Title
GREEN BUILDINGS, GOOD JOBS, SAFE JOBS: SOCIAL JUSTICE PATHWAYS TO A SUSTAINABLE LOS ANGELES

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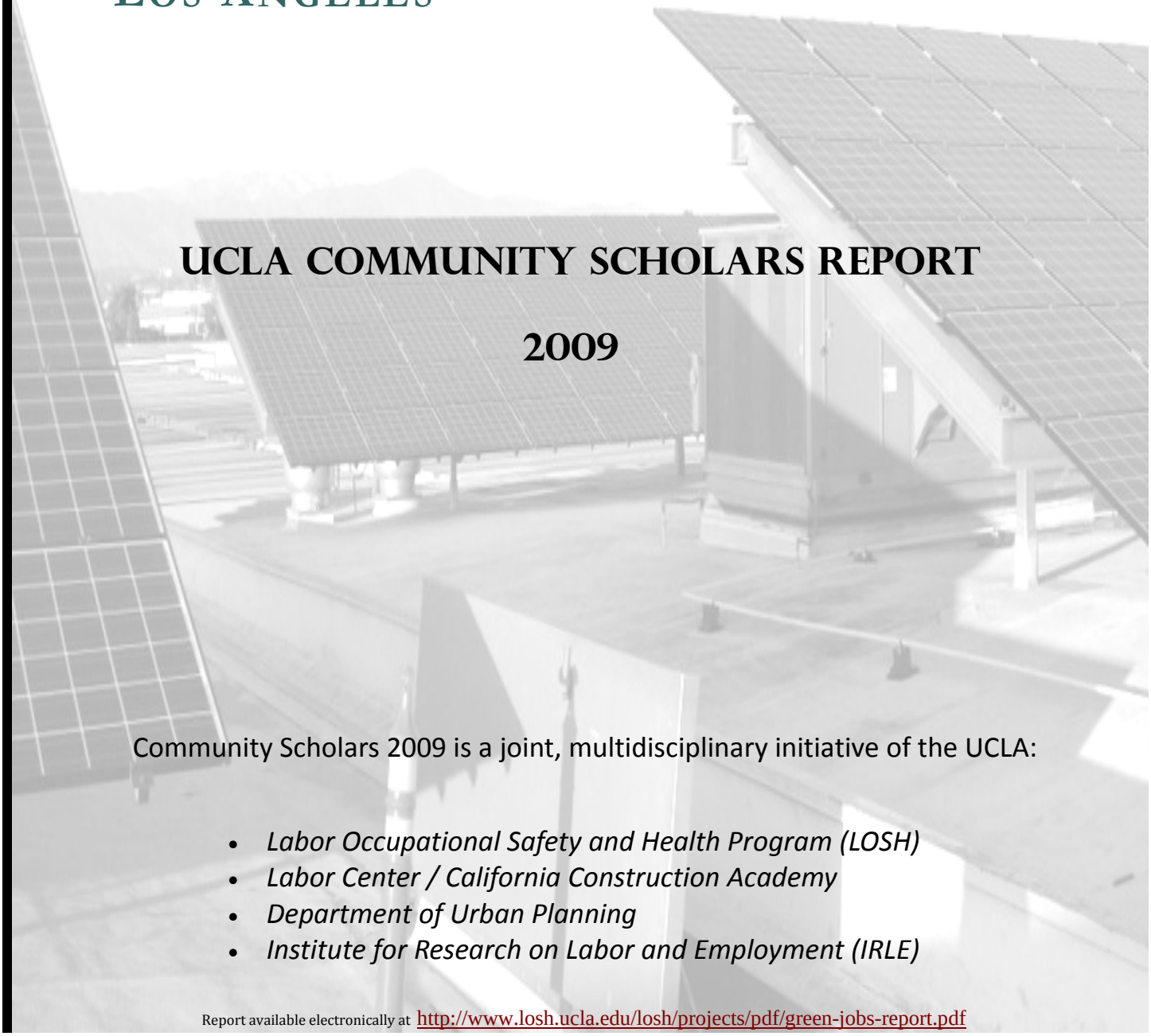

UCLA COMMUNITY SCHOLARS REPORT

2009

Community Scholars 2009 is a joint, multidisciplinary initiative of the UCLA:

- *Labor Occupational Safety and Health Program (LOSH)*
- *Labor Center / California Construction Academy*
- *Department of Urban Planning*
- *Institute for Research on Labor and Employment (IRLE)*

Report available electronically at http://www.losh.ucla.edu/losh/projects/pdf/green-jobs-report.pdf

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Cover photo: Solar Panels on Roof of Electrical Training Institute of Southern California, International Brotherhood of Electrical Workers (IBEW) Local 11 & National Electrical Contractors Association (NECA), Los Angeles County Chapter

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Executive Summary

On April 8, 2009, the Los Angeles City Council unanimously passed an ordinance establishing a ***Green Retrofit and Workforce Program***. The Ordinance calls for green retrofits to more than 1,000 city buildings and a workforce development policy that creates career pathways into good, green, safe jobs, targeting those in low-income neighborhoods. The result of a two-year campaign, the Ordinance was developed by the Los Angeles Apollo Alliance, a coalition formed by Strategic Concepts in Organizing and Policy Education (SCOPE) and comprised of more than 25 community, labor, and environmental organizations in Los Angeles.

This groundbreaking Ordinance addresses major issues confronting society today – environmental, economic, and health – and represents the first time a program designed to retrofit buildings and reduce municipal energy and water costs has been combined with training for green, quality, union jobs, with the added provision of pathways out of poverty for residents in low-income neighborhoods and with consideration of worker and community health.[1]

The Ordinance represents a convergence of community organizing and local, state and federal initiatives to address climate change at a historic moment. At the local level, the ordinance is one component of the Green LA Climate Action Plan. At the state level, the Global Warming Solutions Act of 2006 (AB 32) requires a reduction in greenhouse gas emissions to 1990 levels by 2020. And at the federal level, stimulus funds are forthcoming to address the dual environmental and economic crises through investment in a green economy.

This report explores ways to effectively implement the Ordinance to enhance the environment, support community economic development and promote the health and wellbeing of workers and building users. The recommendations herein are designed to provide guidance to the Program Director and the policymakers, community, labor and environmental representatives who will comprise the City Taskforce and Advisory Council – with the goal of creating a model program that can be adapted in other cities, in the private sector, and beyond.

Green Retrofit & Workforce Program Highlights

- *Green retrofit city-owned buildings greater than 7,500 ft^2 or constructed prior to 1978 to achieve LEED®* -EB silver or higher certification*
- *Improve energy efficiency, water conservation, indoor air quality; integrate sustainable products, processes, renewable energy*
- *Prioritize investment in underserved communities – local hire, career pathways, Project Labor Agreements (PLAs)*
- *Appoint Program Director to implement program*
- *Establish a City Interdepartmental Taskforce and an Advisory Council*

*** LEED-EB: Leadership in Energy & Environmental Design, Existing Buildings**

[1] Schneider, K. (4-09-09) LA Apollo Helps City Adopt Landmark Green Jobs Ordinance. Apollo News Service

Executive Summary

This report is a result of research conducted under the **UCLA Community Scholars Program**. Initiated in 1992, the program is an innovative multidisciplinary program that recognizes the important role that community and labor leaders play in shaping community development policy in Los Angeles. By bringing these stakeholders together with graduate students, the program provides an avenue to develop and apply research skills to critical policy issues facing Los Angeles.

The 2009 Community Scholars course ***"Green Collar Jobs, Green Buildings, and Social Justice: Pathway to a Sustainable City",*** was sponsored by the UCLA Labor Occupational Safety and Health Program (LOSH); Labor Center / California Construction Academy (CCA); Department of Urban Planning; and Institute for Research on Labor and Employment (IRLE).

Participants in this year's Community Scholars course were graduate students in urban planning, public policy, public health and law, as well as community activists, labor leaders and workforce specialists. We represented construction and public sector unions, community and environmental justice organizations, legal aid and youth organizations.[2] The course was led by UCLA-LOSH Director Linda Delp, with the assistance of Elizabeth Stewart from the UCLA Labor Center / California Construction Academy and Revel Sims, a doctoral student in the UCLA Department of Urban Planning.

Community Scholars 2009 builds on the LA Apollo Alliance's organizing efforts and was informed by the language and principles of the Ordinance. Using a case study approach, we conducted site visits, reviewed relevant literature and City documents, attended meetings, and interviewed key stakeholders from labor, workforce development programs and the City, as well as energy and environmental specialists with expertise in LEED certification.[3] We applied principles of green retrofits to the case of the Vernon Public Library by conducting audits of the facility, interviewing staff, and applying the LEED checklist for Existing Buildings Operations & Maintenance (LEED-EBOM). We drew on our own personal and professional experiences and documented best practices in other cities. The recommendations contained in this report are informed by these activities.

Community Scholars Briefing at City Hall, June 2009

The research culminated in a briefing at Los Angeles City Hall on June 11, 2009 to present preliminary recommendations and solicit feedback from policymakers, city staff, community, labor, and environmental groups who helped shape and pass the Ordinance. We subsequently held a community-based conference on August 5, 2009 at the UCLA Downtown Labor Center to present results and discuss next steps for implementation with key stakeholders.[4]

[2] See page 81 for a listing of Community Scholars participants and their affiliations

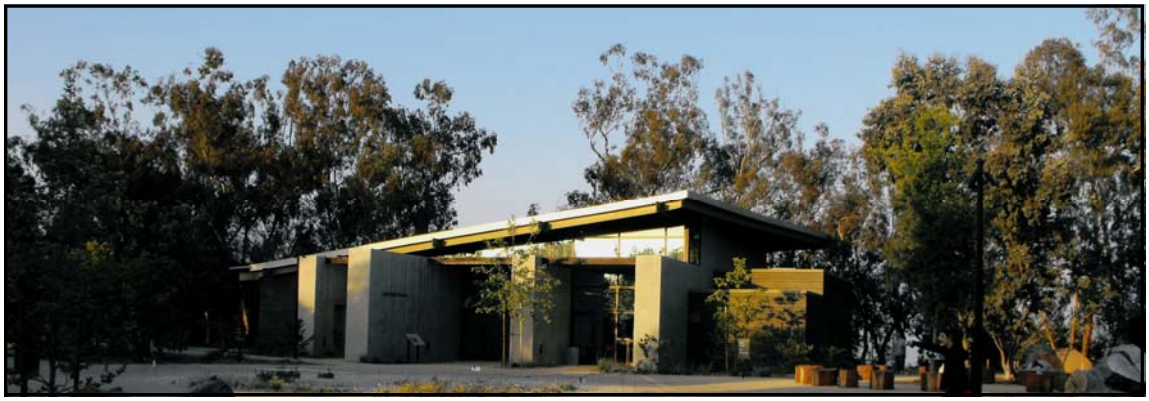
[3] LEED is a certification program of the U.S. Green Building Council and includes six categories: Sustainable Sites, Water Efficiency , Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Operations (http://www.usgbc.org/)

[4] "Working in Unity, Greening our Community" (http://www.losh.ucla.edu/losh/events/GreenJobsConference.html)

We frame sustainability[5] in terms of environmental, economic and health goals grounded in principles of social justice. We propose that green buildings must contribute to sustainable goals in each of these areas; the government must play a role in advancing those goals; and workers, community members and their representatives must be involved in setting and implementing policies.

Implemented within a framework of sustainability, green building retrofits can address some of the environmental, economic and health problems facing society today.

Buildings and the Environment – Buildings are major contributors to the greenhouse gas emissions that cause climate change. Nationwide, buildings account for 72 percent of all electricity consumed and use 40 percent of all raw materials. They are also responsible for 14 percent of potable water consumption, 38 percent of all carbon dioxide (CO_2) emissions, and 30 percent of waste output.[6] Green building retrofits can minimize society's impact on the environment.



LEED Certified Building, Tree People

Buildings and the Economy – The collapse of the financial system, the decline in the commercial and residential real estate market, bankruptcies, foreclosures, and rising unemployment have all translated into an economic recession unprecedented in recent years. The City of Los Angeles and the State of California face huge budget deficits resulting in job furloughs, cuts to programs and services, and suspension of public work contracts. Locally, the Los Angeles County unemployment rate has almost doubled in the past year, reaching 11.4 percent in June 2009; Los Angeles City's rate is even higher, at 12.5 percent.[7] Energy efficiency and water conservation retrofit measures generate cost savings and help conserve limited government funds. Green retrofit projects also create jobs and can contribute to efforts to rebuild the local economy.

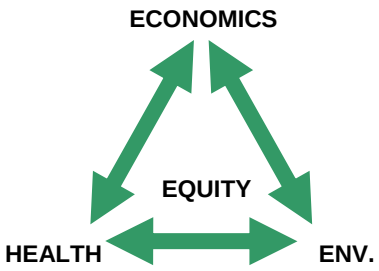
[5] Sustainability is defined in a variety of ways. One common global definition is: "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Source: http://www.epa.gov/sustainability/basicinfo.htm, accessed September 5, 2009. Definition from the 1987 Report of the World Commission on Environment and Development.
[6] United States Building Council. "Green Building Research." http://www.usgbc.org/DisplayPage.aspx?cmspageID=1718
[7] California Employment Development Department, Labor Market Info: Unemployment Rate and Labor Force. http://www.labormarketinfo.edd.ca.gov/?pageid=1006

Buildings and Health – Older, deteriorating buildings can put construction, maintenance, service and office workers at risk of exposure to health and safety hazards. Maintenance work may release asbestos and lead-containing dust. Research by the U.S. Environmental Protection Agency indicates that the indoor environment can become more polluted than outdoor air, even in large, industrial cities. Indoor air pollutants from a variety of sources may become concentrated in buildings with poor ventilation.[8] The use of green building materials, safe work practices to limit release of asbestos, lead paint and other hazards, and improved ventilation systems can all contribute to the health of workers and building occupants. They can also result in cost savings by reducing absenteeism and increasing productivity.

Sustainability and LA's Green Retrofit and Workforce Program – The Program addresses the three components of sustainability outlined in this report – environmental, economic, and health - that stem from our built environment. If implemented successfully, the Ordinance will contribute to the goals of a more sustainable Los Angeles:

- Environmental benefits – through reduced greenhouse gas emissions and environmental resource conservation
- Economic benefits – through cost savings, job creation and investment in underserved communities
- Health benefits for workers and the community – through safe retrofit and maintenance jobs, improved building conditions and use of safer products

Social Justice Framework - True sustainability[9] also requires that decisions be made through the social justice lens of equity to ensure that disenfranchised community members and workers are empowered, involved in decisions, and equally reap the benefits of a green economy.



The Ordinance prioritizes green building retrofit work and job creation for local residents in areas with high levels of poverty and unemployment. Green retrofit projects have the potential to create jobs and, more importantly, a career pathway with family-supporting wages and benefits. The workforce program created by the Ordinance will build on Project Labor Agreements[10] that have been crafted to balance economic benefits for existing workers and equitable access to jobs for unemployed workers living in poverty.

[8] United States Environmental Protection Agency, Office of Radiation and Indoor Air. "The Inside Story: A Guide to Indoor Air Quality," EPA Document 402-K-93-007. http://www.epa.gov/iaq/pubs/insidest.html#Intro1

[9] In his 1996 article *Green Cities, Growing Cities, Just Cities*, Scott Campbell defines sustainability as the center of the "three E's triangle—Economy, Environment and Equity. We revise the model to explicitly integrate health and to highlight equity as the social justice foundation.

[10] Project Labor Agreements were the subject of the 2008 UCLA Community Scholars class. See the report at: http://www.labor.ucla.edu/publications/reports/CRA-Report.pdf

New reports on the green economy surface almost daily. This report focuses on how the concept of green jobs and the goals of sustainability can be applied to the reality of implementing a green building retrofit policy in a major metropolitan area with numerous public sector buildings and with large areas characterized by a history of disinvestment. It contributes to the growing body of knowledge about green jobs by highlighting the need to create ***good, green, safe jobs*** that benefit community economic development, the environment, and worker and community health. The report is designed to provide information and tools for use by the Green Building and Workforce Program Director, the City Interdepartmental Taskforce and the Advisory Council – entities to be created pursuant to language in the Ordinance.

We set out to answer the following questions:

- With more than 1,000 buildings to be retrofitted, how should the City proceed?
- What specific steps are needed to achieve the sustainability goals of the ordinance—to improve the environment, create jobs and generate cost savings, and promote health and safe job conditions? How can we measure the results?
- What are the workforce development needs? What resources exist?
- Where are potential sources of funds to carry out these efforts?
- How can workers, community members, and their representatives be involved in the decision-making process?

Several principles underlie the recommendations: Our recommendations range from the specific and technical aspects of implementing green building retrofits to the social justice aspects of investing in underserved communities and, ultimately, to the broader goal of building a movement for good, green, safe jobs and a more sustainable Los Angeles.

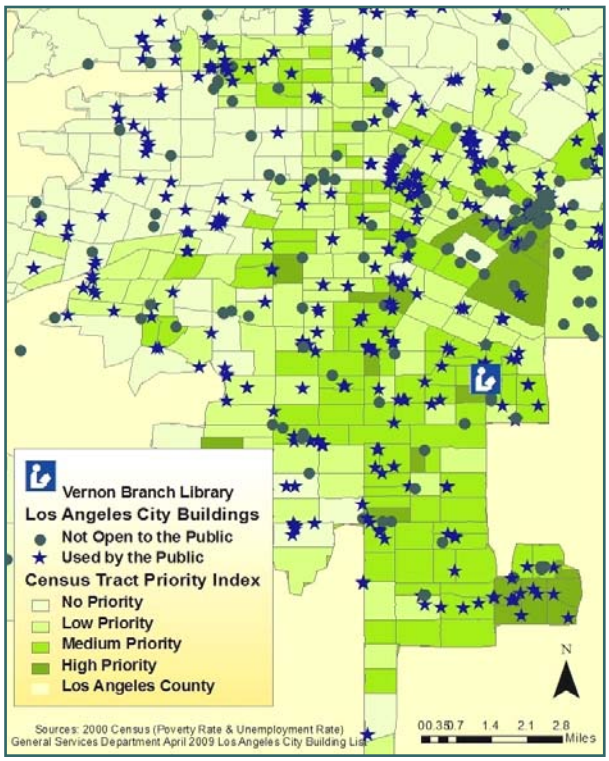
1. ***Sustainability goals*** – Implementation of the Ordinance must maintain sight of goals to improve the environment, invest in cost-saving systems, generate good, green, safe jobs, and enhance the health of workers and building users. Implementation must also be carried out through a lens of social justice and equity.
2. ***Role of government*** – City government must play a critical leadership role as policy maker, employer, owner of large-scale building stock, contract administrator and procurer of equipment and supplies.
3. ***Civic engagement*** – Involvement of workers and informed input from community, labor and environmental representatives is critical to successfully implement the Ordinance and to create a movement for green retrofits that extends beyond city buildings.

1. Establish structures and processes to facilitate the informed participation and involvement of workers, community members, and their representatives.

- Develop a participatory training program for City Interdepartmental Taskforce and Advisory Council members in a forum that allows for mutual education among members and from external advisors.
- Implement an outreach and education plan for city workers and building occupants through city departments and the City Coalition of Unions to achieve worker buy-in and active participation in efforts to green LA City buildings.
- Collaborate with local community-based and youth organizations and schools to create a community outreach and education program. Hold a community event in local public-use city buildings when embarking on a green retrofit project in that community.
- Establish a Joint Labor Management Safety Committee as outlined in the 2007-2012 Mutual Gains bargaining agreement. Educate and involve Committee members in the building selection, audit and retrofit phases to identify health and safety risks workers might confront during retrofits and to recommend appropriate precautions to protect workers, building occupants and the community.

2. Prioritize buildings based on social justice goals and potential for energy efficiency and cost savings.

- Use the Building Selection tool (see Appendices at http://www.losh.ucla.edu/losh/projects/pdf/gj_appendices.pdf to create a list of community-serving buildings in areas of high poverty and unemployment to ensure investment in underserved communities.
- Identify those on the list that present health and safety risks and that represent different geographic areas to enhance widespread public awareness and support for the program.
- Select 10-15 buildings from the priority list that represent each major building category for inclusion in a retrofit pilot stage.
- Establish a documentation and tracking system upfront to monitor reductions in energy use and green house gas emissions, water conservation, job creation and enhancement, cost savings and improved health and safety conditions.
- Expand the program to include all buildings targeted by the Ordinance and apply lessons learned from the pilot stage.



Poverty and Unemployment Rate Index—Close-up of South Los Angeles

3. Conduct Comprehensive Audits and Retrofits to keep sight of the Ordinance's overarching environmental, economic and health sustainability goals.

LA City Library Site Visit, 2009

- Gather and analyze utility data across the City's building portfolio to obtain a benchmark ENERGY STAR rating for each building. Factor the rating into the building selection process to identify buildings and retrofits that will generate cost savings to help fund the program.
- Conduct onsite comprehensive audits of prioritized buildings. Collect data to inform retrocommissioning and to identify energy-saving retrofits and safety precautions needed. Interview building staff and users, test building systems, and perform short-term diagnostic monitoring. Document indoor air quality concerns of occupants.
- Establish benchmarks for energy and water use and associated utility costs, rates of injury, illness and absenteeism and other indicators for use in monitoring the impact of retrofits.
- Use the Retrofit Planning Matrix tool (see page 27) to initially prioritize energy-saving and water conservation retrofits that will generate cost-savings and create jobs; to achieve ENERGY STAR certification; and to address the 13 retrofit elements in the Ordinance.
- Implement other sustainability-related city policies such as the Environmentally Preferable Products Purchasing Program.
- Achieve and maintain LEED-EBOM Silver certification for all buildings targeted under the Ordinance. This will require investment in retrofits and worker education and involvement to optimize ongoing operations and maintenance.

4. Create partnerships among existing workforce development resources to build pathways into green, sustainable careers – with living wages, safe working conditions, health benefits, and opportunities for growth and advancement – for both City building retrofit jobs and beyond.

- Conduct a 'job audit' for each major building type during the pilot phase to quantify the kind of jobs and associated job skills required and the potential health benefits and hazards of those jobs.
- Build on existing Memoranda of Understanding and on past Los Angeles experience with Project Labor Agreements, local hire policies, the City Jobs model and others to provide promotion opportunities for existing workers and to recruit workers from underserved areas of the City.
- Provide education and wrap-around services to support workers who confront barriers to employment such as the need for job preparation skills, child care, and other social services.
- Integrate education about the environment and the green economy into existing programs – pre-apprentice, apprenticeship and community college, as well as worksource center and community group programs – along with job skills training and health and safety education so workers understand the importance of their role in promoting a green economy and precautions required to protect their own health and the health of other workers and the community.

5. Identify short-term start up funds and establish longer-term finance mechanisms to sustain and expand the program.

- Use available ARRA[11] and other local, state and private-sector funding to jumpstart energy efficiency retrofits and workforce development programs. Potential sources include the Energy Efficiency Block Grant and State Energy Program funds, Department of Labor Workforce Investment Act and Green Jobs funding.
- Use Qualified Energy Conservation Bonds to fund projects that test new green building technologies and to finance an educational campaign to promote green behaviors among workers and communities using public buildings.
- Create a revolving energy fund loan to finance retrofits that have a quantifiable monetary savings or return such as energy efficiency, energy/water conservation, renewable energy, and retrocommissioning.
- Use government funds to leverage private-sector funding sources for expanded programs.

6. Inform workers, surrounding communities and the public at large about the Ordinance, with the longer-term goal of building a movement to expand good, green, safe jobs in the green economy.

- Create targeted media messages and use social networking avenues to reach targeted constituents, including youth and adults.
- Integrate environmental literacy and participatory education activities into programs for the new and existing workforce such as job training and workforce development programs. Where possible, use a peer education approach – worker to worker, community member to community member.
- Create visual factsheets and other materials for distribution at community events. Partner with community groups, churches, schools and other organizations to identify avenues to reach their constituents.

7. Expand the impact of the program by creating a model that can be adapted in other cities and in the private sector. Explore possibilities to revitalize the local manufacturing sector by producing products for green building retrofits.

- Leverage the City's purchasing power to stimulate demand for locally produced green building products and provide incentives to create good, green, safe manufacturing jobs.
- Implement policies to stimulate comprehensive green retrofits within the City's large commercial and residential building stock.
- Provide information and guidance about ways to adapt the Los Angeles City program to other cities throughout the region and to county buildings.

[11] ARRA - American Recovery and Reinvestment Act of 2009

LA Labor-Community Forum, 2009

Los Angeles has a unique opportunity to implement a Green Building Retrofit and Workforce Program that can serve as a model within the region and nation-wide. The Program is innovative in its origin and focus. Created by a coalition of labor, community and environmental organizations, it establishes a mechanism for ongoing input through an Advisory Council with stakeholders from similarly diverse backgrounds. Its focus is comprehensive, addressing three critical issues facing our society – environmental degradation, escalating unemployment and health problems that stem from our built environment.

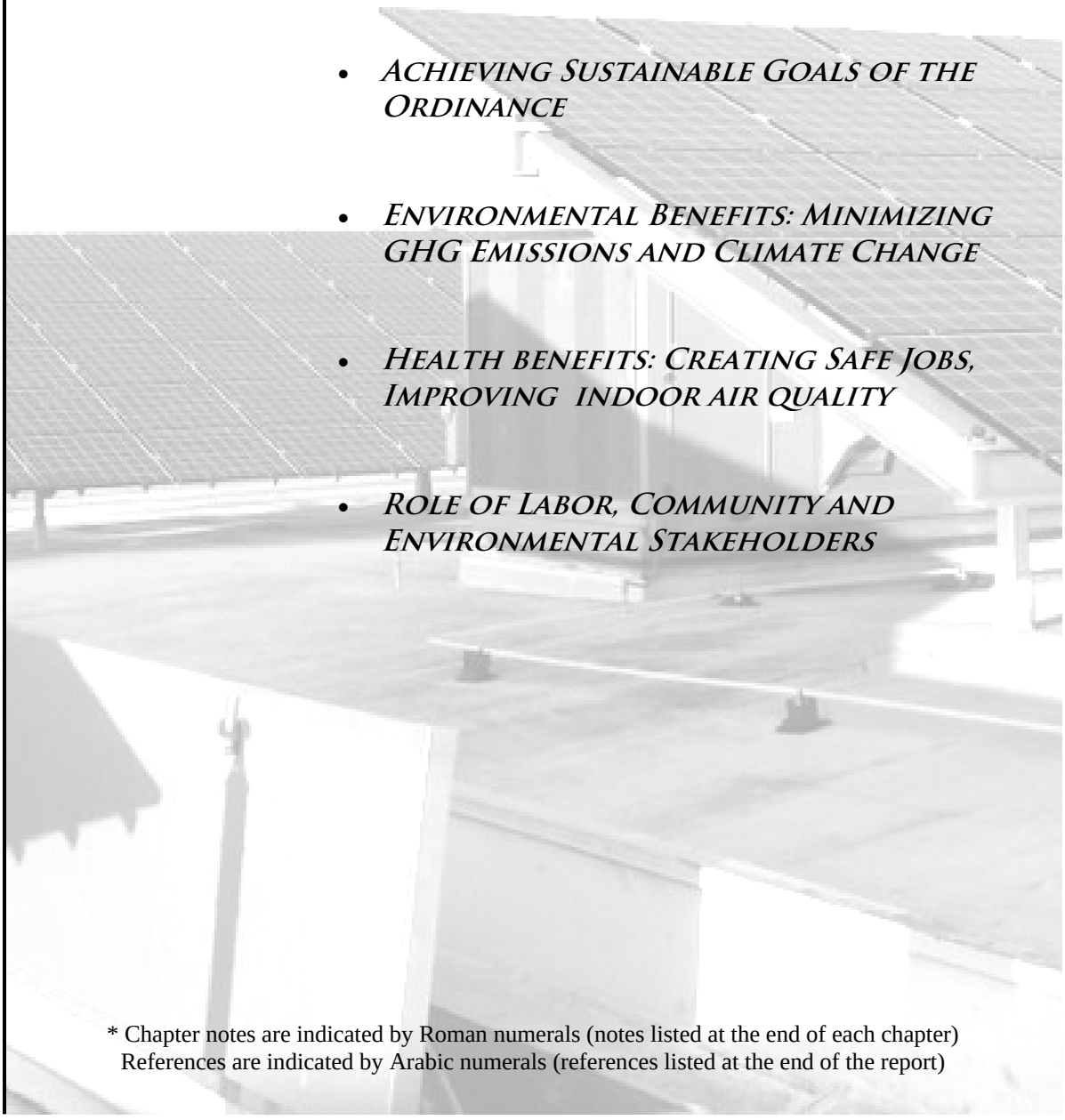
A comprehensive approach to implementing the Ordinance will address some of the tensions likely to surface, particularly during this economic downturn.

- *How can we ensure that people desperate to work have access to **quality** jobs rather than being forced to accept any job available?*
- *How can we create **good, green, safe jobs** that provide union representation and lead to careers?*
- *And, finally, how can we balance the need to maintain jobs for existing workers and the need for employment in underserved, disadvantaged communities that confront huge employment and health disparities?*

Los Angeles has taken the lead to confront these tensions through a policy that will create good, green, safe building retrofit jobs and establish a workforce program to educate existing workers and recruit new workers from underserved communities. Through this innovative program, and others that it inspires, Los Angeles leads the way to create a more sustainable city.

Introduction: Green Buildings and Sustainability *

- *Background*
- *Achieving Sustainable Goals of the Ordinance*
- *Environmental Benefits: Minimizing GHG Emissions and Climate Change*
- *Health benefits: Creating Safe Jobs, Improving indoor air quality*
- *Role of Labor, Community and Environmental Stakeholders*



* Chapter notes are indicated by Roman numerals (notes listed at the end of each chapter)
References are indicated by Arabic numerals (references listed at the end of the report)

Background

The current environmental crisis is forcing cities, states, and nations to address their ecological footprints. Data from the U.S. Energy Information Administration illustrate that buildings are responsible for almost half (48 percent) of all energy consumption and greenhouse gas emissions annually; globally the percentage is even greater.[1] Seventy-six percent of all power plant-generated electricity is used just to operate buildings.[2] The need for innovative programming to address environmental degradation caused by conventional building practices has never been more apparent.

The State of California and City of Los Angeles have begun to address climate change through legislation, building codes, and other policy changes. (See Appendix A: Local and State Regulations) In addition to regulating CO_2 emissions from vehicles, state and city policies address the built environment as one of the largest contributors to climate change.

Los Angeles City Hall

The government plays a key role in efforts to build a green economy that integrates a social justice perspective into policies designed to address the current environmental and economic crises. Economic stimulus funding under the Obama Administration offers the City of Los Angeles an opportunity to create model programs and take the lead in shaping their success. With the adoption of LA's new Green Retrofit and Workforce Program Ordinance, the City of Los Angeles can create quality jobs and safe working and building conditions, stimulate demand for retrofit jobs and related products, and serve as a model for private sector building retrofit projects.

Deputy Mayor Larry Frank and Krista Kline of the Mayor's Office at the Community Scholars City Hall Briefing, June 2009

Green Buildings and Sustainability

The Ordinance builds upon previous green building initiatives in Los Angeles and is one component of the Mayor's Green LA Climate Action Plan [i], adopted in 2007 with the goal of reducing greenhouse gas emissions in Los Angeles to 35% below 1990 levels by the year 2030.[3]

LA GREEN BUILDING INITIATIVES

April 2002:	**LA City Council requires LEED certification for all city-funded new construction greater than 7,500 square ft [a]**
Feb 2006:	**Launch of LA Apollo Alliance [b]**
May 2007:	**Green LA Climate Action Plan [c]**
June 2006:	**Green LA Coalition [d]**
April 2008:	**Private Sector Green Building Ordinance (new construction) & Green Building Team [e]**
July 2008:	**Environmentally Preferable Products Purchasing Program - Green building products and waste disposal practices [f]**
Nov 2008:	**Solar LA Plan [g]**
April 2009:	**Green Retrofit and Workforce Program Ordinance – (LA City-owned Building Retrofits) [h]**

SOURCES:

a. http://eng.lacity.org/projects/sdip/docs/SustainableBuildingInitiativeActionPlanFinal043003.pdf; City of Los Angeles Sustainable Building Initiative: An Action Plan for Advancing Sustainable Design Practices.

b. http://apolloalliance.org/state-local/los-angeles/ ; Campaign for good, green jobs and the Ordinance initiated in August 2006

c. http://mayor.lacity.org/Issues/Environment/index.htm; accessed May 31, 2009

d. http://greenlacoalition.org/contact.htm ; Renamed from original Working Group initiated in Nov 2005 by Liberty Hill and Environment Now

e. *http://mayor.lacity.org/Issues/Environment/index.htm*

f. http://greenlacoalition.org/index.htm ; Green Purchasing Policy Workshop resources, July 2008

g. http://mayor.lacity.org/Issues/Environment/index.htm; EPA guidelines: http://www.epa.gov/epp/

h. http://clkrep.lacity.org/onlinedocs/2006/06-1963_ord_180633.pdf ; Green Retrofit and Workforce Program Ordinance

Achieving Sustainability Goals of the Ordinance

The foremost sustainability goals of the Ordinance, attached as Appendix B: Green Retrofit and Workforce Program Ordinance, are to improve the environment, generate good, green, safe jobs, and enhance the health of workers and building users. The Ordinance incorporates social justice goals of the LA Apollo Alliance by prioritizing community investment in underserved areas; specifically, green building retrofit work and job creation for local residents in areas with high levels of poverty and unemployment. City-owned buildings that provide direct services for residents and pose substantial health and safety issues are also prioritized.

Elsa Barboza,
LA Apollo Alliance

The Ordinance leads the way in building a regional green economy, and provides environmental benefits. It contains four areas of focus: energy conservation, renewable energy, water conservation and environmental quality. Retrofits such as heating, ventilating, and air conditioning upgrades, water conservation devices, energy efficient lighting and appliances, and renewable energy systems will reduce the demand on coal-fired plants as a source of the city's energy, leading to reductions in greenhouse gas emissions. These retrofits, explored in the report, can similarly create an environmental career pathway for incumbent and new workers.

Sustainability Goals of the Ordinance

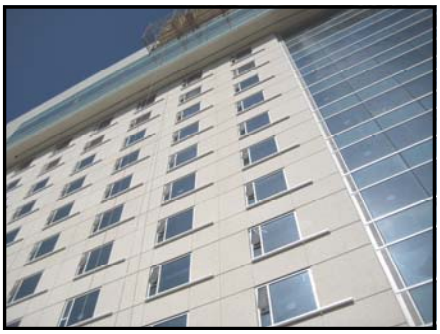
- *Environmental benefits – through reduced greenhouse gas emissions and environmental resource conservation*
- *Economic benefits – through cost savings, job creation and investment in underserved communities*
- *Health benefits for workers and the community – through safe retrofit and maintenance jobs, improved building conditions and use of safer products*

Retrofit projects will enhance the health and safety of building workers and users through improved ventilation and indoor air quality and through the use of sustainable products. This report additionally explores measures needed to ensure that retrofit jobs are safe for workers, such as those who will work on roofs, replace ventilation systems, etc. Many of the hazards associated with traditional construction and maintenance work are likely to be found within green jobs as well. The Ordinance will not provide sustainable benefits to workers if they become injured or ill as a result of the work. Measures to ensure safe jobs are outlined in this report.

Environmental Benefits: Minimizing GHG Emissions and Climate Change

Buildings are major contributors to the greenhouse gas (GHG) emissions that cause climate change. A building can generate GHG emissions at numerous points throughout its life cycle, from energy needs during construction to energy use while in operation. In Los Angeles, buildings currently consume two-thirds of the city's electricity. This electrical demand contributes over 32 percent of the city's carbon dioxide emissions.[4] Green buildings can help mitigate the environmental crisis through energy-efficient design and operation and by reducing the amount of electricity, gas, and water consumed and the quantity of solid waste generated.

Under the Ordinance, greater energy efficiency of city buildings will be achieved by improving heating, ventilation, and air conditioning (HVAC) systems; conserving scarce water resources; replacing inefficient lighting and energy consuming appliances; and other retrofits. Solar, geothermal and other renewable energy systems will likewise reduce the demand on coal-fired plants as a source of the city's energy, leading to reductions in greenhouse gas emissions.



LEED Certified W Hotel, Los Angeles

According to the U.S. Green Building Council, Buildings in the United States Account For:

- ***72% of electricity consumption***
- ***39% of energy use***
- ***38% of all carbon dioxide (CO2) emissions***
- ***40% of raw materials use***
- ***30% of waste output (136 million tons annually)***
- ***14% of potable water consumption.***

Source: *US Green Building Council. Green Building Research.*

Economic Benefits: Costs Savings, Job Creation, and Investment in Underserved Communities

Los Angeles currently relies on costly out-of-state energy sources—44 percent of its energy comes from coal-fired plants—and sources its water from Colorado and Northern California. Thirty percent of California's total energy use is expended on water transportation, storage, treatment, and distribution. In addition, the water use cycle annually consumes close to 19 percent of the state's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel.[5] Retrofitting existing buildings will help conserve water and reduce energy use. In turn, the city will save money through immediate energy and water cost-savings and reduce the amount of money spent on transporting energy and water.

The Ordinance additionally offers another economic benefit. Job retention and creation—an important goal of the Ordinance—is integral to rebuilding the local economy and workforce. With the loss of key industries, such as the aerospace industry in the early 1990s, employment in manufacturing and other unionized industries with good wages and career ladders has been steadily declining. As these jobs disappeared, Los Angeles experienced a shrinking middle class and greater income inequality. More than 50 percent of wealth is concentrated in the 20 percent of households with the highest incomes while the lowest-earning 20 percent received 3 percent of the county's total income in 2007.[6] Dwindling wages and the loss of good jobs have had a disproportionate impact on low income, traditionally underserved communities. A substantial number of buildings in these neighborhoods are in need of repairs and, in many cases, pose health risks to residents and workers. "Greening" these buildings will not only create jobs for residents, but will also boost investment and stimulate economic development in these areas.

Laborer's Union Training School

Health Benefits: Creating Safe Jobs, Improving Indoor Environmental Quality

The large percentage of time urban dwellers spend indoors increases the likelihood of falling ill or becoming injured in buildings with unsafe conditions. Most homes and buildings have numerous sources of indoor air pollution that release gases or particles into the air.[7] Poor ventilation concentrates these indoor pollutants when there is inadequate outdoor air to dilute the emissions. Green building measures can prevent indoor air pollution by limiting or eliminating the use of toxic products and by properly designing and maintaining ventilation systems.

Green buildings and retrofit jobs can enhance the overall quality of working and living conditions for workers who retrofit green buildings and for those who occupy them if measures are taken to protect health. They can provide construction and maintenance workers a safer work environment and reduce exposure to harmful substances. Occupants benefit from a low-toxin environment, natural daylight and efficient climate control systems. With the proper precautions, training, the involvement of workers, and supportive city policies, the hazards of green building retrofits can be minimized and the benefits maximized.

While green building retrofits pose many environmental, economic, and health benefits, capturing these benefits while meeting the comprehensive goals of the Ordinance is not straightforward.

Role of Labor, Community and Environmental Stakeholders

To accomplish the Ordinance's comprehensive sustainability goals, community, labor, and environmental stakeholders must work with city government to take an active part in its implementation. Involvement of workers and informed input from community, labor, and environmental representatives is critical to successfully carry out the Ordinance and to create a movement for green retrofits that extends beyond city-owned buildings. The Green Retrofit and Workforce Program is unique in that it brings together organized labor, the community, environmental groups, and city government to reach its sustainability goals and to circumvent the decades-old jobs versus the environment conflict [ii]. This is evidenced by the origins of the Ordinance in the LA Apollo Alliance, the recommendations in this report from UCLA Community Scholars Course (which by its design includes labor and community leaders), and the multi-stakeholder governance structure to be created through an Advisory Council and City Task Force.

Community Scholars Briefing at City Hall, June 2009

Within the context of multiple goals, the need to retrofit a large number of buildings, and the limited availability of resources, a key question is how to apply the Ordinance to meet its sustainability goals. Holistic implementation of the Ordinance requires balancing many objectives, including selection of buildings and retrofit elements, ensuring an educated workforce with opportunities for all, and educating the public to build support for a model program with the potential to expand beyond city buildings.

The 2009 UCLA Community Scholars course focused its research on how to best implement the Green Building and Workforce Program to meet the comprehensive sustainability goals of the Ordinance. The following chapters outline recommendations for technical implementation based on the multi-faceted goals of the Ordinance. It is followed by chapters on worker and community engagement, financing and next steps to build a green economy in Los Angeles.

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[i] A new federal sustainability initiative was modeled after the Green LA plan. It sets goals for 500,000 federal buildings and 600,000 fleet vehicles operated by the federal government. Jim Tankersley, Los Angeles Times, October 6, 2009

[ii] Kazis and Grossman presented an early analysis of how the "jobs versus the environment" debate has been used in corporate campaigns to instill fear and foster divisiveness. (Kazis, Richard and RL Grossman, Fear at Work: Job Blackmail, Labor and the Environment. The Pilgrim Press, New York, 1982, 306 pgs.)

Roadmap to retrofits: technical implementation *

- *Introduction and key recommendations*
- *Phase 1: building selection*
- *Phase 2: comprehensive building audits & energy, water and retrocommissioning retrofits*
  - ◊ *Green retrofits matrix tool*
- *Phase 3: additional retrofits and green policies to achieve LEED-EBOM certification*
- *Case study: Vernon branch library*
- *Pilot stage*
- *summary*

* Chapter notes are indicated by Roman numerals (notes listed at the end of each chapter)
References are indicated by Arabic numerals (references listed at the end of this report)

Introduction and Key Recommendations

This chapter outlines recommendations for **technical implementation** of green building retrofits as specified in the Ordinance—what we call a "Roadmap to Retrofits." The plan is designed to meet several sustainability goals; namely, to invest in areas of historic disinvestment, to reduce greenhouse gas emissions, and to focus on retrofit elements with the potential for creating cost-savings and jobs. Outlining the technical implementation steps of building retrofits will enable the Program Director and City Taskforce to identify job creation opportunities and create a workforce development program, outlined in the next section of the report.

Los Angeles City departments have a decade of experience with building retrofits. This Roadmap builds on that experience by proposing a systematic approach to retrofits that considers the multiple goals outlined in the Ordinance. Throughout the chapter, we make the following recommendations, which will be described below with technical details in Appendix C: Roadmap to Retrofits Technical Details.

1. Prioritize city-owned buildings in census tracts with high levels of poverty and unemployment and with high potential for energy-related cost savings.

2. Achieve ENERGY STAR certification for each building (requires an ENERGY STAR score of 75 or higher).

3. Conduct comprehensive building audits that include data gathering for energy efficiency, renewable energy, and water conservation solutions along with data required for Retrocommissioning. Complete retrofits related to this data first before using LEED-EBOM framework.

4. Achieve and maintain LEED-EBOM Silver certification for all buildings targeted under the Ordinance. This will require investment in retrofits as well as ongoing operations and maintenance.

5. Test the Roadmap with a Pilot Stage that includes retrofitting a building from each major building category. The pilot stage will require:

- ***Conducting a 'job audit' for each pilot project.***
- ***Establishing a documentation and tracking system upfront to monitor cost savings, job creation and enhancement, green house gas emission reductions, health benefits, and control of potential hazards.***
- ***Involving workers and the community in the process to ensure buy-in from staff and education of community residents around the pilot retrofit projects.***

6. Expand the Green Retrofit and Workforce Program based on lessons learned from the Pilot Stage.

The implementation plan we lay out below involves three phases:

1. *Building Selection*
2. *Comprehensive Building Audits & Energy, Water, and Retrocommissioning Retrofits*
3. *Additional Retrofits and Policy Changes to achieve LEED-EBOM Certification*

We recommend conducting a Pilot Stage to test this plan. The lessons learned from this stage would then be used to expand the Green Retrofit and Workforce Program to other public sector buildings and beyond.

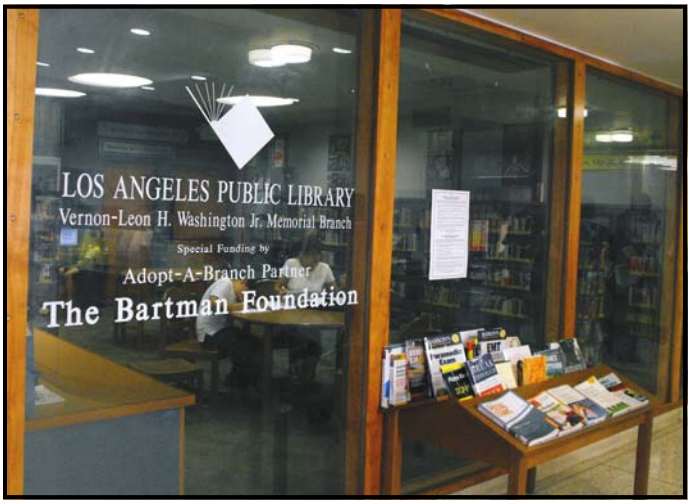
PHASE 1: BUILDING SELECTION			
Sustainability Goal	**Outcome**	**Green Jobs**	**Tools**
Social Justice: Prioritize public use city buildings in areas with high poverty and unemployment and that pose substantial health and safety risks for workers and community members.	Priority Building List of city-owned buildings by basic building data, socioeconomic criteria, and potential health and safety risks as outlined in the Ordinance.	General Services Department	Building Prioritization Tool*

Steps:*

1) Assemble list of city-owned buildings
2) Utilize Building Prioritization Tool to prioritize buildings by poverty, unemployment, and public use
3) Identify and prioritize buildings that pose health and safety risks by working with Coalition of LA City Unions to solicit input from workers, stewards and Health and Safety Committee members

*** See Appendix C for the technical details for each step and the Building Prioritization Tool**

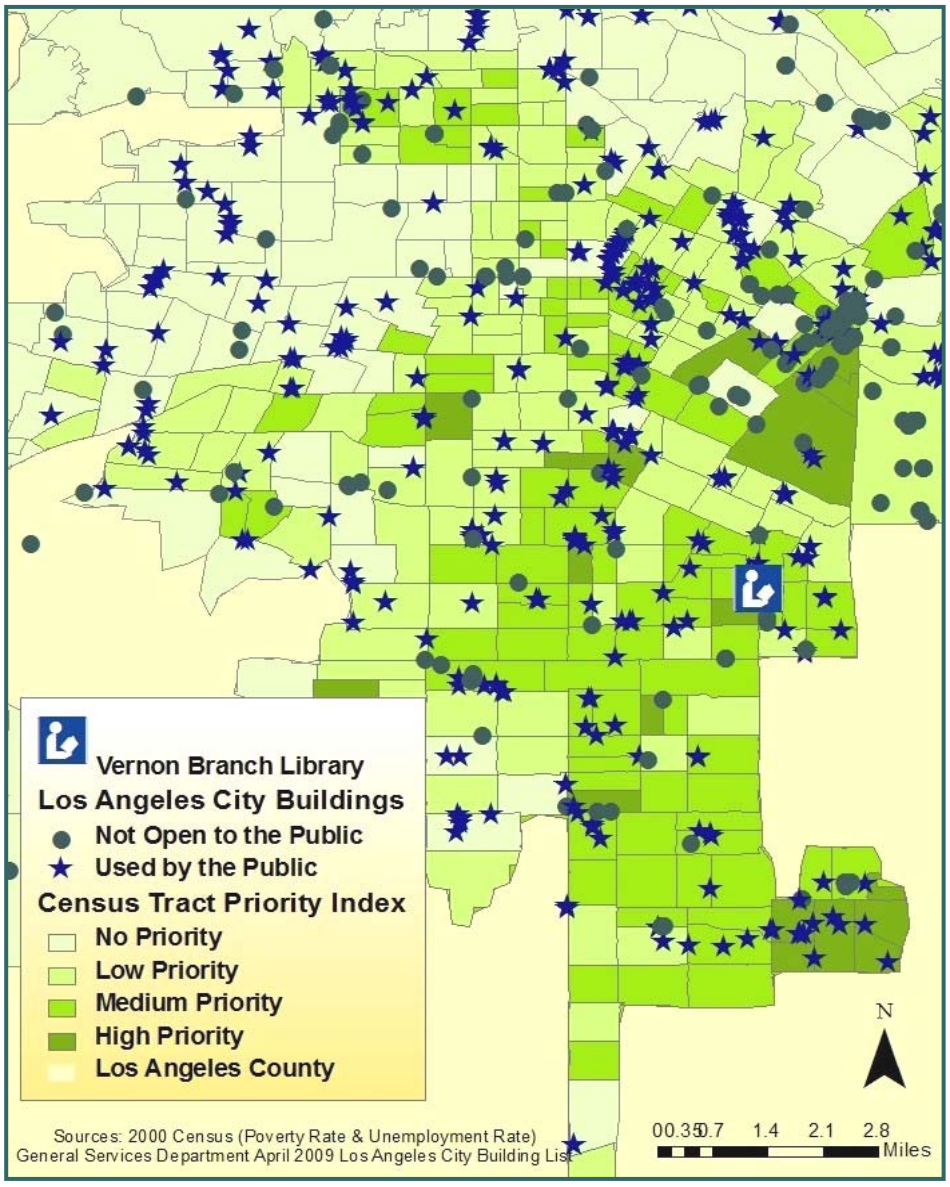
The Ordinance clearly lays out two social justice goals for implementation of the retrofit program: 1) invest in underserved communities by locating 50 percent of retrofits in the first five years in areas of poverty and high unemployment (and hiring from those communities to the extent feasible); and 2) invest in community-serving facilities (i.e. Public Use Buildings) and those that present health and safety hazards.



Vernon Public Library

The Building Selection process is designed to help the City meet these social justice goals. The Building Prioritization Tool created by the Community Scholars course and described in Appendix C: Roadmap to Retrofits Technical Details can be used to select Public Use, City-owned buildings for retrofits. We recommend that the highest scoring buildings (based on socio-economic criteria and health and safety indicators) identified by this tool be used to create a Priority Building List.

The map below shows city-owned buildings in South Los Angeles, an area characterized by high poverty and unemployment rates. Public use buildings are designated by a star. These buildings would be included on the Priority Building List.



Poverty and Unemployment Rate Index—Close-up of South Los Angeles

PHASE 2: Comprehensive Building Audits & Energy, Water and Retrocommissioning Retrofits			
Sustainability Goals	**Outcomes**	**Green Jobs**	**Tools**
Environment: Prioritize system improvements that reduce greenhouse gas emissions and save water. **Economic:** Create jobs and produce cost savings that can fund additional retrofits. **Health:** During planning stages, identify precautions needed to protect workers.	Energy efficiency, water conservation, renewable energy generation, and mechanical system retro-fits. ENERGY STAR ratings of 75 or higher for all retrofitted City-owned buildings.	Varies at each step of the process	1) Audit checklists – energy, water, health and safety 2) Green Retrofit Matrix Tool (described below)

Steps:*

1) Obtain an ENERGY STAR Rating across the entire portfolio of buildings on the Priority Building List (list generated during Phase One: Building Selection). Use these ratings to further prioritize buildings for retrofitting.

2) Conduct a Comprehensive Building Audit that simultaneously gathers data on energy and water components and retrocommissioning. Compile findings into a report with recommendations for retrofits related to energy efficiency, water conservation, renewable energy, and fine-tuning of mechanical systems. Include information about potential hazards of retrofit work to ensure plans are made to protect workers and building occupants.

3) Using the Green Retrofit Matrix Tool (see page 27), create a work plan for all energy efficiency, water conservation, renewable energy, and systems calibration retrofits based on their potential for cost savings, job creation, greenhouse gas reduction, and health and safety criteria.

4) Implement energy efficiency, water conservation, renewable energy generation, and mechanical systems retrofits.

*** See Appendix C for the technical details for each step**

The overarching purpose of Phase Two is to implement system improvements that reduce greenhouse gas emissions, save water, create jobs, and produce cost savings that can be used to fund additional retrofits. This phase involves an extensive audit process to collect data on the buildings' systems and operations to inform opportunities for retrofits; specifically:

1) ***Identify building retrofit components that will generate costs savings;***
2) ***Identify energy and water saving components that will reduce carbon emissions and conserve natural resources; and***
3) ***Achieve industry-recognized building benchmarks and certifications.***

Based on the goals of cost-savings, job creation, and reduction of greenhouse gas emissions in the Ordinance, we recommend prioritizing audits and retrofit work of major systems—energy, water, and mechanical—before using the LEED point system to identify retrofits and building improvements. These retrofits will save money, create the largest number of jobs, and reduce carbon emissions the most out of the possible retrofit elements needed for LEED certification. We recommend using the LEED checklist in Phase Three of the Roadmap as described below. To obtain LEED-EBOM Silver certification, Phase Three would take into account the Phase Two retrofits listed here along with additional retrofits required to achieve the standard.

LA City Library Site Visit, 2009

Rooftop HVAC Unit

Green Retrofit Matrix Tool

Retrofits should initially be prioritized based on their potential for cost savings and energy efficiency. Yet, retrofits may also produce different but equally important benefits such as job creation and improved health and safety. To address this challenge, we created the "Green Retrofit Matrix Tool" to discern the relative benefits of each retrofit element in the categories of cost savings, job creation, greenhouse gas reduction, and worker health and safety. These indicators help translate how technical retrofit components, outlined in the audit phase above relate to the larger sustainability goals of the Ordinance.

We recommend using the Green Retrofit Matrix Tool to:

- ***Translate the Energy and Water Audit and Retrocommissioning findings and recommendations into a larger context of multiple goals;***
- ***Prioritize potential retrofits identified during the LEED-EBOM Gap Analysis (described in Phase Three below); and***
- ***Help make balanced decisions that weigh cost savings and energy efficiency against job creation, greenhouse gas reduction, and health and safety benefits.***

Retrofit elements in the Retrofit Matrix Tool are categorized according to their potential to create direct or indirect benefits* in the following areas:

- ***Potential for Cost Savings***

Does the retrofit element have the potential to create direct cost-savings for the city? For example, changing to more efficient lighting or conserving water automatically decreases energy use and cost. While many energy efficiency and renewable energy projects generate cost savings, the payback period varies based on initial upfront costs of the retrofit and the type of financing available. Indirect savings are related to, but not directly caused by, the retrofit project. For example, a sub-meter might create indirect savings by identifying inefficiencies. Additional cost savings may be generated by meeting health and safety goals; specifically, improved indoor environmental quality has been linked to decreased absenteeism.

- ***Green Job Creation***

Does a retrofit project create jobs? Does it increase labor hours and career advancement opportunities for city workers or workers contracted by the city? Does it provide job placement opportunities for unemployed workers? Building retrofits could also indirectly create jobs in other sectors outside the immediate parameters of the Ordinance such as in manufacturing or transportation; for example, by stimulating demand for locally manufactured green building products as described in the "Next Steps" chapter.

- ***Potential to Reduce Greenhouse Gas (GHG) Emissions***

Does the retrofit element have the potential to reduce the carbon footprint of the city building and contribute to city-wide greenhouse gas reduction goals? Direct reductions occur within the city's building portfolio. Indirect reductions are captured through the city's efforts, but are realized outside the boundary of a city building. For example, reducing water consumption will create indirect reductions in greenhouse gas emissions by reducing the energy needed to heat, sanitize, and transport water.

- ***Potential for Occupant Health and Safety Benefits***

Does the retrofit element have the potential to create worker and community health and safety benefits such as improved indoor air quality? Sustainable purchasing policies that require the use of less toxic products (e.g. low V.O.C carpet or safer cleaning chemicals) can contribute to better interior air quality and diminish hazards for workers who handle the products. Conversely, retrofitting and maintaining green buildings may pose hazards that can increase the costs of injuries and illnesses; for example, if asbestos-containing materials or lead-containing paint must be disturbed, if workers must clean up broken light bulbs that contain mercury, or if safeguards are not in place to protect against fall hazards. Planning for retrofits should include a job hazard analysis to identify potential hazards, training and protective equipment needs described in greater detail in the "Worker and Community Development (Worker Health section)" chapter [i].

* In the matrix, three symbols = direct benefit, two symbols = indirect benefit, and one symbol = no or very little benefit.

The recommended retrofit elements described in the Ordinance and included in the Green Retrofit Matrix Tool can be compared in terms of overarching environmental, economic and health sustainability goals of the Ordinance. The tool examines specific criteria within those goals for a variety of retrofit elements - GHG reduction, cost savings, job creation, and worker health and safety benefits. Once the multiple goals of the Ordinance are weighed using the Matrix, the Advisory Council, Interdepartmental Taskforce, and General Services Department can then decide on a work plan and begin retrofit implementation.

Green Retrofit Matrix Tool*

	Possible Retrofit Elements	Economic		Environment	Health	Total Symbols	Associated LEED Credits
		Potential Payback	Potential Job Creation	Potential GHG emissions reduction	Potential for occupant health and safety		
Energy Efficiency	Upgrade to energy efficient appliances	$ $ $			+	8	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance
	EE Lighting	$ $ $			+	10	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance
	Lighting sensors	$ $			+	7	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1 point:** IEQ Credit 2.1 Occupant Comfort - Occupant Survey
	HVAC system upgrades	$ $ $			+ + +	12	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1 point:** IEQ Credit 1.3 IAQ Best Management Practices Increased Ventilation
	Cool Roofs	$ $ $			+	10	**1 point:** SS Credit 7.2 Heat Island Reduction-Roof **Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance
	Refrigeration Systems	$ $ $			+	10	**1 point:** EA Credit 5 Enhanced Refrigeration Management
	Weatherization Window Replacement	$ $ $			+ + +	12	**Required:** EA PR 2 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1 point:** IEQ 2.1 Occupant Comfort Survey **1 points:** IEQ 2.4 Daylight and Views
	Weatherization Window Tinting	$ $ $			+ +	9	**Required:** EA PR 2 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1 point:** IEQ Credit 2.1 Occupant Comfort Controlled Lighting **1 point:** IEQ Credit 2.4 Daylight and Views
	Weatherization Insulation (walls & hot water heater)	$ $ $			+	9	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance
	Weatherization Caulking	$ $ $			+	8	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance
Renewable Energy	Micro turbines	$ $ $			+	10	**1-6 points:** EA Credit 4 Renewable Energy
	Solar panels	$ $ $			+	10	**1-6 points:** EA Credit 4 Renewable Energy
	Solar thermal hot water	$ $ $			+	10	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1-6 points:** EA Credit 4 Renewable Energy
Measurement and Monitoring	Automated building systems	$ $			+	7	**1 point:** EA Credit 3.1 Performance Monitoring- Building Automation System
	System-level metering/sub metering	$ $			+	8	**1-2 points:** WE Credit 1.1-1.2 Water Performance Measuring **1-3 points:** EA Credit 3.1-3.2 Performance Measurement
	Demand Management Software	$ $			+	7	**1 point:** EA Credit 3.1 Performance Monitoring- Building Automation System

*** 3 symbols = direct potential; 2 symbols = indirect potential; 1 symbol = no or very little potential**
WE: Water Efficiency; EA: Energy & Atmosphere; SS: Sustainable Site; IEG: Indoor Air Quality

Sources: LEED for Existing Buildings: Operation and Reference Guide, USGBC, September 2008; LEED 2009 for Existing Buildings Checklist

Green Retrofit Matrix Tool*

	Possible Retrofit Elements	Economic: Potential Payback	Economic: Potential Job Creation	Environment: Potential GHG emissions reduction	Health: Potential for occupant health and safety	Total Symbols	Associated LEED Credits
Water Conservation	Water sensors	$ $				6	**1-2 points:** WE Credit 2.1-2.2 Addition Indoor Plumbing Fixture and Fitting Efficiency
	Efficient toilet/urinals	$ $ $				8	**1-2 points:** WE Credit 2.1-2.2 Addition Indoor Plumbing Fixture and Fitting Efficiency
	Water Efficient Landscaping/ Irrigation	$ $ $				8	**1-5 points:** WE Credit 3 Water Efficient Landscaping
	Grey Water Recycling	$ $ $				10	**1-5 points:** WE Credit 3 Water Efficient Landscaping **1 point:** WE Credit 4.2 Non-Potable Water Source Use
	Natural Filtration Systems	$ $				8	**1-5 points:** WE Credit 3 Water Efficient Landscaping
	Rainwater Catchments	$ $				8	**1-5 points:** WE Credit 3 Water Efficient Landscaping
	Water Conservation Systems	$ $ $				9	**1-2 points:** WE Credit 1 Water Performance Measurement
Indoor Environ. Quality	Green Cleaning/Sustainable Maintenence	$				7	**1-6 points:** IEQ PR 3, IAQ Credits 3.1-3.6 Green Cleaning
	Low-VOC Paints	$				6	**1 point:** MR Credit 1 Sustainable Purchasing - Ongoing Consumables
	Daylight Modeling	$ $				9	**1 point:** IEQ Credit 2.4 Daylight and Views
	Indoor Air Quality Monitoring Systems	$				7	**Required:** IEQ PR 1; **1-5 points:** IEQ Credits 1.1-1.5 Indoor Air Quality Best Management Practices
	Thermal Controls	$ $				9	**1 point:** IEQ Credit 2.3 Occupant Comfort- Thermal Comfort Monitoring, **1-18 points:** EA Credit 1 Optimize Energy Performance
	Lighting Controls	$ $				7	**Required:** EA PR 1 Minimum Energy Efficiency Performance **1-18 points:** EA Credit 1 Optimize Energy Performance **1 point:** IEQ Credit 2.1 Controllability of Systems - Lighting
	Sustainable Carpet	$				7	**Assoc IEQ credits**

*** 3 symbols = direct potential; 2 symbols = indirect potential; 1 symbol = no or very little potential**
WE: Water Efficiency; EA: Energy & Atmosphere; SS: Sustainable Site; IEG: Indoor Air Quality

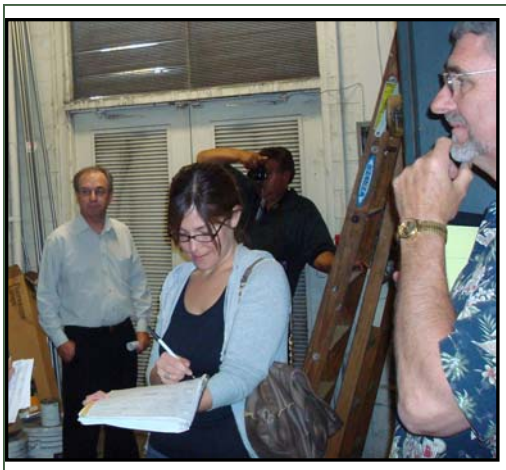
Sources: LEED for Existing Buildings: Operation and Reference Guide, USGBC, September 2008; LEED 2009 for Existing Buildings Checklist

PHASE 3: Additional Retrofits and Green Policies to Achieve LEED-EBOM Certification			
Sustainability Goals	**Outcomes**	**Green Jobs**	**Tools**
Environment: In addition to Phase 2 Energy and Water Retrofits, further implement green measures to achieve LEED-EBOM Silver Certification such as improved air quality and waste management practices. ***Economic:*** Create a range of jobs and improve worker productivity as a result of better indoor air quality. ***Health:*** Contribute to worker and occupant health through improved indoor air quality and the use of less toxic materials.	Achieve and maintain LEED-EBOM Silver Certification for all buildings targeted under Ordinance through retrofits and policy changes. This requires investment in ongoing operations and maintenance.	Varies at each step of the process	1) LEED-EBOM Checklist 2) Green Retrofit Matrix Tool

Steps:*

1) Complete the LEED-EBOM Gap Analysis using a LEED-EBOM checklist. Formulate initial recommendations for achieving Silver Certification.
2) Use the Green Retrofit Matrix Tool to create a work plan for achieving points needed for LEED Silver Certification and to address the 13 retrofit elements in the Ordinance.
3) Implement retrofits and policy changes to achieve LEED-EBOM Silver Certification.
* **See Appendix C for the technical details for each step**

Once the City has begun to implement energy efficiency, water conservation, renewable energy generation, and mechanical system retrofits, it can then direct resources toward additional retrofits and policy changes that fulfill the Ordinance's sustainability goals and meet the LEED-EBOM Silver certification (See Appendix D: LEED-EBOM Checklist). The overarching goal of Phase Three is to achieve and maintain LEED Silver Certification for all buildings targeted under the Ordinance. This will require investment in up front costs and in ongoing operations and maintenance.



LA City Library Site Visit, 2009

The LEED standard provides a performance-based framework for building retrofits. In addition to energy efficiency and water conservation, it addresses green materials, sustainable maintenance standards, and indoor environmental health. Retrofits related to these areas generate environmental benefits such as improving air quality and waste management systems. LEED also sets out a structure for tracking and monitoring building retrofit elements to ensure that systems continue to operate efficiently to meet sustainability goals.

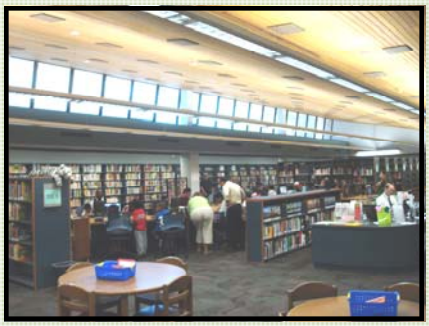
Green improvements included in the LEED checklist can potentially improve health and worker productivity through measures that create healthier indoor environments. These include policy and operational changes to buildings such as those that require the use of less toxic products, thereby contributing to worker and occupant health.

We include a case study of site visits to the Vernon Branch of the Los Angeles Public Library System to illustrate some of the building selection and audit steps described in Phases 1-3.

LA City Library Site Visit, 2009

Case Study: Vernon Branch of the Los Angeles Public Library

To inform our understanding of the audit process, we conducted two site visits to the Vernon Branch Library, selecting it based on criteria in the Ordinance. It is a 10,000 square foot building constructed in 1972, used by the public, and located in a South Los Angeles area with a high Poverty & Unemployment Index. We used a variety of methods to gather data, including interviews with library staff, maintenance staff and patrons.



Category	Energy Efficiency (EE)	EE & Solar Energy
Program Cost	$135,000	$579,000
Energy Savings	$5,148/yr	$14,665/yr
Operational Savings	$7,500/yr	$7,500/yr
Maintenance Savings	$8,000/yr	$8,000/yr
Potential Rebate	$6,125	$19,625
Simple Payback	6.2 yrs	16.9 yrs
Energy Cost Reduction	30%	46%
Total Savings	$309,720 over 15 yrs	$603,296 over 20 yrs

On the first visit, we conducted an energy efficiency audit and collected data based on a checklist and interview questions suggested by an energy and environmental consultant. Based on our findings, and on a review of building plans and utility bills, the consultant prepared a preliminary energy assessment. The Vernon Branch Library received an ENERGY STAR™ rating of 33, indicating that it is less energy efficient than 67 percent of similar buildings in the U.S. Recommendations include improved energy management, HVAC and mechanical systems, lighting upgrades, water conservation and renewable energy. The table below summarizes the costs and benefits of two proposed projects, one with and one without solar panel installation.

On the second visit, we audited the building using a LEED-EBOM checklist to assess the areas in which the library met LEED requirements, could potentially meet LEED requirements and could meet LEED requirements only with difficulty. We were accompanied by a LEED Accredited Professional (AP) who guided the process and by staff from the City's General Services Department. Like the previous results, maintenance staff noted the building's inefficient air handling unit and the need for a Variable Frequency Drive; they also stressed the importance of frequent maintenance to ensure that systems operate at their optimum performance. After adding up the points included in the 6 components of the LEED-EB 2008 scorecard (sustainable sites, water efficiency, energy & atmosphere, materials & resources, indoor environmental quality, and innovation in upgrades) – the Library achieved 24 out of 43 credits required for LEED Silver certification and another 46 potentially feasible credits. At this point, additional data should be factored into the analysis (e.g. whether the equipment is on a schedule for retrocommissioning or replacement), and the Green Retrofit Matrix Tool could be used to discuss potential benefits of various proposed retrofits; i.e. job creation, cost savings, indoor air quality, etc.

LEED for Existing Buildings - Scorecard Survey (2008)

Property Name: VERNON CENTRAL LIBRARY
Address:
Building Manager:

Certified 34-42 points Silver 43-50 points Gold 51-67 points Platinum 68-92 points

		Total	Y	?	N	Notes
	Project Totals (pre-certification estimates)	92	24	46	22	92
Prereq	Occupancy					
SUSTAINABLE SITES		**12**	**3**	**6**	**3**	**12**
Credit 1	LEED Certified Design & Construction	1			1	NO not a LEED building
Credit 2 *	Building Exterior & Hardscape Management	1	1			Policy
Credit 3 *	Integrated Pest Management, Erosion Control, and Landscape Management Plan	1	1			Policy
Credit 4.1	Alternative Commuting Transportation 10%	1		1		*Requires a survey of building users:*
Credit 4.2	Alternative Commuting Transportation 25%	1		1		near buses
Credit 4.3	Alternative Commuting Transportation 50%	1		1		bike racks
Credit 4.4	Alternative Commuting Transportation 75% or greater	1		1		
Credit 5	Reduced Site Disturbance: Protect or Restore Open Space	1			1	
Credit 6	Stormwater Management	1			1	Higher capital improvements
Credit 7.1	Heat Island Reduction: Non Roof	1		1		
Credit 7.2	Heat Island Reduction: Roof	1	1			White Roof / Check roof material SRI
Credit 8	Light Pollution Reduction	1		1		need to measure

Lessons Learned *

- Audits are most effective if basic data, such as building plans and utility bills, are available in advance.
- Input is critical from building occupants, maintenance workers and mechanics familiar with the building.
- Workers can be trained to help with an audit, in consultation with experts.

LA City Library Site Visit, 2009

- It will be challenging to retrofit older buildings to reach LEED-EBOM™ silver certification, but it is an important goal that will generate energy efficiency and cost savings.
- Maintaining LEED-EBOM™ silver certification will require an investment in ongoing operations and maintenance.

* With thanks to: Terrence Mack, Energy and Environment Specialist with Integrated Energy Solutions, formerly with Siemens and Johnson Controls, for leading a class session, providing advice and analyzing the data we collected; Daniele Aquino, LEED AP, Chair of the USGBC EB Committee, for guiding us through the LEED-EB checklist; Bruce Hansell and Dave Costa, General Services Building Maintenance with support from Dan Eason, and John Gorton, A/C Mechanic and UA Local 250 member.

Pilot Stage

Test the Roadmap with a Pilot Stage that includes retrofitting buildings from each major building category. The city should start with approximately 15 buildings. The goal is to create benchmarks for the rest of the buildings targeted by the Ordinance. During this Pilot Stage, conduct a job audit for each project. A job audit would involve documenting all jobs required for each phase, including labor costs, number of jobs created or enhanced, and special training and safety precautions needed. In addition to job creation, record other key outcomes such as cost savings and reductions in greenhouse gas emissions. Involve workers and the community in the Pilot Stage to ensure buy-in from staff and education of residents in communities around pilot retrofit projects.

LEED Certified W Hotel Site Visit, Los Angeles 2009

The purpose of the Pilot Stage is to test the model, learn from it, make the needed changes, and EXPAND the Green Retrofit and Workforce Program to the larger public sector (such as other proprietary departments and buildings). In this way, Ordinance implementation consists of two stages: an initial Pilot Stage followed by an Expansion Stage that builds upon the lessons learned from the Pilot Stage.

Summary of Roadmap

1. ***Retrofit projects should be prioritized on their ability to achieve overall sustainability goals – to lower costs, create jobs, reduce GHG emissions, and improve worker and building occupant health and safety - not only on their ability to achieve LEED points.***
2. ***Certain retrofits may be most cost effective if implemented on a multi-building or portfolio basis.***
3. ***Implement a pilot stage that includes a retrofit of one building in each of the major building types.***
4. ***Use the data collected from the pilot stage to determine which retrofit projects would best be implemented on a portfolio-wide basis.***
5. ***Establish benchmarks against which success in achieving sustainability goals can be measured. Baseline energy and water use, utility costs, staffing levels, absenteeism (or other measure of well-being), and work-related injuries and illnesses should be assessed and a system created to measure changes over the course of the retrofit and workforce development program.***

Finally, resources for staff training and ongoing maintenance will be required to maintain LEED-EBOM certification. Careful planning and worker involvement throughout the course of the retrofit program is critical to successful long-term sustainability.

Conclusion

In summary, the Roadmap outlined in this section provides a technical process to successfully implement the sustainability goals of the Ordinance. However, equally important to the technical implementation and central to sustainability goals and LEED certification is the need to educate and engage the workforce in the process and to commit resources for ongoing operations and maintenance staffing. A European study found that systems designed to save energy were ultimately less efficient than planned due to such factors as a lack of education and information for users, low status of maintenance workers, and a desire among building occupants to have some control over the work environment (including controlling temperature and opening windows).[8] From office workers to building trades to custodial staff, workers must understand the larger sustainability goals of green retrofits to ensure their support.

[i] An Injury & Illness Prevention Program is required by Cal/OSHA and should be adapted as needed to address potential hazards of retrofit and operations and maintenance work.

Workforce and community engagement*

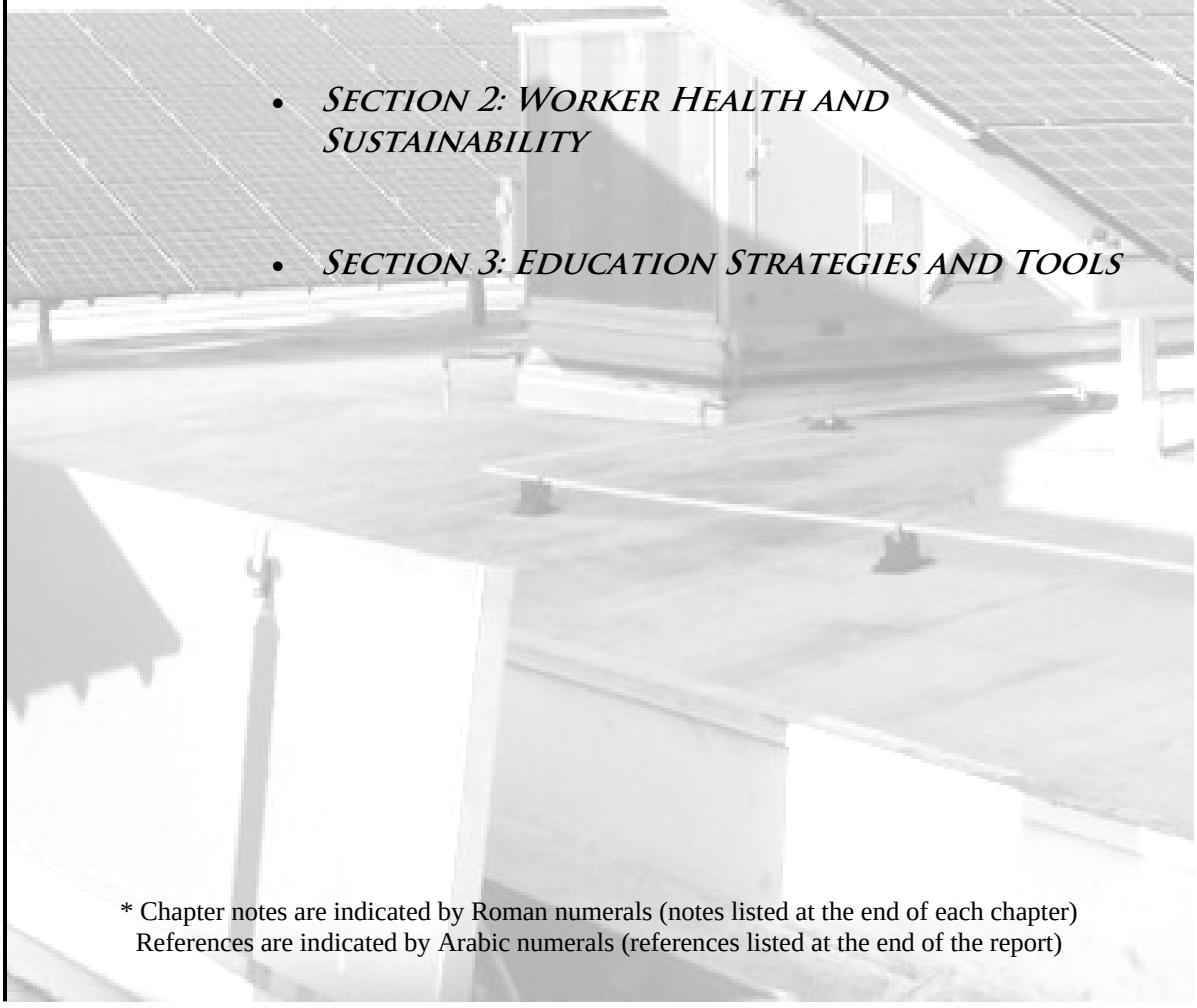
- *Overview:*

  Equally important to the technical application of the Ordinance is the need to engage and educate the workforce and the community. Workforce development, worker health and safety, and public education are critical to successful implementation of the Ordinance.

- *Section 1: Workforce Development*

- *Section 2: Worker Health and Sustainability*

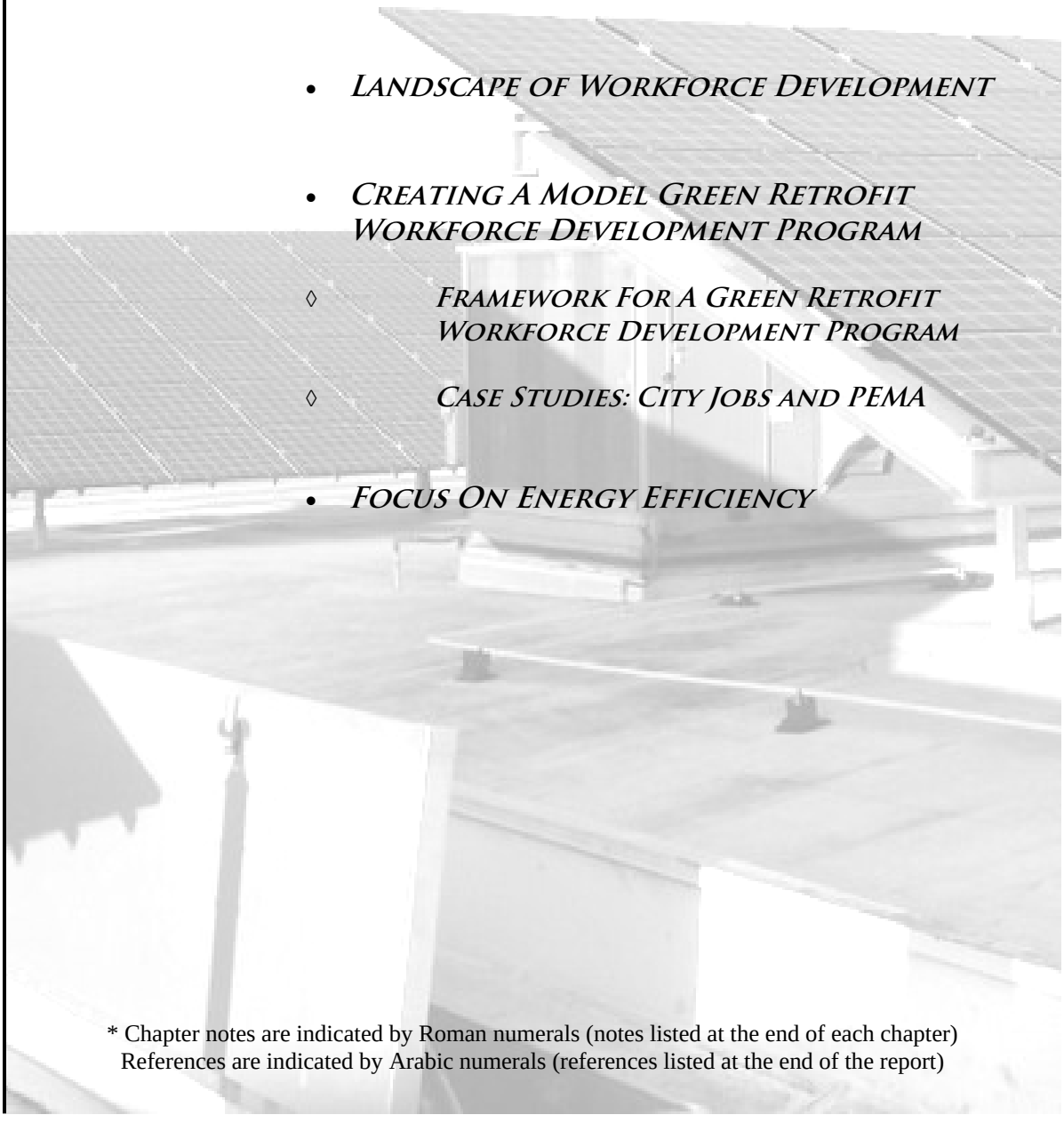
- *Section 3: Education Strategies and Tools*



* Chapter notes are indicated by Roman numerals (notes listed at the end of each chapter)
References are indicated by Arabic numerals (references listed at the end of the report)

Worker and community engagement: Section 1—workforce development *

- *Education And Support For Good, Green, Safe Jobs*
- *Landscape of Workforce Development*
- *Creating A Model Green Retrofit Workforce Development Program*
  - ◊ *Framework For A Green Retrofit Workforce Development Program*
  - ◊ *Case Studies: City Jobs and PEMA*
- *Focus On Energy Efficiency*



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Education and Support for Good, Green, Safe Jobs

"We don't want to *just* retrofit buildings; we want to create jobs too."

Elsa Barboza, SCOPE/LA Apollo Alliance

A sustainable economy is only possible when the workers driving that economy have access to safe, family-supporting career opportunities. One key goal of the Ordinance is to promote pathways into green careers for residents who have not shared in the city's cycles of prosperity. The Ordinance creates an opportunity to craft a workforce development strategy that provides workers with technical skills while simultaneously addressing the barriers to good jobs that confront disenfranchised populations. In order to meet these goals, we propose the following recommendations:

1. ***Focus on a career-pathway orientation and on training in energy efficiency professions.***
2. ***During the Pilot Stage of building retrofits, conduct a job audit to categorize and quantify the kind of jobs, job training and safety training that will be required to implement the retrofit goals of the Ordinance on a larger scale. While precise estimates of job creation are not yet possible, it is, nonetheless, important to estimate job creation to secure funds and to put in place systems that will provide a career pipeline with a full range of support services and training—from basic skills to technical job skills, from environmental literacy to health and safety awareness and certification. The City can draw on a number of existing resources as described below to ensure the successful implementation of this component of the Ordinance.***

The Landscape of Workforce Development

The landscape of workforce development programs in Los Angeles includes programs funded through the Workforce Investment Act, those provided through LAUSD and community colleges, union apprenticeship programs, and those available through other nonprofit organizations. We present a brief overview of the existing workforce development landscape with a few examples to demonstrate the potential for coordination to obtain funds and implement training for green building retrofit jobs. Additional programs that comprise the Workforce Development landscape are summarized in Appendix E: Landscape of Workforce Development Programs.

Workforce Development

Workforce Investment Act (WIA) Funded Programs

The City of Los Angeles funds a total of 18 WorkSource Centers and an additional 15 youth-serving OneSource operators focused on those between the ages of 14-21. They create linkages to community based organizations, labor, training institutions and support services to meet the needs of job seekers and to provide a qualified workforce for employers. Services provided in partnership with government and other agencies include low- to no-cost training; counseling; and access to unemployment benefits, education, and small business development centers.

Laborer's Apprenticeship Training School

The City's Workforce Investment Board (WIB) and Community Development Department provide training and support to maintain database tracking systems for the Workforce Investment System.

LAUSD and Community Colleges

"Working in Unity, Greening our Community"
Downtown Labor Center, August 2009

The Los Angeles Unified School District (LAUSD) We Build program provides pre-apprenticeship training for entry into construction trades, including "green" state-approved solar technology training [1]. Los Angeles Community Colleges also play a role, linking with WorkSource and OneSource centers. The Infrastructure Academy, a pilot program between Los Angeles Trade-Technical College and the Department of Water and Power, teaches skills in the field of civil infrastructure.

Union Apprenticeship Programs

Union apprenticeship programs—ranging from 3-5 years and generally offered through labor-management partnerships—provide access to on-the-job training and long-term careers. Unions conduct outreach through avenues such as community and faith-based organizations, the prison system, Workforce Investment Boards, adult schools, and referrals.

Upon completing the program, apprentices become journeymen with union wages and benefits. Some apprenticeship programs in the building trades include specific green training programs, like IBEW's solar program. Building trades' existing skills can also be applied to green building jobs.

W Hotel Worker Union Card

Solar Panels at the IBEW Local 11 Electrical Training Institute

"The movie of the green building (*The Greening of Southie]* shows that the building trades already have the skills to do the work…..We were all there in that movie – Ironworkers, Laborers, Roofers, Drywallers, Plumbers, Tile Workers, Carpenters…."

Tom Morton, PIPE Trades, Community Scholar

The film tells the story of constructing South Boston's first LEED-certified residential green building. For more information: http://www.greeningofsouthie.com/

Other Nonprofit Organizations

Community-based nonprofit organizations outside the WIA-funded system train and place people in construction and building maintenance and operations jobs in Los Angeles. They fill in gaps not always covered by union and government funded programs, which may include helping people navigate through the extensive but disconnected system of existing programs and advocating for support services. One example is the Century Community Training Program, which offers a pre-apprenticeship construction training program and employment services at no cost to men and women transitioning from unemployment, welfare, low-income jobs, or incarceration. Another is the *Instituto de Educación Popular del Sur de California* (IDEPSCA), which is embarking on a job training program for Spanish-speaking green landscape workers.

Creating a Model Green Retrofit Workforce Development Program

A number of relationships already exist between job readiness programs, union apprenticeship programs and schools. The City can harness this pre-existing infrastructure to craft a model workforce development program that meets the technical demands of an emerging green economy as well as the career mentorship needs of disadvantaged workers. Our research indicates that two main concepts can inform a successful workforce development strategy: a career-pathway orientation and a focus on training in energy efficiency professions.

Career-Pathway Orientation to Good, Green, Safe Jobs

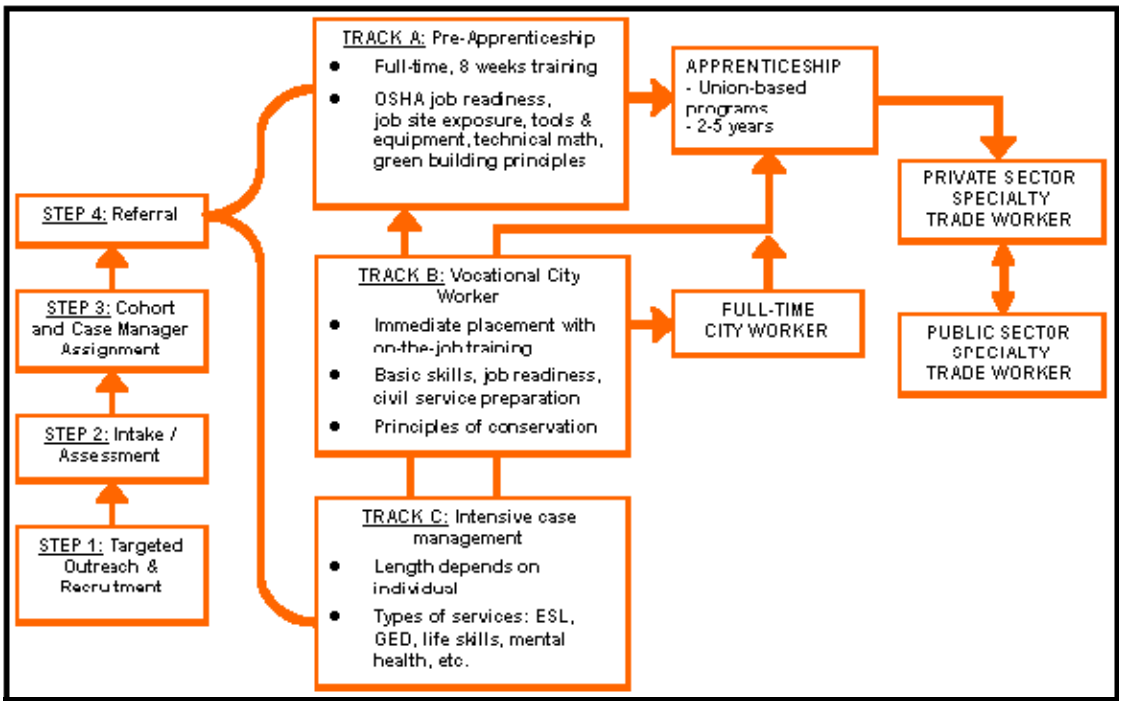
> To have lasting impact, job training must be located within a long-term career-development trajectory. A model program will connect entry-level positions in the building trades or building operations to emerging careers in energy efficiency and will provide the mentorship to empower disadvantaged workers to access those opportunities. This type of "career-first" perspective stands in contrast to job training programs that emphasize job placement at any cost, regardless of whether the job is well-paid, safe, or meaningful.

A successful job-training program will address the needs of those facing chronic poverty, addiction, unstable housing, and other barriers by providing access to mentorship and support services such as individual job counseling; aptitude and placement testing; basic job skills training such as resume writing and computer skills; access to additional voluntary education such as General Equivalency Diploma (GED programs), English as a second language, and community college classes; and access to legal services that provide basic knowledge of rights, documentation, and expunging of records. Once the basic needs of disadvantaged populations are addressed, other programmatic factors such as free training programs and ongoing career and personal counseling can facilitate improved retention.

LA Labor-Community Forum, 2009

The figure below illustrates a framework for establishing a career pathway into green jobs created by the Ordinance and beyond including potential civil service careers and specialty trade careers in the private sector.

Framework for a Green Career Ladder Initiative



Los Angeles City has a track record of policies that enhance career pathways and of stakeholder collaboration that can be models for green building retrofits. An important example is the Project Labor Agreement (PLA)—a collectively bargained construction contract between owners or their representatives and a range of craft labor unions. PLAs are a means to ensure local hiring, the involvement of organized labor, and the protection of public investment in construction projects [ii]. In exchange for assurances that workers will be covered by a collective bargaining agreement, participating unions agree not to strike and agree to hire from local communities. PLAs establish the mechanisms to guarantee the creation of good jobs, high quality workmanship, and safe workplaces.[9] PLAs offer avenues for creating and enforcing the creation of construction careers for apprentices who have the most difficulty "moving up" the construction career ladder. They also include a mechanism to oversee the progress of local hire goals and institute consequences for those who neglect to meet these goals.[10]

Other examples of career-oriented programs include the City Jobs Program and the Port Electrical Mechanic Apprenticeship Program. Both involve collaboration between labor and the city with a local hire component and the goal of creating a career path into family-supporting jobs. The City Jobs Program is extensively described in a workforce development report by SCOPE [iii], one of the community organizations involved in its development. We describe the Port apprenticeship program in greater detail as a case study in collaboration that can lead to long-term careers into good, safe jobs with union representation.

Workforce Development

The City Jobs program was founded to help welfare recipients' transition into career-track employment. A collaboration between community-based organizations, City unions and the City of Los Angeles, the City Jobs program combined "soft skills" and "hard skills" training both on-the-job and in the classroom. Community Development Department coordinators provided case management and mentorship during the initial years of the program. Within 3 years, City Jobs had placed over 200 participants in living-wage city jobs with an overall retention rate of over 70%.

SOURCE: AARON, YARDENNA. "THE LOS ANGELES CITY JOBS PROGRAM: LESSONS FROM A CAREER-FIRST PROGRAM THAT WORKS." COMMUNITY INSTITUTE FOR POLICY HEURISTICS EDUCATION & RESEARCH. LOS ANGELES, CA. DECEMBER 2002.

CASE STUDY: LA CITY PORT ELECTRICAL MECHANIC APPRENTICESHIP (PEMA)

Approximately 1 of every 8 jobs in Southern California (918,880 jobs) is linked in some way to the Port of Los Angeles.[1] This case study focuses on Port Electrical Mechanics who, five years ago, were mostly non-union, under trained and worked on high-voltage equipment without the commensurate work experience and skills to perform the work safely. In response to these conditions, the Port of Los Angeles and the LA/OC Building and Construction Trades Council (BCTC) helped broker an apprenticeship training model in conjunction with the IBEW and the Electrical Training Institute (ETI) with approval from the Civil Service Commission.[2] Together, these partners created the Port Electrical Mechanic (PEM) and Port Electrical Mechanic Apprentice (PEMA) job classifications with a local hire agreement. The PEMA program was approved by the LA City Council on March 9, 2009.

The program consists of closely supervised on-the-job training for journey-level Port Electrical Mechanics to perform duties that range from diagnostic assessments on equipment to electrical work on high voltage electrical conductors under the careful watch of a qualified electrician. The apprenticeship program is five years during which an apprentice is expected to maintain continuous enrollment in the Harbor Department's approved Electrical Apprentice Program. Each participant earns a base salary of $34,577 at the start of the program which will increase throughout the course of the training program to $69,133 contingent upon successful completion of the apprenticeship. Requirements for entrance into the apprenticeship program include a high school diploma, General Equivalency Diploma (GED) or High School Proficiency Examination (HSPE) and one year of high school algebra or one semester of college algebra.

The creation of PEMA is designed to resolve safety concerns and enhance job security by the following agreements: 1) Existing Port Crane Mechanics are automatically incorporated into the apprenticeship program, allowing for a salary increase, should they choose to participate; 2) Crew composition cost may be reduced by as much as 50%; 3) On-the-job training on internal systems is offered; and 4) At the completion of the apprenticeship, workers receive a Civil Service Port Electric Mechanic Certification and the State of California Electrician Certification. The agreement establishing PEMA in effect creates a career ladder from entry level through journey level and into supervisory classifications; a ladder that previously did not exist in the City's system.

Adoption of a similar agreement to implement the Green Building Retrofit and Workforce Development program would provide career opportunities to new workers who would be trained in apprenticeship programs by incumbent workers and, at the end of their training, would have skills to work in city jobs or in private sector construction jobs.

Case study was adapted from research by Athena Ullah, UCLA Labor Center intern, 2009

Sources:
1) Los Angeles Port Jobs portfolio, 2007
2) Apprenticeship was sponsored by Council Member Janice Hahn and approved in March 2009.

Focus on Energy Efficiency

Research on the cost-savings generated by energy efficiency building upgrades looks promising in terms of creating a fund for job training purposes. Energy efficiency jobs also provide a range of entry-level positions and professional development opportunities that could lead to careers in City or private sector construction jobs and provide opportunities to retain existing City workers during the current economic downturn.

This report emphasizes the benefit of energy audits as a way to generate cost-savings that can fund other retrofit components. Energy efficiency retrofits also require a variety of skill levels and, in some cases, spur new specializations. A study conducted by Urban Agenda for the New York City Apollo Alliance identifies three emerging areas of energy efficiency careers with rising demand and sufficient infrastructure to cultivate a skilled workforce (i.e. unions, energy service companies, etc.): 1) Energy Efficiency Upgrades, 2) Efficient Building Operations and 3) Energy Management. Jobs in these areas range from auditors to building trades to custodial work.[11]

Los Angeles City retrofit-related workforce development programs can build on the New York experience but will also require input from a variety of stakeholders to identify important local priorities. For example, water conservation is a critical issue in Los Angeles and a priority for the LA City Department of Recreation and Parks. Career pathways modeled after the City Jobs program could be created to bring workers from entry level jobs into careers in water and natural resource conservation. Similarly, due to its location and climate, solar panel installation may be prioritized in Los Angeles.

Edison Water Pumping System

An effective workforce development approach must include close coordination with the unions representing City workers and with the Building Trades, with the goal of integrating other effective stakeholders from the Workforce Development landscape in Appendix E to create a career-first program to lift people out of poverty.

[i] The "We Build Green" Program connects local workers to the "green" economy through State approved training for solar technology, design, and installation. http://74.125.155.132/search?q=cache%3AdtdkgOFhwHsJ%3Awww.laschools.org%2Fcontractor%2Fwebuild%2Ffs-webuild%2Fdownload%2Fflyers%2FWe-Build-Green-Fact-Sheet.pdf+we+build+green+los+angeles&hl=en&gl=us

[ii] In March 2008, the Community Redevelopment Agency adopted the Construction Careers Policy that ensures that Los Angeles City residents will have access to construction jobs on agency projects by requiring the negotiation of a Project Labor Agreement (PLA). Negotiated local hiring provisions in the Los Angeles PLA have increased local hires and increased the number of new local workers in construction. A UCLA Labor Center report, Construction Careers for Our Communities, outlines the benefits of adopting PLAs and identifies nine conclusions that provide opportunities for implementing best practices. This report is available at: http://www.labor.ucla.edu/programs/pdfs/ConstructionCareersForOurCommunitiesFullReport.pdf

[iii] "Turning Green Jobs into Green Careers", SCOPE, 2009, includes details about how to implement a successful green career ladder training initiative and extensively describes the City Jobs program. http://www.scopela.org/

Worker and community engagement: Section 2—Worker Health and Sustainability *

- *Health Benefits, Health Hazards*
  - ◊ *Case Study: Worker Fatality*
- *Recommendations to Maximize Worker health*
- *Worker Policies and the Role of City Government*
  - ◊ *Framework: Role of City Government*
  - ◊ *Case Studies: When Environmental Protection and Worker Health Collide and Coincide*
- *Recommendations*

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Worker Health and Sustainability

With Los Angeles' new green building retrofit ordinance comes the opportunity to create a benchmark standard for "good, green, safe jobs." Few green job policies explicitly address the range of health benefits and hazards workers might experience. This section proposes steps to enhance the health and safety of both workers and building users, a key component of sustainability.

We first outline the potential health benefits and hazards of retrofit work for building and construction trades workers, service and craft workers, and office and other public service workers whose place of work is a City building. (See Key retrofit-related City jobs below). We then explore the roles and responsibilities of the City as employer and building owner; purchaser and contractor of supplies, equipment and services; and policy maker. We highlight existing policies that complement the Ordinance's sustainability goals and note the potential unanticipated costs associated with retrofits if measures are not taken to ensure worker health.

Finally, we address the importance of worker education and involvement to achieve the goals of sustainability and ensure safe conditions for workers and community members—from new worker training programs to education programs for incumbent workers.

Health Benefits, Health Hazards

A green retrofit project can only be sustainable if the safety and wellbeing of a variety of workers are considered.[12] Building trades workers in structural, mechanical and finishing fields will install retrofits and, along with service and craft workers, are responsible for ongoing maintenance to ensure optimal performance. Custodians, landscapers and other service workers clean and maintain buildings and surrounding grounds and will use more environmentally sustainable products, equipment and work practices. How well these building retrofits perform and are maintained over time will affect building users such as office workers and others who occupy and use City buildings. Examples of potential health benefits and hazards for each of these worker groups are noted below and described in detail in Appendix F: Worker Health & Safety – Benefits and Hazards of Green Building Retrofits.

Key Retrofit-Related City Job Classifications [i]

Building and Construction Trades
Air Conditioning Mechanic
Electrician
Carpet Layer
Painter
Pipefitter
Plasterer
Plumber
Roofer
Sheet Metal Worker
Building Operating Engineer
Mechanical Repairer

Service and Craft Workers
Gardener Caretaker
Maintenance & Construction Helper
Maintenance Laborer
Building Repairer
Equipment Mechanic
Custodial Service Worker
Window Cleaner

Building Occupants
Clerical staff
Librarians

Building Trades

Green building retrofit construction work involves many of the same job tasks building trade workers traditionally do, such as upgrading or maintaining HVAC systems.[13] The hazards of green building retrofits include falls; electrocution; exposure to lead, dust, mold, silica, asbestos, fiberglass; and ergonomic hazards.[14] Building trades representatives in a Community Scholars focus group agreed that "green jobs" present many familiar hazards for which control techniques have already been developed [ii].

LEED Certified W Hotel Workers

Some green retrofit jobs may, however, be more hazardous because particularly high-risk job tasks become more frequent. For example, installation of energy efficient windows, solar panels, and skylights may increase workers' exposure to traditional hazards such as falls, the leading cause of deaths in the construction industry and the second most common cause of nonfatal injuries.[14, 15] In a study of a LEED-certified construction project at the Oregon State University campus, Gambatese et al. discovered that the interior lighting design increased the work time on scaffolding, increasing the risk of falls.[12] Architects and engineers may prioritize the aesthetic design components of a building over safety considerations for maintenance workers. Green buildings often contain advanced features that make system maintenance increasingly difficult.[16, 17] These features can contribute to hazards, especially if workers have not been properly trained or if new workers have limited experience.

Building Trade Workers

Case Study: Fatality during Solar Panel Installation

June 13, 2008: A 34-year old construction worker in Los Angeles fell 35 feet from a scaffold to the ground below. He had been electrocuted while completing the final phase of a solar panel installation. Like many other workplace fatalities, this tragedy could have been prevented. Procedures for safe solar energy projects include conducting daily Job Hazard Analyses to identify electrical and other hazards and integrating safety precautions to prevent contact with overhead power lines and other electrical sources. For example, devices can be used to prevent solar panels from generating electricity while work is in progress. And personal protective equipment such as harnessing and voltage-resistant rubber gloves can provide supplemental protection for workers.

Source: California FACE Report #08CA006. January 27, 2009. http://www.cdph.ca.gov/programs/ohb-face/Documents/08CA006.pdf Accessed 3/1/09.

Service and Crafts Workers

Service and crafts workers are exposed to a variety of hazards from noisy machines to unsanitary conditions. They may sustain cuts, bruises, and burns from machines, hand-tools, and chemicals. They face ergonomic hazards from lifting or pushing heavy furniture or equipment, and from bending, stooping, and stretching while dusting and sweeping. Improvements in building materials, less toxic chemical cleaners, and power equipment have made some of these tasks less hazardous. However, workers risk harm if they are not trained to use the cleaners and equipment properly or if inadequate staffing prevents them from using safe work practices.[18]

Building Users

LEED Platinum Plaque

Green building retrofits have the potential to improve or aggravate health problems related to indoor air quality and building temperature. Research by the U.S. Environmental Protection Agency (EPA) indicates that the air within buildings can be more polluted than the outdoor air, even in the largest and most industrial cities. Because people spend, on average, 90 percent of their time indoors, the health risks of indoor air pollution may be greater than those of poor outdoor air quality. Indoor air pollutants such as gases or particles from adhesives or cleaning chemicals may become trapped and concentrated when there is inadequate outdoor air to dilute the emissions.[7] High temperature and humidity levels can exacerbate the situation.

Measures to prevent indoor air pollution fall into five categories: (1) use green building materials that do not release toxic fumes or particles, such as low-VOC (volatile organic compound) paints, carpets, and wood products; (2) minimize existing hazards, such as radon, asbestos, and lead paint; (3) properly design ventilation systems; (4) maintain ventilation systems and appliances, such as furnaces and stoves; and (5) limit the use of products that cause indoor air pollution, such as chemical cleaners, cigarettes, and solvents.[7]

Building occupants' health can be harmed if energy efficient buildings do not provide adequate ventilation; or it can be enhanced from a low-toxin environment, natural daylight and efficient climate control systems. Green buildings can increase worker productivity by three percent or more, resulting in cost savings.[19] One case study found that absenteeism was reduced by 15 percent when a major bank relocated its headquarters into a new green building.[20]

LEED Platinum Lakeview Terrace Library

Recommendations to Maximize Worker Health

"Green jobs" may benefit worker health, but they may also pose a variety of hazards, which, if not identified in advance, can have serious unintended consequences for the health of workers and for the financial viability of retrofit projects. While uncharted terrain in some respects, many potential hazards can be anticipated and, with commitment and careful planning, can be avoided. The hazards should be eliminated or reduced using the "hierarchy of controls", a framework required by OSHA and used by health and safety professionals to maximize worker protection. Removing the hazard (through substitution or engineering controls) is most effective. Additional controls limit, rather than eliminate, exposure to hazards.[21] Green building retrofits should be designed to minimize or eliminate electrocution, falls, chemical exposure and other hazards through engineering controls such as adding safety features and through policies and procedures such as mandatory hands-on worker training programs. Personal protective equipment such as harnessing provides important protection and should be used if other measures fail to eliminate risks. A building should only be considered sustainable when work practices and products protect both worker and environmental health. With the proper precautions, training, the involvement of workers, and supportive city policies, the hazards of green building retrofits can be minimized and the benefits maximized.

Laborer's Training School

Worker Health Policies and the Role of City Government

City government has multiple roles in promoting the health of workers and the community. As employer, the City is responsible for complying with standards to protect workers from hazards. As a building owner, the City must comply with codes to protect the safety of building users. In its contracting and procurement role, the City can establish criteria defining the type of services, and the quality of supplies and equipment it purchases. Finally, the City establishes policies—such as green building policies to stimulate sustainable development - which can include labor, worker health, and environmental criteria to create good, green, safe jobs. In this section, we highlight selected key policies already in place that complement the Ordinance's sustainability goals. We also explore the potential unanticipated costs associated with retrofits if measures are not taken to ensure worker health.

LA City as Employer

Like all employers and building owners, the City must comply with Cal/OSHA standards [iii], and other worker, environmental and building safety codes designed to protect the health and safety of the workforce and of community members who use City facilities. For example, regulations mandate worker and community protection if retrofit work will disturb asbestos-containing materials, a potent lung hazard often found in insulation, roofing and other materials used in older buildings. Retrofit projects must integrate an Injury and Illness Prevention Program (IIPP) to protect workers through training, accident investigation, and procedures to correct unsafe conditions.[22] Failure to comply with IIPP requirements is the most commonly cited violation by Cal/OSHA compliance officers. The Hazard Communication standard (Right to Know) requires chemical labeling, Material Safety Data Sheets (MSDS) and worker training, whether a chemical is "green" or not. Paperwork compliance alone is not effective. Mandated regulations are a floor, the minimum requirement on which to build effective programs.

"Sure, everybody has it (The IIPP) in a binder somewhere; nobody knows what it is."
Representative, SEIU Local 721

Worker Health and Sustainability, cont.

Role of City Government: Implications for Worker Health and Sustainability

Roles of City Government	Opportunities to Promote Worker Health & Sustainability	Key Policies Relevant to Worker Health & Green Building Retrofits
• Employer	• Comply with worker health and safety regulations, specifically Cal/OSHA standards in Title 8, CCR	• Injury/Illness Prevention Program (IIPP) • Other hazard-specific regulations such as asbestos, lead, Hazard Communication
	• Negotiate with labor representatives	• MOU Agreement to establish Joint Labor Management Safety Committee
• Contract Administration	• Require safety training and protection for workers contracted for retrofit work • Require assessment of worker health risks and benefits in scope of work for consultants who will audit buildings	• MOU 35 with building trades • Project Labor Agreement language in Ordinance
• Procure equipment and supplies	• Include criteria to protect the environment and worker health	• EPPP – Environmentally Preferable Products Purchasing Program
• Create city-wide sustainable policies	• Implement worker and community health component in City's Green Building Retrofit and Workforce Program	• Strive to achieve a LEED innovation credit for a model Worker Health & Safety Program

Contract negotiations between LA City as employer and labor unions provide an avenue to integrate worker health and safety provisions into Memoranda of Understanding (MOUs) that go beyond minimum Cal/OSHA requirements and that provide a framework for worker safety during green building retrofits. The current 2007-2012 MOUs* negotiated through Mutual Gains bargaining between the City and the unions that comprise the Coalition of LA City Unions [iv] include an agreement to establish a Joint Labor Management Safety Committee. A Safety Committee with trained, active members can create a model safety program to ensure that green building retrofit work prioritizes worker health and safety along with environmental and economic goals.

* MOUs—Memoranda of Understanding between the City and Employee Labor Organizations can be found at http://cao.lacity.org/MOUs/index.htm

LA City as Contractor

The Los Angeles City government must assure that City contracted work complies with labor standards including safety training and protection for workers who will be contracted for retrofit work. The current MOU #35 with the Los Angeles Building and Construction Trades Council provides an ongoing mechanism to contract workers through Building Trades local union hiring halls, thereby assuring that workers have received at least basic health and safety training through joint labor-management apprenticeship programs. The Ordinance additionally advocates the use of Project Labor Agreements for contracted work where possible; likewise assuring that disadvantaged City residents recruited through local hire agreements will receive health and safety training specific to their job requirements.

Contracts with environment and energy professional consultants to assist with audits should include the requirement to identify potential health risks and precautions needed for proposed retrofit projects. We recommend that consultants work with a team of City staff including members of the Safety Committee familiar with the type of building and equipment undergoing the audit.

LA City Staff

LA City Procurement Policies

Using its leverage as a major purchaser of supplies, equipment and other goods, the Los Angeles City Council adopted an Environmentally Preferable Products Purchasing Program (EPPP) on June 12, 2009. (See Appendix G: Highlights of the Los Angeles Environmentally Preferable Products Purchasing Program.)

Implementation of a sustainable purchasing policy is a required prerequisite for LEED accreditation with up to six Materials and Resources points for purchasing goods that range from sustainable furniture to lighting fixtures with reduced levels of mercury. Similarly, a green cleaning policy is required for Indoor Environmental Quality LEED credits.

The challenge comes in "deconstructing green"—delving beneath the surface of green eco-label claims to ensure that green labeling and certification incorporate criteria to protect the health of workers and building occupants. Past experience demonstrates the consequences of a disconnect between worker health and environmental protection policies as described here in the example of chlorinated solvents.

Regulating Chlorinated Solvents - *When Environmental Protection and Worker Health Collide*

In 2000, the California Air Resources Board adopted an Airborne Toxic Control Measure prohibiting the production or distribution of automotive products containing chlorinated solvents, most importantly percholorethylene (perc). The automotive industry substituted hexane-acetone blends – neurotoxins - exposing workers in some 6,000 shops across California and leading to deteriorated vision, muscle weakness, and memory failure. Lessons: Agencies must coordinate efforts to avoid unintended negative consequences of "green" initiatives; and worker health effects must be considered in environmental policies

Source: Wilson, M. et al. (2007) *Worker exposure to volatile organic compounds in the vehicle repair*

Similarly, green product certification standards may not consider the impact on the workers who must use those products. For example, pyrethrins found in some green carpet cleaning compounds may exacerbate asthma symptoms in individuals with sensitivities.[23] Changes to strengthen the health criteria used for Green Seal certification provide an example of how environmental standards can incorporate criteria to protect the health of workers and community members [v].

Green Seal Certification - *When environmental protection and worker health coincide*

Cleaning products have been found to cause or aggravate asthma in workers and bystanders. Staff in the Occupational Health Branch (OHB) of the California Department of Public Health contributed information about this potential hazard during the process to revise the Green Seal Environmental Standard for Industrial and Institutional Cleaners – GS-37. The revised version of GS-37, effective August 2009, contains stronger worker health and environmental protections including a prohibition of ingredients known to cause allergic-type asthma; strengthened toxicity and corrosive limits; tighter limits on ingredients that can cause indoor air pollution; and strengthened limits on chemicals that can be absorbed through the skin. Green Seal: http://www.greenseal.org/about/index.cfm.

Source: Occupational Health Branch Announcement - Revised Consensus Standard for Safer Cleaning Products October 2008.

Worker Health and Sustainability

The City's varied roles and responsibilities provide multiple avenues to enhance the health of City workers and community members who use City facilities. An additional overarching responsibility of City government—to use taxpayer dollars in a fiscally responsible way—is also furthered when an effective worker health and safety program is integrated into the Green Retrofit and Workforce Program. As described above, green retrofit elements can produce health benefits and improved productivity among workers in buildings with improved environmental quality. Less recognized are the potential hazards of green retrofit work and the importance of a worker safety program to mitigate the negative fiscal impact of lost work days, health care and workers' compensation costs that accrue from work-related injuries and illnesses. Thus, two sustainability goals of the Ordinance—promoting worker and community health as well as cost savings—are achieved through an effective safety program.

Worker Education and Involvement

Lessons from history demonstrate the value of coupling worker health and safety education with environmental initiatives. The model worker education and training program initiated by the National Institute for Environmental Health Sciences (NIEHS) in the mid 1980s was designed to ensure that workers receive training to protect themselves and the community while remediating hazardous waste sites and handling hazardous materials. That program continues to fund training for building trades and other unionized workers, as well as programs that recruit, train and place minority workers into what are now called "green" jobs [vi]. Funds from this program can be leveraged to integrate worker health and safety training into job skills training for City retrofit projects.

Laborers Training School
Green Construction Awareness

Worker health and safety education programs should be targeted at three levels: 1) Hazard identification and awareness education for those entering the workforce, 2) Job-specific health and safety education coupled with job skills training for new and incumbent workers, and 3) Leadership education for Safety Committee members and stewards.

Hazard Awareness Education – Rights and Responsibilities

Training can be provided through nonprofit community organizations, pre-apprenticeship programs and educational institutions that recruit and train workers along the career pipeline. (See Workforce Development Landscape; Appendix E). New workers, at higher risk of work-related injury, need to understand potential hazards and measures to protect themselves and their coworkers. Interactive, contextualized education will engage workers and address barriers such as limited literacy skills or limited English proficiency.

Worker Health and Sustainability

Worker Health and Job Skills Training

Joint labor-management funded apprenticeship programs are perhaps the best model of job skills training with their emphasis on intensive training for long-term careers. In Los Angeles they include most Building Trades unions as well as the Los Angeles County–SEIU 721 Workforce Development Program. Union apprenticeship training programs include instruction in the required OSHA 10- and 30-hour construction training courses as well as job-specific hazards and protocols such as ladder safety and scaffolding. Apprenticeship instructors are from the trades and can illustrate concepts with real-life examples as described by Community Scholars representatives in a focus group discussion [vii].

Solar Panel Installation
Pierce College

Quality Worker Health and Safety Education in the Building Trades:

- ***OSHA training*** – The PowerPoint training is boring to many workers, especially because they take the class after hours, so I incorporate pictures, news reports and other real life examples in my scaffold safety training and we discuss them. Safety training is more interesting when we as instructors relate actual on-the-job stories. Having a dialogue helps workers learn.
- ***Hands-on practice*** – Apprentices have the chance to practice in a safe environment—hooking up solar panels, suiting up to remediate asbestos, hanging iron— before they go into the field.
- ***Supervised work on the job*** – Electrical supervisors oversee safety programs on job sites and ironworker journeymen established an informal mentorship system whereby they take apprentices under their wing and "teach them everything we know." They also implement a coding system; apprentices affix colored stickers to their hard hats that identify their level of job-site experience.
- ***On-going training*** – Some trades, such as electrical workers, require ongoing training to remain certified. Others integrate new information into apprenticeship programs and invite journeymen to participate. These courses provide an avenue to incorporate worker health and safety refresher training as well as skills needed for jobs in the "green economy."

Leadership Education

Leadership training for Safety Committee members will provide the skills to fulfill the goals of the Mutual Gains bargaining agreement described above and the health goals of the Ordinance. Worker involvement in an effective health and safety program will also contribute to a reduction in work-related injuries and illnesses and the associated costs to workers, family members, coworkers and the City [viii].

We recommend that the City create a model worker health and safety program with a Safety Committee whose work is integral to the implementation of the Green Building Retrofit and Workforce Development Program. As specified in the MOU mutual gains bargaining language, an effective Safety Committee would play a critical role in all aspects of a Safety program and would monitor trends in worker health and work-related injuries, identify potential health benefits, and monitor cost savings. We also recommend that the City apply for a LEED innovation credit towards Silver certification for worker involvement in an effective green retrofit safety program.

Recommendations

- Redefine good, green jobs to explicitly include the sustainability goal of promoting worker health and safety.
- Integrate worker health into all phases of the Green Retrofit and Workforce Development Program from planning to implementation to long-term tracking and evaluation.
  - ◊ *Building audits and retrocommissioning—identify potential hazards & precautions as well as ways to minimize them, and potential health benefits and ways to maximize them*
  - ◊ *Job skills training - integrate worker health and safety education at all levels of workforce development*
  - ◊ *Retrofit jobs – use OSHA's hierarchy of controls as a framework to protect workers from potential hazards*
  - ◊ *Documentation – track indicators of health and wellbeing, injuries and illnesses to examine trends and document cost savings before, during and after retrofit work*
- Establish a Joint Labor Management Safety Committee as outlined in the 2007-2012 Mutual Gains bargaining agreement
- Strive for a LEED innovation credit for establishment of an effective worker health and safety component of the Green Building Retrofit program

Chapter Notes

[i] Job classifications are from 2007-2012 Memoranda of Understanding with: 1) the Building Trades through (MOUs) 2 & 13 (LA/OC Building and Construction Trades Council), 35 (LA County Building and Construction Trades Council), and 9 Operating Engineers Local 501); 2) SEIU Local 721 (previously Local 347) through MOUs 4, 14 and 15; and 3) AFSCME through MOUs 3 (AFSCME Local 3090), 6 and 16 (AFSCME Council 36). These MOUs and job classifications are examples of City workers represented by the six unions that comprise the Coalition of LA City Unions and its estimated 22,000 members (http://www.lacitycoalition.com/) The specified job classifications are not exhaustive. For further information about City jobs potentially affected by green building retrofits and their associated unions, see: http://www.lacity.org/cao/MOUs/.

[ii] Worker Health and Safety Focus Group at UCLA Downtown Labor Center. 2/25/09. Participants were from Bricklayers Local 4, Ironworkers Local 433, Laborers LECET, IBEW Local 11, Painters and Allied Trades District Council 36.

[iii] The California Occupational Safety and Health Administration (Cal/OSHA) establishes occupational safety and health regulations found in Title 8, California Code of Regulations. California is the only state that requires employers to provide a comprehensive health and safety program known as an IIPP. Cal/OSHA standards also cover a variety of specific workplace hazards of potential concern during green building retrofit work, such as falls, ergonomics, electrical, toxic substances and harmful physical agents.

[iv] Coalition of LA City Unions: http://www.lacitycoalition.com/, accessed August 1, 2009.

[v] Other organizations include GreenGuard Environmental Institute, a non-profit organization that establishes indoor air standards and certifies products such as paints and sealants if VOC and other emissions meet acceptable Indoor Air Quality pollutant guidelines and standards: www.greenguard.org. See also: http://www.epa.gov/epp/; and www.greenlacoalition.org/docs/10_Steps_GPI.doc *(Accessed July 31, 2009)*

[vi] UCLA-LOSH is the lead organization for the five-member Western Region Universities Training Consortium funded by NIEHS (http://www.niehs.nih.gov/careers/hazmat/about_wetp.cfm). Other grantees include building trades and other unions (http://www.niehs.nih.gov/careers/hazmat/programs/hwwt/hwwt_awardees.cfm). The origins of the program are documented in Craig Slatin (2009), Environmental Unions: Labor and the Superfund. Baywood Publishing Company, Inc. New York.

[vii] See chapter note [ii]

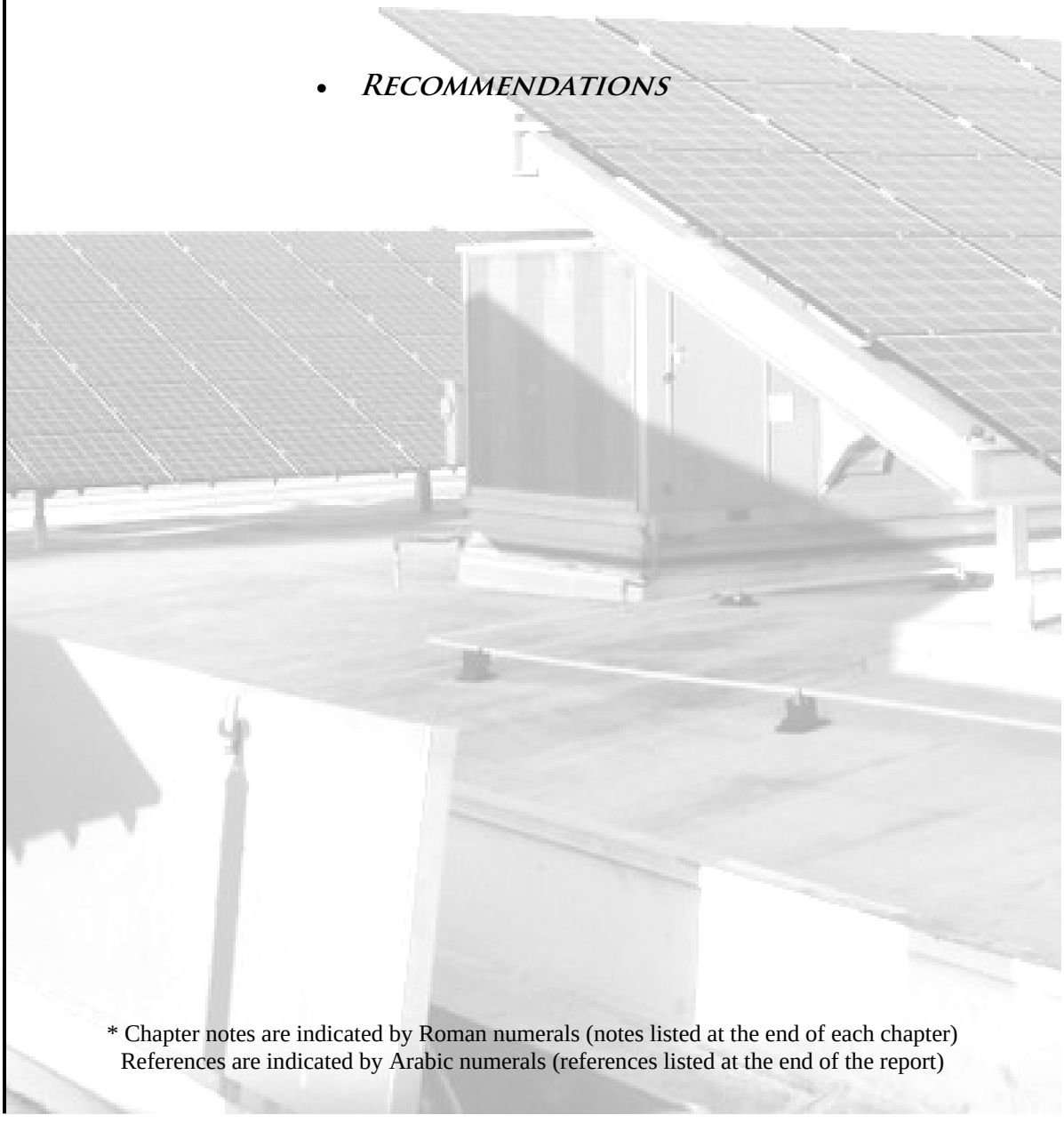
[viii] An innovative statewide leadership course to promote worker involvement in health and safety programs has been developed by UCLA-LOSH and UCB-LOHP with funding from the California Commission on Health and Safety and Workers' Compensation. In Southern California, UCLA-LOSH provides a 24-hour interactive Worker Occupational Safety and Health Specialist course designed to promote Safety Committees and effective Injury and Illness Prevention Programs. http://www.losh.ucla.edu/woshtep/index.html

LA City Library Site Visit, 2009

LA Labor-Community Forum, SEIU 721 and Community Scholars Representatives

WORKER AND COMMUNITY ENGAGEMENT: SECTION 3—EDUCATION STRATEGIES AND TOOLS *

- *OVERVIEW*
- *RECOMMENDATIONS*



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Overview

An effective education campaign will help create an informed public that is actively engaged in policies affecting their workplace, neighborhoods, and the larger environment. A recent study by Occidental College and Green LA, *Engaging the Public in the Fight against Global Warming*, demonstrates public interest in environmental issues and describes efforts by the City to stimulate civic engagement.[24] Language in the Green Retrofit Ordinance lays the groundwork for civic engagement, creating a structure to involve key stakeholders in its implementation through appointment of an Advisory Council to work with the City's Interdepartmental Task Force.

LA Labor-Community Forum, SEIU 721 and Community Scholars Representatives

Recommendations

An education campaign should begin with members of the Advisory Council and Task Force, structured as a forum that allows for mutual education and that draws on the knowledge and experiences of those in the group and of external advisors. An education sub-committee could then be established to create a systematic public education campaign with the following four objectives:

1. ***Inform the public at large about the Ordinance through a media and public education campaign to generate enthusiasm for its implementation and support for expanded green building measures. Potential avenues include:***
   - **Mainstream and Alternative Media Sources**: City and neighborhood newspapers, magazines, radio and television PSAs (Public Service Announcements)
   - **Media Kits/PR events:** Work with social marketers to compile narratives and case studies, create a Public Relations plan, and produce a message and/or brand that will motivate people to take action and go "green."
   - **Internet and Online Media:** Social networking sites such as MySpace, Facebook and Twitter, blogs, YouTube
   - **Educational Materials**: Factsheets, flyers, DVDs and CDs with visual depictions that demonstrate a building's "carbon footprint" and the environmental importance of green building retrofit projects
   - **Public Displays**: Educational posters, banners (particularly near community centers), and point-of-sale displays near checkout counters at retail establishments

Engage Representatives from local communities to determine which outreach and educational approaches are most effective for specific target population of youth and adults.

2. ***Collaborate with local community and faith-based groups, youth organizations and schools to create a community outreach and education program when embarking on a green retrofit project in that community.***
   - **School Projects:** Connect with school libraries and teachers to identify ways to involve students in green building retrofit projects and in the media and education activities described above.
   - **Neighborhood Public Events:** Hold a community event in local public-use city buildings when embarking on a green retrofit project in a particular community.

3. ***Engage community organizations and other groups in efforts to reach, recruit and educate those the Ordinance targets for job opportunities, notably residents in underserved communities.***
   - **Identify the demand for green retrofit jobs:** Create career pipelines and identify job opportunities during the pilot stage of implementation as discussed in previous chapters of this report.
   - **Integrate environmental and health literacy education activities** into job training and workforce development programs to generate interest in good, green, safe jobs in city building retrofits and beyond. Where possible, use a peer education approach as in apprenticeship programs – worker to worker, community member to community member.

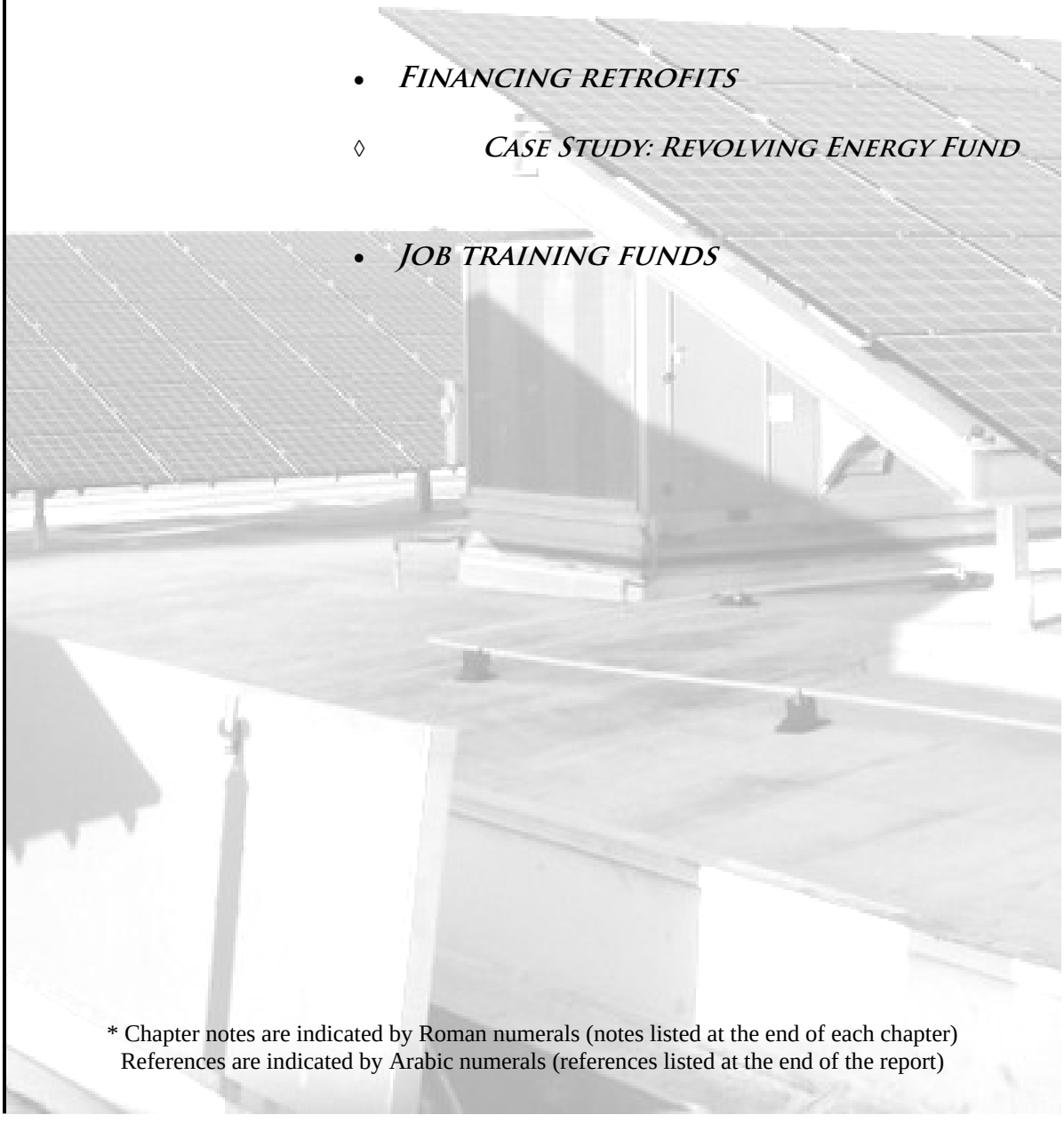
"Working in Unity Greening Our Communities" Conference, 2009

4. ***Collaborate with the City Coalition of Unions and relevant departments to educate the existing workforce—notably city employees who maintain and occupy city buildings—about their role in maintaining green buildings.***
   - ***Popular education:*** *Use an adult education approach that respects the experience of workers and integrates critical thinking skills and hands-on activities. When possible, use peer education and "train the trainer" strategies.*
   - ***Stimulate creative staff ideas*** *by highlighting the best practices to retrofit and maintain green buildings.*

In Summary, build a public social movement to expand good, green, safe jobs through building initiatives in the public, private, commercial, and residential sectors. Publicize City retrofit projects in and around public use buildings as they begin. Identify actions that individuals can take at work and at home, on their own and collectively.

Finance Mechanisms *

- *Introduction*
- *Financing retrofits*
  - ◊ *Case Study: Revolving Energy Fund*
- *Job training funds*



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Finance Mechanisms

Introduction

The city has a unique opportunity in the coming months to leverage funds from a variety of sources to jumpstart the Green Retrofit and Workforce Program. Successful implementation of the Ordinance during an economic downturn will require creating a comprehensive vision and seeking funds for specific components through diverse federal and state mechanisms. We offer the following recommendations to finance retrofits and fund job training programs which are described in greater detail below.

LA City Staff Meeting, 2009

Recommendations to Finance Retrofits – Capital Improvements and Retrofits

1. Use Energy Efficiency Community Block Grant (EECBG) and State Energy Program (SEP) monies to fund all needed green retrofits for the initial pilot set of buildings.
2. Use Qualified Energy Conservation Bonds (QECBs) to fund projects that test new green building technologies and to fund an educational campaign to promote green behaviors among workers and communities using public buildings.
3. Create a revolving energy fund loan to finance retrofits that have a quantifiable monetary savings or return such as energy efficiency, energy/water conservation, renewable energy, and retrocommissioning. Use EECBG and State Energy Program (SEP) monies to leverage private matching dollars for a Municipal revolving energy fund.

Recommendations to Fund Job Training

1. Use California Energy Commission's Department of Labor Workforce Investment Act (WIA) dollars to fund training initiatives for green building retrofits in the City.
2. Coordinate ARRA-funded green jobs training programs through Pathways out of Poverty, Energy Training Partnership and Green Capacity Building Grants which are designed to support and train individuals seeking careers in green industries.
3. Use state-wide Clean Energy Workforce Training Program funds — approximately $20 million from the State Energy Program (SEP) — to support regional training programs for energy and water efficiency, renewable energy, and clean transportation.

The sources of funding and specific recommendations to finance retrofits and train workers are further described on the next page.

Financing Retrofits – Capital Improvements and Retrofits

1. ***Use Energy Efficiency and Conservation Block Grant (EECBG)[25] and State Energy Program (SEP) monies to fund planning, staff coordination, and all retrofits for the pilot set of buildings.***[26-28]

   The City should implement a pilot retrofit stage with several buildings representative of each major building type to document energy-savings and job creation. This process will allow the City to collect data to inform a long-term implementation plan for the rest of the program. The city can use a portion of the $37 million it will receive directly through the EECBG formula grant.

LEED Certified Building, Tree People

   One of the main goals of EECBG funds is to help develop and implement an "energy efficiency and conservation strategy,"[25] which includes hiring technical consultants to aid in developing the strategy. The funds can also be used for energy efficiency and conservation programs, energy distribution technologies, renewable energy technologies, and methane capture technologies.

   Similarly, SEP monies can also contribute to funding the initial pilot stage. The California Energy Commission is expected to receive $226 million for activities that increase energy efficiency, stimulate economic development, and facilitate the use of renewable energy throughout the state.[26-28]

2. ***Use Qualified Energy Conservation Bonds (QECBs)[26] to fund projects that test new green building technologies and to fund an educational campaign to promote green behaviors among workers and communities using public building.***

   ARRA allows large local governments with a population of 100,000 or more to issue tax credit bonds to finance energy conservation projects in the form of loan, rebate, and grant programs.[29] However, as with the creation of grant programs, the city must demonstrate the source of repayment. The QECBs can be used for a wide range of purposes that include implementing capital projects to reduce energy consumption on publicly-owned buildings by at least 20 percent and implementing green community programs and educational campaigns.

   Using QECB funds, the city can initiate two innovative measures to implement the Ordinance. First, use bond financing to test locally-developed emerging green technologies and serve as an incubator for their move toward commercialization. Second, QECBs can fund an educational campaign for workers and surrounding communities about the benefits of green buildings and energy efficiency.

3. ***Create a revolving energy loan fund to finance retrofits that have a quantifiable monetary savings or return such as energy efficiency, water conservation, renewable energy, and retrocommissioning.***

   A Revolving Energy Loan Fund is an initial sum of money set aside for green retrofits that have quantifiable cost savings. A portion of the savings from retrofits related to energy efficiency, water conservation, renewable energy, and retrocommissioning are reinvested into the fund until the work has been paid off. The repayments provide financing for more projects. This Fund can be designed to grow slightly over time to help fund other retrofits without easily quantifiable returns (such as indoor air quality improvements, green cleaning upgrades, etc.).[30]

4. ***Use Energy Efficiency Community Block Grant (EECBG) and State Energy Program (SEP) monies to leverage private matching dollars for a Municipal revolving energy fund.***[26-28]

   Once there is a benchmark for estimated energy savings by building type, the city can use up to 20 percent of the EECBG funds combined with SEP monies to create an internal revolving energy fund that finances further energy-efficiency measures on municipal buildings. Participating departments that receive the benefits could use 80 percent of the savings to pay back the loan over ten years at a three to five percent interest rate. The remaining 20 percent of the savings from each building could pay for the remaining green retrofit improvements that don't have direct, measurable savings, but are necessary to achieve the LEED-EBOM Silver certification and to reach the sustainability goals of the Ordinance.

Electrical Training Institute Solar Panels

   A portion of the ARRA dollars could also be used as a loan guarantee to bring in private sector funds from socially responsible investors and to create a public-private match to expand resources. Typically, socially responsible investors are looking for a lower rate of return (around three to five percent) as compared to other investors. The city could use a ten-year payback period to determine project viability.

CASE STUDY: Revolving Energy Fund, Ann Arbor, MI

Through an initial allocation of $500,000 over five years, the City of Ann Arbor was able to create and sustain a Municipal Energy Fund to finance energy efficiency measures throughout public buildings. Over five years they have been able to reduce CO^2 emissions by 980+ tons annually.

Mechanics of Fund:

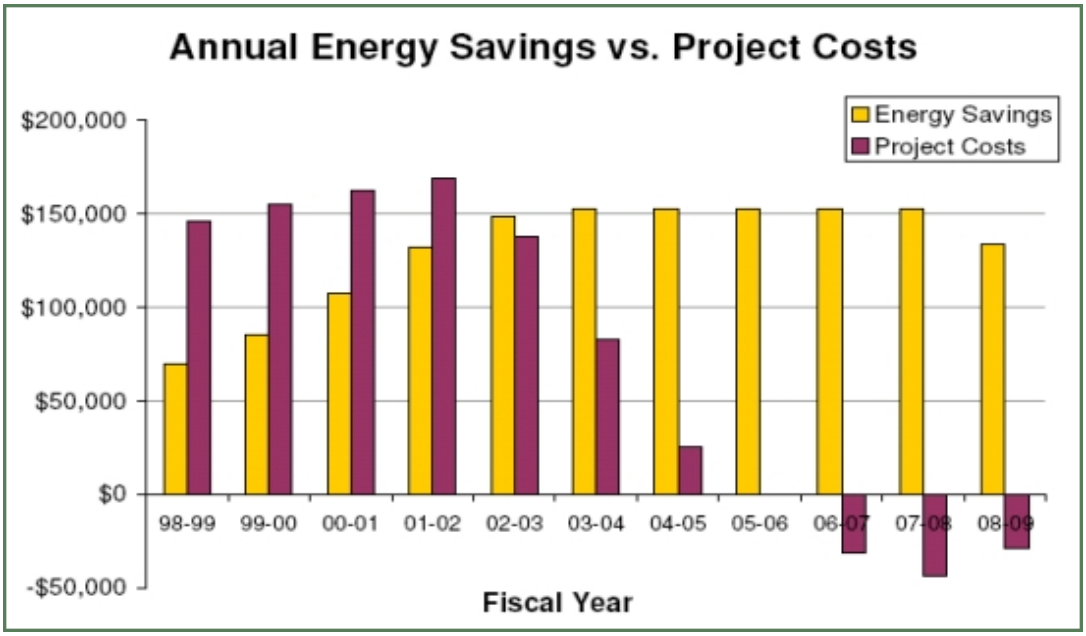
1) Requires an initial funding source (available for three to five years). The level of initial funding is determined by the funds available, the number of buildings, and the condition of the facilities. The City operates 60 facilities and spends $4.5 million per year on energy; $100,000 per year proved to be sufficient to fund management and energy saving improvements.

2) All facilities are required to pay back the Energy Fund using the cost-savings generated from the retrofits for a total of five years. Most measures that have been funded have payback periods of three to six years. However, even older facilities that benefit more quickly from energy efficiency measures are required to place their savings in the fund for a total of five years. This rule helps balance funding for facilities with longer paybacks. It also contributes to a quicker regeneration of the Energy Fund.

3) Annual payments into the Energy Fund are made from 80 percent of the resultant energy savings, which reduces the facility's expenses by 20 percent or allows management to apply the savings to fund further improvements.

4) Through the City's Energy Office, the Energy Fund is supervised by a three person Board that approves project funding and implementation. Facility managers submit project requirements to the Board. Each year the Board reviews requests and makes decisions based on the *energy saving potential*, *improvement of the facility environment* and *educational or demonstrational value of the project.*

Source: http://www.project2degrees.org/Pages/BestPractices/Energy/AnnArborFund.aspx



Source: http://www.a2gov.org/government/publicservices/systems_planning/energy/Pages/FAQ3.aspx

Job Training Funds – ARRA Funds

1. ***Use California Energy Commission's Department of Labor Workforce Investment Act (WIA) dollars [27, 31, 32] to fund training initiatives for green building retrofits in the City.***

   The City of Los Angeles Local Workforce Investment Area is expected to receive approximately $43.7 million from the Department of Labor ARRA funds—$22 million for the Adult and Dislocated Worker program, $20 million for Youth funding, and $1.5 million in Rapid Response funding. These dollars can help build the green workforce capacity required to implement the Ordinance. Use ARRA Green Jobs funding[29] from the Department of Labor to fund job training programs that prepare workers for green building retrofits.

2. ***Current ARRA-funded competitive grant programs focus on green jobs training such as Pathways out of Poverty Grants, Energy Training Partnership Grants, and Green Capacity Building Grants which are designed to support and train individuals seeking careers in green industries.***

   Los Angeles City can coordinate applications for these funds across the range of players that contribute to the green workforce pipeline, including the building and construction industry. Examples include pre-apprenticeship programs, community colleges, apprenticeship programs in the building trades and other workforce development intermediaries.

3. ***The state-wide Clean Energy Workforce Training Program administered through the California Energy Commission[33] will provide approximately $20 million from the State Energy Program (SEP) to support regional training programs for energy and water efficiency, renewable energy, and clean transportation.***

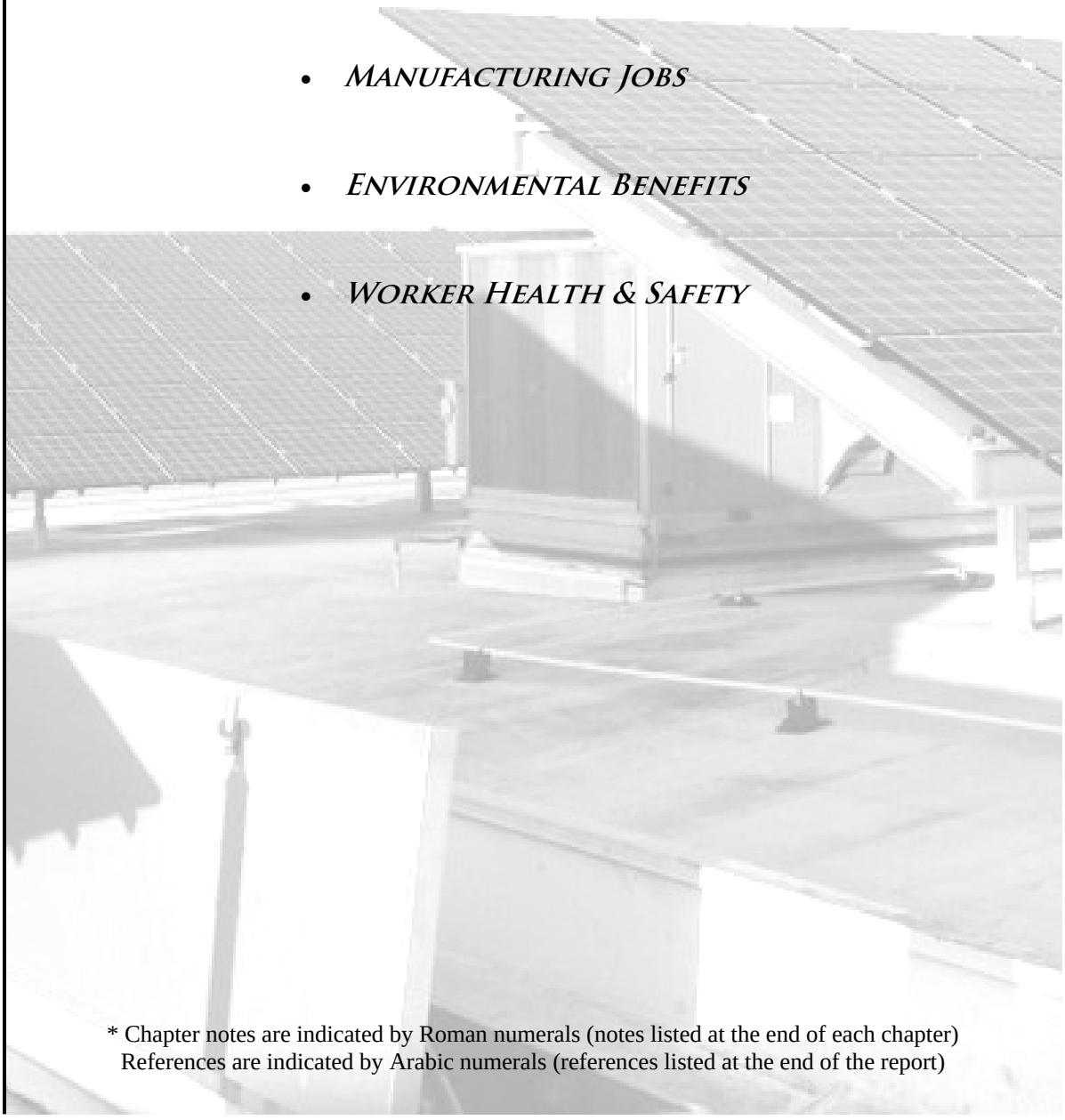
   Using a sector approach, the California Energy Commission will disburse funding to green building and clean energy re-training and pre-apprenticeship partnerships throughout the state. This work will be done in partnership with the state Green Collar Jobs Council [i].

IBEW Local 11 Electrical Training Institute, 2009

[i] The Green Collar Jobs Council is an intergovernmental working group established to address workforce needs of California's growing green economy. Source: California Green Solutions. AB 3018 California's 2008 Green Jobs Legislation. http://www.californiagreensolutions.com/cgi-bin/gt/tpl.h,content=2569 Accessed 10/1/09

Next Steps: Manufacturing Green Building Products in Los Angeles *

- *Demand for Locally Produced Products*
- *Manufacturing Jobs*
- *Environmental Benefits*
- *Worker Health & Safety*



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The Green Retrofit and Workforce Program has the potential to increase local production of green building materials. What exactly is manufactured, as well as how, where, and by whom those products are produced, involve important considerations that will impact the environment, economy, employee wellbeing, and community health. Initiatives to manufacture green building products locally have the potential to stimulate economic development, achieve local environmental goals, and improve worker and building user health and safety. Retooling and attracting local green manufacturers can create safe, family-supporting jobs in Los Angeles and minimize GHG emissions by cutting down the transportation distance from production to end user. By being a leader in green building materials manufacturing, Los Angeles will also position itself to be a supplier to other cities and regions. The City has the opportunity to stimulate demand for these products through policies that require or award locally manufactured green products.

Demand for Locally-Produced Green Products

Because Los Angeles is large and the site of many green building projects, City policies can help induce demand for locally produced green products. Policies with the potential to spur growth in the local green manufacturing industry include the following:

- **The *Green Building Program,*** approved by the City Council in April 2008, provides expedited permit processing from the Department of City Planning for private-sector projects that voluntarily commit to LEED Silver Level certification or higher.[34] Optional LEED credits are available for the use of locally manufactured products.
- **The *Green Retrofit and Workforce Program***, the focus of this report, was approved by the City Council in April 2009. It will phase in retrofits of City-owned buildings and create green jobs for low-income residents.
- **The *Environmentally Preferable Products Purchasing Program (EPPP)***, approved by the City Council in June 2009, directs City Departments to purchase environmentally friendly supplies. (See Appendix G: Highlights of the Los Angeles Environmentally Preferable Products Purchasing Program)[35]

The Green Retrofit and Workforce Program, as mandated by the Ordinance, will strive to obtain LEED silver certification for city-owned buildings. The LEED certification checklist includes a section on Materials & Resources. A sustainable purchasing policy is a required prerequisite, with up to six points for purchasing environmentally preferred goods ranging from sustainable furniture to low-mercury lamps. The Indoor Environmental Quality section requires a green cleaning policy and awards points for sustainable cleaning equipment. LEED and city requirements to purchase sustainable building materials, equipment and supplies will increase demand for these products. Policies that promote good, green, safe local manufacturing jobs can, in turn, help the City achieve the economic, environmental, and health sustainability goals of the Ordinance.

Manufacturing Jobs

Los Angeles is currently the largest major manufacturing region in the U.S., with 470,000 workers engaged in direct manufacturing work.[36] City manufacturing jobs comprise one-third of all those in California. Taking multiplier effects into account, manufacturing is ultimately responsible for two million jobs in Los Angeles County. Yet, similar to national trends, Los Angeles County lost 130,000 manufacturing jobs during the 2001 through 2005 economic downturn.[37] In 2008 alone, Los Angeles lost 6,800 manufacturing jobs.[38] This decline also eliminates opportunities for semi-skilled workers to earn middle-class wages and benefits, obtain career-ladder employment, and achieve union representation.

LA City Library Site Visit, 2009

The new green economy offers a window of opportunity for a U.S. manufacturing renaissance. In addition to jobs creation through green construction and green building retrofits, the green economy has the potential to create safe, family-supporting, career-ladder jobs in green manufacturing. Green manufacturing, however, lacks a clear definition.[39] A model green manufacturer produces green products, uses green inputs and processes, and produces items that can be recycled or disposed of in a sustainable way. Yet, companies of this type are rare. Los Angeles has a unique opportunity to frame green manufacturing in terms of job quality and worker health and safety.

Environmental Benefits

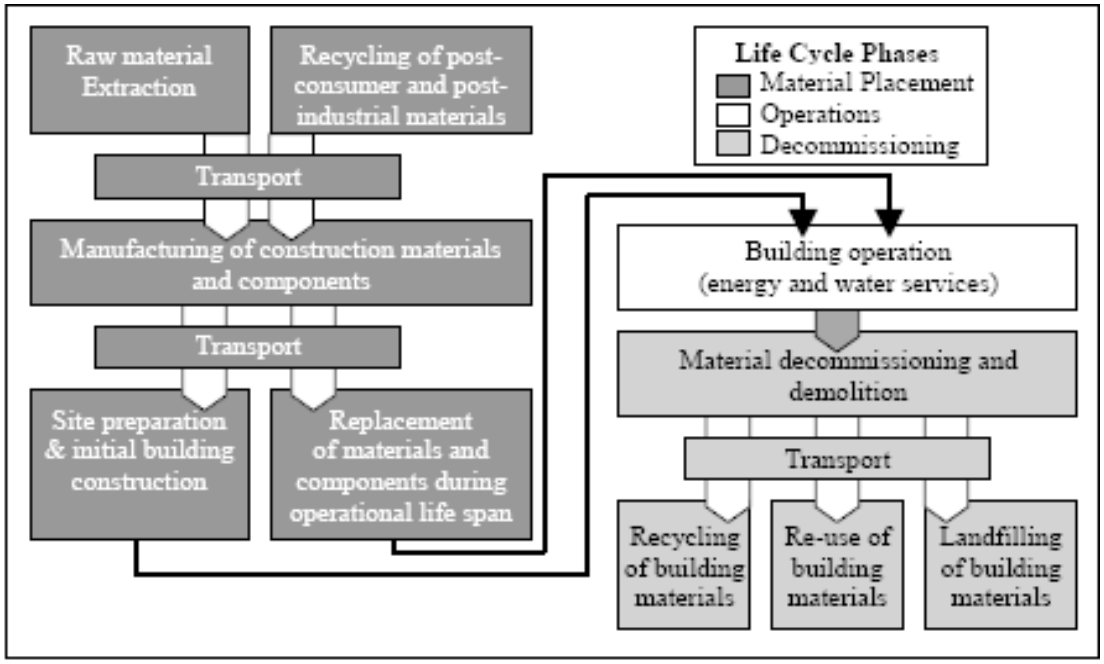
The Ordinance creates the impetus to define “green” environmental standards for production processes and products. One of the greatest challenges, however, is the lack of clear criteria, and the many phases in a product’s lifecycle, making it difficult to label it as "green" or "not-green".

When purchasing green products and materials, green building professionals often rely on LEED criteria and product labeling to guide the process. Surveys of green building professionals have found that these professionals have trouble sourcing green building products (procuring products based on their environmental impact). When asked what information they need in the course of their work, “learning about green products” was at the top of the list.[40] In Building Design & Construction's 2003 White Paper on Sustainability, 55 percent of professionals cited trouble sourcing green products; only sixteen percent did not have trouble. This report states that “the chief obstacle [to a marketplace for truly sustainable products] is the lack of a consensus baseline for measuring the greenness of products (Building Design & Construction, 2003).” [41]

Consumers and businesses alike must decide which "green" label to trust. Eco-labels seek to define products as "green" or "sustainable." Yet, product labeling varies based on criteria used and products included. EnergyStar, provided by the EPA, has become the industry standard for most energy efficient appliances including office equipment and home electronics, and has been incorporated into the LEED credit system. GREENGUARD is another standard, certifying products based on indoor air quality and the volatile organic chemicals (VOCs) emitted by paints and sealants.

A variety of environmental factors must be considered to determine a product's "greenness". One comprehensive approach is to analyze the entire life cycle of a product. The following figure illustrates the life cycle phases of a green building product: resource extraction, manufacturing, on-site construction, occupancy/maintenance, demolition, and recycling/reuse/disposal.[42]

Life Cycle Phases



The goal of a life cycle assessment is to close the waste and resource loop by reducing the inputs and reusing or recycling the outputs, often referred to as a "cradle-to-cradle" approach. In *Cradle to Cradle: Remaking the Way We Make Things*, architect William McDonough and chemist Michael Braugnart (2002) highlight the negative impacts of the cradle-to-grave manufacturing approach which deplete natural resources, generate waste, and produce toxic and polluted by-products. They propose a cradle-to-cradle approach, which strives to conserve natural resources, minimize waste and energy use, and reuse a material after its original "life" has ended.[43]

Local production of green building materials in LA to meet local demand can help minimize pollution and waste in a product's life cycle. Specifically, a local circle of supply and demand shortens the distance that freight has to travel and thereby reduces the carbon footprint and air pollution within the product lifecycle. A critical mass of regional businesses can keep the entire supply chain of materials and inputs local and can support a strong industry cluster. Locating manufacturing facilities near transportation corridors can also minimize employee commute time, and provide transit options for employees.

IBEW Local 11 Electrical Training Institute

Manufacturers can play an active role in responsible end-of-life disposal of green building products. Some products used for green building and renewable energy still contain toxic materials. Solar panels, for example, are similar to microelectronics and must be treated as toxic waste. Toxic substances can leach into ground-water from landfills, or release toxic materials into the air upon incineration. The Silicon Valley Toxic Coalition (SVTC), in their report *Toward a Just and Sustainable Solar Energy Industry*, urges manufacturers to adopt an Extended Producer Responsibility (EPR). Through an EPR, a manufacturer is responsible for the sustainable disposal of their product. For example, solar companies adopting an EPR would agree to abstain from shipping waste to developing countries or using U.S. prison labor to dismantle the panels and would recycle and reuse as much of the material as possible.[44]

Greening the production process and minimizing the amount of waste generated can help mitigate the historically negative environmental impacts of manufacturing on local communities. Green building material companies can provide employment opportunities and greener products, all the while becoming a responsible neighbor and producer through cleaner production processes and waste management practices.

Worker Health and Safety

Cleaning up the production process can benefit workers as well as nearby communities. Industrial processes may involve contact with hazardous substances, putting workers on the frontlines of exposure and resulting in elevated cases of chemically induced diseases. A recent report by UCLA and UC Berkeley estimates that 200,000 Californians were diagnosed in 2004 with a preventable chronic disease attributable to chemical exposures in the workplace; another 4,400 died prematurely as a result. These diseases produced an estimated $1.4 billion in direct and indirect costs.[45]

In April 2007, the California Green Chemistry Initiative was launched as a collaborative effort between the California Environmental Protection Agency (Cal/EPA), and other state agencies. The initiative produced a final report with policy recommendations in which they define their overall goal: California is a leader in the innovation, manufacture and use of safer, more environmentally benign products and processes and in the protection of public health and the environment from toxic harm.[46]

Green chemistry is an emerging field with principles that apply to green manufacturing processes. A key green chemistry principle asserts that product manufacture should use energy efficient processes at minimal temperature and pressure, reduce chemical intermediates and produce minimal or no waste, and use biologically benign solvents. As California firms move to adopt and integrate green chemistry applications into existing production, or begin new ventures based around green chemistry products and solutions, there will be a growing need for workers trained in new areas of production and product design.[47] Indeed, a serious commitment to green chemistry has the potential to create new green jobs.

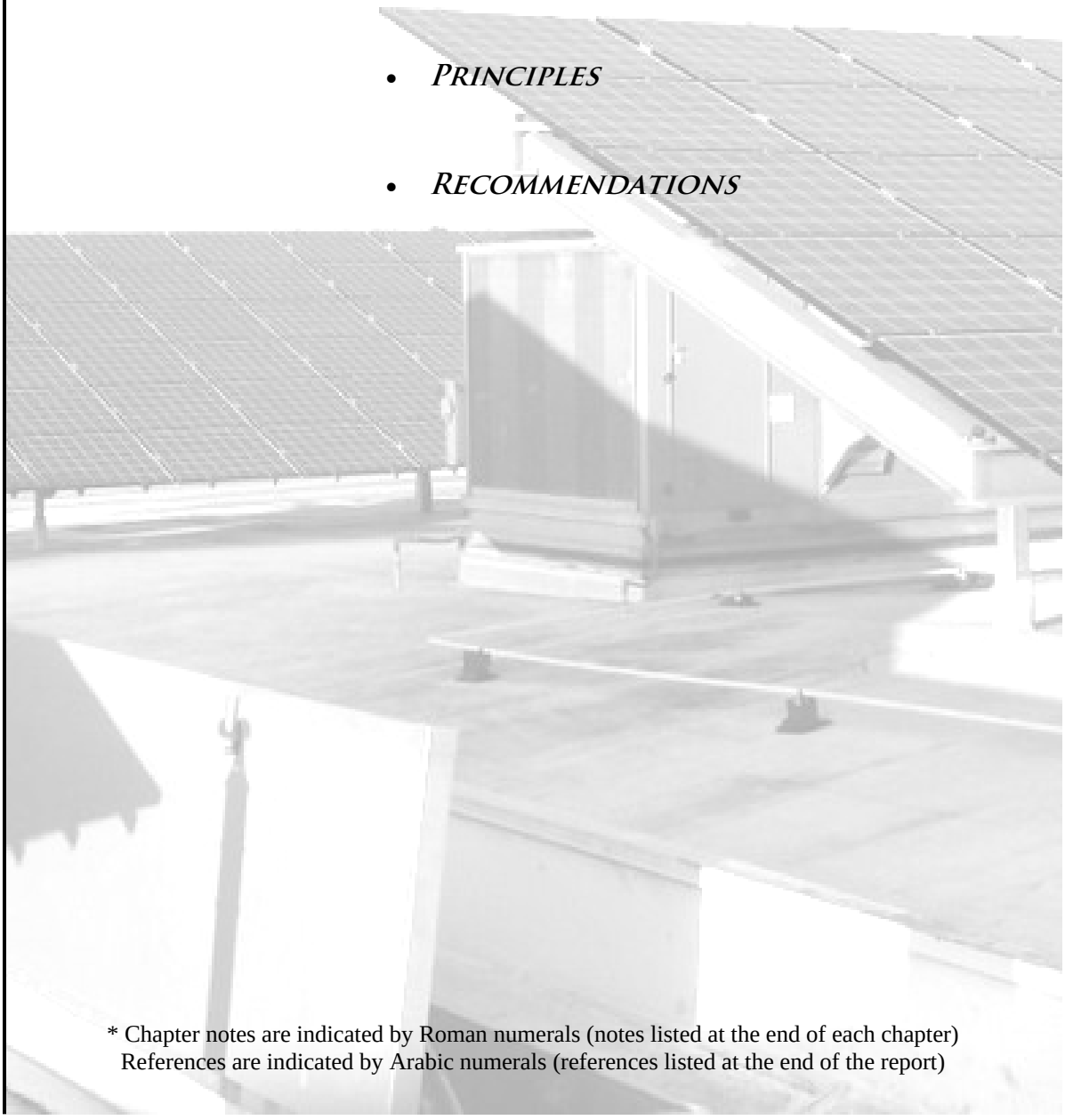
In summary, the City of Los Angeles has an opportunity to revitalize its industrial base through green manufacturing. Ordinances such as the Green Retrofit and Workforce Program create local demand for green building products. The City should link implementation of the ordinance with efforts to promote local manufacturing and the longer-term goal of economic development that improves the quality of jobs, the environment of local communities, and worker and community health and safety.

- **Key Recommendations: Creating a Model Program** *

- *Questions*

- *Principles*

- *Recommendations*



* Chapter notes are indicated by Roman numerals (notes listed at the end of each chapter)
References are indicated by Arabic numerals (references listed at the end of the report)

KEY RECOMMENDATIONS: Creating a Model Program

New reports on the green economy surface almost daily. This report focused on how the concept of green jobs and the goals of sustainability can be applied to the reality of implementing a green building retrofit policy in a major metropolitan area with numerous public sector buildings and with large areas characterized by a history of disinvestment. It contributes to the growing body of knowledge about green jobs by highlighting the need to create ***good, green, safe jobs*** that benefit community economic development, the environment, and worker and community health. The report provides information and tools for use by the Green Building and Workforce Program Director, the City Interdepartmental Taskforce and the Advisory Council – entities to be created pursuant to language in the Ordinance.

We set out to answer the following questions:

- *With more than 1,000 buildings to be retrofitted, how should the City proceed?*
- *What specific steps are needed to achieve the sustainability goals of the ordinance—to improve the environment, create jobs and generate cost savings, and promote health and safe job conditions? How can we measure the results?*
- *What are the workforce development needs? What resources exist?*
- *Where are potential sources of funds to carry out these efforts?*
- *How can workers, community members, and their representatives be involved in the decision-making process?*

Several principles underlie the recommendations: Our recommendations range from the specific and technical aspects of implementing green building retrofits to the social justice aspects of investing in underserved communities and, ultimately, to the broader goal of building a movement for good, green, safe jobs and a more sustainable Los Angeles.

1. ***Sustainability goals*** – Implementation of the Ordinance must maintain sight of goals to improve the environment, invest in cost-saving systems, generate good, green, safe jobs, and enhance the health of workers and building users. Implementation must also be carried out through a lens of social justice and equity.

2. ***Role of government*** – City government must play a critical leadership role as policy maker, employer, owner of large-scale building stock, contract administrator and procurer of equipment and supplies.

3. ***Civic engagement*** – Involvement of workers and informed input from community, labor and environmental representatives is critical to successfully implement the Ordinance and to create a movement for green retrofits that extends beyond city buildings.

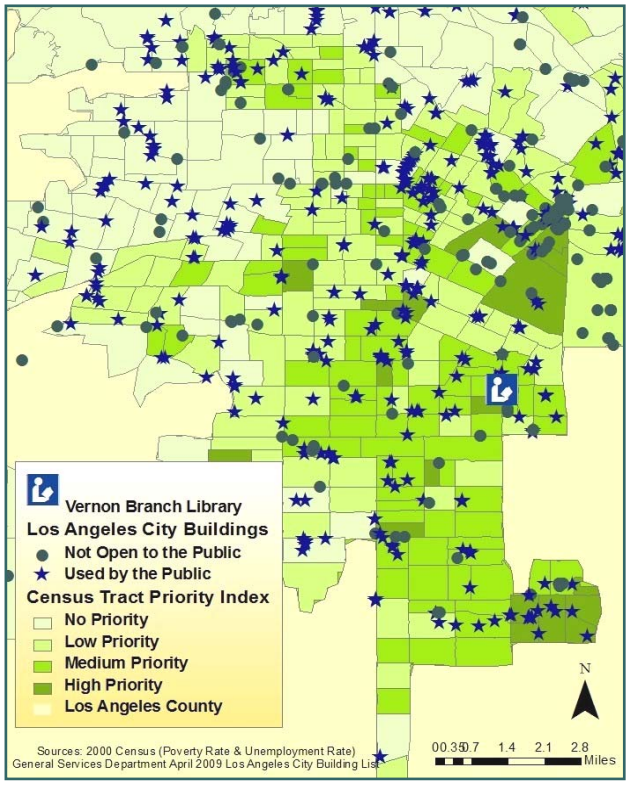
KEY RECOMMENDATIONS: Creating a Model Program

1. Establish structures and processes to facilitate the informed participation and involvement of workers, community members, and their representatives.

- Develop a participatory training program for City Interdepartmental Taskforce and Advisory Council members in a forum that allows for mutual education among members and from external advisors.
- Implement an outreach and education plan for city workers and building occupants through city departments and the City Coalition of Unions to achieve worker buy-in and active participation in efforts to green LA City buildings.
- Collaborate with local community-based and youth organizations and schools to create a community outreach and education program. Hold a community event in local public-use city buildings when embarking on a green retrofit project in that community.
- Establish a Joint Labor Management Safety Committee as outlined in the 2007-2012 Mutual Gains bargaining agreement. Educate and involve Committee members in the building selection, audit and retrofit phases to identify health and safety risks workers might confront during retrofits and to recommend appropriate precautions to protect workers, building occupants and the community.

2. Prioritize buildings based on social justice goals and potential for energy efficiency and cost savings.

3. Use the Building Selection tool (see Appendices: Building Selection Tool) to create a list of community-serving buildings in areas of high poverty and unemployment to ensure investment in underserved communities.
- Identify those on the list that present health and safety risks and that represent different geographic areas to enhance widespread public awareness and support for the program.
- Select 10-15 buildings from the priority list that represent each major building category for inclusion in a retrofit pilot stage.
- Establish a documentation and tracking system upfront to monitor reductions in energy use and green house gas emissions, water conservation, job creation and enhancement, cost savings and improved health and safety conditions.



Poverty and Unemployment Rate Index
Close-up of South Los Angeles

- Expand the program to include all buildings targeted by the Ordinance and apply lessons learned from the pilot stage.

3. Conduct Comprehensive Audits and Retrofits to keep sight of the Ordinance's overarching environmental, economic and health sustainability goals.

LA City Library Site Visit, 2009

- Gather and analyze utility data across the City's building portfolio to obtain a benchmark ENERGY STAR rating for each building. Factor the rating into the building selection process to identify buildings and retrofits that will generate cost savings to help fund the program.
- Conduct onsite comprehensive audits of prioritized buildings. Collect data to inform retro-commissioning and to identify energy-saving retrofits and safety precautions needed. Interview building staff and users, test building systems, and perform short-term diagnostic monitoring. Document indoor air quality concerns of occupants.
- Establish benchmarks for energy and water use and associated utility costs, rates of injury, illness and absenteeism and other indicators for use in monitoring the impact of retrofits.
- Use the Retrofit Planning Matrix tool (see page 27) to initially prioritize energy-saving and water conservation retrofits that will generate cost-savings and create jobs; to achieve ENERGY STAR certification; and to address the 13 retrofit elements in the Ordnance.
- Implement other sustainability-related city policies such as the Environmentally Preferable Products Purchasing Program.
- Achieve and maintain LEED-EBOM Silver certification for all buildings targeted under the Ordinance. This will require investment in retrofits and worker education and involvement to optimize ongoing operations and maintenance.

4. Create partnerships among existing workforce development resources to build pathways into green, sustainable careers – with living wages, safe working conditions, health benefits, and opportunities for growth and advancement – for both City building retrofit jobs and beyond.

- Conduct a 'job audit' for each major building type during the pilot phase to quantify the kind of jobs and associated job skills required and the potential health benefits and hazards of those jobs.
- Build on existing Memoranda of Understanding and on past Los Angeles experience with Project Labor Agreements, local hire policies, the City Jobs model and others to provide promotion opportunities for existing workers and to recruit workers from underserved areas of the City.
- Provide education and wrap-around services to support workers who confront barriers to employment such as the need for job preparation skills, child care, and other social services.
- Integrate education about the environment and the green economy into existing programs – pre-apprentice, apprenticeship and community college, as well as worksource center and community group programs – along with job skills training and health and safety education so workers understand the importance of their role in promoting a green economy and precautions required to protect their own health and the health of other workers and the community.

5. Identify short-term start up funds and establish longer-term finance mechanisms to sustain and expand the program.

- Use available ARRA* and other local, state and private-sector funding to jumpstart energy efficiency retrofits and workforce development programs. Potential sources include the Energy Efficiency Block Grant and State Energy Program funds, Department of Labor Workforce Investment Act and Green Jobs funding.
- Use Qualified Energy Conservation Bonds to fund projects that test new green building technologies and to finance an educational campaign to promote green behaviors among workers and communities using public buildings.
- Create a revolving energy fund loan to finance retrofits that have a quantifiable monetary savings or return such as energy efficiency, energy/water conservation, renewable energy, and retrocommissioning.
- Use government funds to leverage private-sector funding sources for expanded programs.

6. Inform workers, surrounding communities and the public at large about the Ordinance, with the longer-term goal of building a movement to expand good, green, safe jobs in the green economy.

- Create targeted media messages and use social networking avenues to reach targeted constituents, including youth and adults.
- Integrate environmental literacy and participatory education activities into programs for the new and existing workforce such as job training and workforce development programs. Where possible, use a peer education approach – worker to worker, community member to community member.
- Create visual factsheets and other materials for distribution at community events. Partner with community groups, churches, schools and other organizations to identify avenues to reach their constituents.

7. Expand the impact of the program by creating a model that can be adapted in other cities and in the private sector. Explore possibilities to revitalize the local manufacturing sector by producing products for green building retrofits.

- Leverage the City's purchasing power to stimulate demand for locally produced green building products and provide incentives to create good, green, safe manufacturing jobs.
- Implement policies to stimulate comprehensive green retrofits within the City's large commercial and residential building stock.
- Provide information and guidance about ways to adapt the Los Angeles City program to other cities throughout the region and to county buildings.

* ARRA - American Recovery and Reinvestment Act of 2009

KEY RECOMMENDATIONS: Creating a Model Program

LA Labor-Community Forum, 2009

Los Angeles has a unique opportunity to implement a Green Building Retrofit and Workforce Program that can serve as a model within the region and nation-wide. The Program is innovative in its origin and focus. Created by a coalition of labor, community and environmental organizations, it establishes a mechanism for ongoing input through an Advisory Council with stakeholders from similarly diverse backgrounds. Its focus is comprehensive, addressing three critical issues facing our society – environmental degradation, escalating unemployment and health problems that stem from our built environment.

A comprehensive approach to implementing the Ordinance will address some of the tensions likely to surface, particularly during this economic downturn.

- *How can we ensure that people desperate to work have access to **quality** jobs rather than being forced to accept any job available?*
- *How can we create **good, green, safe jobs** that provide union representation and lead to careers?*
- *And, finally, how can we balance the need to maintain jobs for existing workers and the need for employment in underserved, disadvantaged communities that confront huge employment and health disparities?*

Los Angeles has taken the lead to confront these tensions through a policy that will create good, green, safe building retrofit jobs and establish a workforce program to educate existing workers and recruit new workers from underserved communities. Through this innovative program, and others that it inspires, Los Angeles leads the way to create a more sustainable city.

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"Working in Unity, Greening Our Community", Downtown Labor Center, August 2009

Community Scholars Participants

Top Row: **Johnny O'Kane, Ironworkers 433; Sharon Gagan Cech, Urban Planning; Marisol Wauters, Urban Planning; Brandi Odom, Urban Planning; Laura Henne, Urban Planning.**
Bottom Row: **Graciela Geyer, SCOPE; Sharon Anderson, CCI-Worksource; Eileen Burstein, Mechanical Engineering**

Colleen Callahan, Urban Planning; Sabrina Bornstein, Urban Planning; Megan Emiko Scott, Public Policy; Michelle Wong, Bresee Foundation

"The opportunity to work with the community scholars created a great medium for expanding my understanding of applied green urbanism and what it really means." - Urban Planning Student

Daniel Garcia, Bricklayers Local 4; Maya Saraf, Urban Planning; Jessica Barcellona, UCLA-LOSH; Sarah Jacobs, UCLA-LOSH

Community Scholars Participants

Top Row: **Margaret Schwartz, California Conservation Corps; James Irwin, Painters and Allied Trades District Council 36; Petar Blanusa, AFSCME Council 36; Haan-Fawn Chau, Urban Planning**
Bottom Row: **Ruth Reyes, Pacoima High School; Alexis Lantz, Urban Planning; Greg Ptacek, Downtown Film-Festival**

Tom Norton, SoCal Pipe Trades

"I LOVED hearing from practitioners in the field. I have a more solid sense of workforce development programs and their role in social justice work."
- Urban Planning Student

Top Row: **Serena Lin, Legal Aid Foundation of LA; Aditi Mahmud, Urban Planning; Camille Cimino, Strategic Actions for a Just Economy (SAJE); Roxanna Aguilar, SAJE; Hector Huezo, Goodwill Southern California; Tammy Camarillo, Urban Planning**
Bottom Row: **Kristen Coleman, Urban Planning; Clare Robbins-Fox, Urban Planning; Marcy Koukhab, Public Policy**

Community Scholars Participants

Alexa Engelman, Law;
Zoe Elizabeth Mangan,
Urban Planning

Lori Moilov
(seated on right)
Cal State University,
Long Beach

"We shared our experience to allow the students to understand how things work in the real world. And we learned new research techniques from the students."
- Community Scholar

Top Row: **Matthew Palmer, Urban Planning; Benito Robles, Labors-Employers Cooperation and Education Trust (LECET); Robert Lizarraga, LECET; Christopher Gladora, Urban Planning; Jose Trujillo, AFSCME Council 36**
Bottom Row: **Lupe Perez, PIPE Trust Fund and SoCal Pipe Trades; Maeve Johnston, Urban Planning; Elizabeth Paez, Latino Issues Forum**

Acknowledgements

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"The benefits of diversity and experience were priceless." - Community Scholar

Community Scholars Participants **-** The active engagement of the students, labor and community scholars listed on the previous pages led to lively debates about green jobs, sustainability and social justice. They attended evening classes, participated enthusiastically in site visits and meetings outside of class; and interviewed an array of labor and workforce development representatives, educators, community and environmental justice organizers, City staff and policy makers. It was an honor to teach a group of such dedicated students and scholars.

Course Speakers & Advisors **–** Numerous people contributed to the success of the class. Jackie Leavitt, Kent Wong and Brian Taylor from UCLA provided advice and a historical perspective about the origins and importance of the Community Scholars program. The ongoing advice and class presentations from Elsa Barboza, Joanna Lee and Gloria Walton from the LA Apollo Alliance and SCOPE (Strategic Concepts in Organizing and Policy Education) were invaluable as were those of City staff Krista Kline and Romel Pascual from the Mayor's office. We also benefited from thoughtful and inspiring presentations by Sean Arian, Martha Matsu-oka, Manuel Pastor, Dave Sickler, Victor Narro, Teresa Sanchez, Jason Elias, Mike Massey, James Irwin and Terrence Mack. Special thanks to Elizabeth Stewart and Revel Sims for ideas and hard work as we planned weekly classes, organized site visits, and developed this report. Thanks as well to Andrea Arias and John Vu for assistance with weekly class logistics.

"The most interesting was the visit to the IBEW 11 training center. We benefited from the breadth of knowledge and paradigms presented." - Public Health Student

Site Visits **–** The Community Scholars program is dedicated to applying theory and research to critical policy issues and real life settings in Los Angeles. Our ability to do so was enhanced by site visits to the IBEW Local 11-NECA Electrical Training Institute, Tree People and the Vernon Branch Library. Our gratitude to Kim Craft, Jane Templin, Diana Limon, Eric Brown, Pat Owens and Shamari Davis from IBEW Local 11; to Dan Eason, Bruce Hansell, John Gorton, Dave Costa, Robyn Myers, Jie Rem and other staff from the City and Vernon Branch library; to Mathew Palmer and to Edith Ben-Horin at Tree People. Many thanks as well to Terrance Mack and Daniele Aquino for their expert assistance with site visits at the Vernon Branch library.

Acknowledgements

Briefings and Conferences **–** Community Scholars 2009 participants shared research findings and solicited feedback in three venues - a Winter quarter briefing at the UCLA Downtown Labor Center, a Spring quarter briefing at Los Angeles City Hall and a community conference in August at the Downtown Labor Center. These events provided an avenue to disseminate research results to hundreds of stakeholders. We are grateful for the assistance of the UCLA LOSH and Labor Center staff, of Deputy Mayor Larry Frank and Lorraine Green, and of City staff Debbie Kindred and James Gibson as well as Public Works Commissioner Julie Gutman.

"This course brought together people of diverse perspectives to get a fuller picture of all the issues surrounding green jobs." - Urban Planning Student

Speakers at the August 5th "Working in Unity, Greening our Communities" conference inspired us as we celebrated passage of the groundbreaking Ordinance and discussed next steps to implement it as a national model. Our thanks to Larry Frank, Manuel Pastor, Elsa Barboza and Joanna Lee, Phil Thompson, Krista Kline and Romel Pascual, Teresa Sanchez, Richard Slawson, Daniel Villao, Jane Paul, Dave Sickler and Kent Wong. SCOPE arranged for translation into Spanish and IBEW Local 11 generously hosted the lunch barbecue, cooking for everyone under the summer sun.

Thanks to Chris Tilly and the IRLE for supporting Community Scholars events. Thanks also to Sharon Beard and Chip Hughes for their vision and support to integrate worker health as a critical component of green jobs. We'd also like to thank the myriad of additional contributors to this report—too numerous to mention here.

Finally, thanks to Maya Saraf, Sabrina Bornstein, Clare Fox and Kevin Riley for editorial assistance with this report and to Susan Holcomb for the many hours she dedicated to the report's design.

It has been an honor to teach Community Scholars 2009 and it is my hope that this report will serve as an impetus to create a model program for good, green, safe jobs in Los Angeles and beyond.

Linda Delp

Linda Delp, Director
UCLA-LOSH

From left to right:
Coralie La Salle, SHEPMA;
Linda Delp, UCLA-LOSH;
Gloria Walton, SCOPE;
Graciela Geyer, SCOPE