now, before the e-mails pile in to me or to ICMA's ethics director, please understand, I am *not* suggesting ICMA members need to be recruiting elected officials. I am recommending that you make it easy for others to do so from a crop of knowledgeable individuals. Are you doing all you can to make governing sustainable?

Just as one must plant before harvesting, you must start now to cultivate future effective elected officials. In the spirit of green, do it organically! **PM**



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Asking Your Police and Fire Chief *the Right Questions* to Get *the Right Answers*

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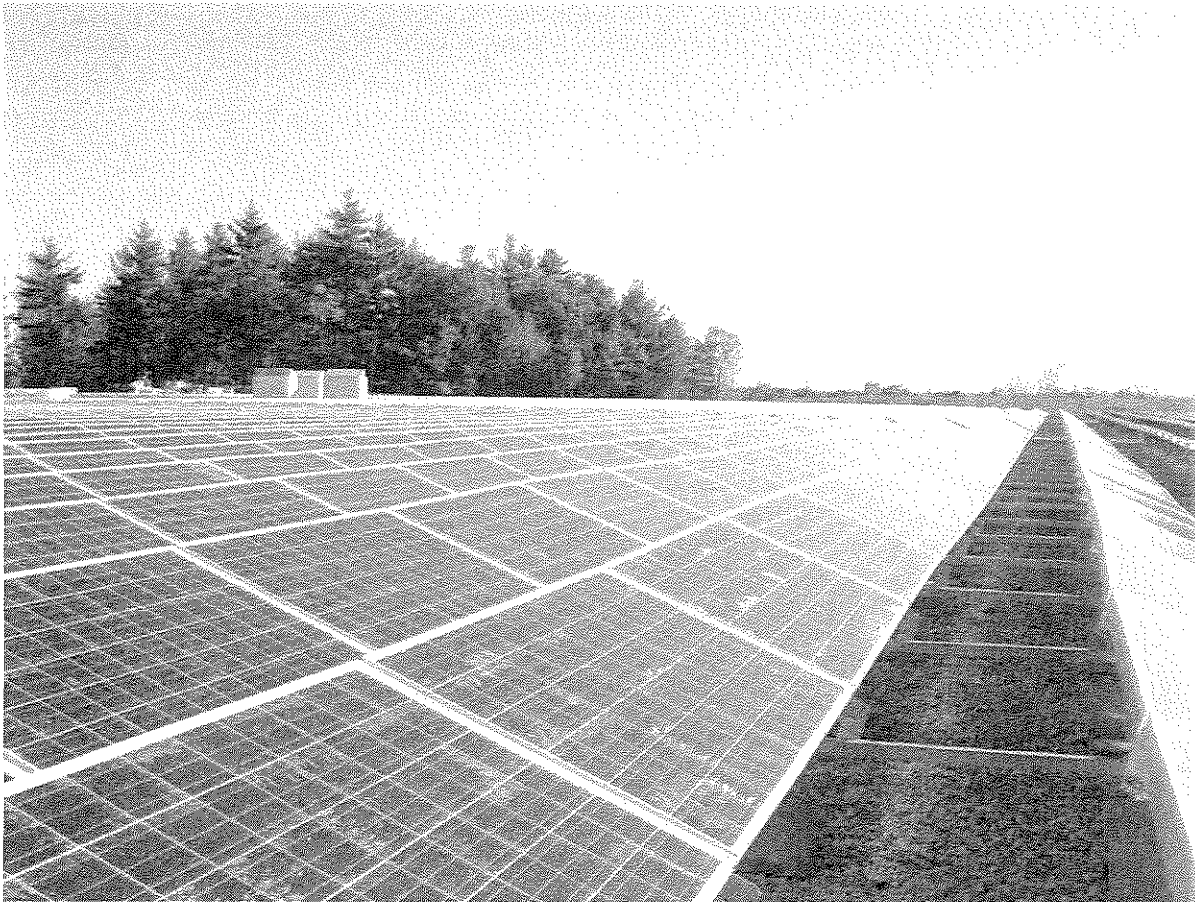


ICMA UNIVERSITY

CLEAN ENERGY RESULTS

Questions & Answers

Ground-Mounted Solar Photovoltaic Systems



Westford Solar Park, photo courtesy of EEA

December 2012

Massachusetts Department of Energy Resources

Massachusetts Department of Environmental Protection

Massachusetts Clean Energy Center

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Background

Solar photovoltaic (PV) technology, which converts sunlight directly into electricity, is a key priority for the state of Massachusetts' clean energy efforts. The environmental benefits of solar PV abound. Unlike conventional fossil fuel power generation (such as coal, gas and oil), generating electricity with solar PV involves no moving parts, uses no water, and generates electricity without emitting climate-warming greenhouse gases or other pollutants.

Solar PV's environmental and energy benefits, combined with strong incentives, have significantly increased the use of this technology. The Commonwealth's vibrant solar industry has a variety of ownership and financing options for Massachusetts residents and businesses looking to install solar PV systems. Purchasing a solar PV system generally involves upfront installation and equipment costs, but there are significant incentives¹.

As the Massachusetts clean energy sector grows, the Patrick-Murray Administration is working to ensure that solar PV and other clean energy technologies are sited in a way that best protects human health and the environment, and minimizes impacts on scenic, natural, and historic resources.

Purpose of Guide

This guide is intended to help local decision-makers and community members answer common questions about ground-mounted solar PV development. Ground-mounted solar PV has many proven advantages and there has been a steady growth of well received projects in the Commonwealth. However, these systems are still relatively new and unfamiliar additions to our physical landscape.

This guide focuses on questions that have been raised concerning the installation and operation of ground-mounted solar PV projects. It provides summaries and links to existing research and studies that can help people understand solar PV technology in general, and ground-mounted solar in particular.

Solar PV panels can and are of course also installed on buildings², car ports or light poles. This guide focuses on ground-mounted systems since most questions relate to this type of solar installations.

Developed through the partnership of the Massachusetts Department of Energy Resources (DOER), the Massachusetts Department of Environmental Protection (MassDEP), and the Massachusetts Clean Energy Center (MassCEC), this guide draws from existing, recent literature in the United States and abroad and is not the result of new original scientific studies. The text was reviewed by the National Renewable Energy Laboratory (NREL).

As new information becomes available, the guide will be updated and expanded.

¹ For a comprehensive overview, start at <http://masscec.com/index.cfm/page/Solar-PV/pid/12584> and <http://www.dsireusa.org/solar/>

² For an overview of the multiple options for siting PV and buildings in the same footprint, see the Solar Ready Buildings.Planning Guide, NREL, 2009.

Solar PV Projects Are Sited Locally

The siting authority for solar PV projects resides at the local – not the state – level. One purpose of this guide is to inform and facilitate local efforts to expand clean energy generation in a sustainable way, and provide a consolidated source of existing research and information that addresses common questions faced by communities.

As part of the Green Communities Act of 2008, DOER and the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) developed a model zoning by-law/ordinance called “as-of-right siting” that does not require a special permit. It is designed to help communities considering adoption of zoning for siting of large-scale solar. This model zoning by-law/ordinance provides standards for the placement, design, construction, operation, monitoring, modification and removal of new large-scale ground-mounted solar PV installations. The latest version of the model by-law was published in March 2012³. It provides useful information that will not be repeated extensively in this guide.

Consider Impacts of Other Possible Developments at Site

Use of land for the purpose of solar photovoltaic power generation should be compatible with most other types of land usage. However DOER strongly discourages designating locations that require significant tree cutting, because of the important water management, cooling and climate benefits trees have. DOER encourages designating locations in industrial and commercial districts, or on vacant, disturbed land.

When assessing the impact of new ground-mounted solar arrays, communities and other stakeholders should carefully consider other types of development that might take place in a particular location if there was no solar installation. Stakeholders should bear in mind the higher or lower impacts that those alternatives might have in terms of noise, air pollution or landscape. These alternative impacts fall outside the scope of this guide, but are relevant when looking at individual projects.

³<http://www.mass.gov/eea/docs/doer/green-communities/grant-program/solar-model-by-law-mar-2012.pdf>

Hazardous Materials

Question: What, if any, health risks do chemicals used in solar panels and other devices used in solar PV arrays pose if they are released into the environment?

Bottom Line: Because PV panel materials are enclosed, and don't mix with water or vaporize into the air, there is little, if any, risk of chemical releases to the environment during normal use. The most common type of PV panels is made of tempered glass, which is quite strong. They pass hail tests, and are regularly installed in Arctic and Antarctic conditions. Only in the unlikely event of a sufficiently hot fire is there a slight chance that chemicals could be released. This is unlikely because most residential fires are not hot enough to melt PV components and PV systems must conform to state and federal fire safety, electrical and building codes.

Transformers used at PV installations, that are similar to the ones used throughout the electricity distribution system in cities and towns, have the potential to release chemicals if they leak or catch fire. Transformer coolants containing halogens have some potential for toxic releases to the air if combusted. However, modern transformers typically use non-toxic coolants, such as mineral oils. Potential releases from transformers using these coolants at PV installations are not expected to present a risk to human health.

More Information: Ground-mounted PV solar arrays are typically made up of panels of silicon solar cells covered by a thin layer of protective glass attached to an inert solid underlying substance (or "substrate"). While the vast majority of PV panels currently in use are made of silicon, certain types of solar cells may contain cadmium telluride (CdTe), copper indium diselenide (CIS), and gallium arsenide (GaAs).

All solar panel materials, including the chemicals noted above, are contained in a solid matrix, insoluble and non-volatile at ambient conditions, and enclosed. Therefore, releases to the ground from leaching, to the air from volatilization during use, or from panel breakage, are not a concern. Particulate emissions could only occur if the materials were ground to a fine dust, but there is no realistic scenario for this. Panels exposed to extremely high heat could emit vapors and particulates from PV panel components to the air. However, researchers have concluded that the potential for emissions derived from PV components during typical fires is limited given the relatively short-duration of most fires and the high melting point (>1000 degrees Celsius) of PV materials compared to the roof level temperatures typically observed during residential fires (800-900 degrees Celsius). In the rare instance where a solar panel might be subject to higher temperatures, the silicon and other chemicals that comprise the solar panel would likely bind to the glass that covers the PV cells and be retained there.

Release of any toxic materials from solid state inverters is also unlikely provided appropriate electrical and installation requirements are followed. For more information on public safety and fire, see the Public Safety section of this document.

We should also note that usually the rain is sufficient to keep the panels clean, so no extra cleaning in which cleaning products might be used, is necessary.

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End-of-Life/Decommissioning

Question: What happens after solar panels are no longer used and are being decommissioned? Do hazardous waste disposal requirements apply?

Bottom Line: The interest in recycling of solar panels has increased in Europe and the U.S. as more panels are decommissioned. State regulations are in place to ensure proper disposal and recycling of panels with components that constitute solid or hazardous waste under state regulations.

More information: The average life of solar PV panels can be 20-30 years (or longer) after initial installation. PV cells typically lose about 0.5% of their energy production capacity per year. At their time of decommissioning, panels may be disposed, recycled or reused. Since widespread use of solar PV is recent in Massachusetts, only a small percentage of solar panels in use in the state have reached the end of their useful lifetime. A significant increase in the amount of end-of-life PV modules is expected over the next few decades.

When solar panels are decommissioned, state rules require that panel disposal be “properly managed” pursuant to Massachusetts hazardous waste regulations. There are many different types of solar panels used in ground-mounted solar PV systems; some of these panels have components that may, by state regulation, require special hazardous waste disposal or recycling. Solar module manufacturers typically provide a list of materials used in the manufacturing of their product, which is used to determine the proper disposal at the time of decommissioning.

People who lease land for solar projects are encouraged to include end-of-life panel management as part of the lease. In cases where panels are purchased, owners need to determine whether the end-of-life panels are a solid or hazardous waste and dispose of the panels appropriately. Massachusetts regulations require testing of waste before disposal.

Because of the various materials used to produce solar panels (such as metal and glass), interest in recycling of solar modules has grown. Throughout Europe, a not-for-profit association (PV Cycle) is managing a voluntary collection and recycling program for end-of-life PV modules. The American photovoltaic industry is not required by state or federal regulation to recycle its products, but several solar companies are starting to recycle on a voluntary basis. Some manufacturers are offering end-of-life recycling options and independent companies looking to recycle solar modules are growing. This allows for the recycling of the PV panels and prevents issues with the hazardous materials. Currently, the California Department of Toxic Substances Control is considering standards for the management of solar PV panels at the end of their use.

DOER’s model zoning provides language on requirements for abandonment and decommissioning of solar panels for use by local officials considering local approvals for these projects.

Resources

End-of-life PV: then what? - Recycling solar PV panels
<http://www.renewableenergyfocus.com/view/3005/end-of-life-pv-then-what-recycling-solar-pv-panels/>

MassDEP Hazardous Waste Regulations 310 CMR 30
<http://www.mass.gov/dep/service/regulations/310cmr30.pdf>

PV Cycle, Europe: <http://www.pvcycle.org/>

California Department of Toxic Substances Control, Proposed Standards for the Management of Hazardous Waste Solar Modules,
http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/Reg_Exempt_HW_Solar_Panels.cfm

Ambient Temperature (“Heat Island”)

Question: Does the presence of ground-mounted solar PV arrays cause higher ambient temperatures in the surrounding neighborhood (i.e., the “heat island” effect)?

Bottom Line: All available evidence indicates that there is no solar “heat island” effect caused by the functioning of solar arrays. Cutting shade trees for solar PV might increase the need for cooling if those trees were shading buildings. This is primarily a concern in town centers and residential areas (locations where large ground-mounted PV is not encouraged) and is a potential impact of any development activity that requires tree-cutting.

More Information: All available evidence indicates that there is no solar “heat island” effect caused by the functioning of solar arrays. Solar panels absorb photons from direct sunlight and convert it to electricity. This minimizes the likelihood of substantially changing temperatures at the site or the surrounding neighborhood. For an area with no PV system, solar energy impacting the ground is either reflected or absorbed. There is no research to support heat production from the solar panels themselves.

Sunpower, a private solar manufacturer, conducted a study on the impact of solar PV on the local temperature and concluded that a solar PV array can absorb a higher percentage of ambient heat than could a forested parcel of land without an array. The study points out that while solar PV modules can reach operating temperatures up to 120 degrees Fahrenheit, they are thin and lightweight and therefore do not store a large amount of heat. Because of this, and the fact that panels are also shown to cool to ambient air temperature shortly after the sun sets, the Sunpower study concludes that the area surrounding a large-scale solar array is unlikely to experience a net heating change from the panels.

If trees are removed that were previously shading a building, that building could get warmer in full sunshine than when the trees were shading it. The June 1, 2011 tornado that ripped through Western Massachusetts created an opportunity to empirically measure the affects of the loss of neighborhood trees on temperatures and air humidity in the streets. A report by the U.S. Department of Agriculture Forest Service concluded that in the tornado-impacted neighborhood in Springfield, Massachusetts, daily mean morning and afternoon temperatures were typically greater than in the unaffected neighborhood and forest sites, but were similar at night. Residents noted increased use of air-conditioning units and an overall increase in energy costs in July and August of 2011.

Resources:

SUNPOWER, Impact of PV Systems on Local Temperature, July 2010

USDA Forest Services report: <http://www.regreenspringfield.com/wp-content/uploads/2011/11/tornado%20climate%20report%203.pdf>

Electric and Magnetic Fields (EMF)

Question: What, if any, health risks do the electric and magnetic fields (EMF) from solar panels and other components of solar PV arrays pose?

Bottom Line: Electric and magnetic fields are a normal part of life in the modern world. PV arrays generate EMF in the same extremely low frequency (ELF) range as electrical appliances and wiring found in most homes and buildings. The average daily background exposure to magnetic fields is estimated to be around one mG (milligauss – the unit used to measure magnetic field strength), but can vary considerably depending on a person's exposure to EMF from household electrical devices and wiring. The lowest exposure level that has been potentially associated with a health effect is three mG. Measurements at three commercial PV arrays in Massachusetts demonstrated that their contributions to off-site EMF exposures were low (less than 0.5 mG at the site boundary), which is consistent with the drop off of EMF strength based on distance from the source.

More Information: Solar PV panels, inverters and other components that make up solar PV arrays produce extremely low frequency EMF when generating and transmitting electricity. The extremely low frequency EMF from PV arrays is the same as the EMF people are exposed to from household electrical appliances, wiring in buildings, and power transmission lines (all at the power frequency of 60 hertz). EMF produced by cell phones, radios and microwaves is at much higher frequencies (30,000 hertz and above).

Electric fields are present when a device is *connected* to a power source, and are shielded or blocked by common materials, resulting in low potential for exposure. On the other hand, magnetic fields, which are only generated when a device is *turned on*, are not easily shielded and pass through most objects, resulting in greater potential for exposure. Both types of fields are strongest at the source and their strength decreases rapidly as the distance from the source increases. For example, the magnetic field from a vacuum cleaner six inches away from the motor is 300 mG and decreases to two mG three feet away. People are exposed to EMF during normal use of electricity and exposure varies greatly over time, depending on the distance to various household appliances and the length of time they are on. The daily average background level of magnetic fields for U.S. residents is one mG.

EMF from PV Arrays: Solar PV panels produce low levels of extremely low frequency EMF, with measured field strengths of less than one mG three inches from the panel. Solar PV power inverters, transformers and conduits generate higher levels of ELF-EMF. The amount of ELF-EMF is proportional to the electrical capacity of the inverter and is greater when more current (electricity) is flowing through a power line.

In a study of two PV arrays (using 10-20kW invertors) in Kerman and Davis, California, the magnetic field was highest at the inverters and transformers, but decreased rapidly to less than one mG within 50 feet of the units, well within the boundary of the PV array (Chang and Jennings 1994). This data indicates that extremely low frequency EMF field strengths at residences near systems of this size would be below the typical levels experienced by most people at home. The highest extremely low frequency EMF (up to 1,050 mG) was found next to an inverter unit at the point of entry to the electrical conduits. Even this

value is less than the ELF-EMF reported for some common household devices, such as an electric can opener with a maximum of 1500 mG at 6 inches.

In a recent study of 3 ground mounted PV arrays in Massachusetts, the above results were confirmed. The PV arrays had a capacity range of 1 to 3.5 MW. Magnetic field levels along the PV array site boundary were in the very low range of 0.2 to 0.4 mG. Magnetic fields at 3 to 7 feet from the inverters ranged from 500 to 150 mG. At a distance of 150 feet from the inverters, these fields dropped back to very low levels of 0.5 mG or less, and in many cases to much less than background levels (<0.2 mG).

Potential Health Effects: Four research studies have reported an association between three to four mG EMF exposure and childhood leukemia, while 11 other studies have not. These studies are inconsistent and do not demonstrate a causal link that would trigger a World Health Organization (WHO) designation of EMF as a possible carcinogen⁴. Studies looking at other cancers in humans and animals have not found evidence of a link to residential ELF-EMF exposure.

Reference Exposure Levels: To protect the general public from health effects from short-term high level magnetic fields, the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 2010) advised an exposure limit for extremely low frequency magnetic fields at 2000mG. ICNIRP determined that the evidence on the impact of long-term exposure to low level magnetic fields was too uncertain to use to set a guideline. Guidelines for the magnetic field allowed at the edge of transmission line right-of-ways have been set at 200 mG by Florida and New York. Exposure to magnetic fields greater than 1000 mG is not recommended for people with pacemakers or defibrillators (ACGIH, 2001).

ELF-EMF does not appear to interfere with hearing aids, though interference from higher frequency EMF associated with cell phones has been reported.

Resources:

American Conference of Government Industrial Hygienist (ACGIH). 2001. as cited in NIEHS 2002.

California Department of Health Services (CA DHS). 2000. Electric and Magnetic Fields, measurements and possible effect on human health — what we know and what we don't know in 2000. This factsheet has a moderate level of technical detail and is intended for those with an interest in science. For more information, see <http://www.dhs.ca.gov/ps/deodc/ehib/>. California Electric and Magnetic Fields Program, A Project of the California Department of Health Services and the Public Health Institute.

Chang, GJ and Jennings, C. 1994. Magnetic field survey at PG&E photovoltaic sites. PG&E R&D Report 007.5-94-6. Available

⁴ WHO has designated ELF-EMF as a possible carcinogen. The use of the label "possible carcinogen" indicates that there is not enough evidence to designate ELF-EMF as a "probable carcinogen" or "human carcinogen," the two indicators of higher potential for being carcinogenic in humans.

Electric Power Research Institute (EPRI). 2012. EMF and your health. Available http://my.epri.com/portal/server.pt?Abstract_id=00000000001023105.

International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2010. ICNIRP Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz – 100kHz). Health Physics 99(6):818-836.

National Cancer Institute (NCI). 2005. Magnetic Field Exposure and Cancer: Questions and Answers. U.S. Department of Health and Human Services, National Institutes of Health. Available <http://www.cancer.gov/cancertopics/factsheet/Risk/magnetic-fields>, accessed May 14, 2012.

National Institute of Environmental Health Science (NIEHS) 2002. Electric and Magnetic Fields Associated with the Use of Electric Power: Questions and Answers. Available http://www.niehs.nih.gov/health/assets/docs_p_z/results_of_emf_research_emf_questions_answers_booklet.pdf, accessed May 11, 2012.

National Institute of Environmental Health Science (NIEHS) web page on EMF. Available <http://www.niehs.nih.gov/health/topics/agents/emf/>, accessed May 11, 2012.

Oregon Department of Transportation (Oregon DOT). Scaling public concerns of electromagnetic fields produced by solar photovoltaic arrays. Produced by Good Company for ODOT for the West Linn Solar Highway Project. Available www.oregon.gov/ODOT/HWY/OIPP/docs/emfconcerns.pdf.

World Health Organization (WHO). 2007. Electromagnetic fields and public health: Exposure to extremely low frequency fields. Fact sheet N°322. June 2007. Available <http://www.who.int/mediacentre/factsheets/fs322/en/index.html>, accessed May 16, 2012. This fact sheet provides a short summary of the in-depth review documented in the WHO 2007, Environmental Health Criteria 238. Available http://www.who.int/peh-emf/publications/elf_ehc/en/index.html.

EMF in Your Environment, Magnetic Field Measurements of Everyday Electrical Devices (USEPA, 1992)

Tech Environmental, Study of Acoustic and EMF levels from Solar Photovoltaic Projects, Prepared for the Massachusetts Clean Energy Center, December 2012

Property Values

Question: How do ground-mounted solar PV arrays adjacent to residential neighborhoods influence the property values in those neighborhoods?

Bottom Line: No research was found specific to ground-mounted solar PV and property values. Residential property value research on roof-mounted solar PV and wind turbines illustrates no evidence of devaluation of homes in the area. Municipalities that adopt zoning for solar facilities may want to consider encouraging project developers to include screening vegetation along site borders to minimize visual impacts on surrounding neighborhoods.

More Information: A review of literature nationwide shows little evidence that solar arrays influence nearby property values. An analysis focused on roof-mounted solar PV panels done by the U.S. Department of Energy Lawrence Berkeley National Laboratory concludes that household solar installation actually increases home property values. This research analyzes a large dataset of California homes that sold from 2000 through mid-2009 with PV installed. Across a large number of repeat sales model specifications and robustness tests, the analysis finds strong evidence that California homes with PV systems have sold for a premium over comparable homes without PV systems.

While neither of these reports focused on ground-mounted solar PV, this information may be relevant to this discussion.

Resources:

The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis <http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf>

An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California <http://eetd.lbl.gov/ea/emp/reports/lbnl-4476e.pdf>

Public Safety (including fires)

Question: What public safety issues arise from people's (including children) access areas where the solar arrays are installed? Can electrical and other equipment associated with solar projects cause electrical fires?

Bottom Line: Large-scale ground-mounted arrays are typically enclosed by fencing. This prevents children and the general public from coming into contact with the installations, thus preventing unsafe situations. The National Electric Code has mandatory requirements to promote the electrical safety of solar PV arrays. The solar industry and firefighters provide training and education for emergency personnel to ensure that the proper safety precautions are taken.

More Information: The National Electric Code has mandatory requirements for the electrical safety of solar PV arrays. To protect intruders, Article 690 of the National Electric Code covers the safety standards for solar PV installation and requires that conductors installed as part of solar PV be "not readily accessible." With a large-scale ground-mounted array, a fence is typically installed around the system to prevent intruders. Some communities have solar PV or signage by-laws that require identification of the system owner and 24-hour emergency contact information.

DOER's model by-law/ordinance requires owners of solar PV facilities to provide a copy of the project summary, electrical schematic, and site plan to the local fire chief, who can then work with the owner and local emergency services to develop an emergency response plan.

These measures can be combined with products to prevent theft of the panels. Some are very low cost options (fastener type) while there are other options that are more expensive (alarm system type) but also more effective. The biggest potential risk associated with solar PV systems is the risk of shock or electrocution for firefighters and other emergency responders who could come in contact with high voltage conductors. A 2010 study on firefighter safety and emergency response for solar PV systems by the Fire Protection Research Foundation, based in Quincy, Massachusetts, recommended steps firefighters can take when dealing with wiring and other components that may be energized. The Solar Energy Business Association of New England (SEBANE) has been working to provide training and education to first-responders to identify and avoid potential hazards when responding to a solar PV fire.

For more information about toxics/fires, see the Hazardous Materials Section.

Resources:

"Moskowitz, P.D. and Fthenakis, V.M., Toxic Materials Released from Photovoltaic Modules During Fires: Health Risks, Solar Cells, 29, 63-71, 1990. 21."

Solar America Board for Codes and Standards

<http://www.solarabcs.org/about/publications/reports/blindspot/pdfs/BlindSpot.pdf>

"Fire Fighter Safety and Emergency Response for Solar Power Systems: Final Report" May 2010.
Prepared by The Fire Protection Research Foundation

National Electric Code Article 250: Grounding and Bonding, Article 300: Wiring Methods, Article 690
Solar PV Systems, Article 705 Interconnected Electric Power Production Sources

Historic Preservation

Question: What are the appropriate standards when land with certain historical or archaeological significance is developed for large-scale solar PV arrays?

Bottom Line: Parties undertaking solar PV projects with state or federal agency involvement must provide the Massachusetts Historical Commission (MHC) with complete project information as early as possible in the planning stage, by mail, to the MHC's office (see Resources). Parties should also contact local planning, historical or historic district commissions to learn about any required local approvals. Municipalities should also take the presence of historic resources into account when establishing zoning regulations for solar energy facilities in order to avoid or minimize impacts.

More Information: Land being evaluated for the siting large-scale solar PV may have historical or archaeological significance, including properties listed in the National or State Registers of Historic Places and/or the Inventory of Historic and Archaeological Assets of the Commonwealth.

Federal and state laws require that any new construction, demolition or rehabilitation projects (including new construction of solar PV) that propose to use funding, licenses or permits from federal or state government agencies must be reviewed by the MHC so that feasible alternatives are developed and implemented to avoid or mitigate any adverse effects to historic and archaeological properties. Projects receiving federal funding, licenses or permits are reviewed by the involved federal agency in consultation with the MHC and other parties in compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f) and the implementing regulations (36 CFR 800) in order to reach agreement to resolve any adverse effects. Projects receiving state funding, licenses or permits must notify the MHC in compliance with M.G.L. c. 9, ss. 26-27C and the implementing regulations 950 CMR 71. If the MHC determines that the project will have an adverse effect, the involved state agency, the project proponent, the local historical preservation agencies, and other interested parties consult to reach an agreement that outlines measures to be implemented to avoid, minimize, or mitigate adverse effects. For projects with both federal and state agency involvement, the Section 106 process is used.

Some communities have local preservation ordinances or established historic districts that require local approval for new construction visible from a public way. Local historic district commissions have adopted design guidelines for new construction within their historic districts and historic neighborhoods. However, these guidelines must account for Chapter 40C Section 7 of the General Laws, which requires a historic district commission to consider the policy of the Commonwealth to encourage the use of solar energy systems and to protect solar access.

Resources:

Federal Agency Assisted Projects:

Section 106 review information and federal regulations 36 CFR 800 are available at the Advisory Council on Historic Preservation (ACHP) web site: www.achp.gov. Check with the involved federal agency for how they propose to initiate the MHC notification required by 36 CFR 800.3.

State Agency Assisted Projects:

Massachusetts General Laws Chapter 9, sections 26-27C

<http://www.malegislature.gov/Laws/GeneralLaws/Search>

MHC Regulations 950 CMR 71 (available from the State House Bookstore)

MHC Review & Compliance FAQs <http://www.sec.state.ma.us/mhc/mhcrevcom/revcomidx.htm>

MHC Project Notification Form (PNF) & Guidance for Completing the PNF and required attachments (USGS locus map, project plans, current photographs keyed to the plan). Mail or deliver the complete project information to the MHC's office: <http://www.sec.state.ma.us/mhc/mhcform/formidx.htm>

General Guidance about Designing Solar PV Projects on Historic Buildings and in Historic Areas:

<http://www.nrel.gov/docs/fy11osti/51297.pdf>

Noise

Question: Do the inverters, transformers or other equipment used as part of ground-mounted solar PV create noise that will impact the surrounding neighborhood?

Bottom Line: Ground-mounted solar PV array inverters and transformers make a humming noise during daytime, when the array generates electricity. At 50 to 150 feet from the boundary of the arrays, any sound from the inverters is inaudible. Parties that are planning and designing ground-mounted solar PV can explore options to minimize noise impacts to surrounding areas even more. These could include conducting pre-construction sound studies, evaluating where to place transformers, and undertaking appropriate noise mitigation measures.

More Information: Most typically, the source of noise associated with ground-mounted solar PV comes from inverters and transformers. There also may be some minimal noise from switching gear associated with power substations. The crackling or hissing sound caused by high-voltage transmission lines (the “Corona effect”) is not a concern in the case of solar PV, which uses lower voltage lines.

Parties siting ground-mounted solar PV projects should consult equipment manufacturers to obtain information about sound that can be expected from electrical equipment, which can vary. For example, according to manufacturer’s information, a SatConPowergate Plus 1 MW Commercial Solar PV Inverter has an unshielded noise rating of 65 decibels (dBA) at five feet. This is approximately the sound equivalent of having a normal conversation with someone three feet away. Another source of information is the National Electrical Manufacturers Association (NEMA) standards, which will provide maximum sound levels from various equipment arrays. From NEMA, a large dry-type transformer (2001-3333 kVA) that is forced air cooled and ventilated has an average sound level of 71 dBA, which is approximately the sound level one would expect from a vacuum cleaner at ten feet. There may be several such units on a substantially sized PV site, which would increase the sound level to some degree.

Sound impacts from electrical equipment can be modeled to the property line or nearest sensitive receptor (residence). Sound impacts can be mitigated with the use of enclosures, shielding and placement of the sound-generating equipment on-site. The rule of thumb for siting noise-generating equipment is that the sound impact can be reduced by half by doubling the distance to the receptor.

In some areas both in the U.S. and Canada, sound impact analysis is required as part of the permitting process for large PV systems. For example, in the Province of Ontario, Canada, any project greater than 12 MW is required to perform a sound impact analysis (Ontario 359/09). California also requires a sound impact analysis for Large PV projects. Massachusetts currently has no such requirement, but the reader should note that ground mounted systems in Massachusetts very rarely go over 6 MW, which is half the size of the 12 MW that triggers a sound analysis in Ontario.

A recent study measured noise levels at set distances from the inverters and from the outer boundary of three ground mounted PV arrays in Massachusetts with a capacity range of 1 to 3.5 MW. Close to the inverters (10 feet), sound levels varied from an average of 55 dBA to 65 dBA. Sound levels along the fenced boundary of the PV arrays were generally at background levels, though a faint inverter hum could be heard at some locations. Any sound from the PV array and equipment was inaudible and sound

levels were at background levels at setback distances of 50 to 150 feet from the boundary. Project developers should consult with local planning and zoning officials to determine if local noise ordinances may be applicable. Many local noise ordinances establish absolute limits on project impact noise (such as a 40 dBA nighttime limit). In these communities, a noise impact assessment may be required.

Resources:

NEMA Standards Publication No. TR=1-1993(R2000), *Transformers, Regulators and Reactors*

Noise Assessment: Borrego 1 Solar Project, MUP 3300-10-26 Prepared by Ldn Consulting, Inc, Fallbrook, CA. January 14, 2011

Ontario Regulation 359/09 Renewable Energy Approval (REA) Regulation, Ontario Ministry of the Environment, Canada

Tech Environmental, Study of Acoustic and EMF levels from Solar Photovoltaic Projects, Prepared for the Massachusetts Clean Energy Center, December 2012

Water-Related Impacts

Question: Can chemicals that might be contained in solar PV threaten public drinking water systems? Will flooding occur in cases where trees must be removed in order to install the solar arrays? How do we ensure that wetland resources are protected?

Bottom Line: Rules are in place to ensure that ground-mounted solar arrays are installed in ways that protect of public water supply, wetlands, and other water resource areas. All solar panels are contained in a solid matrix, are insoluble and are enclosed. Therefore releases are not a concern.

More Information: Because trees offer multiple water management, cooling and climate benefits, clear cutting of trees for the installation of ground-mounted solar PV is discouraged. For projects that do propose to alter trees, the Massachusetts Environmental Policy Act (MEPA) has thresholds for the proposed alteration of a certain number of acres of land, the size of electrical facilities, and other criteria that trigger state review of proposed projects. Clear cutting of trees and other aspects of proposed projects would be reviewed through an Environmental Notification Form/Environmental Impact Statement if thresholds are triggered.

MassDEP has determined that the installation of solar arrays can be compatible with the operation and protection of public drinking water systems. This includes the installation of solar arrays within Zone I, which is a 400-foot protective radius around a public ground water well. Solar projects proposed on lands owned by public water systems outside Zone I may be approved subject to standard best management practices, such as proper labeling, storage, use, and disposal of products. MassDEP has a guidance/review process in place to ensure that the installation of ground-mounted solar PV in these areas protects public water supplies.

Installing solar arrays on undeveloped land can preserve the permeable nature of the land surface provided the project design minimizes disturbance to natural vegetative cover, avoids concentrated runoff, and precipitation is otherwise recharged into the ground to the greatest extent practicable. Storm water flow, as well as information about site-specific soils and slope, is taken into account during the design and installation of solar arrays.

MassDEP discourages installation of ground-mounted solar PV systems in wetland areas, including riverfront locations. Solar projects within wetland areas are unlikely to comply with the performance standards in the Wetlands Protection Act regulations. If a solar installation is proposed in a wetland, a riverfront area, a floodplain, or within 100 feet of certain wetlands, the project proponent must file a notice of intent (or application to work in wetland areas) with the local Conservation Commission, which administers the Wetlands Protection Act at the municipal level. Copies should also go to MassDEP. Solar installations may be sited near, but outside of wetlands, in a manner that protects the functions of wetlands and that minimizes impacts from associated activities such as access and maintenance. Ancillary structures related to construction of a solar installation or transmission of power may be permitted to cross rivers and streams using best design and management practices.

Resources:

More information about the Wetlands Protection Act requirements may be found in the implementing regulations at 310 CMR 10.00: <http://www.mass.gov/dep/service/regulations/310cmr10a.pdf>

More information about Environmental Notification Form/Environmental Impact Statement: <http://www.env.state.ma.us/mepa/regs/11-03.aspx>.

MassDEP Policy for Siting Solar Projects in Zone I: <http://www.mass.gov/dep/water/laws/1101.htm>

MassDEP Guidance for Siting Wind and Solar in Public Water Supply Land: <http://www.mass.gov/dep/water/laws/wseppws.htm>

MassDEP Chapter 91 Guidance for Renewable Energy Projects: http://www.mass.gov/dep/water/priorities/ene_91.htm

Glare

Question: How important is reflectivity and potential visual impacts from solar projects, especially near airports?

Bottom Line: Solar panels are designed to reflect only about 2 percent of incoming light, so issues with glare from PV panels are rare. Pre-construction modeling can ensure that the placement of solar panels prevents glare.

More Information: Solar panels are designed to absorb solar energy and convert it into electricity. Most are designed with anti-reflective glass front surfaces to capture and retain as much of the solar spectrum as possible. Solar module glass has less reflectivity than water or window glass. Typical panels are designed to reflect only about 2 percent of incoming sunlight. Reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight.

An analysis of a proposed 25-degree fixed-tilt flat-plate polycrystalline PV system located outside of Las Vegas, Nevada showed that the potential for hazardous glare from flat-plate PV systems is similar to that of smooth water and is not expected to be a hazard to air navigation.

Many projects throughout the U.S. and the world have been installed near airports with no impact on flight operations. United Kingdom and U.S. aircraft accident databases contain no cases of accidents in which glare caused by a solar energy facility was cited as a factor.

When siting solar PV arrays pre-construction modeling can ensure the panels are placed in a way that minimizes any potential glare to surrounding areas.

Resources:

Technical Guidance for Evaluating Selected Solar Technologies on Airports, Federal Aviation Administration, November 2010 (currently under review):
http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide.pdf

A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat-Plate Photovoltaic Systems, Black & Veatch Corporation, August 2011: <http://www.isrn.com/journals/re/2011/651857/>

Solar Photovoltaic Energy Facilities, Assessment of Potential Impact on Aviation, Spaven Consulting, January 2011: <http://plan.scambs.gov.uk/swiftig/MediaTemp/1121414-374831.pdf>

Endangered Species and Natural Heritage

Question: Who ensures that rare animal and plant species and their habitats are not displaced or destroyed during the construction of ground-mounted solar PV?

Bottom Line: Rules are in place to ensure that the installation of ground mounted solar arrays protects state-listed rare species and animals and plants. Project proponents can check with the local Conservation Commission to determine if the footprint of the solar PV project lies within a rare species habitat.

More Information: The Massachusetts Natural Heritage and Endangered Species Program (NHESP) was created under the Massachusetts Endangered Species Act (MESA) and is responsible for protecting rare animal and plant species and their habitats from being displaced or destroyed. Specifically, NHESP reviews projects proposed for:

- **Priority Habitats:** These are areas known to be populated by state-listed rare species of animals or plants. Any project that could result in the alteration of more than two acres of Priority Habitat is subject to NHESP regulatory review. Projects will need to file a MESA Information Request Form, along with a project plan, a U.S. Geological Service (USGS) topographical map of the site, and a \$50 processing fee. NHESP will let project administrators know within 30 days if the filing is complete, then will determine within the next 60 days whether the project, as proposed, would result in a “take” of state-listed rare species that might require the project to redesign, scale down, or abandon its plan.
- **Estimated Habitats.** These are a sub-set of Priority Habitats that are based on the geographical range of state-listed rare wildlife – particularly animals that live in and around wetlands. If the project is proposed for one of these areas and the local Conservation Commission requires filing a Notice of Intent (NOI) under the Wetlands Protection Act, the project will need to submit copies of the NOI, project plans and a U.S. Geological Service (USGS) topographical map to NHESP. Within 30 days of receiving this information, NHESP will send its comments to the Conservation Commission, with copies to the project administrator, project consultants, and the Department of Environmental Protection (MassDEP).

Projects can check with the Conservation Commission in your town or city to find out if its footprint lies within an Estimated Habitat for rare species. Each Commission has a large-scale map of its community available for public inspection. Each map NHESP develops to delineate a Priority Habitat or Estimated Habitat is based on at least 25 years of local rare animal and plant observation, and the best scientific evidence available. It is important to note that to ensure adequate protection of rare species, NHESP does not disclose detailed site-specific information about them.

Resources:

To learn more about the NHESP review process and download a MESA Information Request Form, visit:
http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/ mesa/ mesa_project_review.htm

For lists of rare animal and plant species in Massachusetts, visit:
http://www.mass.gov/dfwele/dfw/nhesp/species_info/ mesa_list/ mesa_list.htm

